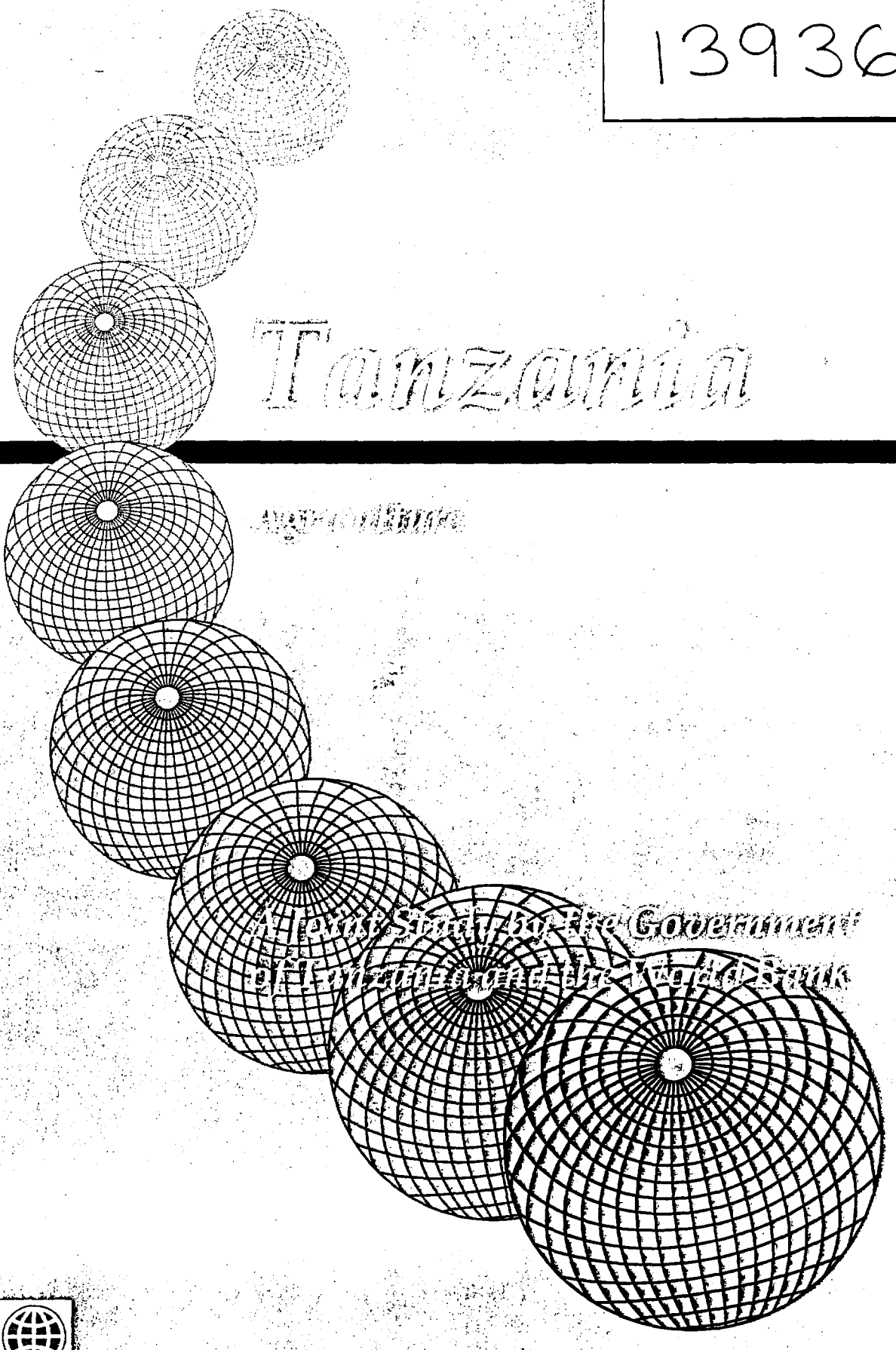
Tanzania



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PREFACE

This report is a collaborative effort between the Government of Tanzania and the World Bank. It draws on the studies undertaken for the Agricultural Adjustment Program of 1990, on papers commissioned during 1991 and 1992, an Agricultural Diversification and Intensification Study financed by ODA, completed in September 1992, and recent Mid Term reviews for the donor-supported Agricultural Research, Agricultural Extension and Tree-Crops projects. The review process was initiated formally in March 1992 by the Government and the Bank with assistance from the donor community, and seeks to assess constraints to growth and formulate development policy for the agricultural sector. A joint Government/Bank mission assembled during October and November 1992 to review studies, assess field activities, and draft a first statement of development priorities. Direct support for this effort was provided by ODA, FAO, Finland and Ireland. The mission concluded with a week long seminar on agriculture policy with participation from Government agencies, donors and the private sector. To sustain the participatory process, the preliminary conclusions of the joint report were reviewed with the Government at a technical level in July, 1993. A formal review of the Green Cover report was held in October 1993.

Since the main mission in November 1992, the Government has acted on many of the policy recommendations made at that time. Significant changes in policy include the unification of the official and the market exchange rate in August, 1993, which removed the implicit tax on agricultural exports, and the passage of a law, also in August 1993, which allowed the private sector to enter the processing and marketing industries in coffee, cotton, cashews and tobacco. Fertilizer subsidies were discontinued in the 1994/95 Budget. These policy changes have been reflected in the text, and in a matrix attached to the executive summary.

The report provides an overview of agro-ecological characteristics, the rural household, and the institutional framework which together determine Tanzania's agricultural development prospects. Section I sets the stage with a brief review of agricultural growth since the late 1960s, identifying the sector's performance under different policy regimes. The macroeconomic framework is described with a brief assessment of its effect on agricultural growth. Section II describes the natural resource base, land use, and the nature of the rural household, drawing on a recent Poverty Profile to identify disadvantaged regions and characterize the rural poor. Tanzania has a very diverse geography and ecology. Population density and agricultural potential vary considerably across regions. The implementation of a development strategy will differ by region. To clarify the constraints and opportunities available across the country, and to assist in identifying concrete actions in the implementation of the proposed strategy, a review of the rural population and infrastructure density by region is presented. Section III provides an assessment of the Government institutions, farmer cooperatives, and other enterprises which support agricultural development, identifying new roles and priorities as the framework for economic management is restructured to foster competition amongst private enterprises in the provision of services to agriculture. In 1986, the process of adjustment was accelerated with rapid devaluations, various measures to increase private sector participation in the economy, and an agreement with the World Bank, the IMF and other donors on a substantially enlarged financial assistance program. Section IV starts with an assessment of the results of adjustment on agricultural production. Following a review of market prospects for Tanzania's produce, an in-depth review of key subsectors is undertaken, to provide a more thorough understanding of the constraints to growth, and the detailed measures needed to revitalize the agricultural economy.

In Section V, the report attempts to fit the characteristics of the various subsectors, the constraints to development and growth opportunities described in Section IV, to the Government's objectives for the sector. Thus, it is shown how a focus on re-establishing profitability for traditional export crops can address not only the foreign exchange constraint the country lives under, but also address poverty

alleviation concerns. Similarly, facilitating the intensification of cultivation can have important positive effects on rural family incomes, and diminish environmental concerns of increased pressure on lands of marginal agricultural potential. The process of intensification, coupled with a liberalized foreign investment policy, and a restructured financial system will permit the gradual diversification of agricultural exports into high value products and non-traditional goods. A coherent policy of land and natural resource management (addressing tenure definition, assessment and location of regional areas of good potential, judicious location of infrastructure) can have important effects on rural incomes as well as mitigate concerns regarding mismanagement and loss of topsoil, and expansion into marginal areas where agriculture is unsustainable. Similarly, a nationwide policy on water management, coupled with the rehabilitation and improvement of smallfarmer traditional irrigation schemes will reduce conflicts on water use for purposes of agriculture or power generation and raise rural incomes at minimum cost.

Also in Section V, the report recommends Government interventions in the short and medium term, to support agricultural development. A short term program aimed at reversing price distortions and recuperating losses due to inefficient processing and marketing industries would focus on: (i) revitalizing the export processing industries, and (ii) continuing to reduce Government participation and control in produce marketing and input supply mechanisms for the sector. In the medium term the report recommends measures to: (i) improve the Government's ability to understand and influence the market-determined incentive structure for agricultural production and processing, enhance competition in liberalized input and product markets, and at the same time, manage the country's natural resources to sustain productivity and minimize negative environmental consequences; (ii) improve the functioning of markets for the land, capital and labor elements of the agricultural production process, and (iii) induce technological change by improving the efficiency of markets that supply improved agricultural inputs, and by increasing the effectiveness of the Government's agricultural research and extension services.

The final Section VI provides a brief review of the potential role of Government in supporting and investing in agricultural development. Following an assessment of the performance of the Bank's previous projects in the sector, the report provides a list of potential areas and priorities for Government and donor collaboration in projects and programs.

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This report is a joint effort of the Government of Tanzania and the World Bank. It was prepared following a joint mission to Tanzania in October and November 1992. The Government Task Force for the review, under the general direction of Mr. W. Ngirwa (CPM-MOA), was led by Mr. P.M. Lyimo (MOA), and included Mr. E.T.K. Luyangi, and Mr. E.M. Sikana (MLHUD), Dr. E.C. Ndisi (BOT), Mr. J.M. Madika, Mr. R.R. Makusi, Mrs S. Kaduma, Mr J.S. Mawalla, Mr A.O. Farahani, Mr. A.L. Ngondo, Mr. D.R. Mbwele, Mr. O.N.E. Shuma, Mr. D. Urasa, Mr. E.J. Lujuo, Mr. J. Crees, Mr.T.E. Banda, Mr. D.A. Kajumulo, Mr.A. Lamosai, Dr.M.L. Ngutter, Mr. I.N.L. Kaduma, Mr. E.L.K. Bubelwa, Mr. N.S. Mwasalyanda, Mr.Mdadila, and Mr. Uledi (MOA). The Bank team was led by Mr. J. Coates and included Mr. R. Noronha, Mr.M. Mayfield, Dr.N.S. Shetty, Mr.K.M. Agarwal, Mr.A. Finney, Mr.R. White, Mr.R. Southworth, Mr.M.J. Hebblethwaite, Mr.J.P. Srivastava, Mr.R. Gray, Mr. W. Van der Geest, Mr. J. Grindle, Mr. F. Byamugisha, Mr.D. Gustafson, Mr.R. Kettering, and Mr.H. Porvali. Mr. D. Cotlear and Mr. R. van den Brink led the Bank preparation efforts prior to the October 1992 mission. The report was prepared by Mr. J. Coates and edited by Ms M. Hileman. The work was carried out under the supervision of Ms. S. Ganguly, Chief, AF2AE. The Peer Reviewer was Mr. G. Donovan, the Lead Economist was Mr. P. Miovic and the Department Director, Mr. F. X. Colaço.

ABBREVIATIONS AND ACRONYMS

ASMP	Agriculture Sector Management Project
CBS	Central Bureau of Statistics
ERP	Economic Recovery Program
FAO	Food and Agriculture Organization
FSAC	Financial Sector Adjustment Credit
GDP	Gross Domestic Product
IDA	International Development Association
IMF	International Monetary Fund
LART	Loans and Advances Realization Trust
MDB	Marketing Development Bureau
MOA	Ministry of Agriculture
NALERP Program	National Agricultural and Livestock Extension Rehabilitation
NALRP Program	National Agricultural and Livestock Research Rehabilitation
NGO	Non-Governmental Organization
NMC	National Milling Corporation
PPMB	Project Preparation and Monitoring Bureau
PSAC	Public Sector Adjustment Credit
UNDP	United Nations Development Program

EXECUTIVE SUMMARY

Sectoral Background

Agriculture is the foundation of the Tanzanian economy, providing employment, food and exports. Some 84 percent of the employed population work in agriculture[1], producing 61 percent of both GDP and merchandise exports[2]. Tanzania's 3.5 million farm families work small holdings with an average cultivated area of 0.9 hectares. Some 93 percent of all farmers cultivate less than 2.0 hectares[3] each. Average GDP per capita in 1992 [4] was estimated at $ 110, making Tanzania one of the poorest countries in the world.

Food crop production dominates the agricultural economy totaling 55 percent of agricultural GDP[5], with livestock accounting for 30 percent, and the traditional cash crops (coffee, cotton, cashewnuts, sugar, pyrethrum, tea, tobacco, sisal) for only 8 percent. Fishing and hunting contribute 6 percent and forestry 1 percent of agricultural GDP.[6]

Average GDP growth for the whole economy since the mid-1970s has been below the population growth rate. Between 1967 and 1978 the population grew at 3.3 percent per annum, vs. 3.6 percent per annum for GDP. Population growth slowed to 2.8 percent per annum between 1978 and 1988[7], and GDP grew only at 1.7 percent per annum. As a result, GDP per capita fell during the early 1980s, and is only now beginning to rise to the levels enjoyed in the early 1970s. Presently real income per capita, evaluated using various deflators, is not much higher than it was in the mid-1950s.

Real growth in agricultural GDP[8] has paralleled total GDP growth from 1966 through 1992. Agriculture averaged 2.8 and GDP averaged 2.7 percent per annum[9]. The similarity is misleading; there have been sharp divergences between growth in agriculture and GDP (see figure below). Growth in agriculture lagged significantly behind GDP during the initial period of increased Government intervention in the economy. Average annual growth rates differed by some 45 percent in 1966-75, and 65 percent in 1976-80. In the early 1980s, the bottom of the economic decline, agriculture had actually started to recover, even while GDP growth was negative. Agriculture growth has led the economy through the periods of reform and economic recuperation since the early 1980s, responding to the earlier reforms in marketing of agricultural produce.

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1 ILO, "1990/91 Labor Force Survey Tabulations", Table M-1.

2 Based on official data, three year average.

3 URT, Bureau of Statistics, Agricultural Sample Survey of Tanzania Mainland, 1989/90, Table 9.

4 World Bank, World Development Report 1994. p 162. There are indications that official GDP statistics do not capture much of the economic activity which takes place in the informal sector. Inclusion of this "second economy" would increase total GDP estimates by a minimum of 45 percent (Maliyamkono, T.M., and Bagachwa, M.S.D., "The Second Economy in Tanzania", Eastern African Studies, James Currey, London, 1990).

5 At current prices. In 1976 prices however, livestock was only 13 percent of agriculture GDP in 1989-91, with crops accounting for 76 percent. This indicates a substantial shift in the price of livestock output relative to crops, which is hard to find evidence for.

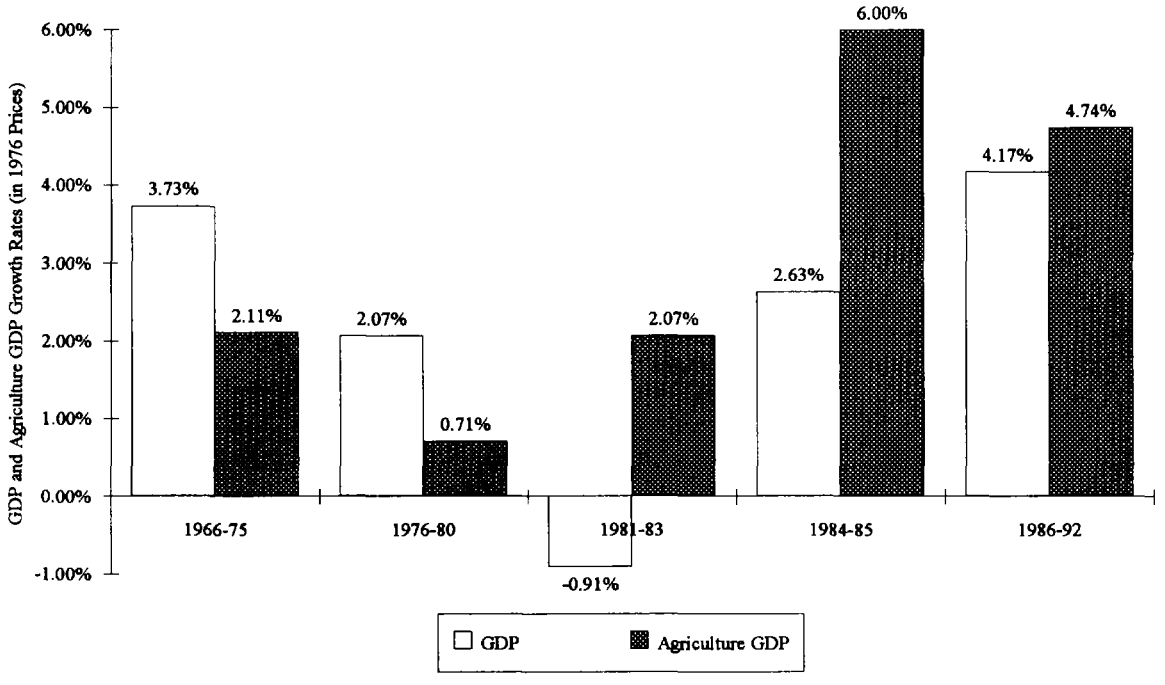
6 URT, Bureau of Statistics, "National Accounts of Tanzania 1976 - 1991", Table 10.1 and mission estimates.

7 These are Census years.

8 Unless mentioned specifically, all trend growth rates are average annual exponential rates, calculated using the least squares method.

9 In 1976 prices.

Real Growth in GDP and Agriculture GDP (1976 prices)



. The normal process of structural transformation, and the gradual decline in agriculture's share of total production which accompanies the shift of resources into higher-valued activities and sectors came to a halt in Tanzania around 1967. In the early 1960s agriculture represented some 60 percent of the economy. Agriculture's share of the economy had dropped to 40-45 percent by 1968, and remained at that level through 1980. Under the agriculture-led reform program of the mid-1980s, agriculture increased its share of output to around 60 percent.

Crop production , which accounts for 65 to 75 percent of sectoral GDP, has maintained a steady growth rate[10]. In spite of the changes in social and economic policy, growth in output has been between two and three percent per annum. This is to be expected in an agricultural economy based on subsistence farming where an estimated 40 percent of food consumption comes from home production. Under the various policy regimes, annual average growth rates for livestock and the other sub-sectors have been negative on occasion until the period of in-depth reform began in 1986.

Lessons from this Review

This report reviews agricultural performance since independence. Institutional and economic factors are analyzed in order to try and explain the successes and failures of past policy. Some key conclusions, which form the basis for subsequent recommendations on sectoral development policy, are set forth below.

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10 Official data is not available on the breakdown of agriculture GDP. The mission has constructed its own version of the agriculture GDP series from 1976 through 1991, following the methodology used in the CEM. Details on these calculations are available in the Working Paper. References to elements of the agriculture GDP are based on mission estimates.

Smallholder Supply Response

One of the main conclusions of this review is to reaffirm the notion that smallholder farmers respond vigorously to changes in the incentive environment. The economy can rely on smallholder farmers to respond to food shortages, and to foreign exchange earning opportunities, as long as the financial returns to these endeavors are attractive. Smallholders will also adopt new technology if such improvements increase returns to labor without undue increases in risk. The widespread adoption of fertilizer and hybrid seed and other productivity enhancing technology in the high potential agricultural areas provides evidence for this observation. Further evidence is provided by the farm level survey[11] undertaken as a precursor to this study, which indicates that farmers give high priority to improving timely access to productivity improving inputs such as fertilizer.

The implications of this conclusion are that the current structure of production can be relied on to respond effectively to the country's present needs. To produce the present mix of crops, a structure based on individual smallholders is the most efficient, flexible and responsive. The transformation in production technology and productivity necessary to achieve high rural incomes and growth will take place in the smallholder sector, given time and the correct incentives. Smallholders are rapidly entering the market economy, and are highly responsive to changes there. The rapid agriculture supply response to the increased availability of consumer goods in rural areas in 1984-1985 is a case in point. This system can rapidly become more productive using technologies which are already available.

Commercial farms will also be an important source of marketed agricultural production. However, their current contribution to total agricultural output is small, with the exception of certain key sectors such as sugar and high value non-traditional agricultural exports. Over 75 percent of the area under large commercial farms is owned and operated by the Government. Measures taken to revitalize product and factor markets for smallholders will also give impetus to the larger farms. The divestiture of the large Government owned farms and the development of a land market will be necessary to foster the development of commercial agricultural production.

Expansion in Area Cultivated

This review indicates that the area now dedicated to cereal cultivation, using low levels of technology and long fallowing requirements, can theoretically be increased by two thirds without changing technology or affecting the sustainability of production. However, this estimate does not take into account access to markets and other constraints. To use the additional two million hectares of high potential agricultural land which is still underutilized and not in fallow or reserves, enormous investments would have to be made in new roads and social infrastructure, and there would have to be large movements within the rural population. In fact, the limits to sustainable horizontal growth have been reached in many regions. However, if levels of technology are increased and fertilizer, mulching, terracing and other intensification techniques are used, the effective output of the high potential land in the country can be doubled (see table below). Many of these techniques are already in use in the Northern Highlands.

A number of implications follow: (i) the scope for horizontal expansion is limited, and may have negative effects on the sustainability of cultivation in certain regions; (ii) the introduction of new and simple technology, especially to maintain and increase soil fertility, can greatly increase the population carrying capacity of the high potential land; (iii) migration to the underutilized soils of high potential should be indirectly encouraged through improvement and expansion of infrastructure and increased dissemination

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11 Oxford University Food Studies Group and Sokoine University, "Agricultural Diversification and Intensification Study", 1992, Final Report.

of information. Voluntary population flows should be guided and assisted to ensure cultivation of the best lands using the most appropriate techniques, and to avoid expansion into the poor, unsustainable soils.

Assessment of Area Suitable for Cultivation of Maize and Rice ('000 ha)				
Crop	Technology Level	Gross Area Suitable ('000 ha)	Area Available for Agriculture[12] ('000 ha)	Available Adjusting for Full Fallow. ('000 ha)
Maize	Low	10,060	7,511	3,004
	Intermediate	12,179	9,388	6,100
Rice	Low	3,173	2,342	2,342
	Intermediate	4,020	2,918	2,918
Maize + Rice	**Low**	**13,233**	**9,853**	**5,346**
Share of Cereals Area (3.3 million ha)			**34 percent**	**62 percent**
Maize + Rice	**Intermediate**	**16,199**	**12,306**	**9,018**
Share of Cereals Area (3.3 million ha)[13]			**27 percent**	**37 percent**
Mainland Tanzania		**88,332**	**66,440**	

Roads Make a Difference

Measures to improve smallholder access to the market economy, thus reducing the price of consumer goods and agricultural inputs and raising the price of agricultural output, will have a decisive effect on production. Roads are a key ingredient in this process. The correlation between rural road density and high income in rural areas, although not proof of cause and effect, has been pointed out in this review. Transportation costs are lowered. Access to market information is improved. Competition among traders in agricultural produce and suppliers of agricultural inputs is increased to the farmer's benefit. Access to off-farm employment is increased. All these effects increase farm family income, and farmers' responsiveness to market conditions. While the effect of road improvement is most visible, improving other infrastructure such as rural electrification and rural water supply systems can also have a decisive effect on agricultural intensification.

In addition to facilitating intensification, Government decisions on where to locate new roads is most important for determining the location and success of horizontal expansion in agriculture. Ministry of Works decision-making on where to construct new agricultural feeder roads, and which rural roads to rehabilitate, should be preceded by intensive review of the factors that determine agricultural potential: soil

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12 After discounting land of suitable potential located in parks and reserves.

13 This is roughly the area under cereals in the MOA statistics. It coincides with the area planted to annuals under small and large farms, using mission calculations based on the 1971/72 Agricultural Census and the various AGSASU in the BOS statistics.

quality, rainfall and moisture availability, and distance from market, as well as a detailed assessment of the environmental consequences of agricultural development. District level information on agricultural potential is needed to determine road building (or rehabilitation) priorities.

Agro-ecological Information Base

The analysis in this report has suffered from an inadequate or unreliable information base. This shortcoming will continue to affect the quality of policymaking in the agricultural sector. In a more liberalized economy, Government interventions in the agricultural sector will be based on the exception; the state will only intervene where markets are not functioning correctly. To intervene effectively, policy makers have to be aware of failures or inadequacies in the marketing or supply systems, in environmental protection mechanisms as well as in the land and contract dispute settlement arrangements. More resources have to be allocated for obtaining more information on the quality and use of natural resources (soils, forests, lakes and ocean), on the levels of production, and on prices in the various markets affecting the agricultural producer.

Decline in International Commodity Prices

In the late 1970s the real value of Tanzania's exports was affected by the increase in the price of oil. Tanzania's import capacity was again squeezed when the real value of exports was sharply reduced from 1987 by the sudden and sustained declines in the real prices of coffee, cotton and tea exports. Although it appears that prices of these crops have bottomed out and can be expected to recover gradually in real terms over the next 10 years, they are unlikely to return to the levels of the 1970s.

The decline in the prices for coffee, cotton and tea has pushed industry returns in the producing countries down to or below average variable cost. These markets are experiencing an international "shakeout" where only the most efficient, high-quality producers will survive. Tanzania whose flexible smallholder production system has low variable costs, and whose labor costs are low, is well placed to benefit from such competition. Smallholders will determine when to reduce expenditure on inputs and maintenance for perennial crops such as coffee and tea. Such crops can brought back into production fairly rapidly when the price is right. Tea even profits from such a rest.

However, the decline in prices within international commodity markets means that the rents available previously to Tanzania from its export crops have disappeared. These exports can no longer be taxed, through excise taxes or through the exchange rate as they have been since the 1970s, if international competitiveness is to be maintained. The luxury of inefficient processing industries can also no longer be afforded. Efficiency has to be promoted at all levels for exports to be commercially viable. Two points follow:

- At reasonably attainable input levels and yields, using existing prices, margins, and the official exchange rate (the "financial" analysis) certain key export crops (coffee, cotton, sisal and smallholder tea) are not commercially viable.

- When assessed using "economic" or scarcity prices, with taxes, tariffs and subsidies excluded, at the market rate of foreign exchange, all of Tanzania's current export crops are profitable.

The implications for Tanzania's export promotion policy are clear:

- Prices should be adjusted to scarcity or market values, with particular reference to the price of foreign exchange, if profitability and investment in the export industry is to be obtained.

- Research forms part of the country's competitive strategy in tight export markets. It is vitally important to increase farm productivity and reduce farm costs (especially for imported chemicals). The identification and promulgation of disease-resistant varieties of arabica coffee deserve special mention.

- Competition in export processing industries is needed to reduce margins and enhance international competitiveness.

Constraints to Agricultural Growth

Agricultural development in Tanzania faces tremendous challenges. Successful farmers have to overcome the problems of distance from markets for products and inputs; diseases affecting both livestock and crops, and the normal variations in rainfall and climate. In a semi-subsistence agricultural economy such as Tanzania's, growth in food production will always continue at more or less the rate of growth in population. Provided new arable land is available, and there is political stability, the process of expansion whereby new rural families bring additional land into cultivation to provide themselves with their basic food needs, is continuous. For growth in agricultural production to surpass population growth, subsistence farmers need to be brought into a market economy where the availability of consumer goods provides incentives for cash generation and off-farm sales. The market also provides the ingredients for increasing the productivity of labor on the farm, as well as an outlet for marketable produce. Rates of agricultural growth will be greater than population growth to the extent that smallholder semi-subsistence farmers are brought successfully into the cash economy.

Improved literacy and extension of the infrastructure, particularly roads are preconditions to a successful extension of the market economy . Over the past twenty years the Government has made great strides in reducing widespread illiteracy in rural areas. Rural roads however have been allowed to deteriorate. The report's analysis of the factors which have constrained agricultural growth over the past twenty years emphasizes areas where Government policy or institutional inadequacy have hindered the successful, **voluntary**, integration of the smallholder farmer into the cash economy. These factors can be characterized in three ways: (i) the consequences of the experiment with centralized economic management from 1967 to 1982; (ii) a decline in the efficiency of public services; and (iii) the inadequate development of supporting markets.

The Government Dominated Economy

Following the Arusha Declaration in 1967 the state assumed direct control of large sectors of the economy in order to obtain egalitarian income distribution and generate a sustainable, self-sufficient growth path. In those areas where the agricultural economy was dependent on the market to signal shortages and surpluses, and to induce a response from support services such as food marketing, inputs supply, export processing, financial and transport services, the state dictated prices. Markets for agricultural produce and inputs were controlled by monopolistic parastatals. There was a strong drive toward industrialization based on import substitution, and large investments were made in state-owned manufacturing enterprises. During this period the provision of social services improved significantly, and Tanzania was foremost in Africa on such fronts as access to health care, availability of education, literacy improvements, infant survival and access to safe water.

The effects of these policies on agricultural growth were not very positive, as noted below:

- The control of all producer and consumer prices by the state prevented the signaling of shortages and the generation of a supply response. These signals had to be transmitted

through the "second (or parallel) economy", outside the official system, adding to costs and uncertainty.

- Villagization and attempts to collectivize agriculture separated farmers from their perennial crops and known cropland, adding to costs and forcing the exploitation, often beyond sustainable levels, of the land close to the new settlements. Uncertainty related to possible relocation requirements and tenure insecurity reduced investment in land and conservation of soil fertility.

- The dissolution of the rural cooperative system and expropriation of its assets in the mid-1970s set back the development of a burgeoning rural institution capable of responding commercially to farmers needs in the remotest villages.

- The overvaluation of the exchange rate slowed agricultural exports, reduced international competitiveness, and caused severe shortages of foreign exchange.

- The barriers placed on the movement of labor, on the mobilization of savings by the financial system and on the allocation of capital all reduced the returns to investment in agriculture.

- The inefficiency, mismanagement, and over investment in the parastatal monopolies who were charged with the vital support markets for agriculture (processing, marketing and inputs supply), shifted resources out of the hands of farmers, consumers, and the state, which adversely affected farm level investment and caused losses in the banking system.

- The inefficiency and mismanagement in many of the cooperative unions, which were reestablished by fiat in 1985 without receiving compensation from the state for the depreciation of the machinery and other assets expropriated in 1976, has continued to plague the development of export crop industries, particularly the cotton industry.

These policies were not detrimental to agricultural development across the board. Panterritorial pricing (of maize in particular) and subsidized inputs clearly promoted maize production and agricultural development in the Southern Highlands. Regions such as far away as Rukwa and Ruvuma (over 1,000 km) supplied Dar es Salaam, albeit at great public cost.

Inefficiency of Traditional Public Services

During the period of direct Government involvement in production, the state took on more than it could handle. Funding for the traditional support services to agriculture declined. The ineffectiveness and disorganization of public research and extension services reduced the generation and dissemination of improved varieties and husbandry techniques. Without funding for maintenance rural roads deteriorated. The profitability of the railroads declined. The gradual decline in the quality of the road, rail and communications infrastructure raised transport and information costs at the expense of the farmer and the consumer.

Non-Development of Factor and Input Markets

The centralization of production decisions has left financial markets and land markets in a rudimentary state. The finance directed to parastatals and the cooperative system has proven irrecoverable. In an effort to prevent collapse of strategic export industries bad loans followed existing bad loans . Financial institutions in a market oriented system will be charged with taking responsibility for (and bearing potential losses from) their resource allocation decisions. At present the banking network

needs a period of reorientation and decentralization before it can become responsive to agricultural and rural needs.

Land markets operate outside the legal framework. Legislation related to the period of villagization in the mid- 1970s has caused confusion on exactly what tenure rights are, and how they should be transferred. The confusion has opened the door for the illicit manipulation of markets and caused much uncertainty, especially for investors in commercial agricultural undertakings.

The inputs supply markets have also been suppressed because parastatals, or the Ministry of Agriculture, were the exclusive dealers in the high volume products. They enjoyed preferential access to foreign exchange, import rights and subsidies which gave them a dominant position in the market (while also curtailing supply).

Labor markets are only recently emerging from underground as the laws against hiring rural labor are repealed, or not enforced. The movement of labor within Tanzania has been hampered by lack of information on wage differentials and difficulties with transportation and settlement in new areas.

An Agricultural Development Strategy

Tanzania's objectives in agricultural development were set forth by Government in its Agricultural Policy of 1983. The objectives are to: (i) provide sufficient food for a growing population, (ii) generate foreign exchange (agriculture is the prime source of exports for the country); (iii) supply domestic industries with raw materials, and (iv) raise rural income levels and alleviate poverty.

Prior to outlining proposals for short- and medium-term sectoral development strategies, the report describes the interaction between the agricultural sector and the rest of the economy, and provides an assessment of the changes likely to occur as agricultural growth takes place.

The Interaction between Agriculture and Other Sectors

The agricultural sector is inextricably intertwined with the rest of the economy. Measures to improve performance in agriculture have implications for the macro-economy, and for complementary activities. Proposals for action are not directed solely to the Ministry of Agriculture. They cut across the whole economy, affecting budgetary priorities, foreign exchange management, the priorities for improvement of social and economic infrastructure, and priorities for strengthening of social services. The key relationships between agricultural policies and development priorities in other sectors are noted below:

Foreign exchange. Agricultural exports will not be competitive, and investment will not be adequate unless agricultural exports are valued at the market rate of foreign exchange. In July 1993 the Government unified the official and the bureau exchange rates, eliminating this contradiction in development policies.

Budget for agricultural services. Continued growth in agriculture is contingent on adequate budgetary support for key public responsibilities, namely agricultural research and extension services, natural resource management, policy formulation, and environmental regulation and information collection.

Road and rail rehabilitation and expansion. Agricultural growth is dependent on the costs of transport, a key ingredient of farm level prices for both produce and inputs. Rehabilitation of the existing transport network and reduction of transport costs will provide a strong inducement for continued growth in agriculture. Successful horizontal expansion into new areas of good agricultural potential will be conditioned on where new roads and rail lines are built.

Social service improvement and expansion. Adoption of new levels of technology and improved husbandry techniques is a function of literacy and educational level in the farming population. Improvements in the effectiveness of the educational system will result in sustained growth in agriculture through productivity improvements. Successful expansion of agricultural production into new high potential areas will depend on the concomitant extension of reliable and effective social services (education and health in particular) into the new regions. AIDS, malaria, and other diseases will inevitably affect farm family output, and hence agricultural growth. The presence of an effective heath service is an essential ingredient of a successful growth strategy.

Dynamism in the industrial and service sector. Growth in labor productivity in agriculture will not provide the increase in incomes necessary to bring Tanzanians out of poverty. The returns to labor are always higher in the service or manufacturing industries. In fact, the history of the development process indicates that even as labor productivity in agriculture increases, labor leaves agriculture to seek employment or supplement incomes with other commercial or processing activities. Without investment and growth in agriculture, off farm activities do not emerge. At this stage, growth in agriculture is necessary to generate the resources needed to foster off-farm investment. Stable supplies of food, foreign exchange and financial savings are necessary to support non-agricultural development. Policies for development in the non-farm sectors should emphasize support for activities which represent the first stages of off-farm diversification in a predominantly rural country. Small agroprocessing industries and services closely tied to agriculture in the villages and towns will be the first to prosper as the rural community seeks to diversify and increase incomes.

Environmental impact and natural resource management. Agriculture involves the management of natural resources in the production of commercial goods. It is crucial for the long term future of the country that Tanzania's natural resources (soils, water, forests, wildlife) be managed so that production of commercial products is sustainable, and negative externalities are kept to a minimum. The maintenance of current production levels should not require continuous exploitation of ever increasing quantities of Tanzania's natural resources. Nutrients extracted from the soils should be replaced, forests replanted, and water pollution reversed. A strategy for agricultural development should ensure that the incentives for prudent resource management and conservation are in place, along with the appropriate monitoring and regulatory framework. The current shift towards decentralized, market based production and marketing systems, and the increased financial incentives for production of food and cash crops, if allowed to develop without direction, will place increased stress on the country's eco-systems.

The agricultural strategy proposals set forth below assume that the Government is proceeding with its Financial Sector Adjustment program, its Parastatal Reform program and its Civil Service Reform program. The changes and improvements proposed within these programs, which all receive support from IDA and other donors[14], are preconditions for the effective revitalization of the agricultural sector.

The Nature of Future Agricultural Growth

To maintain high rates of growth in agricultural output Tanzania will have to focus in the short run on export crops, where world markets can absorb the increased production without affecting prices. The production of raw material for domestic light industry (cotton, sisal, leather, fruits and vegetables) will also be important. Those crops and livestock products with high income elasticities of demand can expect to see their domestic markets expand. Food production can also be expected to grow, although perhaps not as rapidly as other sectors, in response to population growth, increases in per capita incomes and as improved technology becomes accessible to small farmers. The changes in the structure of production and growth in

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14 Financial Sector Adjustment Credit (Cr. 2308-TA of 1992); Financial and Legal Management Project (Cr 2413-TA of 1992); the Parastatal and Public Sector Reform Project (Cr 2507 of 1993).

Tanzanian agriculture have started already. During the period 1986-91, with the return to normalcy in the supply of consumer goods and imported goods, and the gradual rehabilitation of the road and rail network, the market in food (cereals, starches and pulses) has stabilized, and following rapid increases in the middle of the decade, growth rates appear to have slowed. Growth in cereals production, 18 percent of agricultural GDP, dropped to 0.2 percent per annum in 1986-91, down from 4.3 percent per annum in 1981-85.[15] Production of starches, 21 percent of agricultural GDP, also slipped to 1.9 percent per annum in 1986-91, down from 3.6 percent in the previous period. The crops where growth increased in 1986-91 are those sold in the more elastic export markets (coffee, cotton, cashew, tea). Here growth rates are up to 2.4 percent per annum from -7.9 percent in 1981-85. Production of fruit and vegetables, pulses and oilseeds has also been significantly higher in the most recent policy period (1986-91). Crops and livestock products with high income elasticity of demand, (oilseeds, fruits and vegetables, beef, eggs, milk) can expect to have a good market as domestic demand is likely to grow with increases in income. In the medium term, as improvements in the technology for basic foodcrop production are generated and diffused, a rapid expansion can be expected which will lower real food prices and support development in other sectors.

Thus, the sources of growth in Tanzania's agriculture sector will come from two sets of factors:

- In the **short term,** an end to the command economy will remove the distortions in the exchange rate and other prices, the inefficiencies of monopolistic parastatals and cooperative unions, and the need to circumvent restrictive regulations. This should result in adjustment and growth in all sectors. The returns to adjustment in the cereals subsector have already been realized, and growth there will taper off. However, there should be a surge in exports, up to the ceilings determined by current capacity levels in the processing industries, as the breakup of monopolies increases efficiency in cotton ginning, coffee milling, cashew and pyrethrum processing, and as export marketing opens up to the private sector, providing new opportunities in traditional and non-traditional crops, .

- In the **medium term**, continued growth in agricultural output will depend on (i) the traditional expansion of food production for the domestic market as rural population growth causes an increase in the area under cultivation and livestock holdings, (ii) increases in food production for the domestic market as technological change causes labor productivity to increase and real prices to fall; (iii) increases in production of food, especially animal products and food crops other than starches and cereals, as higher per capita incomes cause effective demand to rise; (iii) increases in production of food for regional export markets, as new openings are found for maize, pulses, and oilseeds for example; (iv) increases in production of food or plantation crops for international export, as investment in the processing industries for crops such as coffee, cotton, cashews, and non-traditional high value items expands production capacity and reduces unit costs; and (v) increases in the production of export crops as technological advances reduce production costs at the farm level, for coffee, cashews and cotton in particular.

A matrix which outlines specific actions to be undertaken under the short- and medium-term strategies, and which identifies progress on these areas since the Joint Agriculture Sector Review Mission of November 1992 is attached at the end of the Executive Summary.

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15 Cereals production data may have been overstated in the early part of the decade, which would imply that the decline in output growth was not as dramatic as these figures suggest (see Sarris, A.H. and van den Brink, R., "Economic Policy and Household Welfare during Crisis and Adjustment in Tanzania", New York University Press, 1993, Ch 5).

Short Term Strategy

Policies to induce growth in the agricultural sector by reversing price distortions and recuperating losses due to inefficient processing and marketing industries should focus on: (i) using the market rate of exchange for agricultural exports; (ii) revitalizing the export processing industries, and (iii) continuing to reduce Government participation and control in produce marketing and input supply mechanisms for the sector. Many of the actions needed to implement such policies are the concern of the Ministry of Finance, the Bank of Tanzania, the Planning Commission, as well as the Ministry of Agriculture and other agriculture-related ministries.

Foreign Exchange Valuation for Agricultural Exports

The profitability of export crop industries is dependent on the use of the market rate of exchange in the valuation of output. The inter-country competition in the markets for traditional goods and the decline in real prices has left little room for rent taking by anyone in the industry. For non-traditional agricultural exports, competition is also tough, and entry costs are high. Whatever profits can be taken in these industries should go to the producers and processors to finance rehabilitation and investment. In November 1992, the joint mission recommended that:

- As a matter of the highest priority, the market rate of exchange (or full retention of foreign exchange) should be applied to all agricultural exports, traditional and non-traditional.

Since the preparation of the report, the Government acted in August 1993 to unify the exchange rates. The official rate is now equivalent to the bureau rate, and export industries are now reimbursed the full domestic value of their export earnings.

Revitalization of Agricultural Export Industries

Increasing the returns from exports will not be translated to the farmgate level unless the efficiency of the export processing and marketing enterprises increases. Increased efficiency will raise returns at the farmer level, and thereby improve incentives for investment and productivity enhancement, and will provide additional retained earnings for reinvestment in export processing. Productivity improvements should be sought by encouraging competition in sectors that have remained monopolies under the cooperative system or under marketing boards. To these ends the Government should take the following actions:

- All relevant Acts governing the production, processing and marketing of export crops should be amended to: (i) allow competitive multichannel marketing from producer through exporter; (ii) permit and encourage competition at all levels of the marketing chain, including at the processing level (where investment in additional capacity by the private sector would be encouraged) and among export agents; (iii) separate the regulatory and commercial functions of marketing boards (the latter to be discontinued).

- Access to ginning, hulling or milling factories should be provided to all market participants on a competitive, fee-for-service basis, until such time as the industries have been restructured, and commercially viable ginneries, coffee factories, sisal spinning mills, cashew factories and other processing plants have been taken over by independent, sustainable companies and joint ventures;

- Interested private sector investors should be encouraged, through the repeal of restrictive legislation or, if foreign, by granting the normal incentives available to foreign private investors, to establish new factories, mills, gins or meat-packing plants, in competition

with existing installations, or to take over and operate processing plants where the current owners are interested in selling or leasing;

- Government should intervene in financial markets, pending the successful reform of the financial system, to ensure the continued availability of long term finance (in dollar terms at dollar rates if necessary) for well managed projects to rehabilitate existing plants or establish new export industries with good market potential.

In August of 1993, the Government passed the Crop Marketing Boards (Amendments) Act which permits private sector entry into marketing and processing of coffee, cotton, tobacco and cashew nuts. When the regulations are finalized and the law is implemented it will address most of the concerns noted above. The legislation still permits the crop boards to exercise commercial activities. This will have to be addressed in future legislative sessions.

Curtail Government Participation in Commercial Activities Related to Agriculture

The intervention of the state in the agricultural economy has driven a wedge between what farmers incomes could be, and what they are now. By imposing formation of rural villages; mandating the use of tractors and other inappropriate "improved" inputs; setting the prices at which farmer produce was procured at below market levels; monopolizing the purchase, processing and sale of food and export crops with inefficient parastatals (or quasi-parastatal cooperative unions); and controlling the price and distribution of agricultural inputs and consumer goods; the state has prevented farmers, traders and industrialists from reacting to the most profitable production opportunities and wasted resources through inefficient intermediaries. Government actions to reverse these interventions should include:

- Discontinuing the Government's practice of setting of farmgate prices and producer margins (even pronouncements on "indicative" levels) in export industries. Between the November 1992 joint mission, and the presentation of this report the Government has discontinued this practice;

- Withdrawing Government from the marketing of agricultural inputs, including fertilizer, agrochemicals and veterinary inputs. The presence of Government agencies in the market makes potential private sector entrants uncertain whether these agencies will seek competitive advantage behind regulations, or employ preferential access to privileged information or domestic or foreign resources. Following the joint mission in November 1992, the Government has announced its withdrawal from the fertilizer, agrochemicals and veterinary inputs markets;

- Eliminating the subsidy on fertilizer. The lack of sufficient budgetary resources to cover the cost of the subsidy reduces fertilizer supplies and affects deliveries. The increased availability of commercially supplied fertilizer should more than outweigh the declines in demand due to real price increases. The subsidy was discontinued in the 1994/95 budget;

- Following an open trade policy which takes advantage of Tanzania's favored position for supplying food to neighbouring landlocked countries in Eastern and Southern Africa. This would support maize production in the Southern Highlands and help counteract the reduced profitability of maize production caused by the removal of the fertilizer subsidy.

Medium-Term Strategy

Over the next five to seven years, the Government should take steps to ensure that the process of innovation and expansion in the agriculture sector continues. The focus should be on confining

Government involvement to the provision of key public goods (research, extension and market information), and intervening in the private sector economy where necessary to ensure that quality standards are set, conditions for a competitive commercial environment are maintained, incentives and controls are in place to ensure sustainable natural resource management, and negative environmental impact especially in water and soil use are prevented or minimized.

For Tanzania to meet the challenge of raising agricultural growth rates above population growth, its 3.5 million subsistence farm families must voluntarily enter the market economy. Experience has shown that smallholder farmers who are integrated into the market economy respond rapidly and efficiently to both positive and negative market incentives. Policies should focus on reducing the costs and uncertainty associated with producing for the market, and on making rural markets more responsive to small farmer needs. Efforts should be made to tailor supporting markets, infrastructure and research to the needs of the smallholder sector. At the same time, measures should be taken to ease the entry of private investors (foreign or local) into commercial agriculture.

The key elements of the medium-term strategy include measures to: (i) improve the Government's ability to understand and influence the market-determined incentive structure for agricultural production and processing, enhance competition in liberalized input and product markets, and at the same time, manage the country's natural resources to sustain productivity and minimize negative environmental consequences; (ii) improve the functioning of markets for the land, capital and labor elements of the agricultural production process, and (iii) induce technological change by improving the efficiency of markets that supply improved agricultural inputs, and by increasing the effectiveness of the Government's agricultural research and extension services.

Government Management of Sectoral Incentives.

Government policy since the mid 1980s has advocated a gradual shift towards private sector ownership of commercial enterprises, and the use of market determined prices and incentives in the agricultural sector. To be successful this shift must occur within an institutional framework which ensures that the direction and nature of growth meets social objectives, markets are competitive, contracts are honored, key public goods are provided and the negative consequences of growth on the environment and on society are minimized. The institutional requirements for managing this type of economy are different from those needed to manage a command economy.

The Government should initiate a process of institutional change in the Ministry of Agriculture and related agencies to:

- strengthen policy formulation and implementation capabilities in the Ministry of Agriculture;[16]

- improve the collection and dissemination by the Ministry of Agriculture of information on prices and wages in key agricultural markets on a regular basis, while strengthening the Ministry's capability to estimate harvest volumes and provide early warning on potential food and raw materials shortages;

- improve the Regional Government's understanding and commitment to the changes in agricultural development policy. The Central Government's capacity to monitor and intervene in regional level actions which affect incentives should be strengthened;

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16 IDA is supporting this process through Credit No. 2537-TA for the "Agriculture Sector Management Project", Report 11769-TA of June 30, 1993, approved by the Board July 20, 1993.

- improve interagency collaboration in setting budgetary priorities and carrying out development activities. Collaboration between the Ministry of Agriculture, the Ministry of Land and Urban Development, the Ministry of Communications and Transport and the Ministry of Works on priorities for regional development should be institutionalized.

- foster the creation of associations to represent private sector participants of industries and services that support agriculture.

Strengthening Markets for Factors of Production

In a market-based approach to agricultural development markets for the different resources used in the agricultural production process need to respond flexibly and efficiently to prices and potential returns. Measures needed to improve the responsiveness of the capital, labor and land markets to the needs of the agricultural sector are summarized below, as well as policy recommendations for farmer cooperatives and rural infrastructure.

In the financial sector, the banks' ability to respond to agricultural demands will depend on the success of the restructuring process now underway. National Bank of Commerce and Cooperative and Rural Development Bank already have an extensive branch network, and will continue to respond to the food and export marketing enterprises' requirements for crop finance, and for suppliers' needs for trade finance for inputs and consumer goods.

- Within the context of financial sector reform, and the use of commercial criteria for loan approval, the Government-owned commercial banking network should be staffed and trained to lend commercially for agriculture at wholesale and retail levels in competition with private sector financial institutions.

- Measures to reduce financial risk in lending to agriculture, such as innovative crop insurance schemes, should be encouraged.

- Measures to induce term lending or equity contributions for investment in agroprocessing facilities or export industries should be encouraged through possible venture capital investment funds, supplemented with lines of long term credit, where appropriate.

- The development of rural savings and credit associations based on farmers groups and other innovative approaches to rural enterprise finance should be encouraged.

Labor market adjustment will be enhanced by: (i) measures taken by the Ministry of Agriculture to improve the dissemination of price (including wage) information; (ii) the reduction of transport costs as road and rail infrastructure improves and vehicle traffic increases; (iii) the increases in literacy and education which will improve labor flexibility and adaptability to new tasks; and (iv) the commercialization of tenure arrangements to facilitate land acquisition and use by persons migrating from other parts of the country.

The land market and land tenure patterns are still in the process of evolution. To title all agricultural lands to individuals at this time would be undesirable and prohibitively expensive. In some areas shifting cultivation and/or transhumance may still be the most efficient land use practice. In these regions, alternative legal instruments, (recognizing rights to water and dry season grazing by pastoralists, for example) and their recognition by Government would be necessary. In areas of dense settlement and highly productive exploitation such as Kagera, Kilimanjaro and Mbeya, the right to land is held by the individual, and the legal instruments should just confirm this. What is essential is umbrella legislation that provides for the selection of alternative forms of "title", recognized and enforced by the national

government, and with enough flexibility to allow for further changes as the economy develops. The Government is currently engaged in establishing the boundaries of the land over which each village exercises control. Once established, this land would be leased to the village, under current legislation. Leases to individuals would be emitted subsequently.

The village authorities should be allowed to control and manage land, not to create title. The traditional and/or the formal-legal system should create the "right to occupancy". The village authorities would merely confirm and verify this right. If the demand for land increases, and its alternative uses widen, processes of appropriation will result in individualized tenure. The village authorities should not be entitled to obstruct such transactions.

The system of rural cooperatives faced severe financial difficulties at the time of the November 1992 review mission. In July 1993, the Government announced it would take the responsibility for approximately 70 per cent of the Tsh 50 billion in overdue bank loans outstanding to certain, carefully selected "indispensable" unions, mainly in the cotton and coffee sectors. This provides compensation to the unions for the expropriation of the assets of the Cooperative Bank in 1967 and for the liquidation of the cooperative unions in 1976. The debt forgiveness also provides redress for union losses caused by the Government decision to set farmgate procurement prices for cotton, coffee and other export crops well above commercially feasible levels. Cooperatives are the only commercial organizations with a network at the grass-root level. Their members are small scale farmers, responsible for most of the agricultural production, who have very little bargaining power in their commercial relations with suppliers and buyers. Primary societies bring economies of scale to buyers who do not have to deal separately with each individual farmer. Cooperatives can and should be given the opportunity to revitalize their activities so they may play a needed role in rural development. Institutions which can compete effectively with other private sector ventures, free from political interference and detrimental Government policies should be established. During the transition period, additional assistance to the cooperative sector should be provided where necessary, to ensure continuity in vital industries. However assistance should only be provided to those cooperatives with prospects for economic viability in a competitive, market based agricultural economy.

Policy recommendations include:

- The 1991 Cooperatives Act provides a reasonable framework for restructuring the rural cooperative system on an independent, voluntary, economically viable basis. The restructuring and consolidation of the primary societies into democratically-run, economically-viable rural institutions has already begun. This process should be continued throughout the hierarchy, with the members at each level determining the characteristics of the next highest group.

- The Cooperative Act of 1991, or to its rules and regulations, need certain modifications to: (i) state clearly that primary societies and their members are free to buy or sell produce on the open market, contingent on clearing their debts with other members of the movement; and (ii) clarify that the regulatory and control functions of the Registrar will diminish as the cooperative system develops its own internal review capacity.

- A Promotional Paper on Rural Cooperative Movement Rehabilitation should be prepared to state the objectives of the Cooperative Act of 1991 and describe the strategy to be followed by the Cooperative Department of MOA, the banking system and other entities to restructure, consolidate and democratize the rural cooperative system. This policy statement should also describe the process set out in Section 24 of the Cooperative Societies Rules, which stipulates that the Registrar shall gradually delegate his duties of

promoting, advising, educating, and training to the cooperative movement, after the movement has fulfilled ten criteria designed to ensure it has the necessary technical and financial capacity.

- In the process of restructuring primary societies and unions, the Registrar should include measures to:

  * drastically cut union operating costs by reducing staffing and administrative expenses;

  * streamline operations by reducing the number of activities and concentrating on those directly relating to their main business;

  * introduce proper accounting, financial control and budgetary follow-up;

  * introduce genuine member control, which itself should result in increased financial accountability by management. Committees should also understand that the unions are in the final analysis private business enterprises responsible to their members

- The Cooperative Department of the Ministry of Agriculture should be strengthened so that it can take the lead in the process of consolidation and democratization of the cooperative movement. To improve coordination and control during the three year transition period, it is recommended that the relevant regional and district level staff be transferred to the Department. Given the smaller number of societies envisioned after consolidation, and given the extreme financial difficulties faced by the Treasury, it is recommended that two-thirds of Department staff be relocated or retrenched, with promotional staff returning to the regional administrations. The savings in salaries and allowances would provide funds for the remaining 500 professionals, mainly auditors, to complete the restructuring exercise efficiently. Similar steps should be taken with the Cooperatives Audit Services Corporation.

- Following completion of the consolidation and restructuring exercise, the Department should be transformed into a much smaller Office of the Registrar, which would be in line with the 1991 Act.

Technology Generation and Natural Resource Management

Agricultural research underpins the development effort. Land and labor productivity in Tanzania are well below what they could be. If problems of rural poverty and food shortages are to be overcome, and if Tanzania is to be competitive in the markets for coffee, cotton, tea, cashews and the other traditional exports, agricultural productivity has to increase. These productivity increases have to be developed in Tanzania. While certain important technologies (such as hybrid maize) can be transferred quite quickly into the country, even this approach, as with other technical advances, requires the tedious adaptation of varieties, husbandry techniques, and agrochemical use to the local environment. A local research capacity is also needed to react to production problems arising from husbandry of a particular crop in a well defined micro-environment.

The economic returns to agricultural research are high. Not all these returns can be captured by a private research company. Thus agricultural research will always be under-funded if left only in the hands of the private sector. The fruits of good research are also easily transferred to smallholder farmers, and provide an inexpensive but powerful way to alleviate rural poverty. For example the enormous advantages

of disease resistant varieties of arabica coffee can be transferred to smallholder producers for the price of a set of coffee seedlings.

Problems facing the research establishment are being addressed under a large donor (and IDA) funded project. The problems relating to organizational structure and the deterioration of physical infrastructure have been clearly identified in the recent Mid Term review, and solutions are are discussion with Government. The essential question still facing the agricultural research establishment is the funding of a "Scheme of Service" with salary levels high enough to provide incentives for full-time, quality research work. Current and projected Civil Service wages will not be sufficient. A special status is necessary for the agricultural research establishment, so measures may be taken in financial and personnel management which will permit the funding of a satisfactory "Scheme of Service". Budgetary allocations will have to increase to meet the additional financing implied by the adjustments in staff emoluments.

The general agricultural extension service for smallholder farmers is necessary to disseminate improved technology and husbandry techniques generated by the research service to the farming population. It is also a necessary link between the farmers and the research establishment, helping to identify those problems worthy of research resources. The returns to agricultural extension are high, and the return to the use of the Training and Visit method appears to be even higher. [17] To make best use of its extension network, Government would be well advised to:

- consolidate the training and visit system, which uses a large number of staff and vehicles, in those areas of best potential and highest returns;

- make decisive efforts to link extension more effectively to the research effort, so that agents can continue to assist farmers as they adopt more sophisticated technologies, or as they face second generation problems. This can be accomplished by ensuring that Research Extension Liaison Committees and officers are appointed for each region, that temporary swaps in personnel are instituted, and that research personnel are encouraged to participate in the training of extension agents and farmers.

- increase the level of funding in real terms, to guarantee access to perdiems, vehicles and materials by the staff. Based on the financial allocations made by successful agricultural economies in Africa and comparisons of funding for agriculture in the developed work, a target of 1.5 percent of agricultural GDP appears an appropriate minimum funding level for agricultural research and extension[18].

- conduct a critical review of the commitment, technical capabilities and retraining potential of the existing village extension workers, retraining or replacing those who are unable to be effective in a unified crop and livestock extension system.

The successful introduction of improved technology relies heavily on the reliability of an agricultural inputs supply market. The use of fertilizers (chemical or organic), other agrochemicals, improved seeds, and the increased use of draft (or tractor) power will play a key role in improving smallholder productivity. The success of a private sector-based inputs supply market depends on the credibility of Government's withdrawal and on its even-handed treatment of parastatal and private sector competitors. Thus subsidies, foreign exchange, local financF t0 cess to storage space, railway transport

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17 Bindlish, V. and Evenson, R., "Evaluation of the Performance of T and V Extension in Kenya", Agriculture and Rural Development Series No. 7, March 1993, pp A13-1 to A13-3.

18 von Blarcom, B. Knudsen, O.; Nash, J.; "Reform of Public Expenditures for Agriculture", World Bank Discussion Paper, February 1993. p.6.

facilities and other services should be made available to both private and parastatal sector competitors on equal terms.

- A major source of competitive advantage in the imported agricultural inputs trade has been access to low-priced foreign exchange, or donations of goods, by Government agencies. The unification of the official and bureau rates of exchange in July 1993, and the revisions in the foreign exchange allocation mechanisms should minimize this distortion. Recently donors have been converting donations of fertilizers and other goods into foreign exchange contributions;

- Subsidies on fertilizer and pan-territorial pricing should be removed[19]. These practices have in the past contributed to shortages and rationing in the fertilizer market. This report argues that Government interference in the fertilizer market is constraining supply by both parastatal and private sector suppliers. A policy of subsidy reduction, combined with a policy of open imports and the freedom to trade with food-deficit countries in central Africa will maintain local markets and can lead to an expansion in output.

- Importation of agricultural inputs (fertilizers, pesticides, insecticides, tractors) should be permitted, at the market rate of exchange, free of duty. Local firms (both Government-owned and private) who want to enter the market should do so in open competition with imported inputs without the protection of high tariff barriers. Government's role should be restricted to reviewing fertilizer and agrochemical inputs to prevent the importation of substances which would be harmful to the environment and human beings, and to provide guidance in the use of those that are imported. Government has moved to put in place the institutions necessary to support this policy.

The management of the country's natural resources is weak. This is a key area for Government intervention, as only Government can act in the long term interests of the society, managing and conserving its natural resources, and minimizing damage to the environment. The country's natural resources, while very large, are threatened by factors linked to un-managed development. The main threat to the country's natural forests is uncontrolled clearing for charcoal, logging, tobacco curing, and cultivation of all crops. Select hardwood species are also being extracted without regard to fees or permits. Lake Victoria is threatened by pollution from the urban centers on its shores and from the runoff of fertilizers and agrochemicals. Coastal waters are threatened by the practice of dynamiting of coral reefs in search of fish. Wildlife management is threatened by the encroachment of reserved areas by cultivation. In certain regions erosion and shortened fallows are affecting the sustainability of cultivation. While the country's natural resources are not near complete depletion, they will be if the current trends are allowed to continue.

The ability to effectively manage increasingly scarce and inaccessible water resources is clearly an issue of high priority in Tanzania. This entails:

- strengthening the information base;

- rationalizing the mechanism by which water is allocated between competing uses;

- ensuring better coordination between institutions involved in the sector.

Of particular importance are: (i) controlling soil erosion in the basins of the Upper Pangani and the Rufiji, to prevent sediment loading in hydropower reservoirs; (ii) measures to control pollution from agro-

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19 As of the 1994/95 budget, these subsidies have been removed and panterritorial pricing discontinued.

chemicals in the Lake Victoria drainage; (iii) measures to reduce pollutants produced by agro-processing industries such as textile plants, tanneries, sisal mills, vegetable oil plants and coffee processing plants.

There are three reasons why the development of irrigation systems is an important aspect of the agricultural development strategy. First, the variability inherent in Tanzania's rainfed production systems creates problems of shortages of the main foodcrops in years of inadequate or poorly timed rainfall. Increasing irrigated food production will improve food security. Second, irrigation shemes if properly managed provide sustainable increases in small farmer productivity and income, addressing rural poverty alleviation and environmental management objectives. Finally, irrigated agriculture is the only way in which high value crops (vegetables, flowers) can be produced under the controlled conditions needed to meet market schedules in Europe and other demanding international markets, thus supporting the drive for diversified high value agricultural exports. The Ministry of Agriculture has been reviewing the Government's experience with irrigation projects, and has concluded that:[20]

- To be successful, "future development should be based on staged improvement and expansion of existing local technology, which allows the farmers to adapt at their own pace. Equal emphasis should be given to operational and extension support to farmers at existing schemes"[21].

- Projects undertaken to date have been too sophisticated, requiring expensive structures and massive capital injections. The funds for completing these projects have often not materialized, causing a massive waste of resources invested in un-used, half completed schemes;

- If a project is expensive to begin with (and recent projects in Tanzania have averaged $15,000 to $20,000 per ha)[22], returns will have to be very good, for the economic rate of return to be positive. The possibilities for marketing such high value crops, or for getting cropping rates above 100 percent, is limited to small, well managed private farms at present.

A ranking of potential projects has been developed, and a smallholder-focussed irrigation development program has been outlined. In order to carry out such a program, it is proposed that the key responsibilities for operational support and extension services would be provided at the Zonal level (bringing together contiguous regions). The Ministry of Agriculture would strengthen its capacity to coordinate irrigation activities and provide assistance at the design and construction stage. Projects would be carried out in Kilimanjaro, Morogoro, Tabora, Mbeya, Mwanza and Mtwara zones. In developing a program for support for irrigation measures to ensure that negative environmental effects resulting from high salinity drainage and wetland conversion are adequately dealt with.

Strong steps are needed to strengthen the management of forests lands, the conservation of reserves, and the collection of fees and royalties for wood harvested. The ability of a weak and sparsely distributed forest service has recently been strengthened under a recent donor and IDA-funded Forest Resources Management Project.

The lead role in defining national policy on environmental issues is now in the hands of the Ministry of Tourism, Natural Resources and the Environment. The process of reviewing environmental policy and defining conservation strategy is the focus of substantial assistance from donors including IDA

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20 Ibid. p 49.

21 Ibid. p 49.

22 Ibid. pp 8, 11.

[23]. The next step will be Government adoption of a National Environment Policy. This will provide the frameworkF 0 updating and streamlining existing environmental legislation, and will establish the guidelines for natural resource management and environmental protection, to be followed by entities engaged in economic development. The National Conservation Strategy and the National Environmental Action Plan, also being formulated, will indicate how legislation will be applied in practical terms, defining reporting, monitoring and law enforcement responsibilities. The responsibility for implementation of national policy on environmental issues will be with the Ministry of Tourism, Natural Resources and the Environment. However, implementation of the conservation strategy is likely to be given to the National Environmental Management Council, a parastatal within the Ministry. Government regulatory and coordination powers are weak. Information on environmental phenomena and natural resource use is also poor. A first task will be to inventory natural resources, and document and evaluate in monetary terms the most important cases of incidence of degradation, pollution and over-exploitation. A first step in this direction will be the natural resource mapping exercise to be carried out by the Institute for Resource Assessment with funding from the IDA supported Forest Resources Management Project. Once the resource maps are available, the relevant legislation revised and the fines increased, Government's theoretical capacity to affect the use of natural resources and protect the environment will be greatly improved. If this is to be translated into changes on the ground, considerable resources should now be devoted to strengthening NEMC, the Forestry Department and other entities charged with monitoring and enforcement.

Environmental Impact of Agricultural rowth

The environmental costs of agricultural growth can be categorized into those that: (i) contribute to irrecoverable soil degradation, (ii) contaminate ground or surface water, and (iii) cause encroachment into national parks, game, wildlife or forest reserves.

Soil fertility mining and degradation.

Soil degradation has been defined as a process which results in the removal of the nutrient rich topsoil, and irrecoverably lowers fertility and water retention capacity. This occurs as a result of water or wind erosion, biological degradation (decrease in humus); physical degradation (increase in bulk density and decrease in permeability), alkalization or acidification. Irreversible soil degradation in an inhospitable climate leads to desertification.

Smallholder agricultural production of cereals and food crops in Tanzania has traditionally relied on a long fallow (five to seven years) to regenerate cultivated areas. As population densities in the settled areas of good potential have increased, the expansion in area cultivated has reduced fallow land. The period when cultivable land is under fallow declines, and the natural regeneration of soil fertility is reduced. Smallholders are aware of this pressure on their land, and normally take measures to stem the decline in fertility. The rapid increase in the use of chemical fertilizer over the past twenty years must be seen in part as an attempt to compensate for the reductions in fallow land, forced on farmers by increasing regional population densities. Improved mulching methods and the use of animal manure will also improve soil structure and fertility, permitting a sustainable reduction in fallowing periods. Also, Tanzania still has the luxury of large tracts of fertile land in regions of good rainfall which is still underutilized. As population density becomes too high in current areas of settlement, farmers will voluntarily move into the under-populated regions of good agricultural potential. The Government must address the task of guiding the flow of migrants to areas where agriculture can be sustainable and productive and supporting the

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23 See BTOs of November 17 1992 and May 28, 1993 of two World Bank Environment Missions, led by Mr. Narendra Sharma, assisting Government in the preparation of a National Environmental Action Plan.

development of permanent new settlements that are environmentally benign through land-use zoning and social and physical infrastructure priorities.

However, the increase in opportunistic cultivation of agro-ecological areas suited mainly to grazing of livestock by transhumant pastoralists is of concern Such lands are only marginally suitable for sustainable agriculture. In these regions, where rainfall is unreliable, averaging barely 500 or 600 mm per annum, removal and incineration of tree cover and cultivation in the ash using the residual fertility will permit two or three seasons of cropping. Farms are then abandoned. If soils are of poor quality and the availability of moisture is very restricted, regeneration of the forest cover will be very slow. High levels of wind and soil erosion may lead to irreversible loss of productivity and desertification.

- It is recommended that tenure arrangements be worked out in semi-arid and arid areas where agro-pastoral activities are encroaching, whereby, at a minimum, pastoralists are given tenure ights to sufficient rangeland to guarantee access dry season fodder and perennial water sources. Agro-pastoralist development should be limited to areas of better potential where a rotational system could be sustained. Agro-pastoralists should also be limited in the areas they are permitted to clear, and induced to move voluntarily to areas of higher agricultural productivity. The development of roads, schools and health posts should not reinforce and support settlements established on the basis of production systems which are unsustainable.

Also of concern is the harvesting of the natural woodlands, without regard for watershed management, biodiversity considerations, livestock and agricultural uses and possible topsoil loss and desertification.

- Under natural resource management programs and environmental action plans measures should be put in place to (i) establish sustainable and recommended exploitation patterns by agro-ecological zone; (ii) place reserves in those areas where deforestation will affect watershed management, exacerbate erosion, or contribute to significant losses of biodiversity; (iii) serve as a guide to the planning of new physical and social infrastructure and (iv) guide the extension service in the formulation of recommendations oh husbandry for the farming community.

Contamination of Ground and Surface Water

The overuse of fertilizer or pernicious agrochemicals can contaminate ground and surface water. The ecosystems most vulnerable to agrochemicals and fertilizer are Lake Victoria and the Northern Zone. The southern part of Lake Victoria is adjacent to Tanzania's Western Cotton Growing Area. In addition to the possibility of wiping out beneficial species and of resistance developing amongst cotton pests, the potential risks to the Lake ecosystem are damage to fish populations (endosulphan is especially toxic to fish), and water hyacinth growth being stimulated by fertilizer run-off. The absence of aerial spraying, and the increased use of ultra-low volume (rather than knapsack) spraying, reduces the risk of pesticide drift and run-off. The effect of fertilizeF 0 water hyacinth is associated much more with the Kenyan areas by the Lake where sugar is grown. Use of fertilizer in Tanzania's Western Cotton Growing Area is small. The potential ecosystem risks in the Northern Zone relate to copper fungicide insecticides run-off. These products are used on coffee around Mount Kilimanjaro and Mount Meru. Some farmers are reported to attribute the decline in maize yields in fields adjacent to coffee plots to spraying. Levels of copper in the soil have increased, and it is conceivable that this could, over many years, inhibit soil micro-organisms and so affect soil structure and fertility. However, there is said to be no evidence from Kenya to support this.

Tanzania has a registration system for agrochemicals, which is controlled by the Tropical Pesticides Research Institute (TPRI) at Arusha. Only five insecticides, three fungicides, two herbicides and one plant growth regulator have full registration. There are many products with provisional, restricted or experimental registration. The policy promoting the development of multi-channel distribution adds to the necessity of monitoring and providing training in the use of correct practices. TPRI has the mandate for these functions, and in 1993 is starting to provide training courses on the safe handling and use of pesticides.

- TPRI's agrochemical monitoring and registration program should be strengthened for the increased coverage and inspection requirements of a liberalized production, importation and distribution scheme. Efforts should be made to design and put in place Integrated Pest Management programs which make use of natural means of controlling infestation.

Encroachment on Reserves

Tanzania has set aside about 22 percent of its mainland surface area (94.3 million ha) as reserves. National Parks take up 4 percent of the country's surface area, Game Reserves 8 percent, and forest reserves another 10 percent. Some of the land in reserves has a high opportunity cost. It is estimated that about 15 percent of the land under reserves is suitable for cereal cultivation. Expansion of cultivated area is the main method used by smallholders to increase production. As agriculture expands, the pressure on reserve boundaries will naturally increase, especially where reserved areas are of good agricultural potential, or immediately contiguous to population centers.

- The policy on natural resource management should include measures to (i) improve the monitoring of encroachment of reserve boundaries, (ii) strengthen Government control of access to reserves and use of wood or other resources (iii) establish buffer zones between population centers and the reserves; (iv) work with the communities contiguous to reserves, who see their livelihoods affected by the reservation policy, to provide them with some of the benefits accruing to the society from the maintenance of these reserves, and to adjust local land-use systems to forego the need to use reserved areas. The use of tourism revenues for improving social and physical infrastructure in townships around national parks may be one approach.

Poverty Alleviation

Poverty alleviation is one of the objectives of the proposed agricultural development strategy. The recent Poverty Profile for Tanzania indicates that the poor are overwhelmingly rural. Rural per capita expenditure levels (adult equivalent) are 63 percent of urban levels, and 44 percent of Dar es Salaam expenditure levels. Rural per capita expenditure is more inequitably distributed than urban expenditure. Per capita rural expenditure varies widely by region, reflecting level of development and agricultural potential. Poor smallholder farms are the backbone of Tanzania's agriculture. They are the most widespread adopters of new technology, and have the highest productivity in land and labor resources. Measures to promote agricultural development and export growth are completely congruent with steps to alleviate poverty. In fact, the reverse is also the case. Measures taken to improve living standards, especially health and educational levels, among the rural poor have an important effect on the adoption of innovation, labor productivity and agricultural output. Comprehensive, multisectoral poverty alleviation is good growth policy.

Features of the proposed agricultural development strategy and their effect on poverty alleviation include:

- the recommended focus on smallholder farmers as the source of growth. The attention and resources used by parastatals and central Government in promoting capital intensive production through large agricultural enterprises should be shifted to the needs of smallholder farmers. This implies the redirection of research and extension, as well as priorities for road rehabilitation;

- the recommended liberalization of marketing and processing in the export crops to eventually improve farmgate returns. Initially, the devaluations of the late 1980s increased domestic returns to the coffee and cotton industries, without any of the increases being passed on to producers. This was due to Government's inaction on the adjustment of producer prices, and to the monopsony position of the cooperative unions who run the processing and export marketing facilities for these crops. The same situation holds for pyrethrum and tobacco, with the monopsony position held by a Government marketing board. Once the marketing and processing industry is opened to private entrants, greater competition for smallholder produce should increase real farmgate prices and provide quality premiums. With exports valued at market rates of exchange, industry returns will increase to the benefit of the smallholder producer.

- **The spatial dimensions of a growth strategy for cotton and cashews are congruent with the priorities for poverty alleviation**. The cotton industry is located in a depressed region: the Lake Victoria Basin. Per capita rural incomes in the cotton areas of Mara, Mwanza and Shinyanga are low. In Shinyanga the share of the population below the national poverty line is 91 percent [24]. In Mwanza it is 58 percent and in Mara, 39 percent. Cotton production is grown exclusively by smallholders. Increasing returns to cotton will increase cash availability, employment and the demand for livestock products (another regional specialty) in the whole region.

- The cashew industry is also centered in a depressed area: the South Coast. Lindi, an important cashew producing region, has 91 percent of its population below the poverty line. Mtwara, another cashew producing region, has 57 percent of the population below the poverty line. Ruvuma, also a cashew producer, has 73 percent. These regions have already benefited from the resurgence in cashew sales, because of the freeing of the export trade. The dissemination of "sulphur dusting" technology has increased yields, improving farm-level returns.

- Agricultural research which focuses on smallholder production problems can dramatically increase farmgate profits and smallholder incomes. The results of such research can be incorporated in low to medium-cost inputs (hybrid maize seed, sulphur dust, fertilizer, pest control chemicals, improved seedlings), easily accessible to smallholders. Research into more effective animal-drawn implements is expected to further improve smallholder cultivation capacity and reduce transport costs;

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24 The results are drawn from the Poverty Profile of December 1993, prepared by the World Bank in collaboration with the Economic Research Bureau of the University of Dar es Salaam and the Food and Nutrition Policy Program of Cornell University. The Poverty Profile is based on a household survey, undertaken by the ERB and Cornell University using the National Master Sample frame, carried out in August-October 1991. The survey was not designed to provide data on a regional basis, and preliminary observations, such as that on Shinyanga, are subject to confirmation. An independent World Bank study, " Promoting Economic Opportunities for the Rural Poor During Economic Reform, the case of Tanzania", T. Addison, March 1994, page 11 indicates that in fact Shinyanga ranks as one of the better-off regions on other social indicators such as percentage of children stunted (relatively low), percentage of children undernourished (low), percentage of women at nutritional risk (low), and percentage of women with chronic energy defficiency (low).

- The use of strategically placed infrastructure, guided by land use studies and assessments of untapped agricultural potential, can direct the flow of rural migration to areas of high return. Such movements in population will benefit the individual and the country, if adequate infrastructure and technical support for sustainable development is provided.

- The maintenance of open borders for the export of maize, pulses and other foodstuffs to neighboring countries will be of most benefit to the regions of Kigoma, Rukwa, Mbeya, Ruvuma, which are far from the wealth-generating markets of Dar es Salaam, Morogoro, Tanga, Moshi and Arusha.

- Support for off-farm enterprise development by providing infrastructure, organizing groups or facilitating access to finance, will create employment opportunities for farm families throughout the year, and provide high-productivity employment for women.

The Role of Government and Public Expenditure in Agriculture

Government should be reaffirming its role in defining and monitoring policies which set the incentive framework for agricultural development. The Ministry of Agriculture's policy analysis capabilities should be strengthened, concomitantly with the ability to gather information on prices, production, crop yields and marketing chains, to support such policy analysis.

The Government should also be strengthening its capacity to deliver key "public goods" in support of agricultural development. These are services which, if left to the private sector, would be delivered at levels well below those necessary to induce rapid agricultural growth. The key activities here are agricultural research and agricultural extension. Low staff morale in these services makes it difficult for them to be effective. Salaries should be raised in real terms, and operating costs should be fully funded to make these services operational and responsive to farmers needs. Research and extension services are expensive. The high cost will force Government to assign strict priorities to the production problems to be addressed, and the geographic areas to be covered. Based on a review of practice in successful agricultural economies, and experience in the developed world, a country dependent on agricultural growth, such as Tanzania, should be able to set aside a minimum of 1.5 percent of agriculture GDP in budgetary funds to support agricultural research and extension. This would imply annual expenditures (from the recurrent and development budgets) on the order of US$ 25 million in support of agricultural research and extension. In 1990/91 total government expenditure on agricultural research and extension were about 0.88 percent of agriculture GDP, around US$ 13 million. Real expenditure on these services should almost double in real terms.

At the same time, based on its sectoral development strategy, Government should take a lead role in defining areas for priority public investment, funded both by local and donor resources. Government should develop discrete project proposals for donor funding. In addition, projects currently funded should be reassessed in light of the sectoral development strategey. Government and donors should undertake a careful review of the existing project porfolio and assess their contribution to agricultural development objectives. There are 55 donor-funded projects in the Ministry of Agriculture's portfolio, with expenditure (from local and foreign funds) of about Tsh 6.8 billion in 1992/93. Each project should be assessed in light of its contribution to the Ministry of Agriculture's revised role in the promotion of agricultural development, and discussions should be undertaken with each donor agency to realign investment priorities with the revised Governmental objectives.

Donor Funded Projects

Donor aid should be used in support of the sectoral objectives outlined in this report. The shift in the use of donor aid in the agricultural sector which occurred in the late 1980s has been beneficial. Since

the Economic Recovery Program was initiated, the donor community has shifted a large share of its resources into providing foreign exchange, available under the OGL procedure, against changes in agricultural development policy. The practice of providing fertilizer or machinery in kind has declined, as has the share of investment project funding. Change in agriculture sector policy has been gradual, but continuous. The gradual liberalization of the grain market has been followed by a gradual process of freeing up entry to the traditional export processing industries, the input supply market, and the foreign exchange market.

Much donor assistance continues to go into traditional Government executed projects. The track record of IDA funded projects over the past 30 years has not been good. Only 10 out of 27 agriculture projects (including two projects with significant agricultural components) completed and evaluated by 1992 were rated satisfactory by the Operations Evaluation Department. Successful projects included three technical assistance operations, two in support of tea production, two in forestry, one in tobacco, one in coconut production, and one agricultural component of a multisectoral rehabilitation project. Projects in a host of other subsectors within agriculture (dairy, general livestock, cashewnuts, sugar, cotton, maize, fisheries, area development), have all proven unsatisfactory. The reasons for unsuccessful projects ranged from the dampening effect of adverse macro-economic policies, to inappropriate design at appraisal (including overestimation of capacity requirements), to management problems.

Donors should continue their two-pronged approach, mixing balance of payments support with investment projects. While the agenda for policy reform in the agricultural sector has gradually been met, there are still areas where attention is needed if the process of market liberalization is to be completed. Also there continues to be a strong need for foreign exchange, to support investment and growth in the sector. The provision of such funding, against policy reform or adjustment in the legislative and institutional framework needed for promoting sustainable agricultural growth continues to be useful. Following the policy-based lending program, "investment projects" focusing on particular institutions or subsectors, can follow through on the changes in the legislative and incentive framework obtained under adjustment programs, and ensure that the institutions and infrastructure are in place to obtain sustainable agricultural growth.

Policy Based Lending

There are still three areas where the markets for agricultural products, or inputs, are not completely liberalized, and a "framework" approach will be needed to obtain the necessary change. This approach can be pursued through the negotiations on the next PFP (in early 1994) and in the preparation of the proposed multisectoral Structural Adjustment Credit. The issues include:

(a) **completing the liberalization of the traditional export crop markets**. Government has passed Crop Marketing Boards (Amendments) Act in August of 1993, liberalizing agricultural export processing and marketing, which permits private sector access to the production, processing and marketing of coffee, cotton, cashews and tobacco. To enhance the introduction of competition into these sectors, the Government should ensure that the various crop Boards: (i) publish the licensing requirements at all levels of the export chain (crop purchase, processing, export marketing); (ii) restrict licensing criteria to simple indicators of business capability and seriousness of intent; and (iii) discontinue the commercial functions of the marketing boards.

(b) **completing the restructuring of the cooperative sector**. The Government should ensure that: (i) the cooperative primary societies **and unions** in the cotton and coffee producing regions are re-constituted under the provisions of the Cooperative Act of 1991. Under this Act, only primary societies which are independent, voluntary, economically viable, with

democratically elected leadership will be registered; (ii) that these reconstituted primary societies address, with extreme priority, the questions of rehabilitation and management of the cotton ginneries and coffee factories owned by their unions; and (iii) the Cooperatives Act of 1991 is adjusted to permit the formation of joint ventures between cooperatives and private sector companies.

(c) **complete divestiture of parastatal crop processing facilities.** The factory for processing pyrethrum, and some of the factories for processing cashews continue to be owned and operated by parastatals at well below capacity. Government should take steps to: (i) encourage the private sector to invest in smaller, more appropriate installations in the sector, (ii) improve capacity utilization in existing factories by divesting itself of these installations to private sector enterprises interested and capable of operating them more efficiently

(d) **improve management of the Strategic Grain Reserve**. Government's direct intervention in the grain trade is now limited to the activities of the Strategic Grain Reserve. In order to find the least cost way of executing the strategic purchases and sales necessary to meet food security objectives, Government undertook to formalize: (i) a tendering procedure for purchases to replace the current agency system, and create a level playing-field between farm groups, private traders and primary cooperatives and cooperative unions; (ii) a procedure for grain release and pricing. A study is needed to produce a rule on intervention that refers to: (a) the maximum permissible variance around the real average monthly market prices for maize; (b) the permissible trade margin between border and wholesale prices; (c) the mechanisms for continuous update of the real average retail prices. Once the need for intervention is established, Government intervention should use market-based mechanisms, such as the auction of food grains in the affected areas, to bring prices down.

(e) **complete the liberalization of the market in agricultural inputs** (fertilizer, pesticides, veterinary drugs and chemicals, tools and implements). Private sector entry into this market has been hampered by direct subsidies and the presence of Government agencies. During 1994 the Government has eliminated the subsidy on fertilizer imports, and discontinued pan-territorial pricing and product allocation procedures. To complete the liberalization process, the Government should discontinue its operations in all agricultural chemicals and should put in place a mechanism to auction all donated inputs (fertilizers and other chemicals or implements) at port of entry, so as not to undercut the domestic trade in these goods. The effectiveness of pesticide regulation at all stages (pre-marketing tests, importation, formulation, retailing) should also be strengthened, as should the legislative framework underlying the fertilizer market. Regulatory reform would be supported under the Agriculture Sector Management Project (Cr 2537-TA).

Investment Lending

Within the framework defined by the above-mentioned adjustments, donors could profitably support Government actions with projects in the following subsectors, listed in a **tentative order of priority**:

1. Support for **agricultural research and extension services** (currently the focus of two multi-donor projects which may need follow-on operations later on in the decade), the strengthening of the **Ministry of Agriculture capacity** to monitor and regulate a market economy and withdraw from commercial activities (also the objective of an ongoing IDA

project), and the management of the **forestry sector** (where a multi-donor project is already in place);

2. A **water resource management** project, to strengthen the frameworkd for management of surface and ground water resources, with a special focus on river basin management and development of smallholder irrigation, would have strong positive effects on poverty alleviation and environmental management;

3. A **wildlife, game reserves and national parks** project could focus on wildlife management and tourism. The project could focus on strengthening national park management capacity and revenue generation, improving park facilities, setting up participatory mechanisms, community development efforts and buffer zones to ensure that surrounding communities benefit from the success of the parks;

4. **Rural financial market** development will assist in increasing income generation, and productivity improvement in rural areas. A project supporting the introduction of savings based rural finance programs, focussing on the creation of rural banks, strengthining the payment mechanisms, fostering savings and credit unions and non-government community development organizations, can provide the basis for an eventual rural financial network. Bank of Tanzania prudential supervision capacity would also have to be expanded;

5. **Diversification of agricultural exports** into high valued agricultural crops (horticulture and flowers) will improve the export position, and if appropriately designed, can provide productin opportunities to smallholder farmers. Cashews, tobacco, and pyrethrum are potentially profitable export crops, where marketing and industrialization is in the process of being transferred to private agents. Measures to facilitate the entry of the private sector, and to introduce new processing technology more appropriate to the small and medium sized operations in Tanzania would increase local value added and export revenue

6. A **livestock sector** project which focused on the development of private sector livestock exports, the dairy industry, small ruminants, and rangeland management, including resource monitoring, addressing land tenure disputes and the issues posed by agropastoral and water point development;

7. Monitoring and regulation of a private sector **fishing industry** (including Lake Victoria, coastal fisheries and the protection of the coral reefs);

Outside of the agricultural sector, there are a series of investment projects by both donors and Government, which will support the agricultural growth strategy developed in this report. These are listed in this report in order of priority:

- The continued restructuring of the **financial sector**, fostering the entry of new banks and enabling them to respond to private sector financial needs as quickly as possible;

- The continued rehabilitation of the **rural roads network**, and the opening up of strategic new feeder roads will play a definitive role in fostering agricultural development. The rehabilitation and efficient operation of the railroad network and ports facilities will also contribute to export competitiveness and making producing regions in the interior of the country more competitive.

- The rehabilitation and improvement of the **communications infrastructure** will smooth trade opportunities, especially in the area of high value exports.

- Establishing a **minimalist regulatory environment** for private sector activities, that fosters competition, and keeps farmer shares of industry returns as high as possible. Government intervention in monopsony markets (such as the sale of green leaf or cane sugar to processing factories by smallholders) may be necessary to safeguard farmer shares;

- strengthening the legal system, and the **enforcement of contracts**.

Short-Term Agenda On Agriculture Sector Policy

Ranking of Key Recommendations, and Highlighting of Actions Taken by Government Since Joint Mission of November 1992.

Rank	Subsector	November 1992 Joint Mission Recommendation	Government Action Since November 1992
1	Export Competitiveness and Comparative Advantage Non Traditional Exports	Allow agricultural exporters to exchange export earnings at the market exchange rate. .	This has been addressed by the unification of official and market exchange rates in August 1993.
2	Reform of Marketing Channels for Traditional Agricultural Exports Coffee	Amend all relevant Acts governing production, processing and marketing of export crops to: (i) allow competitive multichannel marketing from producer through export; (ii) permit and encourage competition at all levels of the markeing chain, including at the processing level, and among "export agents"; (iii) separate regulatory and commercial functions of marketing boards.	Passage of the Crop Boards (Amendments) Bill in August 1993 removes barriers to private sector entry and competition in the marketing of export crops. Regulations still under review. Boards still retain commercial functions.
3	Credit	Banks to manage restructuring or liquidation of large cooperative union debtors. This has been addressed by forgiveness of Tsh 30 billion of cooperative union debt..	In July 1993 Government took over Tsh 30 billion in debts owed to the banks by the Cooperative Unions. This was estimated to be the debt incurred by the unions from following Governments edicts on crop pricing and marketing.
4	Marketing of Foodgrains	Amend the Acts restricting private commerce in foodgrains.	No action taken. De facto, private sector activities are not affected.
5	Agricultural Inputs	Identify and put in place conditions needed to have international inputs companies import and distribute on their own account.	Two private sector firms have imported small quantities of fertilizer in 1993. Subsidy discontinued as of FY 94/95 Budget.
6	Institutional Reform	A functional review of the Ministry of Agriculture be undertaken to design a program to enhance policy formulation, strengthen agriculture information systems, and streamline operations.	A "first round" functional review of the Ministry was undertaken in preparing for the appraisal of the IDA financed Agriculture Sector Management project. This project, appraised in March 1993 and signed in July 1993 will assist the Ministry to divest itself of commercial activities, and strengthen policy formulation and information management.
7	Land Tenure	Urgently develop "umbrella" legislation based on recommendations from the Presidential Commission on Land Tenure accepted by the Government.	The report of the Presidential Commission of Inquiry into Land Matters (the Shivji Commission) was completed in November 1992, and made public in November 1993. Government is drafting a Cabinet Paper on Land Tenure Policy to address land issues.
8	Cooperatives	Implement "spirit" of 1991 Cooperative Act, stopping political interference. Coops should be dissolved and reconstituted democratically.	Restructuring has been completed, with some 1,860 primary societies formed out of the 4,900 active societies registered. However, the reconstitution of the management and assets of the Cooperative Unions, especially in the cotton sector, is still delayed.
9	Livestock	Collect baseline livestock planning information: i.e. tetse infestation, rangelands use, consumption levels of animal products	Little action to date.
10	Agricultural Data and Monitoring Systems	Increase funding (salaries, allowances, operating funds, vehicles) for agricultural information gathering and dissemination systems (i.e. crop surveys, price collection)	Funding included in the IDA supported Agriculture Sector Management Project for improving data collection, management, and for undertaking the Agricultural Census.
11	Seeds Industry	Define National Seed Policy governing such things as patent protection, germplasm access, imports, quarantine, exports.	Draft National Seed Policy reviewed in November mission.. Little action taken.

Source: Bank Mission

Medium-Term Agenda On Agriculture Sector Policy

Ranking of Key Recommendations, and Highlighting of Actions Taken by Government Since Joint Mission of November 1992.

Rank	Subsector	November 1992 Joint Mission Recommendation	Government Action Since November 1992
1	Reform of Marketing Channels for Traditional Agricultural Exports Inputs Supply Seeds Industry	Cease Government support to parastatals marketing fertilizer, agricultural inputs, traditional crops and seeds.	Parastatals marketing fertilizer and other inputs, crops and seeds are are scheduled for eventual joint venture or sale. Little action taken to date. Subsidies for fertilizer imports discontinued as of the 1994/95 Budget. Panterritorial pricing discontinued.
2	Export Competitiveness and Comparative Advantage	Remove administrative controls on importation and marketing of inputs and agricultural produce.	Fertilizer imports opened to private trade. Importation of other agricultural inputs recently liberalized.
3	Marketing of Foodgrains	Liberalize external trade in foodgrains.	No action to date.
4	Land Tenure	Identify and put in place measures to formalize individual tenure.	Demarcation of village boundaries underway. No action on village vs individual tenure policy.
5	Institutional Reform Livestock	Veterinary services, veterinary drug distribution, heifer farms and other directly productive activities in MOA be privatized.	Will be addressed under the Agriculture Sector Management Proejct. No action so far.
6	Cooperatives	Reduce "Cooperative Development Department" of MOA to monitoring and training functions.	Staff reductions to follow the restructuring of the cooperative system under the 1991 Act, still underway.
7	Credit	NBC and CRDP restructured, and staffed to lend commercially for agriculture.	To be addressed under the Financial Sector Adjustment Credit. Issues studied on Financial Sector Review. No action so far.
8	Coffee	Put in place a replacement program for Arabica with new disease resistant varieties, using private sector and vegetative propagation techniques.	Research system gradually being refurbished under donor project. Coffee research still to be rehabilitated.
9	Agricultural Data and Monitoring Systems	Expand funding and coverage of radio broadcasts of price information.	To be addressed under Agriculture Sector Management Project. No action so far.
10	Non Traditional Agricultural Exports	Support creation of sources of long term investment funding.	Private Sector Development Project looking into such an instrument. No action so far.

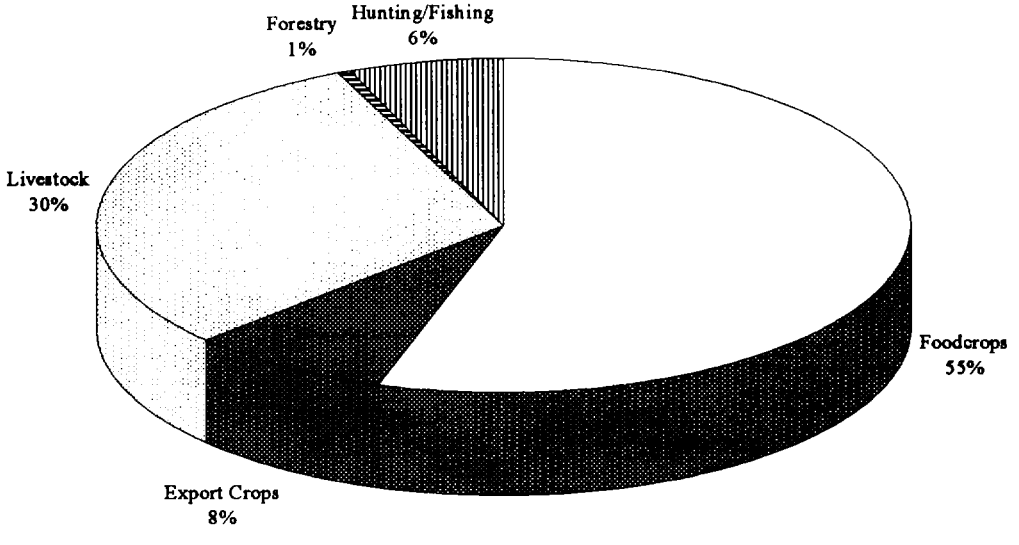
Source: Bank Mission

I. AGRICULTURE AND THE MACROECONOMY

Agriculture is the foundation of the Tanzanian economy, supporting employment, food production and exports. Some 84 percent of the employed population work in the agricultural sector,[1] producing 61 percent of both GDP and merchandise exports.[2] Tanzania's 3.5 million farm families work small holdings, where the area cultivated averages 0.9 hectares. Some 93 percent of all farmers cultivate less than 2.0 hectares.[3] In 1992 average GDP per capita was estimated at US$ 110,[4] making Tanzania one of the poorest countries in the world.

Food crop production dominates the agricultural economy totaling 55 percent of agricultural GDP[5] as noted in Figure 1.1. Livestock accounts for another 30 percent, and the traditional cash crops (coffee, cotton, cashewnuts, sugar, pyrethrum, tea, tobacco, sisal) for only 8 percent. Fishing and hunting contribute 6 percent and forestry 1 percent of agricultural GDP.[6]

Figure 1.1: Shares of Agriculture GDP, 1989-91[7]



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1 ILO, "1990/91 Labour Force Survey Tabulations", Table M-1. Of these, 54 percent are female and 46 percent male.

2 Based on official data, three year average.

3 URT, Bureau of Statistics, Agricultural Sample Survey of Tanzania Mainland, 1989/90, Table 9.

4 World Bank, World Development Report 1994, p. 162. There are indications that official GDP statistics do not capture much of the economic activity which takes place in the informal sector. Inclusion of this "second economy" would increase total GDP estimates by a minimum of 45 percent (Maliyamkono, T.M., and Bagachwa, M.S.D., "The Second Economy in Tanzania", Eastern African Studies, James Currey, London, 1990).

5 At current prices. In 1976 prices however, livestock was only 13 percent of agriculture GDP in 1989-91, with crops accounting for 76 percent. This indicates a substantial shift in the price of livestock output relative to crops, which is hard to find evidence for.

6 URT, Bureau of Statistics, "National Accounts of Tanzania 1976 - 1991", Table 10.1 and mission estimates.

7 Based on Mission estimates. National Agriculture GDP data not broken down by subsector.

A. Sectoral Growth

Economic development in Tanzania was slowed in the late 1970s and early 1980s by a process of social change which included a shift toward state control and operation of productive enterprises. Even the smallholder family farm, the mainstay of Tanzanian agriculture, was affected by policies supporting collectivization and the systematic relocation of people into villages. Data on GDP show a slowdown in the rates of growth in output and productivity in these years, followed by a period of rapid change, starting in 1984, and accelerating following a series of reforms initiated in 1986. A recent World Bank review of the Tanzanian economy[8] identifies four different policy regimes since 1966:

(i) From 1966 through the mid-1970s, Tanzania experienced growth as controls increased following implementation of the socialist policies of the Arusha Declaration of 1967.

(ii) From the mid-1970s through the early 1980s, there was a period of economic decline and slow growth caused in part by external factors: the oil price shocks of 1973 and 1979 and the war with Uganda of 1979-80, and in part by internal factors: the nationalization of industrial, financial and trade concerns; structural reforms in the smallholder sector; and the lack of attention to incentives for output and productivity growth.

(iii) In the early to the mid-1980s a series of changes in economic incentives were attempted, but failed for lack of a comprehensive approach to address the strucuture of ownership and competition in the industrial and trade sectors of the economy.

(iv) From start of the Economic Recovery program in 1986 to the present has been a period of gradually deepening reforms within the macroeconomic environment; a withdrawal of parastatal monopolies in trade and processing; an improvement in the competitive environment and increased attention to production and processing incentives; all of which has opened the doors for sustained growth.

Following the assessment in the Country Economic Memorandum of 1991, performance in the agricultural sector is evaluated here for each of the periods noted above. Real growth in agricultural GDP[9] has paralleled total GDP growth from 1966 through 1992. Agriculture averaged 2.8 and GDP averaged 2.7 percent per annum.[10] The similarity is misleading; there have been sharp divergences between growth in agriculture and GDP (see Figure 1.2). Growth in agriculture lagged significantly behind GDP during the initial period of increased Government intervention in the economy: agricultural growth was 45 percent lower than the GDP rate in 1966-75, and 65 percent lower in 1976-80. In the early 1980s, the bottom of the general economic decline, agriculture had actually started to recover, even while GDP growth was negative. Agriculture growth has led the economy through the periods of reform and economic recuperation from the early 1980s responding rapidly to the earliest reforms in the marketing of agricultural produce.

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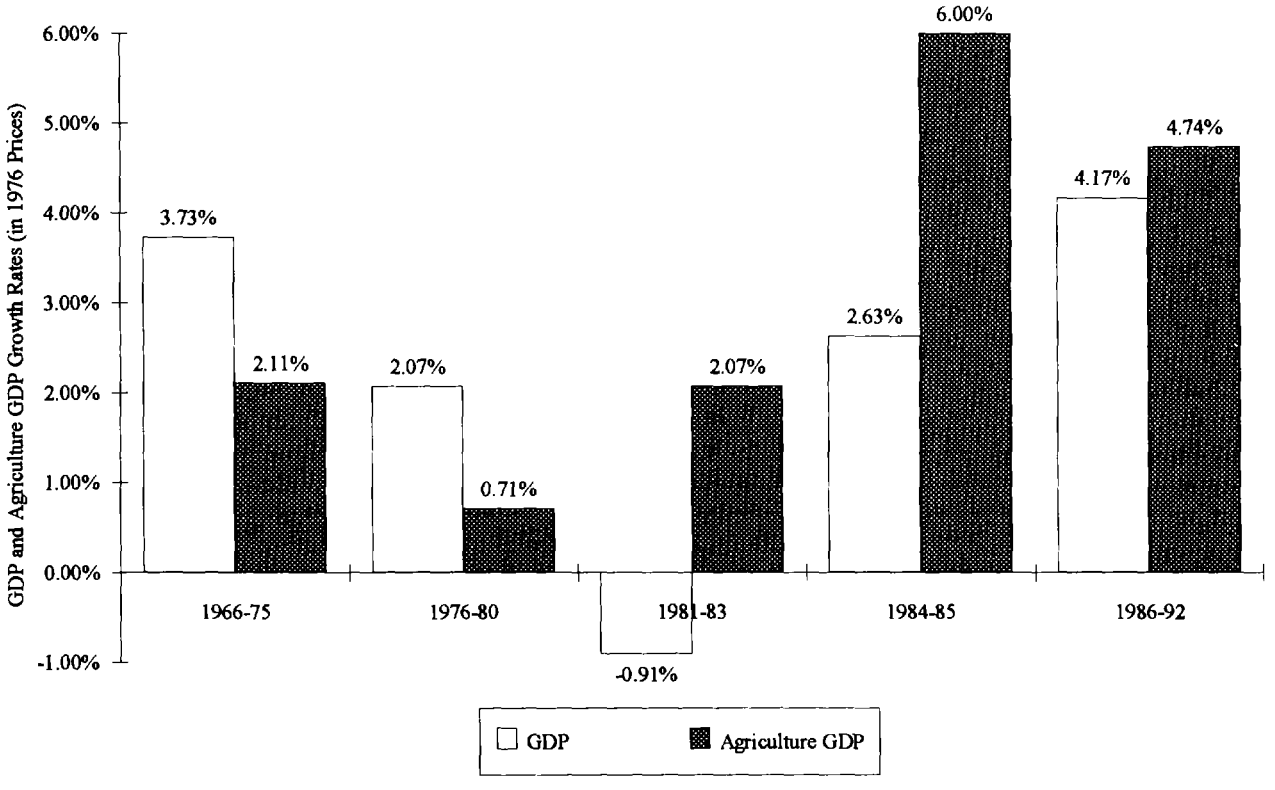
8 World Bank, Report No. 9352-TA, "Tanzania - Towards Sustainable Development in the 1990's", June 11, 1991, pages 1-9.

9 Unless mentioned specifically, all trend growth rates are average annual exponential rates, calculated using the least squares method.

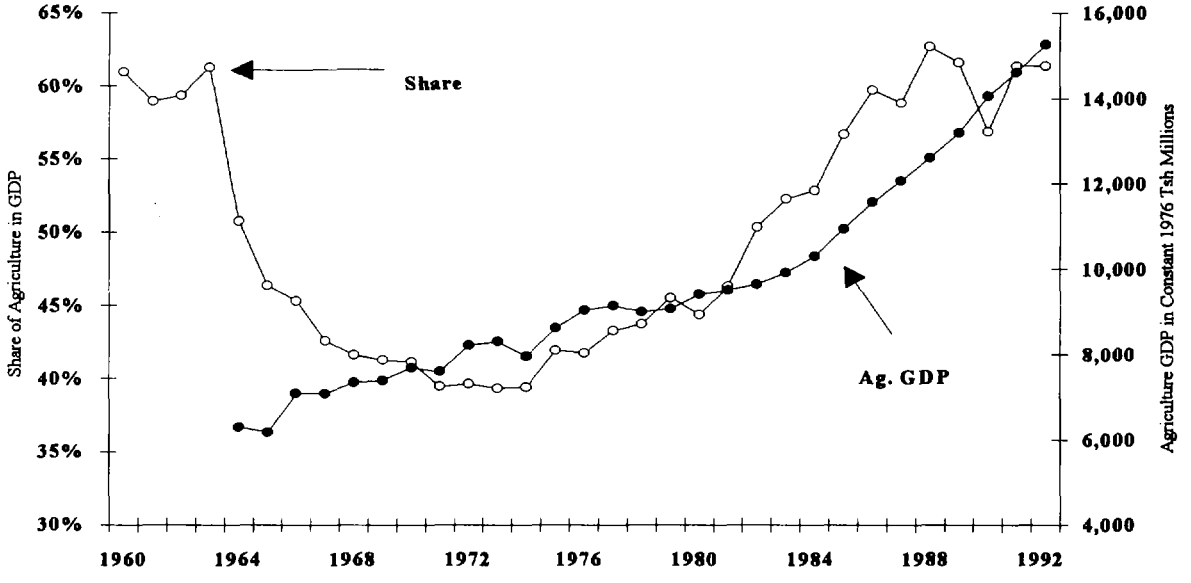
10 In 1976 prices.

Figure 1.2: Real Growth in GDP and Agriculture GDP (1976 prices)



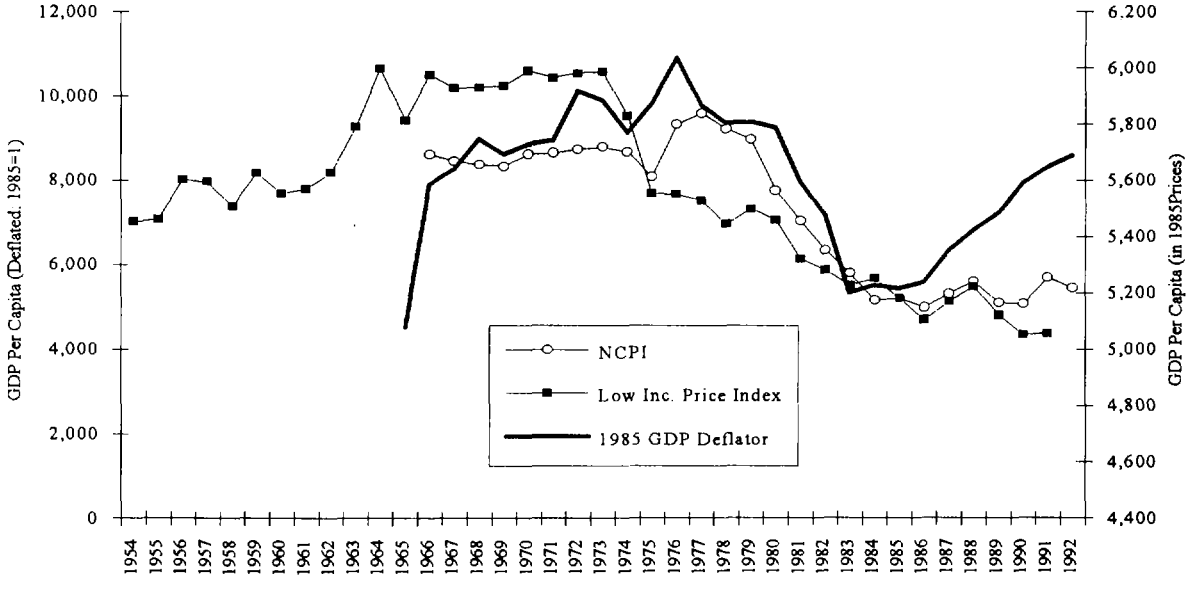
The normal process of structural transformation and the gradual decline in the share of agriculture which accompanies the shift of resources into higher-valued output was slowed, and then reversed in Tanzania in the late 1960s and early 1970s. As the Figure 1.3 indicates, from the late 1960s on, agriculture's share of the economy remained at 40 percent. With the onset of the agriculture-led reform program in the mid-1980s, agriculture increased its share of output to around 60 percent, the status it used to occupy in the early 1960s. While this may indicate that the economy is poised to support another push in the non-agricultural sectors, it is still too early to withdraw from support for agriculture sector growth.. The lead role assigned to agriculture in the process of economic recovery reflects national development objectives. Growth in agriculture is, at this time, the most effective means of generating more foreign exchange, alleviating poverty and achieving food security. An agricultural supply response can best be achieved by increasing attention to production incentives, and providing institutional and infrastructural support for the agricultural sector. Any shifts in economic priorities towards the development of industry and services should ensure that agriculture does not lose the support necessary to continue its expansion.

Figure 1.3: Share of Agriculture in GDP (Current Prices) and Agriculture GDP (Constant Tsh Millions)



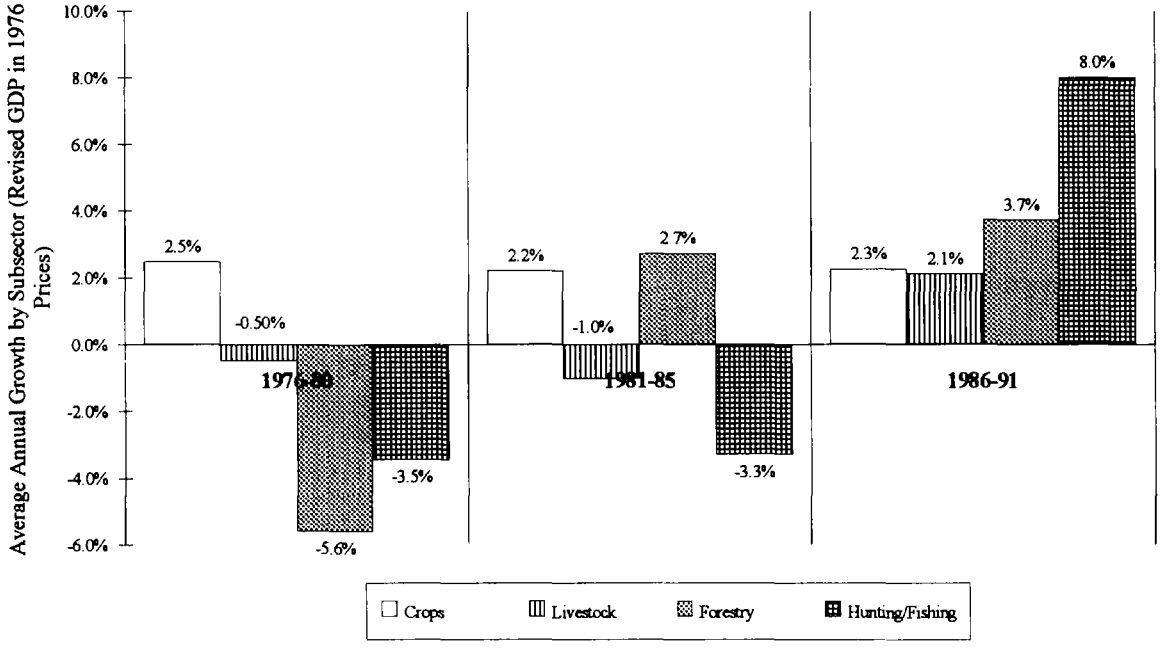
Average GDP growth for the whole economy since the mid-1970s has been below the population growth rate. Between 1967 and 1978 the population grew at 3.3 percent per annum, vs. 3.6 percent per annum for GDP. Population growth slowed to 2.8 percent per annum between 1978 and 1988 (census years) and GDP grew only at 1.7 percent per annum. As a result, GDP per capita fell during the early 1980s, and is only now beginning to rise to the levels enjoyed in the early 1970s. As Figure 1.4 shows, real income per capita, evaluated using various deflators, is not much higher than it was in the mid-1950s, although it appears, using the GDP deflator, that per capita GDP has improved substantially since 1986.

Figure 1.4: Real GDP per Capita, Deflated Using Various Indices.



The nature of growth in agriculture is analyzed below. Within agriculture GDP the crop subsector,[11] which accounts for 65 to 75 percent of agriculture production, has maintained a steady growth rate. Despite the changes in social and economic policy, growth in output has been between two and three percent per annum. This is similar to the rate of population growth in rural areas, and is to be expected in an agricultural economy based on subsistence farming where an estimated 40 percent of food consumption comes from home production. As Figure 1.5 indicates, annual average growth rates for livestock and the other sectors occasionally have been negative under the various policy regimes, until the period of in-depth reform began in 1986. Following the initiation of the Economic Recovery Program, the non-crop production sectors began to respond to improved demand and production incentives.

Figure 1.5: Average Annual Growth Rates in Agriculture by Sector, by Period, 1976-1991



Crop production is the largest subsector in agriculture, contributing around 63 percent to agriculture GDP. Its seemingly stable performance masks severe fluctuations in production and growth by type of crop. These fluctuations have followed the pattern induced by various policy regimes. Cereal production, for example, the basic food crop, which accounts for some 28 percent of the value of present crop output, has seen its growth rate decline from 5.7 percent per annum in the period 1976 to 1980, to 4.3 percent per annum between 1981 and 1985, to 0.2 percent per annum between 1986 and 1991 (Figure 1.6). (However, the very high growth rate in cereals production in 1976-80 is suspect[12]). In 1984 and 1985 there was a surge in production of food and other crops, resulting from the liberalization of "own-funds

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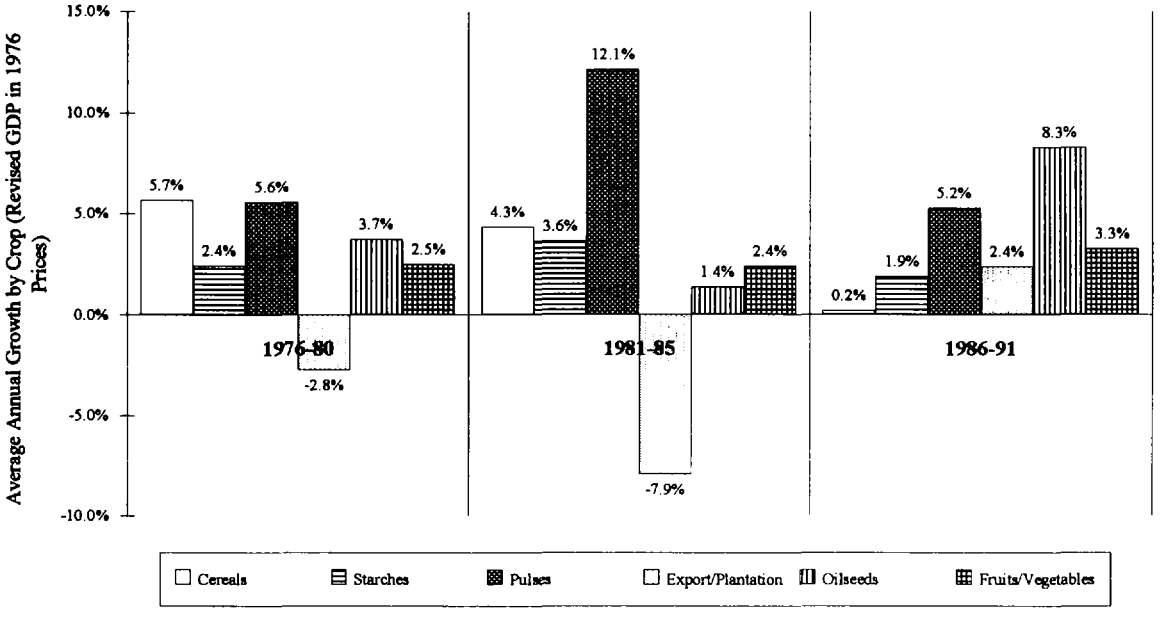
11 Official data is not available on the breakdown of agriculture GDP. The mission has constructed its own version of the agriculture GDP series from 1976 through 1991, following the methodogy used in the CEM. Details on these calculations are available in the Working Paper. References to elements of the agriculture GDP are based on mission estimates.

12 See argument in van den Brink, Rogier, "A Review of Agricultural Statistics of Mainland Tanzania", June 1992, Southern Africa Department, pp 27 and 28, where he points out that the rapid growth in food production posited between 1975 and 1980 is not consistent with independent observations of prices in open food markets, import data, health data, caloric intake data and rates of technology adoption. These point to continued gradual growth during the late 1970's and early 1980's.

imports", and the reappearance of "incentive" consumer goods on the shelves in rural areas.[13] Starches, a subsistence foodcrop which includes cassava and potatoes, is cultivated in the South and other areas not suitable for maize. It contributes some 33 percent to the value of crop output, and has continued to grow at between 2 and 3.5 percent per annum. Growth rates in the production of oilseeds, pulses, and fruits and vegetables, all preferred crops with somewhat higher income elasticity of demand, have responded vigorously to the gradual import liberalization of the early 1980s, as well as to further steps to free up local marketing and promote exports in the late 1980s. Exporters of oilseeds and fruit and vegetables were allowed to retain a portion of their foreign exchange earnings, increasing their attractiveness. Export crops are the most easily affected by changes in policy framework. For smallholder farmers, production of cash crops, expecially in difficult times, will be a residual use of resources after meeting domestic food needs. As the market economy contracted in the late 1970s and early 1980s and consumer goods became scarce, the attractiveness of "cash crops" diminished considerably, whatever the price. Figure 1.6 shows a dramatic reversal in the growth rates of the plantation and export crops (mainly coffee, cotton, cashews and tea) following the initiation of reforms in the trade and foreign exchange regime in 1986. A negative growth rate of -7.9 percent in 1981-85 changed to a positive growth rate of 2.4 percent per annum during the period starting in 1986.

Figure 1.6: Average Real Annual Growth by Subsector, Within Agriculture GDP



B. Agricultural Exports and Imports

Export crop production declined between the mid-1970s and the mid-1980s because of the disincentives created by domestic policies. This trend, combined with the decline in the international prices for traditional agricultural export crops, has caused the value of Tanzania's exports to drop dramatically over the past 25 years. Between 1965 and 1991 the real value of all merchandise exports has declined at an average annual rate of 4.5 percent per annum. Over the same period the real value of total imports

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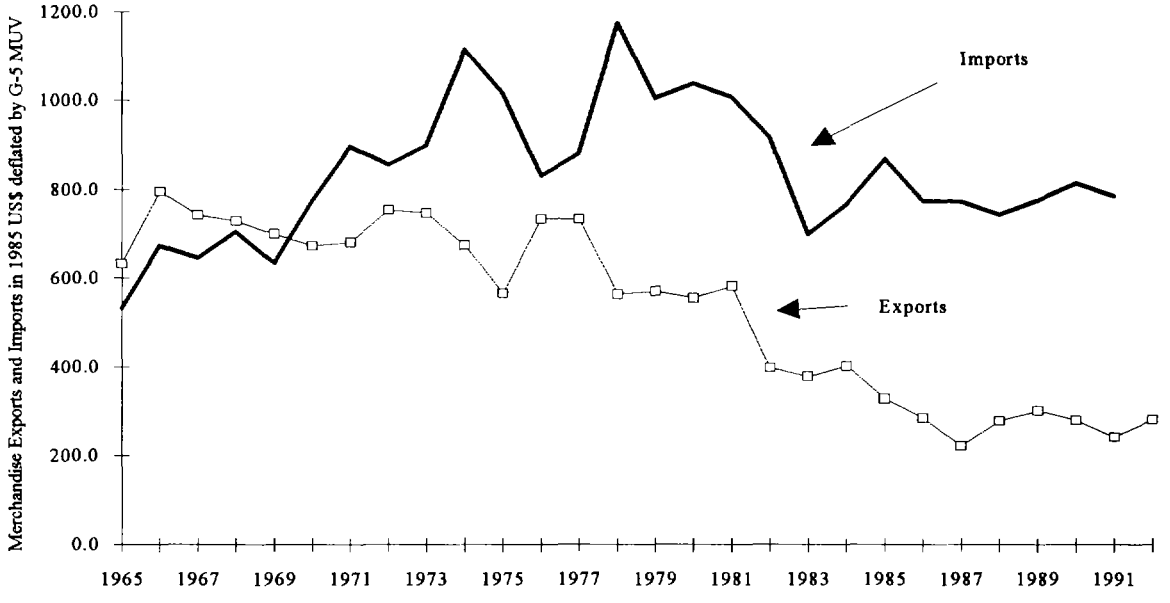
13 See Bevan, D., Collier, P., and Gunning, J.W., "Peasants and Governments - An Economic Analysis", Clarendon Press, Oxford, 1989, pp 153-222, and World Bank, "Tanzania -Economic Report - Towards Sustainable Development in the 1990's", Report 9352-TA, June 11, 1991, pp 66-67.

grew at about 0.7 percent per annum. As Figure 1.7 indicates, the value of all imports has exceeded exports since 1970. Since then the trade deficit has widened with the rapid growth in import demand which accompanied economic reform since 1986, driving the deficit to its maximum value in 1991. The value of all merchandise imports is now three times the value of exports.

Figure 1.7: Total Merchandise Exports and Imports, in 1985 US dollars, Deflated by the G-5 MUV.



The export sector has been very responsive to the policy climate. During the period of gradual socialization of the economy (1965-79), the real value of merchandise exports[14] declined at a trend rate of -1.4 percent per annum, while imports continued growing at over 4 percent. During the period of full socialization and partial reforms (1980-1985), exports declined rapidly at -14 percent per year, with imports also going down at almost -5 percent per annum. Later, when the incentive policies towards export agriculture adopted under the Economic Recovery Program began to have an impact, the decline in exports was arrested. Trend growth in the real value of exports has been zero since 1986. This represents a significant achievement, since the net barter terms of trade[15] for Tanzania have declined by 25 percent during the same period.

The net barter terms of trade for Tanzania have declined significantly since the mid-1980s (Figure 1.8). The drop in international prices coincided with the initiation of the economic reform program, making adjustment more difficult. The barter terms of trade index has dropped by 41 percent since the height of the most recent coffee boom (1985). A key feature of the economic reform program initiated in 1986 has been the devaluation of the currency, induced in part by the deterioration in trade conditions. There have been drastic reductions in the real effective exchange rate since 1986 (Figure 1.8). While devaluation provided some impetus to exports, its supply and income effect in rural areas was muted by the lack of adjustment to farmgate prices. The gains from the devaluations were taken by the export

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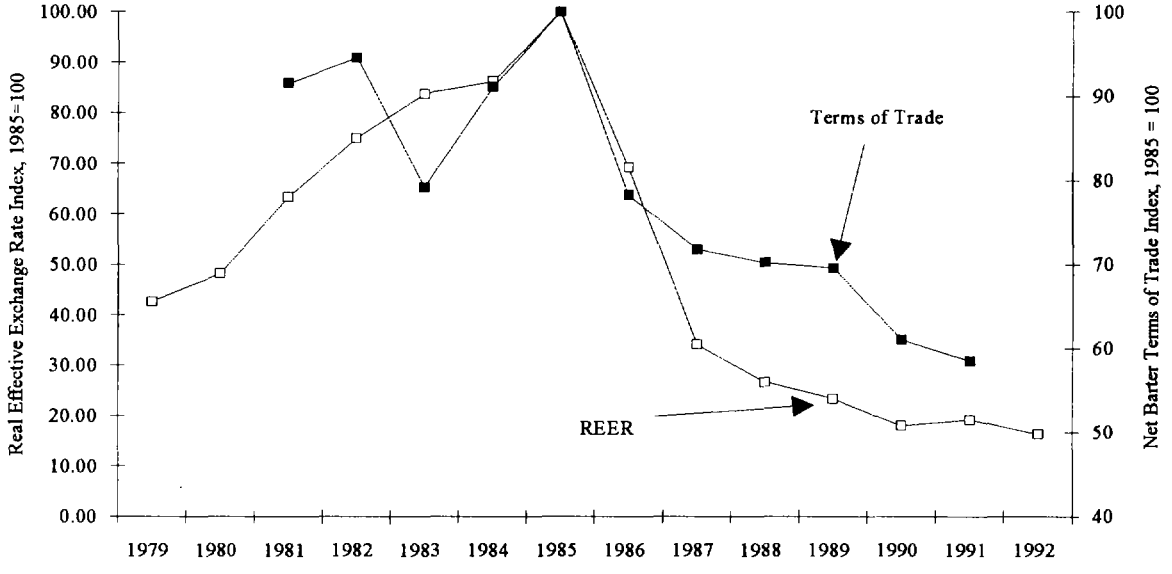
14 In this case the FOB value of merchandise exports deflated by the G-5 MUV (Manufacture Unit Value) Index. This index reflects the US dollar value of manufactures exported from USA, France, Germany, UK and Japan, weighted proportionally to the countries' exports to the developing countries. This is also known as the net income terms of trade: value of merchandise exports divided by the index of import prices.

15 Net barter terms of trade: index of export prices divided by index of import prices.

processing and marketing industries which remained monopolies in the hands of cooperative unions or export marketing boards. Government continued to set farmgate prices and processing margins at levels which favoured the processing industries. Only in the early 1990s was farmgate pricing liberalized, and the first steps taken to introduce competition in export crop marketing and processing.

Figure 1.8: Real Effective Exchange Rate Index (1985 = 100) and Net Barter Terms of Trade Index (1985 = 100)



The sharp decline in the real value of imports between 1980 and 1985 cut deeply into the availability of the raw materials, consumer goods and machinery needed to keep economic growth alive. The slowdown which this produced was an important event, catalyzing the decisions that led to reform and recovery in the middle and latter part of the decade. The agriculture sector memorandum of 1983[16] put a strong emphasis on the constraint to production posed by insufficient foreign exchange for imports that were vital to the functioning of the agricultural economy. The recent country economic memorandum[17] has argued that the increased availability of consumer goods due to the changes in the foreign exchange regime in 1984 caused a one-time increase in production incentives, and was partly responsible for the increased output from agriculture that has occurred since then. In 1986, however, imports started to grow rapidly again increasing at a rate of 3.2 percent per year, thanks to the increased availability of donor import finance.

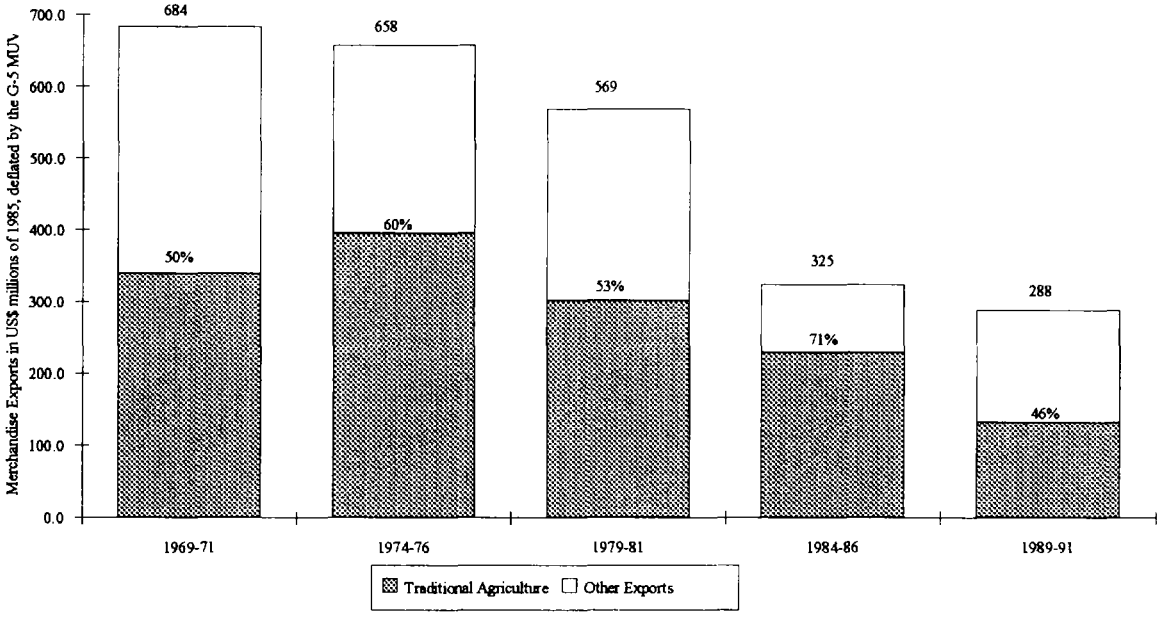
The composition of exports has shifted as export policies and commodity prices have changed. Traditional agricultural exports (coffee, cotton, tea, cashewnuts, sisal, tobacco and pyrethrum) have been a fall-back mechanism for generating foreign exchange. The country is capable of producing and exporting a wide array of products in addition to these traditional export crops. The share of traditional exports is a barometer of how well the non-traditional export economy is faring. In the late 1960s traditional agriculture accounted for only 50 percent of exports. Its share rose as high as 71 percent in 1984-86 before declining in 1989-91 to 46 percent of the total, but with a much lower real value (Figure 1.9) than in the late 1960s. Given that the population has more than doubled since the late 1960s, and the economy is twice as large, the real decline in the value of exports is an alarming phenomenon. The real value of

16 World Bank, Report No. 4052-TA, "Tanzania-Agriculture Sector Report", August 19, 1983.

17 World Bank, Report No. 9352-TA, op. cit.

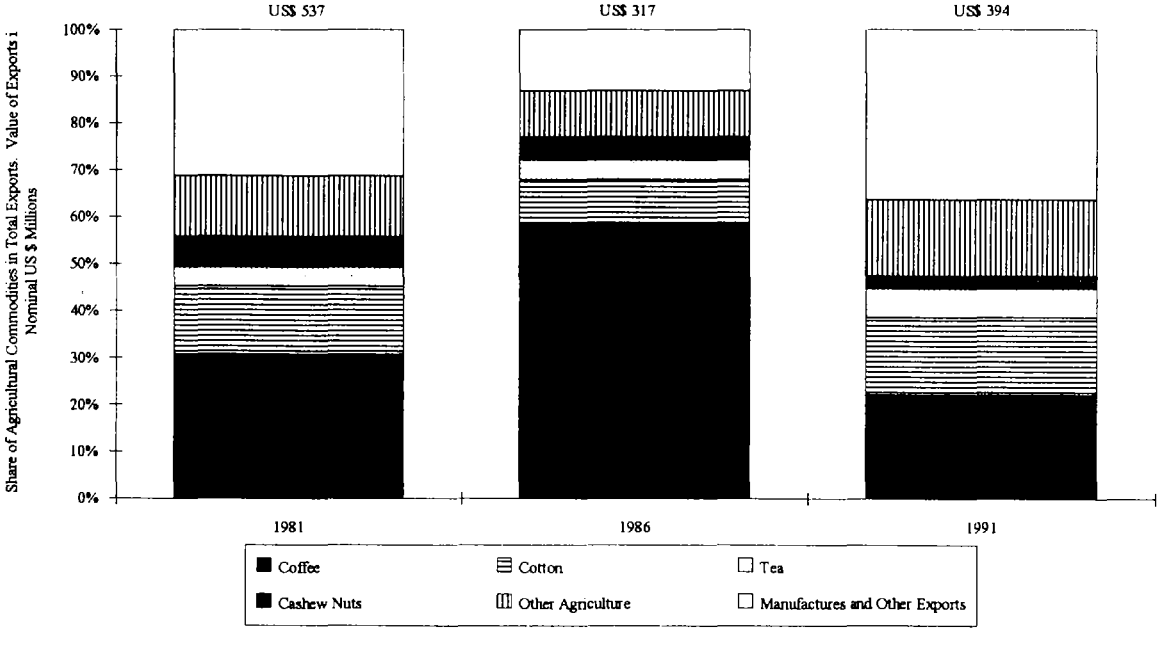
traditional agricultural exports had also declined dramatically from its peak in 1974-76. Thus the diversification and expansion of export capacity must rank very high on the list of national economic priorities.

Figure 1.9: Traditional Agricultural Exports (US$ millions of 1985, Deflated by G-5 MUV)



Coffee continues to play an important, although declining, role in earning export revenue. The nominal value of coffee exports was high in 1986, and had declined substantially by 1991. Cotton exports have grown significantly in value since the mid-1980s, as has the value of non-traditional agricultural exports (Figure 1.10).

Figure 1.10: Traditional Export Crops, and Their Share In Total Exports



The physical volume of exports of traditional agricultural crops was static during the 1970s and early 1980s, with the exception of sisal and cashewnut exports, which declined sharply. The volume of coffee exports remained fairly stable over the years, between 40,000 and 60,000 tons. Cotton lint exports peaked in 1966 at just under 100,000 tons, gradually declined to a trough of about 25,000 tons in 1985, before climbing back up to the 90,000 ton level in 1991. Sisal suffered a dramatic decline, from some 210,000 tons in 1965 to under 5,000 tons in 1991 due to changes in the ownership of the industry, and a decline in international demand. Cashew nut exports rose to over 150,000 tons in the early 1970s, with Tanzania accounting for nearly 30 percent of total world production. By the mid 1980s however, exports of raw nuts had fallen to under 10,000 tons per year, with the collapse in production caused by disruptions to smallholder farming systems and marketing mechanisms. Despite a large buildup in processing capacity, only small quantities of cashew kernels were exported. Following the reforms of the mid-1980s, including currency devaluations; increases in producer prices; and the gradual liberalization of export marketing and other incentive policies, export volumes of coffee, cotton, tea, and tobacco started to go up.

Figure 1.11: Trends in Export Volume for Coffee, Cotton and Tea (in '000 metric tons)

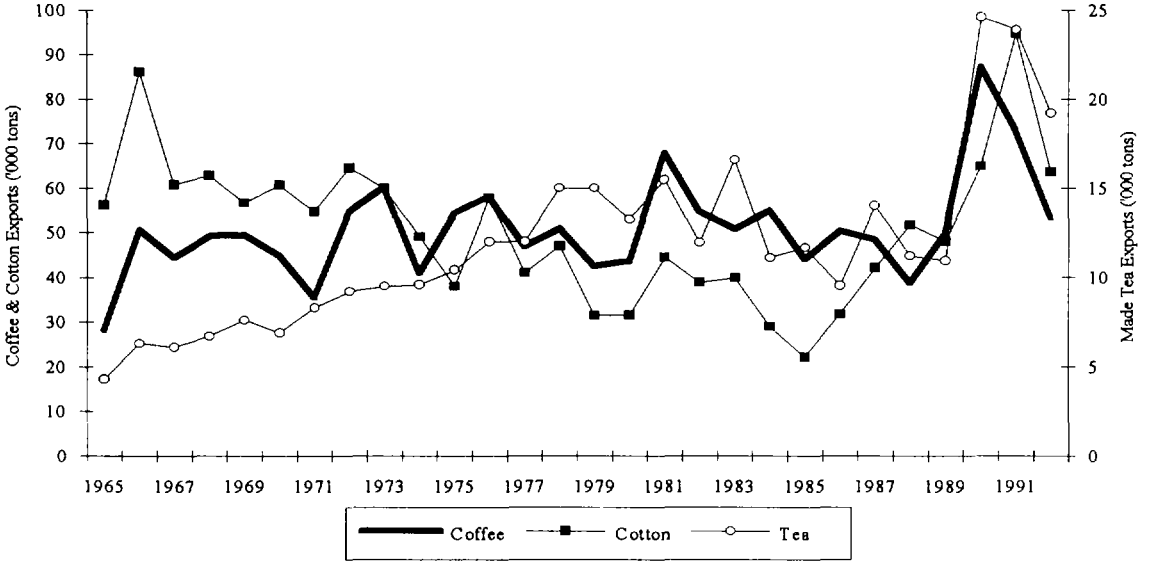
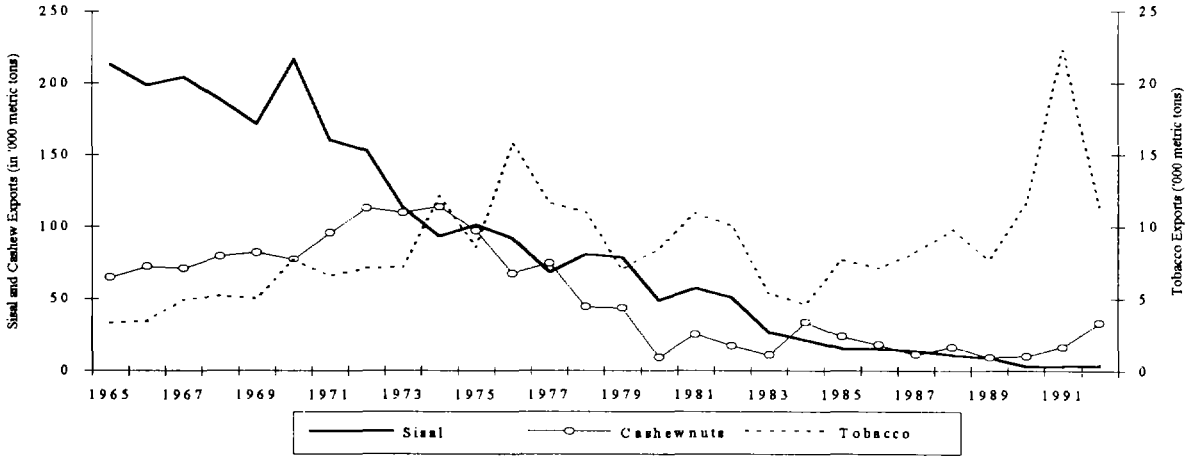


Figure 1.12: Export Volumes for Sisal, Raw Cashews and Tobacco (in '000 metric tons)



The international market for coffee appears to be the most volatile by far for Tanzania. Since the local peak in 1986, the trend in the real coffee price has been steadily downwards, to its lowest real level in the past 25 years (Figure 1.13). In spite of the declining real price, coffee export volumes have remained stable, as noted previously, because of the compensating domestic policy, which has included substantial devaluations. The international price of cotton and tea has also fallen steadily in real terms in the past few years. In 1990 and 1991 the prices of both these crops slipped to their lowest levels for the past 25 years. Despite these unfavourable international incentives, export volumes for both these commodities have increased in the past two years (Figure 1.11) because of the liberalization of domestic pricing and marketing arrangements, in the case of tea, and because of strong subsidies to the sector, in the case of cotton. Cotton ginning and processing have continued to be a series of regional monopolies held by the cooperative unions. The prices for sisal and cashews increased in real terms in 1990 and 1991, after many years of relative stagnation. Tobacco prices, on the other hand, have been falling dramatically in real terms since 1965. The current real tobacco price is less than 20 percent of what it was in the mid-1960s. The market situation for these crops will be explored more fully in Chapter IV.

Figure 1.13: Export Prices for Coffee, Cotton and Tea (in 1985 US$/kg Deflated Using G-5 MUV)

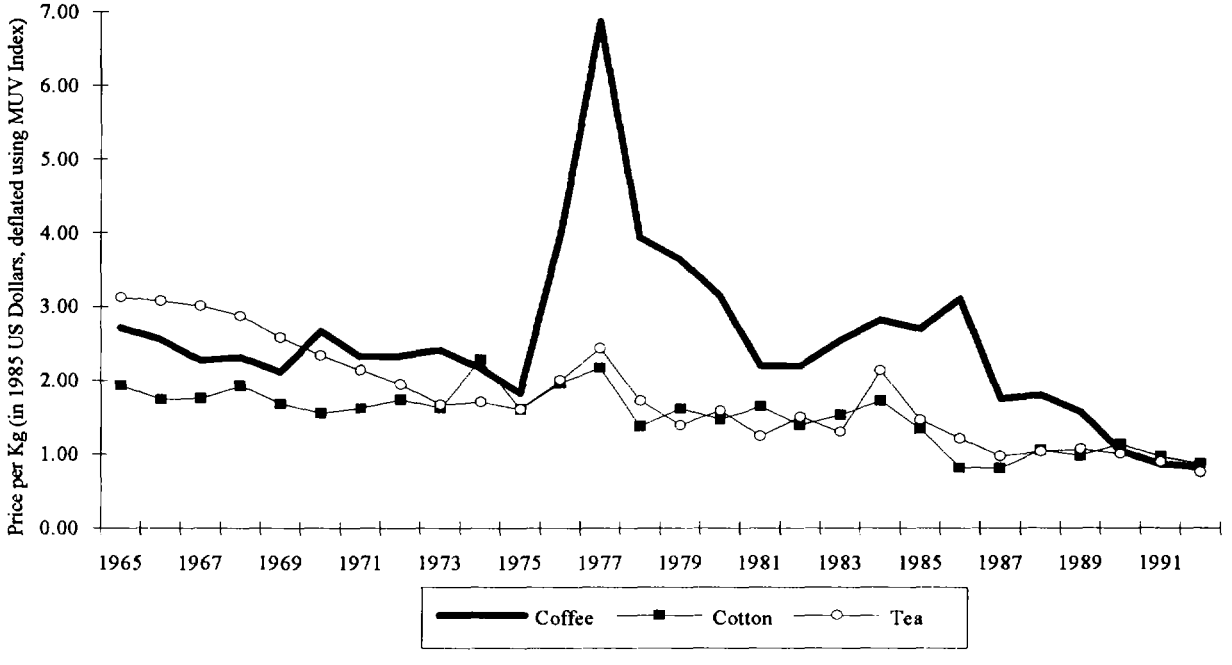
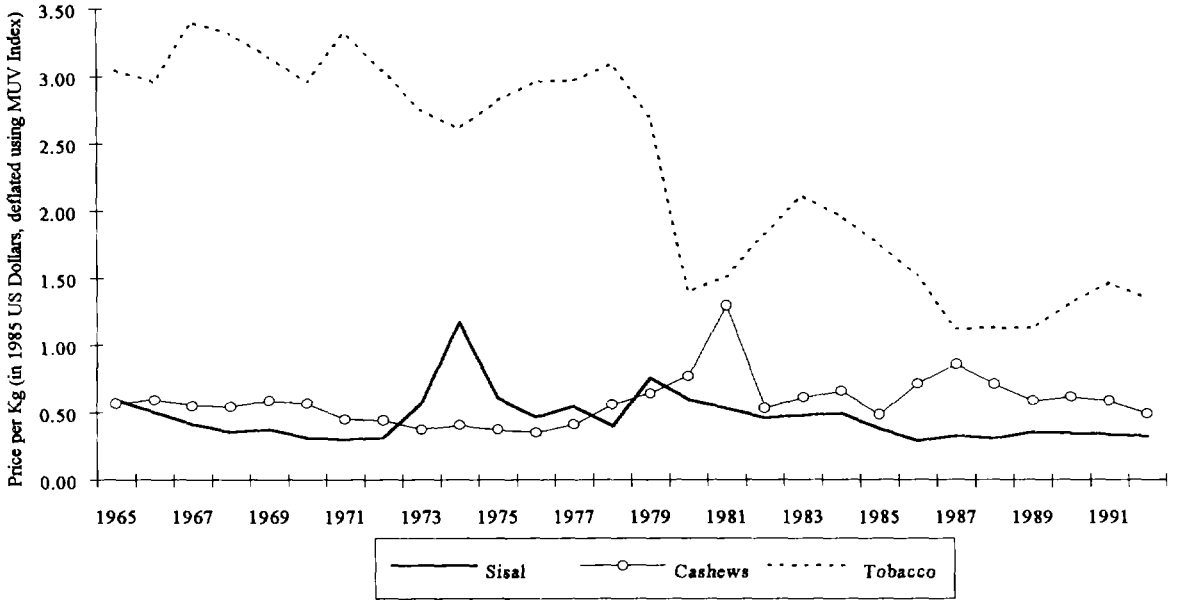


Figure 1.14: Export Prices for Sisal, Cashews and Tobacco (in 1985 US$/kg Deflated Using G-5 MUV)



C. Summary

This chapter describes major trends in the development of agriculture, and places it in the context of the country's overall economic development. The evolution of production, productivity, exports, and prices and over a twenty year period, are synthesised to capture the historical changes which have taken place in production relationships in agriculture, and to set the stage for the prescriptions to be developed in the body of the report. Brief mention is made of the consequences of the increasingly interventionist role of Goverment in the economy as of 1967; the adjustments in import policy and agrarian structure undertaken in the early 1980s; the deeper macroeconomic reforms initiated with donor support in 1986; the sharp drop in the international prices of key exports (coffee, tea, cotton) in the late 1980s; and the consequences of gradual adjustment in the agricultural sector in the late 1980s and early 1990s. The chapter emphasises the consequences of economic stagnation and the decline in per-capita output which took place during the late 1970s and early 1980s, and the positive effects that the gradual liberalization of the foreign exchange market, the grain market, and certain export markets, coupled with the reduction of transport and intermediation costs, have had in stimulating agricultural production.

II. THE RESOURCE BASE AND THE RURAL POPULATION

A. Natural Resources

Tanzania is larger than Kenya and Uganda combined, stretching from the equator down to 12 degrees south Latitude . Mainland Tanzania, the subject of this report, covers 942,800 square kilometers. Zanzibar and Pemba make up another 2,000 square kilometers. The land area of mainland Tanzania is 881,300 square km; an additional 61,500 square km are under inland lakes. The climate is tropical, with mean temperatures determined by altitude. The coastal plain, covering one fifth of the land surface, has a warm climate. From the coast, the land rises gradually to a broad inland plateaux between 750 and 1,500 m high, which accounts for three-fifths of the land area. Here the climate is moderately warm, with mean daily temperatures between 21 and 24 degrees centigrade. Around the periphery of the central plateaux are highland areas with altitudes ranging from 1,500 to 2,300 m. The climate here is moderately cool, with temperatures ranging from 15 to 20 degrees centigrade. Highland areas account for a little less than one-fifth of the land area of mainland Tanzania.[18]

Agricultural potential is determined principally by moisture availability. Irrigation is minimal, and agriculture is dependent on rainfall. Rainy seasons vary along a North-South axis. The North has two growing seasons: the short rains, which start in October and run through January, and the long rains, which start in March and continue through June. Moving South there is a gradual shift to a single growing season which starts in November/December and also runs through June. An assessment of growing period (which takes rainfall distribution, moisture retention, evapotranspiration and other factors into account) indicates that some 46 million ha (about half of the land area) have a growing period of over 120 days (sufficient for maize and beans) and a reliable onset of the rainy season.[19] Within these regions with reliable moisture availability, the cropping potential (using the traditional low-input, low-output techniques) is determined by soil structure and nutrient status. The main physiographic regions are described below in Table 2.1.

Agro-ecological Zones

The simultaneous consideration of thermal, moisture, soil and topography characteristics permits the definition of broad agro-ecological zones. These classifications are useful for determining production, and for assessing the potential for crop cultivation. These agro-ecological zones are described below, and are linked to a descriptions of farming systems.

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18 Taken from World Bank, "Land Resource Potential for Rainfed Production of Bunded Rice and Wheat", 1990 Working Paper No. 1, Tanzania Agricultural Adjustment Program, Volume 1, Supplement to World Bank Report No. P-5200-TA. Land resource inventory derived from the work of de Pauw, E., "Agricultural Potential and Constraints in Relation to Growing Periods and their Variability in Tanzania", Pedology, 1983, (2):, p.147-170; and de Pauw, E., "Soils, Physiography and Agroecological Zones of Tanzania", CMEW project, MALD, Dar es Salaam (1984). Also drawn from Ministry of Natural Resources and Tourism, "Mapped Inventory of a.o. National Parks, Game Reserves and Forest Reserves at scale 1:2,000,000 compiled by Forestry Division.(1974).

19 Ibid. Table 2, page 7.

Table 2.1: Physiographic Regions [20]

	Description	Agro-ecological Zone	Area
Coastal Zone	Low altitude plains (below 750m) on marine secondary and tertiary sediments	I	6 million ha
Eastern Plateaux and Mountain Blocks	Medium altitude plains (150-1,300m) on Precambrian metamorphic rocks	II & III	21.1 million ha
Southern Highlands	High altitude plateaux (1,500-2,000m) with volcanic and pre-Cambrian metamorphic rock	V	6.7 million ha
Northern Rift and Volcanic Highlands	Medium altitude plains (1,000-2,300m), with volcanic and rift landforms	VI	5.8 million ha
Central Plateaux	Medium altitude plains (1,000-1,300m), on granite	IV	32.7 million ha
Rukwa-Rusha Rift	Medium altitude rift depression (800-1,200m) with lake sediment	VII	3.5 million ha
Inland Sediments	Medium altitude plain (750-1,000m) on Karoo sediments	VII	6.7 million ha
Ufipa Plateau	High altitude (1,500-2,200m) on metamorphic, sedimentary and granitic rock	V	1.8 million ha
Western Highlands	Medium to high altitude plain (1,200-1,900m) on volcanic or sedimentary rock	V	4.3 million ha

There have been many attempts to identify agro-ecological zones in Tanzania. All arrive at similar classifications. The presentation below is based on the conclusions of the Land Resources Development Center[21], which in turn draws from prior studies.[22] Seven major agro-ecological regions are identified in Table 2.2 on the basis of climatic and geophysical characteristics in Table 2.1.

Of the regions identified in Table 2.2 (over), the Highlands (Zones V and VI) and the Plateaux (Zone IV) have good soils, reliable and plentiful rainfall, and are of high agricultural potential, especially for smallholder farmers. The Alluvial soil zone also offers good potential for cultivation, although more appropriate for larger-scale, mechanized farming. The Coast and Semi-Arid Lands (Zones I and III) are only moderately suitable for annual cropping and high-intensity agriculture, and are used for more drought resistant crops such as cassava, sorghum and sisal.. The Arid Lands (Zone II) are of low potential for sustained cropping, and are best used for low-intensity extensive livestock grazing.

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20 Ibid. Table 3, page 9.

21 Land Resources Development Center (1987), "Tanzania - Profile of Agricultural Potential", Report for the Overseas Development Administration, UK, in Oxford University Food Studies Group, "Agricultural Diversification and Intensification Study", Final Report, Volume I, pp.25-31.

22 It draws mainly on Moris, M. "Farming Systems in Tanzania", 1981, from the Proceedings of the Conference on Farming Systems and Farming Systems Research in Tanzania, and Samki and Harrop, National Soil Services, Mlingano, 1984, FAO project URT/73/006.

Table 2.2: Agro-ecological Zones

Zone	Sub-Zone and Areas	Soils and Topography	Altitude	Rainfall (mm/yr)	Growing Season
I. COAST	North:Tanga (except Lushoto), Coast and Dar es Salaam) South: Eastern Lindi and Mtwara, (except Makonde Plateau)	Infertile sands on gently rolling uplands Alluvial soils in Rufigi Sand and infertile soils Fertile clays on uplands and river flood plains	under 300m	North: bimodal, 750-1200mm South: unimodal, 800-1200mm	North: October-December and March-June South: Dec-April
II. ARID LANDS	North: Serengeti, Ngorongoro Parks, part of Masailand Masai Steppe Tarangine Park, Mkomazi Reserve, Pangani and Eastern Dodoma	North: Volcanic ash and sediments. Soils variable in texture and very susceptible to water erosion South:Rolling plains of reddish sandy clays of low fertility. Susceptible to water erosion. Pangani River flood plain w/ saline, alkaline soil.	North: 1300-1800m South: 500-1500m	North: Unimodal, unreliable, 500-600mm South: Unimodal and unreliable, 400-600mm	March - May
III. SEMI-ARID LANDS	Central Dodoma, Singida, N. Iringa, some of Arusha, Shinyanga Southeastern: Morogoro (except Kilombero & Wami Basins and Uluguru Mts). Also Lindi and SW Mtwara	Central: Undulating plains, w/ rocky hills and low scarps. Well drained soils w/ low fertility. Alluvial hardpan and saline soils in Eastern Rift Valley and Lake Eyasi. Black cracking soils in Shinyanga. Southeastern: Flat, or undulating plains w/rocky hills. Moderately fertile loams and clays in South (Morogoro), infertile sands in center.	Central: 1000-1500m Southeastern: 200-600m	Central: Unimodal and unreliable:500-800mm Southeastern: Unimodal: 600-800mm	December - March
IV PLATEAUX	Western: Tabora, Rukwa (North and Center), Mbeya (North), Kigoma, part of Mara Southern: Ruvuma, and Southern Morogoro	Western: Wide sandy plains and Rift Valley scarps. Flooded swamps of Malagarasi & Ugalla rivers have clay soil with high fertility Southern: Upland plains w/ rock hills. Clay soils of low to moderate fertility in South, infertile sands in North.	800-1500m	Western: Unimodal, 800-1000mm Southern: Unimodal, very reliable, 900-1300mm	November-April
V. SOUTHERN & WESTERN HIGH-LANDS	Southern: A broad ridge from N. Morogoro to N. Lake Nyasa, covering part of Iringa, Mbeya Southwestern: Ufipa plateau in Sumbawanga. Western: Along the shore of L. Tanganyika in Kigoma and Kagera.	Southern: Undulating plains to disected hills and mountains. Moderately fertile clay soils, with volcanic soils in Mbeya. Southwestern: Undulating plateaux above Rift Valley(s). Sandy soils of low fertility Western: North-South ridges separated by swampy valleys. Loams and clay soils of low fertility in hills, with alluvium and ponded clays in valleys.	Southern: 1200-1500m Southwestern: 1400-2300m Western: 1000-1800m	Southern: Unimodal, reliable, local rainshadows, 800-1400mm Southwestern: Unimodal, reliable, 800-1000mm Western: Bimodal, 1000-2000+mm	Northern. December - April Southwestern: November - April Western: October-December and February-May.
VI. NORTHERN HIGH-LANDS	Northern: foot of Mt Kilimanjaro and Mt Meru, Eastern Rift to L. Eyasi. Granitic Mts: Uluguru Mts in Morogoro, Pare Mts in Kilimanjaro, and Usumbara Mts in Tanga, Tarime Highlands in Mara.	Northern: Volcanic uplands. Volcanic soils from lavas and ash. Deep fertile loams and clays. Soils in dry areas prone to water erosion. Granitic Mts: Steep mountain sides to highland plateaux. Soils are deep, friable and moderately fertile on upper slopes; shallow and stony on steep slopes.	Northern: 1000-2500m Granitic Mts.:1000-2000m	Northern: Bimodal, varies widely: 1000-2000mm Granitic Mts: Bimodal and very reliable 1000-2000mm	Northern: November-January and March-June Granitic Mts. October-December and March-June
VII. ALLUVIAL PLAINS	K- Kilombero (Morogoro) R- Rufiji (Coast) U- Usangu (Mbeya) W-Wami (Morogoro)	K- Central clay plain, with alluvial fans East and West R- Wide mangrove swamp delta. Alluvial soils, sandy upstream, loamy downstream in floodplain. U- Seasonally flooded clay soils in North, alluvial fans in South W- Moderately alkaline black soils in East, and alluvial fans with well drained black loam in West.		K- Unimodal, very reliable, 900-1300mm R- Unimodal, often inadequate 800-1200mm U- Unimodal, 500-800mm W- Unimodal, 600-1800mm	K-November - April R-December-April U-December-March W-December-March

Farming Systems

Recent studies agree that the smallholder farming systems can be grouped into six main categories.[23] The classification is based on agro-ecological similarities, but also makes use of other factors such as cultivation intensity, levels of technology and linkages to the cash economy.

Coffee-Banana and Horticulture. Production in this system is based on perennials. Coffee and bananas are often intercropped. Tea is grown in appropriate areas. Cereals and pulses are intercropped outside the perennials. Land is scarce under this system. There is little fallowing, and fertility is maintained with mulch from crop residue and manure from dairy cattle. Rainfall is high, and high-value vegetables and other crops are grown where linkages to markets are available. The system is found in the densely populated highland areas within the regions of Arusha, Kilimanjaro, Tanga, Mbeya, Ruvuma and Kagera (Zones V and VI).

Maize and Legumes. Of the six farming systems, this one is practiced by the largest number of smallholders. Maize and legumes, sometimes intercropped, are the common denominator of this farming system which also includes coffee, tobacco and pyrethrum as cash crops, and cassava as an additional food crop. Maize is grown as a cash crop as well as for subsistence consumption. Most of the maize marketed in the country is produced under this system. While fertilizer is used in some areas, draught power use and mechanization are limited. Normally land is not scarce under this system, and fallowing and shifting cultivation are practised. The system is found in zones with medium to good agricultural potential, and predominates in the Western Plateaux (Zone IV) and the Southwestern Highlands (ZoneV).

Pastoral and Agropastoral. Pastoralism is prevalent in the arid and semi-arid regions in central Tanzania (Zones II and III). Pastoralists graze herds of cattle, sheep and goats, traveling to take advantage of fodder and water as available. Animals and milk products are sold or traded to purchase cereals and other foods. The Maasai, based in Arusha, are the largest group of pastoralists. The agro-pastoral system is a modification of this approach in regions where rainfall and soils permit limited (and highly risky) cropping. Livestock herds are the family's main commercial activity, with incomes (and diet) enhanced by the cultivation of sorghums and millets. The mixed system has advantages for animal production as well. The clearance of bush reduces the incidence of tetse fly (and trypanosomiasis) which improves animal health, longevity and procreative abilities. Crop residues from cultivated areas improve animal nutrition. However, the cultivation of marginal soils can exacerbate wind and water erosion. Fallow periods have to be very long to restore productivity. The unreliability of rainfall makes the use of fertilizer and other inputs unattractive. The deterioration of conditions for agricultural production causes migration into new, underutilized areas of higher potential. Hence the movement out of Dodoma, Singida and Mara into Tabora, Mbeya, Rukwa, Ruvuma and Morogoro.

Sorghum, millet, livestock (cotton and rice). Under this system cropping is the farmers' main economic activity, contrary to the agropastoralists, who focus on livestock. Conditions for crop production are marginally better than those under the agropastoralist system, and the need for constant migration and shifting cultivation is less. Land is not scarce, and fallowing is practiced. While food production is still based on the drought resistant cereals (sorghum and millet), farmers also produce cotton, oilseed and rice for the market. Rice production from this system has increased markedly in recent years. Livestock are important, not only for meat and milk production, but as a source of draught power for cultivation and transport. Draught power is used for bunding (for rice, in the valley bottoms), ploughing

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23 This section is based on the Oxford University Food Studies Group, "Agricultural Diversification and Intensification Study", 1992, Final Report, Volume I, pp40-48, which itself draws on URT and FAO, "Comprehensive Food Security Programme", 1992, pp 17-23, and Ruthenburg, Hans, "Farming Systems in the Tropics", Oxford, 1980.

and ridging. Animal manure helps to maintain soil fertility. This system is prevalent in the Shinyanga and Mwanza regions at the north of the Plateaux and the Northern Highlands (Zones IV and V).

Wetland paddy and sugarcane. The system is based on the use of permanent water sources to cultivate rice and sometimes sugarcane in river valleys and alluvial plains. Smallholder technology is simple, and furrow irrigation is the predominant technique. The potential for increasing yields through intensification is great. However, additional investment in water management infrastructure and grain milling capacity (by the private sector) will be needed to make expansion attractive to smallholders. Large scale operations, public and private, are also using irrigation to produce sugarcane and rice in these regions. The system is found in the alluvial river valleys in Zone VII.

Cassava, cashewnut, coconut. The key subsistence crop in this system is cassava, grown in regions where maize is too risky. Conditions are also suitable for cashew and coconut cultivation, the traditional cashcrops. Land is not scarce, and fallowing and shifting cultivation are practiced, within limits imposed by continuous access to the cashew and coconut stands. Intensification is limited by climate and access to markets. Low prices for cashews and coconuts have caused smallholders to diversify into sesame and groundnuts. Where irrigation and markets are available, vegetables are also grown. Cashew nut production has been revitalized because of improved access to export markets and the availability of treatment for the powdery mildew disease. The system prevails in the Coast region, Eastern Lindi and Mtwara (Zone I).

Smallholder farmers utilize some 4.5 million ha in crops, fallow pastures and forest. Table 2.3 below summarizes the distribution of the six farming systems amongst the 3.5 million smallholder farming households in Tanzania. The characteristics of the 1.3 million ha under large farms is discussed later.

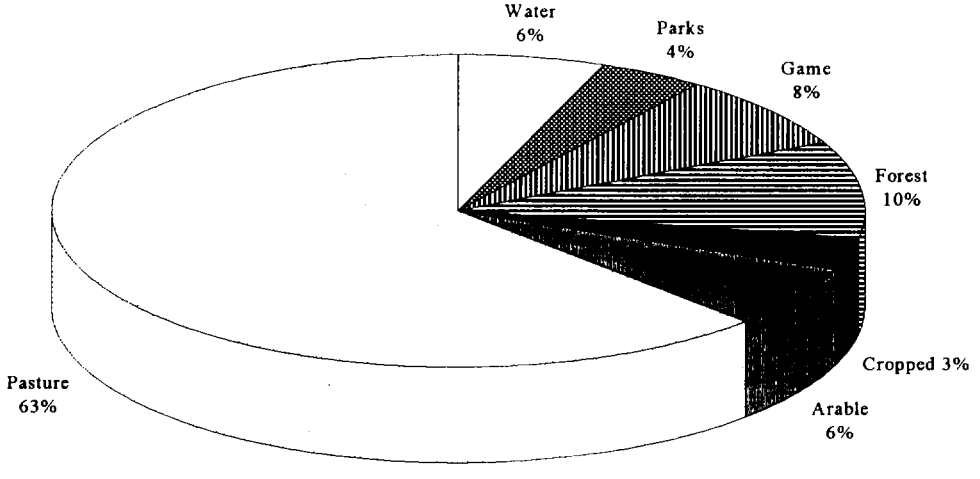
Table 2. 3: Representativeness of Farming System Classification

System	Farming Population (millions)	Farming Households ('000)	Share of Total (%)	Agro-ecological Zone
Coffee, banana	3.2	584	16.6	V
Maize-legumes	6.8	1,258	35.7	IV & V
Pastoral	0.6	106	3	II & III
Agro-Pastoral	1.5	268	7.6	III & IV
Livestock-sorghum-millet	2.6	479	13.6	IV & V
Wetland rice-sugar	0.5	88	2.5	VI
Cassava-cashew-coconut	4.0	740	21.0	I
TOTAL	**19.2**	**3,523**	100	

Land-Use

Current use of the surface area of Mainland Tanzania (94.3 million ha) is depicted below (Figure 2.1). Tanzania has allocated 22 million ha, 23 percent of its surface area to reserves of different kinds, the largest share of land resources allocated to reserves of any country in Sub Saharan Africa. These reserves include National Parks (4.2 million ha), Game Reserves (7.7 million ha) and Forest Reserves (10.1 million ha). The area actually cropped in any given season, a minimum of 3.4 million ha in 1988/89, is only 3 percent of the surface area of Mainland Tanzania.[24] Another 6.5 million ha, outside of the reserves, is considered arable and suitable for cereals such as maize and rice, bringing the total area of good agricultural potential up to about 10 million ha. Much of this land is already used as fallow or pasture. Within the various reserves, there is an additional 3 to 4 million ha which, while not available, has been assessed as suitable for cereal cultivation.

Figure 2.1: Land-use in Mainland Tanzania (94.3 million ha)



Area Under Cultivation

The trend in area planted is one of gradual increase. During the 1980s, the area cultivated has fluctuated around 5 million ha. It is estimated that between 3.4 and 4.5 million ha are physically cultivated every year. Allowing for intercropping and sequential planting in the bimodal rainfall areas, the gross area planted annually is on the order of 5.1 million ha.[25] Of this, some 85 percent are under foodcrops, with cereals occupying 58 percent of total planted area (Figure 2.2).

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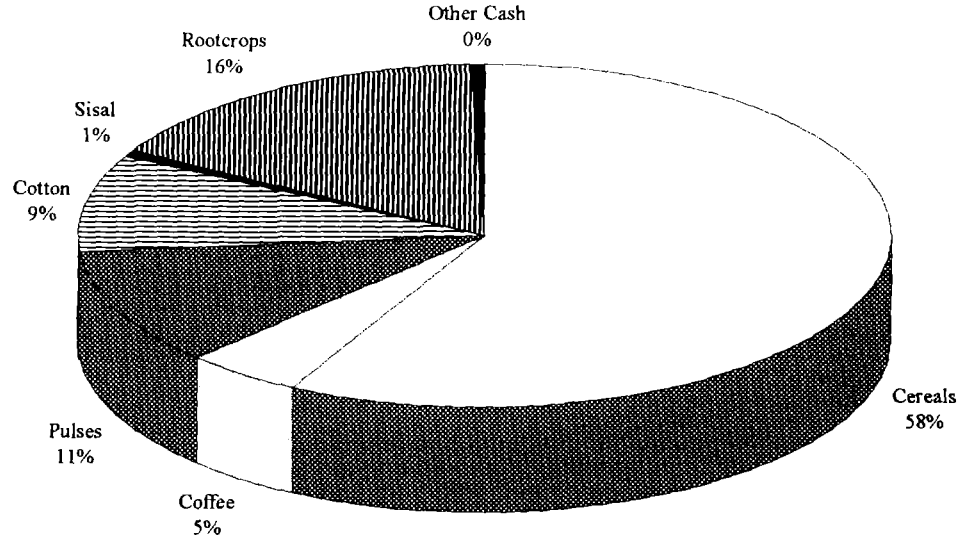
24 Estimates of cultivated area differ; the 3.4 million ha is a minimum estimate, provided by the Agricultural Sample Survey of the Bureau of Statistics, and likely to under-represent the area under perennial crops. There may be a maximum of another 1 million ha under perennials (coffee, sisal and cashew).

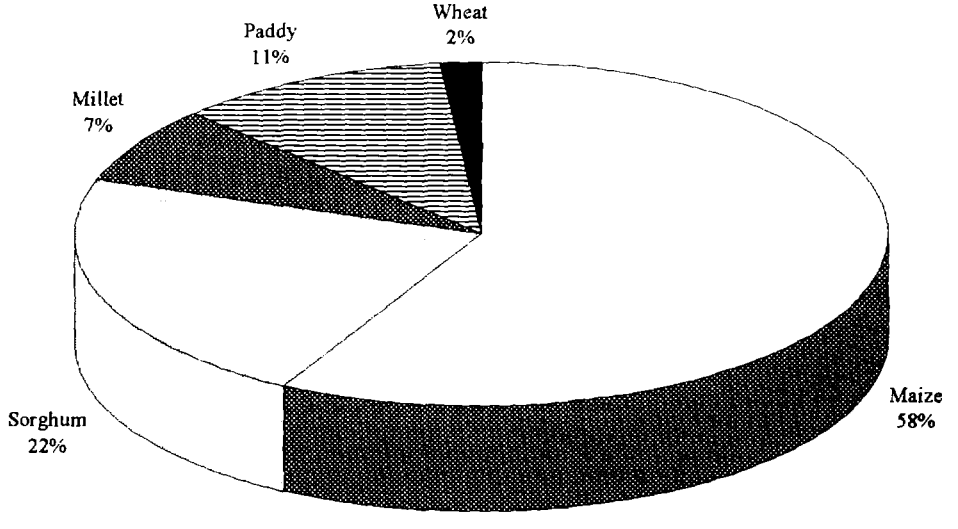
25 There are two main sources of information on land use and agricultural output in Tanzania: (i) the Early Warning System surveys, undertaken prior to harvest by the Ministry of Agriculture, and (ii) the post-harvest national samply survey of 3,100 households administered by the Bureau of Statistics. MOA data on cropped is consistently higher than the BOS survey. MOA data is used as an indicator of country-wide cultivation trends, because it covers all crops systematically. BOS data is used to characterize farm level activity.

Figure 2.2 : Distribution of Area Planted in 1990-92 (5.1 million ha)



Cereals are by far the most important foodcrop in the country. Maize is the preferred cereal, and is grown where the climate and soils permit. Sorghum and millet are used in less favorable climates. Recently rice has become increasingly important, because of the good returns it fetches in the urban markets. The distribution of the area planted to the various cereals is given below:

Figure 2.3: Distribution of Area Planted to Cereals in 1990-92 (2.9 million ha)



The area under farms, estimated at about 5.9 million ha (see Table 2.4 below), does not necessarily coincide with the land of highest potential. Only 70 percent of high-potential land is cultivated or under fallow. The rest is under pasture, forest and other uses.

As Table 2.4 indicates, 91 percent of the 3.4 million hectares cropped in a given year is cultivated by smallholders. The smallholders account for 92 percent of the area under temporary crops (mainly food). Even in the category of permanent crops, smallholders are responsible for three quarters of the area under cultivation (mainly coffee, bananas, cashews and coconuts). Sisal is the exception, it is all grown on large farms in semi-arid areas. With 79 percent of their land under cultivation or fallow, small farmers make more intensive use of their land than the large farmers who cultivate and fallow only 36 percent. The characteristics of smallholder production systems will be reviewed in more depth below.

Table 2.4: Land Under Farms from the 1987/88 Agricultural Sample Survey

	Land Under Small Farms		Land Under Large Farms		Land Under All Farms	
Temporary Crops	2,515	55%	218	16%	2,733	46%
Permanent Crops	340	7%	102	8%	442	7%
Mixed Temp. and Perm. Crops	227	5%			227	4%
Subtotal - Cropped Area	**3,082**		**320**		**3,402**	
Fallow (up to 5yr)	552	12%	159	12%	711	12%
Pastures	120	3%	399	30%	519	9%
Forest	450	18%	147	11%	597	10%
Other	387	8%	298	23%	685	12%
TOTAL	**4,591**	100%	**1,323**	100%	**5,914**	100%

Source: Agricultural Sample Survey 1987/88 , Bureau of Statistics, October 1990, and Survey of Large Scale Farming Report, Tanzania Mainland, 1987/88, Bureau of Statistics, December 1990.

In the absence of technological change or emigration, agricultural growth is horizontal, following rural population growth. New families are assigned underutilized land within the village sphere of influence, and the area under cultivation in the region gradually expands. Clearly the best areas are taken first, and expansion extends into ever more marginal areas. In regions with well-defined and limited land of good potential (such as Kilimanjaro), the density of both population and cultivation increases. As saturation levels draw near, some of the farming population moves to areas with better prospects in the urban or agricultural frontier. Others may expand into contiguous areas of greater ecological fragility and lower agricultural potential, increasing the problems of erosion, and possibly leading to unsustainable cropping practices. **An important question in the context of Tanzania's agricultural growth is how much room exists for horizontal expansion of sustainable cultivation.** The question is regional. Agro-climatic conditions differ dramatically across the country. Current settlement patterns, determined in part by ease of access, agricultural potential, and social and cultural factors, may have left large areas of the

country with good agricultural potential underutilized. It is important to determine where these areas are, and whether steps should be taken to bring them into production.

Assessment of Potential Area for Cultivation

In the following assessment of agricultural potential, maize and rice are used as indicator crops. As noted above, these are the two main foodcrops. They account for 70 percent of the area under cereals, or 40 percent of gross cultivated area. Also, growing conditions for these two crops cover the requirements of most of Tanzania's foodcrops. Areas suitable for maize are also suitable for millet, sorghum, pulses, oilseeds, cassava and some rootcrops. The reverse is not true however; as many of the afore mentioned crops can be produced in more marginal conditions than those required for maize and rice. An assessment of areas suitable for maize and rice will provide a conservative assessment of the possibilities for the horizontal expansion of food production.

The potential for maize and rice cultivation was assessed at different levels of technology.[26] Temperature ranges, gross availability of moisture, the reliability of the rains and their distribution through the growing season, soil nutrition and topography were assessed against crop requirements across the different agro-ecological zones to determine the theoretical potential for cereal production by region. Regions vary dramatically in their productive potential, and in their density of population.

The conclusions of this assessment are presented in Table 2.5, below. The areas appropriate for maize and rice cultivation were classified as "very suitable" and "suitable" in the theoretical assessment. Between 10 and 12 million ha are eminently suitable for sustained maize production. Another 3 to 4 million ha are suitable for rice. The overlap between the areas suitable for these two crops is small, as rice is likely to be grown in the valley bottoms, using more moisture and heavier soils. As noted above, areas suitable for maize and rice will also permit sustained cultivation of most pulses and root crops. For this reason, **the areas suitable for maize and rice are added together to represent the minimum land resources suitable for annual crop production.**

This assessment underestimates the area capable of food production, as sorghum, millet, cowpeas and cassava will grow in agro-ecological areas not suited to sustained and profitable maize and rice cultivation. Extending cultivation of maize and rice outside those regions identified as suitable will lead to lower yields and create problems of sustainability, as soil fertility becomes lower, and moisture availability declines or becomes less reliable. Cultivation of foodcrops in regions identified as less suitable may eventually lead to degradation of soils and vegetation, unless very long fallows are allowed and careful land and water management techniques are used.

The gross area suitable for cereals is adjusted first for the presence of Parks and Game and Forest Reserves. Within the 21.9 million ha of reserved areas, some 3 to 4 million ha are suitable for cereal cultivation. Where this is the case, the suitable area within a reserve has been deducted from the gross area suitable for cultivation.

The area suitable for cereal cultivation has also been adjusted for fallowing requirements, to ensure that the production systems will be sustainable (Table 2.5, far right column). For maize cultivation at low input levels, a fallow of about two and a half years has been allowed (i.e. up to 40 percent of the area would be planted in a given growing season). As the level of input use increases, and husbandry and nutrition replacement improve, the fallow is reduced to 1.5 years (i.e. 65 percent of the area is planted in a

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26 World Bank, "Land Resource Potential for Rainfed Production of Bunded Rice and Wheat", op. cit., p.13-31. Wheat was included in the assessment, but is not included in the discussion in the report, as its impact is marginal.

given year). Rice production under the widely used bunding techniques in the depressions and alluvial valleys on heavy fertile Fluvisols, Gleysols and Vertisols, requires no fallow.

As Table 2.5 indicates, in gross terms, without considering the situation in individual regions or the problems of access to market, and assuming no change in the current low levels of technology (with their large fallowing requirements), growth through horizontal expansion could continue until the area under cultivation in any given year has been increased by 50 percent over current levels. With a base rate of growth in the rural population of say 2.4 percent per annum, theoretically there is land available (disregarding other considerations) for another 20 years of expansion **at current levels of technology**. It is clear however, that access to the more remote areas of good potential will not be feasible or economically viable during that time period. For agricultural growth to be sustainable a sector development strategy should also foster the intensification of input use and an increase in the sophistication of production technology, to permit more productive use of the high-potential areas. Unless the human carrying capacity in the high-potential areas is increased by replenishing soil fertility and raising yields, cultivation will expand into less favorable areas, raising questions of sustainability and requiring delicate natural resource management.

Table 2.5: Assessment of Area Suitable for Cultivation of Maize and Rice ('000 ha)

Crop	Technology Level	Gross Area Suitable ('000 ha)	Area Available[27] for Agriculture ('000 ha)	Adjusting for Full Fallow ('000 ha available in a given season)
Maize	Low	10,060	7,511	3,004
	Intermediate	12,179	9,388	6,100
Rice	Low	3,173	2,342	2,342
	Intermediate	4,020	2,918	2,918
Maize + Rice	**Low**	**13,233**	**9,853**	**5,346**
Share of Cereals Area (3.3 million ha)			**34 percent**	**62 percent**
Maize + Rice	**Intermediate**	**16,199**	**12,306**	**9,018**
Share of Cereals Area (3.3 million ha)[28]			**27 percent**	**37 percent**
Mainland Tanzania		**88,332**	**66,440**	

Because of the differences across regions, an assessment of the potential for horizontal expansion should be at the regional level in order to provide background information for the design of an agricultural

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27 After discounting land of suitable potential located in parks and reserves.

28 This is roughly the area under cereals in the MOA statistics. It coincides with the area planted to annuals under small and large farms, using mission calculations based on the 1971/72 Agricultural Census and the various AGSASU in the BOS statistics.

development strategy. Table 2.6, below, provides an indication (conditioned on the weaknesses in the data) of the availability of high-potential agricultural land by region, and its current level of use.

Table 2.6: Land-use and Potential for Expansion for Annual Crops

Region	Small 1/ Farms	Area Planted to Annuals per HH 2/3/	Area Planted to Annuals by Small-holders	Area Planted to Annuals by Large Farms 8/	Total Area Planted to Annuals	Area Suitable for Annuals 4/	Share of Gross Suitable Area Currently Cropped 5/	Share of Suitable Area Currently Used, Adjusting for Fallow) 6/7/
	(No.)	(ha)	('000 ha)	('000 ha)	('000 ha)	('000 ha)	(%)	(%)
Dodoma	224,199	1.15	257.6	40.4	298.0	144.0	207%	351%
Arusha	221,112	0.83	183.7	46.4	230.0	287.0	80%	170%
Kilimanjaro	175,622	0.59	104.2	4.3	108.6	54.0	201%	517%
Tanga	210,276	0.70	146.3	1.3	147.5	158.0	93%	151%
Morogoro	185,894	0.60	111.1	16.2	127.3	996.0	13%	23%
Coast	117,849	0.95	112.2	54.8	167.0	319.0	52%	78%
Dar es Salaam	51,878	0.50	25.9	0.2	26.1	13.0	201%	290%
Lindi	124,397	1.00	124.3	14.5	138.8	475.0	29%	48%
Mtwara	179,591	0.80	143.7	1.0	144.7	213.0	68%	138%
Ruvuma	130,303	1.63	212.2	2.0	214.2	1,139.0	19%	40%
Iringa	231,059	0.63	144.8	7.3	152.1	1,092.0	14%	34%
Mbeya	250,253	0.68	169.2	6.0	175.3	1,020.0	17%	34%
Singida	137,148	0.81	111.1	0.6	111.7	104.0	107%	125%
Tabora	155,177	0.92	142.3	0.0	142.3	678.0	21%	39%
Rukwa	111,334	1.25	139.2	0.2	139.4	981.0	14%	32%
Kigoma	129,865	1.03	133.9	0.7	134.5	544.0	25%	51%
Shinyanga	257,364	1.55	398.4	1.2	399.6	573.0	70%	90%
Kagera	254,229	0.52	131.8	4.1	135.9	339.0	40%	60%
Mwanza	246,737	0.73	179.1	1.1	180.2	535.0	34%	51%
Mara	129,080	0.87	112.7	15.9	128.6	189.0	68%	77%
Total	3,523,366	0.88	3,083.5	218.2	3,301.6	9,853.0	34%	62%

Sources: 1/ Estimated From Pop. Census 1988 and Agricultural Sample Survey 1989/90; 2/ Coeffs for DSM, Rukwa and Mtwara estimated independently; 3/ From 1971/72 Agriculture Census; 4/ Gross suitable area, less the suitable area in Parks and Reserve; 5/ Area crop to annuals over gross suitable areas outside reserves; 6/ Kilimanjaro adjusted for lower fallow requirements. 7/ Fallow requirements calculated at low technology levels; 8/ From "Survey of Large Scale Farming Report 1987/88", CBS 1990, which did not cover all large farms, and may require revision.

Results indicate a wide variation in the use of high-potential land. While the use of the gross available high-potential area for the current crop is 34 percent (see Table 2.5 above), four regions have over 100 percent occupation (Dodoma, Kilimanjaro, Dar es Salaam and Singida). Although farming systems differ radically across these four regions, this is an indication that cultivation may be expanding from the high-potential areas into marginal zones.

The Table 2.6 confirms the existence of substantial underutilized areas of good potential in the Southwest. Even after adjustments for full fallowing in annual cereal producing areas, nine regions have under 55 percent of the high-potential agricultural area in use. These include Morogoro, Lindi, Ruvuma, Iringa, Mbeya, Tabora, Rukwa, Kigoma and Mwanza. Whereas the overall use rate including fallow requirements is 62 percent, some regions have rates which appear to exceed the sustainable cropping possibilities at low levels of technology. Clearly in some of the regions with use rates of over 100 percent, fallow requirements have been shortened with the use of fertilizers and other nutrients. Also, the use of more drought resistant cereals and rootcrops (millet, sorghum, cassava) will permit the profitable and sustainable use of land beyond that identified as the most suitable for cereal cultivation.

B. Land-Use and the Environment

Agricultural development can have environmentally damaging consequences which can affect the sustainability of production systems. The 2.6 percent per annum growth in a rural population of subsistence farmers causes an expansion in cultivated area as new families bring new land into subsistence production. Expansion may take place in regions where inadequate rainfall and poor soil quality limit the period of sustainable cultivation and require long fallows. Longer fallowing periods require the clearing of ever larger amounts of more marginal land in the rotation. The area deforested can then become barren increasing the risks of loss of topsoil from wind and water erosion. As the Table 2.6 shows, the pressure on high-potential agricultural land varies dramatically across regions. In the regions where the lands with good potential are under intense cultivation pressure, such as Dodoma, Arusha, Kilimanjaro, Tanga, Mtwara and Singida (over 100 percent of good land in use, when fallowing requirements are taken into consideration), the dangers of erosion are exacerbated.

Extensive, nomadic or semi-nomadic livestock husbandry in the arid and semi-arid areas is potentially the most efficient way of making sustainable, productive use of rangelands. However, as in the cultivated areas, the increase in the pastoral population requires an increase in the livestock population necessary to provide a family with adequate food and income. And the best rangeland may gradually be cutting back as they are brought into agricultural production.

Improved crop and animal husbandry, the use of cultivation techniques which minimize erosion (contour ploughing, bunding, minimum tillage) and increase fertility (mulching, the use of animal manure and chemical fertilizers) can permit continuous cultivation with ever increasing yields on land which is otherwise in an agro-climatic zone not suitable for agriculture. The ADIS survey [29] investigated farmer perceptions of fertility declines and tried to identify farmer responses to these difficulties. The survey indicates that for all but one of the farming systems reviewed, farmers felt that fertility had dropped. Of those that thought fertility had declined, a majority of farmers in five out of six systems felt the decline was marginal. Only in the far South, in the cashew and cassava system in Newala did 55 percent of farmers feel the fertility declines were substantial.

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29 ADIS, vol I, p.157-166.

Table 2.7: Farmers' Views on Soil Fertility Over the Past Ten Years

Farming System	Zone	Declined a lot	Declined a little	Same	Improved	Don't know
Cashew/Cassava	S. Coast	47%	39%	10%	3%	1%
Maize, coffee, cattle	S. Highlands	32%	54%	4%	8%	2%
Tobacco, rice, maize	W. Plateau	33%	48%	12%	3%	3%
Cotton, rice	Central Semi-Arid	11%	39%	31%	8%	11%
Agro-pastoralist	Agro-pastoral, Semi-Arid	19%	19%	43%	20%	1%
Coffee, banana, dairy	N. Highlands	21%	34%	27%	17%	1%

Source: ADIS

The main reason for the decline in fertility was the reduction in fallow, and the resulting overcultivation. Only in the Southern Highlands (Mbozi) and in the agropastoral zone (Dodoma) did more than 10 percent of the farmers identify soil erosion as a causal factor.

Table 2.8: Farmers' Views on Reasons For Decline in Soil Fertility

Farming System	Zone	Insufficient Fallow	Soil Erosion	Over-grazing	Other	Don't Know
Cashew/Cassava	S. Coast	70%		1%	7%	22%
Maize, coffee, cattle	S. Highlands	83%	12%	1%	1%	3%
Tobacco, rice, maize	W. Plateau	86%	3%	3%	5%	3%
Cotton, rice	Central Semi-Arid	75%	6%	5%	4%	10%
Agro-pastoralist	Agro-pastoral, Semi-Arid	55%	11%	10%	13%	11%
Coffee, banana, dairy	N. Highlands	79%	8%	2%	7%	4%

Source: ADIS

There are indications that fallowing periods are declining across the board. Why do farmers not move to more productive lands in other regions? There are many factors preventing farmers from moving to new areas. These include lack of reliable information, added difficulties of transport and access to markets and social services, as well as the social and cultural costs of leaving home and facing the unknown problems of life in a new area outside of the traditional social safety net. All of these have to be weighed against the benefits from increased agricultural productivity.

Farmers are aware of the declines in productivity and the reasons for them. Deforestation was seen as a key problem by 45 percent of the farmers interviewed in the tobacco, rice and maize system in Tabora. The demand for fuel for curing tobacco has caused widespread deforestation. Only 24 percent of the farmers interviewed in this region said they were planting trees in response to this problem, and the extent of replanting efforts is very limited.[30] Deforestation was also seen as a secondary environmental problem in the cashew and cassava system (Coast), in the cotton and rice system, and for agropastoralists (Semi-Arid Lands). Reduced fallow was again cited as the main cause of environmental degradation for the majority of farmers interviewed in the Coastal and Southern Highlands regions. Overgrazing was the majority concern in the two Semi-Arid Lands systems. In the coffee, banana, dairy system in the Northern Highlands, erosion caused by the ploughing of slopes was felt to be the key environmental problem by a majority of the farmers.

30 TFAP, Tanzania.

Many farmers are taking whatever measures are possible to improve soil and plant husbandry, and to increase inputs designed to increase fertility and prevent erosion. The ADIS survey indicates that in Hai over 70 percent of the farmers interviewed were making investments to enhance soil fertility and improve the sustainability of agricultural operations. Over 50 percent of farmers interviewed in Mbozi, in the Southern Highlands, were involved in this type of investment, with the shares declining for other regions. The most frequent type of investment was tree planting in three systems: the sorghum, millet, cotton and rice system in the Northwest, agropastoralism (in the Semi-Arid Zone), and in the Northern Highlands. The interview data supports Boserup's hypothesis that population growth and rural population density drive farmers into more intensive higher productivity technologies, in reaction to fertility losses from fallow-reduction and over-cultivation.[31] Areas with the highest population density (the two highland areas) are indeed those with the largest share of farmers making fertility sustaining investments. Indeed, as ADIS points out: " an important implication of ... the survey is that increasing population pressure on land does not necessarily imply environmental degradation. Indeed, a higher value placed on land through increased demand for both agricultural and non-agricultural purposes may well be a pre-requisite for local people to make substantial investments in their land".[32]

If it is indeed the case that farmers will invest in conservation and sustainability-enhancing measures when it is in their interest, Government policy should endeavor to ensure that the preconditions for this self-interest are met. One precondition is that the benefits from such investments, which often are realized only in the medium to long-term, should redound to the benefit of the investor. **Tenure security is a key precondition for this to occur.** Lowering the costs of such investments by **improving access to fertilizers, improved implements and other technology for successful intensification** is also important. Finally, measures taken to increase the returns to agricultural production will enhance the return from investments in sustainable agriculture.

In areas of open access and common use, however, where the benefits from measures to protect soils, rangelands, forests and other natural resources from deterioration cannot be restricted to those who engage in these investments, Government regulatory action is required. Clarification and confirmation of tenure rights rank high on the natural resource management agenda. Resolution of tenure disputes between range-users and cultivators is a topic of current importance. Definition of tenure rights to traditional grazing lands for nomadic and semi-nomadic pastoralists will permit them to define sustainable-use patterns for ecologically fragile areas. The situation in forested and rangelands areas is reviewed below.

The lead role in defining national policy on environmental issues is now in the hands of the Ministry of Tourism, Natural Resources and the Environment. The process of reviewing environmental policy and defining conservation strategy is the focus of substantial assistance from donors including IDA.[33] The next step will be Government adoption of a National Environment Policy. This will provide the framework for updating and streamlining existing environmental legislation, and will establish the guidelines for natural resource management and environmental protection, to be followed by entities engaged in economic development. The National Conservation Strategy and the National Environmental Action Plan, also being formulated, will indicate how legislation will be applied in practical terms, defining Government's reporting, monitoring and law enforcement responsibilities. The responsibility for implementation of national policy on environmental issues will lie with the Ministry of Tourism, Natural Resources and the Environment. However, implementation of the conservation strategy is likely to be given to the National Environmental Management Council, a parastatal within the Ministry. Government

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31 Boserup, Ester, "The Conditions of Agricultural Growth. The Economics of Agrarian Change Under Population Pressure", Aldine Publishing Co., New York, 1965.

32 ADIS, Vol I, p. 165.

33 See BTOs of November 17 1992 and May 28, 1993 of two World Bank Environment Missions, led by Mr. Narendra Sharma, assisting Government in the preparation of a National Environmental Action Plan.

regulatory and coordination powers are weak. Information on environmental phenomena and natural resource use is also poor. A first task will be to inventory natural resources, and document and evaluate in monetary terms the incidence of degradation, pollution and over-exploitation currently underway. A first step in this direction will be the natural resource mapping exercise to be carried out by the Institute for Resource Assessment with funding from the IDA supported Forest Resources Management Project. Once the resource maps are available, the relevant legislation revised and the fines increased, Government's theoretical capacity to affect the use of natural resources and protect the environment will be greatly improved. If this is to be translated into changes on the ground, considerable resources should now be devoted to strengthening National Environmental Management Council, the Forestry Department and other entities charged with monitoring and enforcement.

Forests

Forests and woodlands are estimated to cover 44 million ha, or half of mainland Tanzania. Of this, some 29.3 million ha is unreserved forests on public land, 13 million ha is under forest reserves, and 2 million ha is forests and woodlands in national parks. The nature of this resource, and its legal status, is as follows:[34]

Table 2.9: Area Under Forest ('000 ha)

	Total	Reserves	Other
Closed Forest	1,400	958	442
Mangrove Forest	80	80	
Miombo Woodland	42,891	11,986	30,905
Total	44,371	13,024	31,347
Productive	34,626	7,002	27,624
Unproductive	9,745	6,002	3,723
Total	44,371	13,024	31,347

Source: ADIS

Within the "productive reserved forest" category, there are 1,600,000 ha of forests in strategic catchments, 150,000 to 200,000 ha in plantation forests of Pinus, Cupressus or Eucalyptus, and 10,000 ha in wattle plantations. Miombo woodlands, the largest category of forests, are dominated by Brachystegia and Isoberlinia species. Forest standing volume and annual yield estimates are given below:

Table 2.10: Forest Volume and Productivity

	Standing Volume (m^3/ha)	Annual Yield (m^3/ha/year)
Closed Forests	197	3-5
Savanna Woodlands	47	2
Intermediate Woodlands	15	4-5
Plantations	300-600	15-25

Source: ADIS

34 From URT, Ministry of Lands, Natural Resources and Tourism, "Tanzania Forestry Action Plan - 1990/91 - 2007/08," September 1989, Dar es Salaam, Technical Annex III, p.2.

There is little reliable data on availability of wood or its rate of use. If properly managed, it is believed that the current forest stock could theoretically provide for consumption requirements from sustainable annual yield. Estimates of the annual yields from harvestable woodlands vary between 20 and 147 million cubic meters; the actual harvest is estimated to be about 27 million cubic meters, based on per capita wood consumption data. Over 90 percent of national energy requirements are provided by woodfuels. On the demand side, it is estimated that about 22 million cubic meters of wood is used annually for household energy (including charcoal), with the remainder going into tobacco curing, rural craft industries, and providing energy for restaurants and other urban services.[35] However, management of the forests and woodlands is poor to non-existent. Woodfuels are taken mainly from the miombo woodlands. Harvesting is clearly uneven with deforestation occurring in and around areas used for cultivation and urban settlement. It is estimated (very roughly) that 300,000 to 400,000 ha of forest and bushland are cleared annually for agricultural or other purposes. The expansion of land under cultivation is estimated at about 2.5 percent per annum, equal to the rate of growth of the rural population. If all of this were taken from wooded land, it would imply deforestation of about 125,000 ha per annum. The rest of the clearing would come from tree harvesting for charcoal and construction requirements.

Forests and plantations are also the source of non-wood products such as honey, beeswax, tannin, gum arabic, wattle and medicinal plants. Honey exports accounted for US$ 800,000 in 1988, and wattle exports for US$ 4 million.

Demand for fuelwood is estimated to grow at about 1.5 percent per annum, below the population growth rate. The Tanzania Forestry Action Plan notes that it would theoretically be possible to meet current woodfuel requirements from plantations covering some 2.7 million ha (6 percent of total wooded area) with a sustainable production of 10 cubic meters per ha annum. This does not account for the problems of identifying climate, soils, space and management services for such plantations in each region.

Use of the country's forests is regulated by the Forest Ordinance of 1957, which was established to guide implementation of the Forestry Policy of 1953. Under this policy, forestry reserves covering nearly 15 percent of the surface area of Mainland Tanzania were established. While 10 million of the 13 million ha in reserves are supposed to be under Central Government control, local government is the de facto regulator of reserve use, because of the lack of institutional resources at the national level. Felling of ten varieties of hardwood trees for commercial purposes without license on unreserved land is illegal. Cutting down trees in order to support subsistence agriculture (opening land for cultivation, using the wood for construction, charcoal, and arts and crafts) in unreserved forests is not an offense. Licenses for exploitation of unreserved foresters are issued by local (district) government officials. Revenue remains with local government. This income is important and for this reason licensing has exceeded the regenerative capacity of the unreserved woodlands.

Forest reserves were created to protect catchments, valuable ecosystems and species (46 percent of total reserves). They are also created to permit management of commercially attractive forests for sustainable timber production. Both types of reserves have been overexploited by extensive felling of commercial species without replacement and by the use of logging and clearing methods which damage the forests' capacity for regeneration. New logging often opens up avenues for subsequent immigration. The new permanent inhabitants take over reserve land for cultivation or grazing. Control of reserved forests is poor. The two forest eco-systems most at risk are closed canopy forests (936,000 ha) and mangrove forests (80,000 ha), and these are declining rapidly.

Industrial plantations cover 80,000 ha composed mainly of pinus and cupressus species. Without well-developed management plans, they are often poorly utilized, with declines in genetic quality

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35 TFAP, Main Report, p.16.

and concentration of species increasing the risk of losses from disease. The production potential from industrial plantations is estimated at 1.3-1.6 million m^3/year. Log consumption from the forest industry is only about 700,000 m^3/year. Of this, some 54 percent is for sawmills, 22 percent for pit-saws, 20 percent for pulp and paper mills, and 4 percent for plywood factories. The use of the pulp and paper mills is 45 percent of capacity.

The main threat to the country's natural forests is uncontrolled clearing for logging, agriculture, or related uses (tobacco curing), coupled with the systematic extraction of select hardwood species. The deterioration is most serious near densely populated areas. Because of unclear institutional responsibilities and a lack of financial resources and personnel, Government has been unable to exercise the responsibility entrusted to it under the 1957 Ordinance. The Forestry and Beekeeping Division in the Ministry of Tourism, Natural Resources and Environment is responsible for the management of national forest reserves and plantations, and for monitoring the collection of royalties from public lands. The actual collection of fees, however, is undertaken by Local Government, over which the Forestry and Beekeeping Division has little control. Land-use and land tenure questions are administered through a separate Ministry of Lands, Housing and Urban Development.

Recently the Government has taken steps to improve forest management. A draft Forestry Policy was prepared in 1990. Higher fee structures for natural forest products, and increased enforcement efforts have also started. An effective fee collection mechanism, with royalties set at reasonably competitive levels and based on standing timber, can limit overharvesting, promote better wood use, and encourage private investment in trees. In 1990, fee levels were raised 500 percent, returning them to 1981 real levels. However, without measurement facilities assessment is based on finished forest products, not standing timber use, which diminishes its forest management effectiveness. Fee collection which is also sporadic, dimities incentives. Following the preparation of Tanzania's Forestry Action Plan 1990/91-2007/08 in September 1989 Government and donor efforts to improve forest resource management have received new momentum. A recent Bank and donor-funded Forest Resources Management Project[36] (Credit 2335-TA) costing US$ 18.3 million over 6 years, will attempt to strengthen the institutions charged with developing and carrying out policy on forest and land management.

Wildlife[37]

Tanzania has one of the most diverse wildlife habitats, and range of species, in the world. It has placed large shares of the country in reserves in order to protect these habitats. Fully four percent of Mainland Tanzania (4.1 million ha) is in its 12 National Parks, and an additional eight percent (7.7 million ha) in 15 Game Reserves. These reserves have enormous scientific and "existence" value. They also support and increasingly important wildlife industry based on tourism, sport hunting, and export of live animals. Gross earnings from this sector are estimated at about US$ 120 million per annum, of which US$ 50 million were illegal.[38] Tourism is presently concentrated on the national parks in Arusha, Lake Manyara, Ngorongoro, Serengeti, Tarangire and Mt Kilimanjaro, the "northern circuit".

By far the greatest concern for wildlife management is encroachment of reserved areas by cultivation and bush clearing from subsistence farmers and large, mechanized schemes. The consequences of these activities include the reduction of areas suitable for wildlife, the blocking of annual migratory routes, the reduction of surface water needed for wildlife maintenance, contamination of land and water by agrochemicals, and the raiding of crops by wildlife. Pressures for expansion are strong, especially from

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36 World Bank, Tanzania-Forest Resources Management Project, December 23, 1991, Report No. 9964-TA.

37 Drawn from an Annex to the Environment Mission BTO of November 17, 1992, prepared by Ms. Agi Kiss.

38 URT report prepared for UNCED.

pastoral and agropastoral groups, who are active in the same agro-ecological areas where parks are located. In order to allocate land between competing uses, resource assessment and land-use planning activities have to be strengthened. As discussed elsewhere, an assessment of the quality of the country's natural resources to zone different kinds of land-use activities according to their sustainability, long-term productivity, and the country's development objectives, is needed. The pre-emptive gazetting of large portions of the country has meant a good start for such a policy. However, as the rural population expands, and as investment in agro-industrial endeavors increases, pressure on high-potential agricultural resources will increase, making the definition and protection of wildlife reserves ever more critical. The Land-use Commission under the Ministry of Lands and Urban Development plays the key role in this assessment. All land-use management activities should be coordinated by the National Land-Use Planning Commission, established in 1984, which has a series of regional and district committees. This coordination has been largely ineffective to date.

The Ministry of Tourism, Natural Resources and Environment is the lead agency for defining policy on wildlife management. USAID is assisting the Wildlife Department of this Ministry to assess the current and potential capacity of generating revenue from tourism, hunting and wild animal sales in a sustainable fashion. The national parks are managed by the parastatal Tanzania National Parks Service, which is financially autonomous and fairly well-funded, because it retains the park entrance fees. In spite of this, monitoring of park resources and the prevention of encroachment is very weak. Fee levels should be assessed in light of the East African tourist market, and more attention paid to research, resource monitoring, and maintenance of park facilities. There are additional parastatals which carry out research on wildlife, train wildlife managers for the Government agencies, manage the Ngorongoro Conservation Area and manage game hunting activities. Coordination of the activities of these independent agencies is complicated, and adds to the difficulty of formulating and carrying out a coherent policy for wildlife management. The policy on wildlife and natural resource management should include measures to (i) improve the monitoring of encroachment of reserve boundaries, (ii) strengthen Government control of access to reserves and use of wild animals, wood or other resources (iii) establish buffer zones between population centers and the reserves; (iv) work with the communities contiguous to reserves, who see their livelihoods affected by the reservation policy, to provide them with some of the benefits accruing to the society from the maintenance of these reserves, and to adjust local land-use systems to forego the need to use reserved areas. The use of tourism revenues for improving social and physical infrastructure in townships around national parks may be one approach

Water and Irrigation

Water Resource Management

Surface Waters. Almost 35 percent of Tanzania receives less than 800 mm of rainfall and is arid or semi-arid. With only one-third in areas with precipitation in excess of 1,000mm, it is easy to see why water shortages exist. The long dry season results in low river flows which, with growth in urban demand, contributes to scarcity. The dry season normally extends from June to October. About 7 percent of the surface of mainland Tanzania is covered by lakes which include Lake Victoria, the second largest freshwater lake in the world, Lake Nyasa and Lake Tanganyika along the western border. Extensive wetlands line rivers across the country and provide essential habitat for fisheries. The deltas of coastal rivers are especially important as nursery areas for aquatic life. Mangrove trees line the brackish edge of these important wetlands. Tanzania's two largest rivers, the Malagarasi and the Rufiji drain opposite sides of the country into Lake Tanganyika and the Indian Ocean respectively. Because of their locations in higher rainfall areas, the Wami, Ruvu, and Pangani Rivers also have significant flows.

Ground Water. Very old "Precambrian " rocks underly more than 75 percent of the country. Tahey generally yield water only in joints, tissues or fractures and are therefore fairly low in yield, although

suitable for village water supply. There are groundwater aquifers of quite variable yields -- from productive volcanic alluvium near Mt. Kilimanjaro and high-yielding coastal limestone deposits to very low yielding clay deposits of old lake beds. Less than one-third of the country can be characterized by groundwater in highly productive areas of sand, sandstone, and alluvial aquifers.

Ground water is a key source of water for both rural and urban areas, including the cities of Arusha, Dodoma, and Mtwara. Before 1978, emphasis was on construction of deep wells to tap protected, lower aquifers. By 1980, as much as 50 percent of these boreholes and water systems were inoperative because of maintenance problems with the diesel pumps. Since that time, shallow aquifers have been emphasized for water supply despite their vulnerability to pollution.

Water Use. In urban areas the largest use of water is for domestic water supply. In Dar es Salaam, domestic consumption accounts for approximately 70 percent of total consumption. Industry typically accounts for about 10-20 percent of total consumption. Demand for water exceeds supply in most urban centers. Tariffs are too low. Also it appears that the constraining factor is less one of absolute scarcity than that of : a) lack of funds to exploit new sources of water; b) technical, financial and managerial problems which result in an under utilization of existing capacity; and c) inefficient utilization and allocation of existing water resources. Of the total of 62 urban areas with piped water systems, over 90 percent reported serious deficiencies in the systems in 1990.

In rural areas water is used primarily for domestic purposes and for watering livestock. The total amount of irrigated land remains limited despite considerable irrigation potential particularly within the major river basins such as the Pangani and Rufiji. Nationwide, approximately 150,000 ha. are under irrigation, with fully one-third of the total located in the Arusha/Kilimanjaro area. The majority of irrigated lands are small scale projects with predominant crops being rice and sugar. The development potential for irrigation is large, with almost 900,000 hectares potentially suitable. Over 50 percent of this total is in the Rufiji River basin, where water allocation conflicts are already evident. In addition, some 80,000 hectares are located in the Ruvu basin (the current source of water for Dar es Salaam) and another 85,000 ha. in the nearby Wami basin. Irrigation development will be discussed below.

Water is also used for production of electricity. Eighty percent of installed electric generation capacity relies on hydropower. The two large projects, Mtera and Kidatu in the Rufiji River basin account for most of the hydropower capacity (280 mw) while four smaller projects in the Pangani basin account for approximately 40 mw of capacity. Conflicting priorities for use of water in the Rufiji basin combined with effects of land degradation on sustained low flows, and low precipitation have created water shortages and caused reductions in hydropower generation at Mtera and Kidatu dams. Resulting power shortages and blackouts have affected citizens and industry and had an extensive and negative effect on the economy.

The increased pressure on surface water is due to a series of factors. Surface water levels are reported to have been decreasing because of loss of vegetation cover and changes in land use patterns, themselves a consequence of increases in the rural population. Rivers which used to be perennial are reported to have become intermittent during the dry season. Irrigation is anticipated to increase, and unregulated abstraction of water is already a source of concern in the major river basins. Additional pressure is also expected from increasing demand in a number of major urban centers.

Water Availability. The Ministry of Water, Energy and Minerals estimates that about 43 percent of the rural population has access to improved water supply systems. Rural coverage varies greatly by region, however, and not all systems function. Water for villages is provided through gravity fed and motorized piped systems, boreholes equipped with hand pumps and improved and protected shallow hand-dug wells. The National Water Policy paper issued by the Government in 1991 stated that at least 40 percent of these systems were not functioning. It is estimated that at present only about 25 percent of the

total rural population has adequate water supply. The remainder makes do with unprotected sources with adverse effects on health. Improving access to clean water in villages and rural areas will greatly improve health, and reduce the time spent, mainly by women, in fetching water for domestic use. This will increase time available for agricultural activities, and other productive activities.

In urban areas, it is estimated that about 65 percent of the population is being supplied with water for their daily usage. However, services are often intermittent as a result of frequent breakdowns. In Dar Es Salaam existing water supply facilities could supply some 60 million gallons of water a day from the Ruvu river and two smaller tributaries. However, power shortages together with faulty pumping systems and filtration plant deficiencies mean that only about 60 percent of this capacity is currently being utilized. Access to water in the cities of Dar es Salaam, Tanga, Mtwara, Lindi, Iringi, Singida and Shinyanga is below the urban average of 53 percent. Complicating the situation even more, industrial water supplies are often provided from city treated water systems and take priority over providing drinking water to the urban poor.

Water Quality. The lack of detailed information hampers the preparation of a national water quality assessment for Tanzania. On the basis of the available data, serious water quality degradation was found in urban areas of Tanzania due to untreated or poorly treated industrial waste water discharges and sewage. The availability of potable water for domestic consumption is reduced as a consequence. Adequate treatment of piped water by chemical additives, filtration and disinfection is often hampered by limited funds. Sewer collection systems leak into groundwater. When coupled with lack of proper sanitation and industrial pollution control, these subsurface contaminants enter urban streams and other water sources for the poor. This has resulted in outbreaks of cholera, typhoid and dysentery.

An industrial pollution discharge inventory indicates that the priority areas of concentration include Dar es Salaam, Arusha, Moshi, Tanga, Lake Victoria, and the Morogoro area which serves as the head-waters for the Ruvu River and the water supply for Dar es Salaam. Most of the industries discharge untreated wastewater. In Dar es Salaam no industry is responsibly treating its waste water, which results in serious pollution of the Msimbasi River, the harbor, and the near coastal area.

Transboundary Water Pollution. Tanzania shares many waterbodies with neighboring countries. Of these, only Lake Victoria has been identified as having a serious pollution problem. Untreated discharges of sewage from the country's second largest city(Mwanza) reach the lake. In addition, large textile and tannery mills discharge toxic substances and oxygen demanding pollutants. Coffee processing, cotton ginneries, vegetable oil, cosmetics, soap and 8-10 fish processing plants discharge oxygen demanding wastes to the lake watershed. Lake Victoria appears to be susceptible to eutrophication due in part to the introduction of the Nile Perch. The number of small fish which controlled algae blooms has been severely reduced, as they are food for the perch. This "food web" change indicates that more extensive pollution control measures are needed if oxygen deficiencies are to be improved. Frequent fish kills following algal blooms have been reported in Uganda, Kenya, and Tanzania.

Tanzania appears to have the least amount of wastewater entering the lake according to officials. Other sources of contamination include mercury waste, coming from mining areas in the Lake Basin, and runoff from the overuse of agrochemicals and fertilizer in cotton production. A joint international effort to reduce pollution loading in the lake, and better manage fishing and other activities is being supported by IDA and the Global Environment Fund.

Legislation, Policy, Water Allocation and Regulation. The regulatory and institutional framework for water resources management are provided under the Water Utilization Act of 1974. The Act declares that all water rights are vested in the Government, sets conditions on the use of water, and authorizes a Principal Water Officer and a Central Advisory Water Board to be responsible for allocation

of water rights for "National Basins" and Regional Water Officers and Regional Advisory Water Boards for "Regional Basins" . Ministry of Water, Energy and Minerals administers the law, granting rights for each withdrawal of water for use in domestic, industrial, hydropower, livestock, irrigation, or mining activities. A maximum of fifty percent of the expected low flow of a river at a point can be granted as a right to a person or corporation. This is done through a fairly lengthy procedure of application via the office of the Regional Water Engineer located in each of the 20 administrative regions of the country.

Despite these statutory powers, management of water resources by the Government is highly fragmented and ineffective. Virtually all work related to water resources management and development has been carried out at the regional level. This has included the formulation of Water Master Plans for 17 different regions all of which, with the exception of one, have been financed and prepared by donor agencies in different formats and containing different types of information. The main river basins were divided up into fragmented areas making water resource management difficult. The authority of regional water engineers is also fragmented as competition between regions for water becomes in issue and essential data from regions do not get transferred to a central office. Also many of the rain gauges and hydrometric equipment do not work.

National Water Policy. In an effort to improve the management of water resources, and with the aim of achieving the ambitious goal of providing water within easy reach (400 meters or less) to all by the year 2002, the Party adopted a National Water Policy for Tanzania in 1991 While the policy deals mostly with water supply issues, a number of important points relating to water allocation and pollution control are not addressed. A framework for preventing and resolving conflicts among competing users and for regulating demand for water is needed. The conflicts surrounding the use of water in the Mtera Reservoir chrystalize the issue. This is not dealt with in the policy paper. In addition the Policy proposes no change in law or introduction of incentives to improve the status quo with regard to putting effective water pollution controls in place. Nor does it fully address the fragmentation caused by 20 regional water organizations and the resultant problems in resolving cross-cutting regional water resources management issues. With these three shortcomings, and an emphasis on drainage of wetlands so land can be used productively and on other water development and flood control structural works, the 1991 National Water Policy may result in actions which further degrade environmental quality in Tanzania.

Pricing Policies. The price of water does not at present reflect its true scarcity value. This causes two types of problem. The first is that insufficient revenues are generated to cover operation and maintenance costs. The quality of the service, and of the water received, is undermined. A second problem is that the low tariffs encourage inefficient use of water and waste by industry and consumers. As a result much of the urban population in Tanzania is being undersupplied. Plans are in effect to progressively increase water tariffs throughout Tanzania by at least 60% over the next 5 years. The new rates would still only be sufficient to cover operation and maintenance costs and minor capital works, without financing expansion needs. In order to help conserve water and maximize economic and social benefits in the long run, there needs to be a pricing mechanism which reflects the marginal scarcity rent of water bearing in mind equity considerations.

In agriculture, irrigation is not yet widespread, but where it does occur there are few means to regulate water consumption. Although water rights for irrigation are obtainable at a fee, use of water as such is not priced. Smallholder farmers, who account for about 80 percent of water abstractions for irrigation, tend to use traditional furrows which are prone to excessive leakages, poor drainage and water logging. Since there is no charge for volume of water utilized, the tendency is to use water well in excess of what is needed for productive purposes. Progressive tariffs could in principle regulate water use conflicts. In practice it is difficult to do this in small holder irrigation schemes because of high transaction costs and the difficulty of promoting and enforcing compliance.

Water Quality Management. The 1974 Act was amended in 1981 to provide for water pollution control and to establish standards for effluent discharges and receiving waters. In 1988, this was finally implemented with the creation of a Central Water Board with executive powers for specifying pollution control measures and for enforcement. These statutory powers have not enabled the government to regulate water quality effectively because of problems in enforcing the Act. Penalties have been very low , and there is little incentive to install control measures. Government efforts are also hampered by resource alloctions inadequate to support aggressive policing and data collection efforts.

Conclusions and Recommendations. The ability to effectively manage increasingly scarce and inaccessible water resources is clearly an issue of high priority in Tanzania. This entails:

- strengthening the information base of the sector;
- rationalizing the mechanism by which water is allocated between competing uses;
- ensuring better coordination between institutions involved in the sector.

Unhealthy living conditions in urban centers of Tanzania have emerged as a result of poor sanitation and inadequate environmental pollution control, including contamination of water resources. Both Dar es Salaam and Mwanza require special attention. The areas most severely affected by industrial and municipal pollution are the Dar Es Salaam metropolitan area and the Lake Victoria region. The upper Pangani River Basin encompassing Arusha and Moshi, also deserves priority attention because of industrial and sewage discharge. Measures to improve pollution control include:

- increasing the penalties for breaking the law;
- improving data capture and analysis capabilities;
- strengthening Governnent's monitoring and enforcement capabilities.

With barely 65% of urban and 43% of rural residents in Tanzania with access to potable water within 400 meters, providing safe drinking water and environmentally acceptable sanitation and sewage treatment also remains an issue of priority concern. Institutional changes in the provision of water supply and sanitation services are urgently required including: (i) improved pricing policies, (ii) greater financial autonomy for urban water authorities, and (iii) adoption of appropriate technologies and workable maintenance systems which can be easily sustained at the community level.

Irrigation Development

There are three reasons why the development of irrigation systems is an important aspect of the agricultural development strategy. First, the variability inherent in Tanzania's rainfed production systems creates problems of shortages of the main foodcrops in years of inadequate or poorly timed rainfall. For this reason, policy makers concerned about food security have always sought to increase food production in irrigated areas, and to reduce this variation. Second, irrigation schemes if properly managed, provide sustainable increases in small farmer productivity and income, addressing rural poverty alleviation and environmental management objectives. Finally, irrigated agriculture is the only way in which high value crops (vegetables, flowers) can be produced under the controlled conditions needed to meet market schedules in Europe and other demanding international markets, thus supporting the drive for diversified high value agricultural exports. The statement on irrigation policy in the 1983 National Agricultural Policy document reaffirmed Government's commitment to developing irrigation schemes, while addressing problems which had affected such projects in the past. The 1983 policy document noted that irrigation projects had foundered due to:

- lack of an irrigation development policy
- reliance on sophisticated irrigation techniques, which demanded heavy investment, highly trained manpower, and a lot of foreign exchange;
- lack of expertise in the design and construction of large irrigation schemes;
- poor planning, especially of small farmer schemes.

Information on areas under irrigation and water abstraction from rivers and aquifers is sparse, and unreliable. It is estimated that some 150,000 ha are under irrigation by smallholder farmers, using "run of the river" techniques. Another 25,000 ha are in large centrally managed Government schemes, half of them State Farms run by NAFCO or SUDECO. The main crop produced in irrigated areas is rice. Also, in the drive for self sufficiency and at times of relatively good international prices, four large estates were established. They are currently irrigating about 15,000 ha of sugar. In addition, there are a few farms in the Moshi-Arusha area producing irrigated flowers and vegetables for the European market. The area which is potentially irrigable in Tanzania is large, possibly as much as 850,000 hectares. The results of an FAO study in the late 1980s which assessed irrigable area (taking both soil and water constraints into consideration) are noted in the Table 2.11 below.[39]

The Ministry of Agriculture, with assistance from FAO and UNDP has been reviewing the Government's experience with irrigation projects, and have concluded that:[40]

- The emphasis should be on existing smallholder schemes, and **"future development should be based on staged improvement and expansion of existing local technology, which allows the farmers to adapt at their own pace. Equal emphasis should be given to operational and extension support to farmers at existing schemes."**
- Projects undertaken to date have been too sophisticated, requiring expensive structures and massive capital injections. The funds for completing these projects have often not materialized, causing a massive waste of resources invested in un-used, half completed schemes;
- If a project is expensive to begin with (and recent projects in Tanzania have averaged $15,000 to $20,000 per ha),[41] returns will have to be very good, for the economic rate of return to be positive. The possibilities for marketing such high value crops, or for getting cropping rates above 100 percent, is limited to small, well managed private farms at present;
- For smallholder irrigation schemes to succeed, management of water and land use should be in the hands of associations representing the interests of participant small farmers.

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39 URT/FAO, "Field ocument 14, Smallholder Irrigation evelopment Priorities", September 1990.

40 Ibid. p 49.

41 Ibid. pp 8, 11.

Table 2.11: Irrigation Potential by River or Lake Basin[42]

Rufiji River Basin	Usangu Plains	207,000	Kapunga (6,250), Madibira (7,900), Village (4,000)
	Kilombero Valley	330,000	
	Lower Rufigi Valley	80,000	
	Pawaga	4,800	
Ruvu River Basin	Mgeta Plain	6,500	+/- 1,500
	Ruvu Plain	36,000	+/- 4,000
	Lower Ruvu Valley	32,000	
Wami River Basin	Mkata Plains	44,000	Mtibwa Sugar, NAFCO akawa (2000)
	Wami Coastal Plain	40,500	+/- 3,500
Pangani River Basin 1/	Upper Basin	4,020	Kahe and Rau River projects
	Middle Basin	3,700	1/ 150,000 ha in small farmer irrigation
	Lower Basin	8,640	
	Upper Mkomazi Basin	4,760	
Msangasi River Basin	Mzundu Valley	800	
	Mkalamo Project	4,000	
Sigi River Basin	Lower Sigi Project	400	
Umba River Basin	Mnazi Plains	640	
	Mnazi Flood Plain	100	
	Mwabijembe	320	
Lake Victoria Basin	Mara Valley	6,250	+ 30000
	Mori Valley	600	
	Suguti Valley	1,500	
	Crumeti Valley	1,000	
	Magogo Valley	3,300	
	Isanga Valley	2,000	
	Bukome Bay	520	
	Simiyu uma Valley	7,000	
	Kashasha Valley	3,500	
	Kabele Valley	2,000	
	Ruiga Bay	220	
Ruvuma and Southern Basins	Maharunga	8,600	
		1,800	Chiumo
	Nangaramo	1,200	
	Makangaga	800	
	Matandu	800	
	Malinkwa Ruo	1,100	
	Kitere Village	940	
TOTAL		**851,310**	

F 0 4

Source: FAO Review of Irrigation.

42 URT/FAO, "Field ocument 14, Smallholder Irrigation evelopment Priorities", September 1990.

A ranking of potential projects has been developed, and a smallholder-focussed irrigation rehabilitation and development program has been outlined. In order to carry out such a program, it is proposed that the key responsibilities for operational support and extension services would be provided at the Zonal level (bringing together contiguous regions). The Ministry of Agriculture would strengthen its capacity to coordinate irrigation activities and provide assistance at the design and construction stage. Projects would be carried out in Moshi, Morogoro, Tabora, Mbeya, Mwanza and Mtwara zones.

Land Tenure

As noted previously, there are some 3.5 million smallholder farmers in Tanzania, farming about 3.1 million ha. Some 730 large farms cover an additional 2.0 million ha, owned and operated primarily by parastatals. The distribution of the farming population, and hence rural population density, follows the map of agricultural potential and access to market. Smallholder farms are concentrated in the regions of high-potential (Table 2.3). The distribution of land cultivated by smallholders is given below:

Table 2.12: Size Distribution of Small Farm Holdings (including all plots) in ha[43]

Size of Planted Area	No. of Holdings	Planted Area	Average Planted Area p/Holding	Cumulative Share of Holdings	Cumulative Share of Area	Average Household Size
No Land	26	0		0%	0%	5.2
0.01-0.20	1,215	110	0.09	35%	4%	3.4
0.21-0.40	696	171	0.25	55%	9%	4.2
0.41-0.60	392	190	0.48	66%	15%	5.3
0.61-0.80	194	134	0.69	72%	20%	8.2
0.81-1.00	163	142	0.87	77%	24%	5.3
1.00-1.50	382	466	1.22	87%	40%	8.3
1.51-2.00	195	328	1.68	93%	51%	8.3
2.01-5.00	202	549	2.72	99%	69%	11.2
5.01 +	45	961	21.36	100%	100%	8.6
Total	3,510	3,051	0.87			

Farm size does not vary dramatically for smallholders, notwithstanding large difference in incomes across regions. Some 93 percent of the smallholders cultivate less than 2 ha. There is some concentration of holdings, with the 10 percent of the farmers operating more than 2 ha controlling 49 percent of the area cultivated. However, much of the difference in land-use appears to be explained by the difference in family size, with the exception of the category of 0.8-1 ha, where the sharp drop in family size could imply improved access to capital and technology. "The degree of inequality in the distribution of land between households appears to be lower than in other African countries. The Gini coefficient of land concentration was 0.35 compared with 0.42 in Mozambique (traditional sector), 0.55 in Kenya (registered smallholdings), 0.55 in Somalia and 0.64 in Ghana."[44]

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43 URT, Bureau of Statistics, Agricultural Sample Survey of Tanzania Mainland, 1989/90, pp 6, 18.

44 Collier, P.; Radwan, S.; Wangwe, S.; "Labour and Poverty in Rural Tanzania", Clarendon Press, Oxford, 1990, p.50. The "Poverty Profile: (see below) estimates a Gini coefficient for rural land holdings of 0.48 (Table C.9).

Access to land, as implied by the above data, is a problem in certain areas. The ADIS survey[45] indicates that, as expected, access is perceived to be difficult in high-potential areas in the Southern Highlands (Mbozi), and in the Northern Highlands (Hai). However, even in the Semi-Arid lands in Shinyanga (Kwimba), farmers perceived access to land as quite or very difficult.

Table 2.13: Farmers' Views on Access to New Land for Agricultural Expansion

Farming System	Zone	Quite or Very Difficult	No Problem
Cashew/Cassava	S. Coast	28 %	72 %
Maize, coffee, cattle	S. Highlands	70 %	30 %
Tobacco, rice, maize	W. Plateau	10 %	90 %
Cotton, rice	Central Semi-Arid	65 %	35 %
Agro-pastoralist	Agro-pastoral, Semi-Arid	41 %	59 %
Coffee, banana, dairy	N. Highlands	96 %	4 %

Source: ADIS

The source of small farmers' claim to tenure of the land they cultivate is due in large measure to traditional mechanisms which include inheritance, allocation by the village elders, and investment in clearing. A recent survey (see Table 2.14) indicates that only 7 percent of all rural households, purchased land in the last decade[46].

Table 2.14 Source of Tenure for Rural Land Owners (1991)

Source of Tenure	Share of Rural Land Owners
Inheritance	38%
Allocation by Village	34%
Clearing	19%
Purchased	7%
Borrowed or Rented	0.5%
Other	1.5%

Source: ADIS

While the situation varies in different parts of the country, it seems clear that tenure regimes in Tanzania are still heavily influenced by "customary tenure systems" where land is communally owned, user rights are administered within the clan, and transfers to outsiders are rare. As indicated by Migot-Adholla, "The distinguishing feature of different tenure regimes may thus be said to revolve around restrictions on the individual holder's ability to transfer land (only among family members, within the lineage or community, or to outsiders; and with or without approval from other lineage or community members), which also tends to coincide with the mode of transmittal (inheritance, gifts or bequests, and sale)."[47] Governmental control may at one time have been exercised through the village allocation

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45 ADIS, Volume I, p.77.

46 World Bank, "Tanzania - A Poverty Profile", Report 12298-TA, December 1993, Table C.8.

47 Mighot-Adholla, Shem; Hazell, Peter; Blarel, Benoit; Place, Frank; "Indigenous Land Rights Systems in Sub-Saharan Africa: A Constraint on productivity?", World Bank Economic Review, Vol 5, No. 1, p 159.

mechanism, but by 1991, this mechanism was firmly in the hands of local authorities.[48] The thesis advanced by Migot-Adholla and others following a cross sectional study of tenure in Ghana, Rwanda and Kenya, is that the intensification of cultivation methods, brought about by increased population pressures[49] or by other inducements to technological change, brings also a gradual individualization of tenure rights. "As increased intensification leads to virtual exclusion by farmers of other individuals, there may be localized exchanges in productive factors leading to land or labor tenancies and credit markets." "... indigenous African tenure systems have moved along that continuum [between communal tenure and privatized rights] in the direction of greater individualization of land rights."[50]

This process appears to be underway in Tanzania. While it appears that 91 percent of the land transfer rights are controlled by village authorities (inheritance, clearing or direct allocation), with only 7 percent being transferred by sale (Table 2.14), in fact, land acquisition through purchase is widespread. A review of regional data in the Cornell/ERB survey, while not statistically representative, indicates that purchase transactions were occurring in all but two of the regions (Mara and Ruvuma). The regions with the highest level of purchase transactions included Kagera (24 percent of all forms of land acquisition), Shinyanga (18 percent), Singida (16 percent), Rukwa (14 percent), Lindi and Dodoma (13 percent), and Mbeya and Mtwara (11 percent).

An additional 2.0 million ha is in some 730 large farms, owned and operated by Government agencies and the private sector[51] Based on a survey of 480 such farms occupying 1.3 million ha, the distribution of farms by size category is given below:

Table 2.15: Distribution of Large Farms by Size Category (ha)

Size of Holding (ha)	No. of Holdings	Area Under Holdings (ha)	Cumulative Share of Holdings	Cumulative Share of Area	Share Privately Owned
0-100	83	4,630	17%	0%	60%
100-200	78	12,119	34%	1%	67%
200-500	95	31,826	53%	4%	74%
500-1,000	60	43,188	66%	7%	55%
1,000-2,000	48	70,986	76%	12%	48%
2,000-5,000	62	208,366	89%	28%	34%
5,000-10,000	33	245,621	96%	47%	21%
10,000 +	21	706,710	100%	100%	14%
Total	480	1,323,446			54%

Source: Bureau of Statistics

Not surprisingly, concentration is higher amongst larger farms, with 4 percent of the largest farms occupying 53 percent of the total area. In sharp contrast to the area under small farms however, only 30 percent is cropped. An additional 14 percent of the total area is under both crops and livestock, and 56 percent is allocated to livestock grazing. A little over half the large farms, about 54 percent, are owned

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48 World Bank, Southern Africa Department, by Cotlear, D.; "Empowering Villages to Manage their Natural Resources: Rural Land Policy in Tanzania", June 1992, p.7.

49 Boserup, E., 1965, op cit.

50 Mighot-Adholla, p. 171.

51 Rough estimate, based on the "Survey of Large Scale Farming Report - Tanzania Mainland 1987/88", URT, Bureau of Statistics, Dec. 1990, Summary page, assuming the size distribution of the responding farms is that of the full 730.

and operated by the private sector. The private farms are the smallest of those in the large farm subsector. As Table 2.15 shows, only 22 percent of the total area is under private farms. The private sector is also much more likely to grow crops than Government. About 57 percent of the farm area is under crops for private sector farms, vs. 23 percent for Government. This could either signal a high degree of under-use of high-potential land on Government farms, or indicate that Government farms are in areas with lower agricultural potential. A review of the distribution of large farms by regions shows that one third or more of the area in large farms is in private hands in Arusha, Tanga, Dar es Salaam, Lindi, Iringa, Singida, Shinyanga and Mwanza. Only Arusha, Tanga and Iringa are in the high-potential zones, and even these regions have low-potential areas. In high-potential areas such as Kilimanjaro, Mbeya, Rukwa, Ruvuma and Kigoma, the Government owns over 80 percent of the area under large farms. **Sale of these farms in high potential areas to private farmers should greatly increase use rates, and could have a major impact on production and exports of coffee and non-traditional high value crops**.

Table 2.16: Ownership and Use of Area under Large Farms, By Region

Region	Private Area	Total Area	% Private	Share of Private Area Cropped	Share of Government Area Cropped
Dodoma		43,290			0%
Arusha	57,231	110,400	52%	60%	81%
Kilimanjaro	1,141	11,378	10%	94%	56%
Tanga	123,119	306,539	40%	52%	46%
Morogoro	18,720	262,692	7%	86%	24%
Coast	27,263	105,333	26%	93%	6%
Dar es Salaam	500	984	51%		
Lindi	8,981	28,442	32%	71%	6%
Mtwara	1,136	34,136	3%	100%	
Ruvuma	3,784	25,640	15%	17%	28%
Iringa	33,564	74,071	45%	23%	16%
Mbeya	2,528	69,739	4%	100%	17%
Singida	1,017	1,017	100%	94%	
Tabora		230			100%
Rukwa		100,648			
Kigoma		71,575			3%
Shinyanga	2,376	2,616	91%	26%	100%
Kagera	408	34,309	1%	100%	26%
Mwanza	6,321	7,435	85%	54%	100%
Mara	2,209	32,972	7%	0%	13%
Total	290,298	1,323,446	22%	57%	23%

Source: Bureau of Statistics

Land Legislation

The right of occupancy in Tanzania is dualistic. Smallholder farms hold their land, almost entirely, under customary tenure or deemed right of occupancy. Subject to continuous use, and the approval of the village or other communal authorities, this right is held in perpetuity. Most of the large farms, however, are held under a granted right of up to 99 years, subject to land-use conditions.

The foundation of Tanzania's land legislation is the Land Tenure Ordinance Number 3/1923 (Land Ordinance Chapter 113). Enacted under the British Administration in 1923, this Act declared all land, whether occupied or unoccupied, to be public land. Land could be alienated under freehold rights, provided initially to foreign settlers, and later to large commercial agricultural undertakings. The remaining land was publicly held, for use under a "right of occupancy" by indigenous Tanzanians, defined in 1928 to include the "title of a native community lawfully using or occupying land in accordance with the customary law". The Ordinance failed to establish the principle of protecting native rights to land, nor could it prevent acquisition of the native lands by the Government for the benefit of immigrants (or for other interests in the post-colonial period). By the end of the British administration alienated lands in freehold remained just under one percent of the total area, a little more than the 1.3 million ha which had been granted to immigrants by the German administration. This represented about "forty percent of all land under cultivation".[52]

Following Independence in 1963, all freehold lands were converted to government leaseholds by the Freehold Titles (Conversion) and Government Leases Act. The non-freehold sector continued to be regulated by traditional tenure systems. The Arusha Declaration of 1967 brought changes in tenure arrangements. The most important event was "villagization", under which rural dwellers were brought together, often forcibly, into villages located and controlled by Government appointees. The intention was to encourage communal production while permitting a more efficient provision of social services and infrastructure. Land-use in reorganized villages was a mix between individual tenure (often over a new, undeveloped plot), communal plots, or "block farms" where plots were located side by side to facilitate mechanization. The movement began voluntarily but towards the end villagers were being forcibly moved. Between 1969 and 1973 the number of reorganized villages rose from 809 to 5,628.[53] In 1974 "Operation Sogeza" was launched in order to complete the process, so that by end 1975 a large majority of the rural population was in reorganized villages.[54] Between forty and fifty percent of rural dwellers moved during Operation Sogeza. The disruption in cultivation and living standards had a severe impact on agricultural output. Following the relaxation of Government controls on villages in the mid 1980s, there are indications that between thirty and forty percent of those who were moved during Operation Sogeza have moved back. These continuous movements onto land not chosen, necessarily for its agricultural potential or its capacity for sustainable agriculture, will have contributed to degradation of its productive potential. The large number of returnees attests to the undesirability of the new sites.

Two pieces of legislation that followed the Arusha Declaration should be mentioned. The first was the Village Act of 1975, which, together with other provisions, put the powers of land allocation and land-use in the hands of district directorates. It called for the establishment of village boundaries and their registration. Village boundaries were to be marked by natural features such as trees, rivers and prominent landmarks. Unfortunately village boundaries were not properly defined, and no ruling was given on what was to happen to the already registered lands (commercial farms, minor settlements and trading centers). The result was the degazetting of these lands, leaving them under village administration. These events were followed by remarkable deterioration of minor settlements and endless conflicts between commercial farmers and village authorities who now considered the farmers under the village jurisdiction.

The second relevant piece of legislation was the Local Government (District Authorities) Act, 1982, which consolidated the 1975 Village Act, and again called for the demarcation and registration of villages. The Local Government Act gave power on all village matters, including the allocation of land for

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52 Mbilinyi, M., "The Transition to Capitalism in Rural Tanzania", ERB Paper 74.7, University of Dar es Salaam, pp. 90-91.

53 Coulson, Andrew, "Tanzania - A Political Economy", Clarendon Press, Oxford, 1982, p. 241.

54 Collier, P.; et al, "Labour and Poverty in Rural Tanzania", op. cit. p.5.

communal or individual use, to the village council. The system had no written guarantee of land ownership rights, which could be terminated at will of the state. Security of tenure was poor and not conducive to capital investment.

The National Agricultural Policy of 1983, the most recent official pronouncement on land tenure policy, attempts to reduce tenure insecurity within the framework of village-based tenure: "It is therefore essential that all users feel confident that their investments of effort and money will be beneficial to them and their families as well as to the nation as a whole. This principle applies equally to the peasant farmer, the village community and the private or public commercial farmer".[55] The Policy outlines a system under which villages are allocated land under a 999 year lease, with the power to sublease any part of their land to individuals, enterprises or institutions for shorter periods of between 33 and 99 years. Such leases can not be sold. It called for the Ministry of Lands, Housing and Urban Development to continue work in designing a land tenure system which would encourage conservation and investment while respecting "the traditional land practices and beliefs".[56]

Respecting "traditional land practices and beliefs," while ensuring that all users are confident that their investments of labor and money will bring returns may be problematic for women farmers (a majority of the agricultural labor force). Women traditionally, and in most cases legally, have only usufruct rights to land designated for their use by male relatives. Nor do women normally inherit land.[57] With the erosion of clan influence, whose authority rested upon maintaining a network of good relations between the husband's and wive's lineages, there may be less support for equitable divisions of land within households, or fair treatment of widows and divorcees. Village authorities are usually men, despite Government efforts to achieve equality.[58] As land becomes more of a commodity, it is important that women's usufruct rights are also translated into transferable leasehold or freehold. Otherwise incentives for investments of additional effort and money in farming by women farmers will be eroded.

One aspect of traditional land-use rights which has not been included in village-based tenure, has been grazing and access to water rights of the nomadic groups in the semi-arid and arid areas. This omission, coupled with the expansion of cultivation into more marginal agricultural areas (hitherto used only for grazing), has caused sharp conflict between agriculturalists and pastoralists, and has generated most tenure-related disputes in recent years.

A Proposal for Tenure Reform

The recommendations in the National Agricultural Policy statement were endorsed by the ruling political party which directed, in 1987, that the village demarcation process be completed within five years. The implementation of these recommendations has been slow for administrative reasons, as the Department of Surveys in the Ministry of Lands, Housing and Urban development works under severe physical, financial and human resource constraints. However, there are issues where the lack of clarity or definition is hampering progress on tenure reform. These include the effect of the current village demarcation program on:

- The social and production effects in the villages created under "villagization" schemes;

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55 URT, "The Agricultural Policy of Tanzania", March 31, 1983, Section 27.

56 URT, The Agricultural Policy of Tanzania, op.cit., Section 30.

57 Gondwe, Zebron S., University of Dar es Salaam, "Female Intestate Succession to Land in Rural Tanzania--Whither Equality?" Working Paper #202, Michigan State University Working Papers, Michigan State University, February 1990.

58 UNICEF/GoT "A Situation Analysis", 1990 p. 109.

- the area over which each village shall exercise control;
- the nature of the village title and its effect on the derived titles and traditional user rights of residents is unclear, and creates uncertainty;
- the effect of village-based titling on the "rights" of non-residents such as nomadic grazing groups who use village resources such as grazing areas or trees on a predictable basis;
- the management of "common natural resources" such as grazing areas, trees, rivers;
- the administrative responsibility and authority for planning and monitoring land-use.
- the degree of village control over transfers of land, and its powers of allocation across individuals or enterprises;
- The relationship between village authorities and government agencies and institutions on tenure issues;
- The resolution of conflicts intra- and inter-village, or between villages and the national authorities.

The decision to begin titling land in Tanzania to villages (as a first phase towards an eventual individualization of title) was taken with the belief that such "title" would improve tenure security. More security of tenure would bring increased investment in land and management, resulting in intensification, improved yields and rural incomes. However, experience in other African countries has shown that title per se does not necessarily provide either "security of tenure", nor, by itself, does it serve as an incentive to better land management or sustainable production. The Migot-Adholla study of land tenure in Africa indicates "no relationship between cross-sectional variations in land rights and productivity. Thus it undermines the conventional view that land rights are a constraint on productivity."[59] One conclusion of the study is to warn against equating formalization of tenure rights, via emission of a title, with tenure security. The success of agriculture functioning under customary tenure systems is "predicated on the solidarity of small-scale social entities. These entities may cease to function if national institutions or national and international mobility of labour destroy their legitimacy, or if loyalties to lineage and communal groups become weak."[60] For Tanzania the question may be raised, whether villagization has so weakened the land-use parameters established under the customary tenure system, that the introduction of Government titling and a leased-based system is needed to forestall collapse and complete confusion. The absence of widespread tenure disputes in the country, other than livestock grazing and watering rights (which have been in constant dispute for generations) suggests that the region-specific evolution of tenure rights can be allowed to continue its course. Government intervention would be needed to confirm individualized rights in areas where these are already well developed, or to permit the introduction of commercialized, high-intensity agriculture in regions where the tenure systems appropriate to this type of land management have not yet evolved. Such selective Governmental intervention should be sanctioned under umbrella land tenure legislation, which will establish basic principles and procedures.

Recommendations Land tenure and land-use systems are implemented at the local level, therefore it is the village authorities that should be responsible for their control. The national authorities have not usually been able to control or implement legislation directly.

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59 Migot-Adholla, S., op. cit., p. 172.

60 Migot-Adholla, S., op. cit., p. 172-173.

Because land tenure patterns are still in the process of evolution, it would be undesirable to immediately title all lands throughout the country. There are some areas where titling would be unnecessary and/or premature. Furthermore, in other areas shifting cultivation and/or transhumance may still be the most efficient land-use practice. In these areas, alternative forms of recognition of rights and their enforcement by Government would be necessary. Umbrella legislation is needed which provides for the selection of alternative forms of property rights, recognized and enforced by the national government and with sufficient flexibility to allow for further changes with economic advance.

The village authorities should be entitled to control and manage land, not to create title. In other words, the traditional or the formal-legal system should "create" the title (or "right to occupancy"), as well as provide for its transmission. The village authorities would merely confirm and verify these rights. As the demand for land increases and the economic returns from its use increase, processes of appropriation could lead to individual tenure and to a reduction in the levels of authorization needed to sell or rent land.

Government should recognize that land transactions are increasing in frequency and that land is being "commoditized". Furthermore, land transfers involve the exchange of substantial sums of money. Government should seek to capture some of the gains made by the parties and to monitor land transactions by decreeing that land transactions should be registered. In the absence of monitoring, only the powerful can take the risk of land transactions for cash, facilitating land grabbing and hoarding.

To ensure sustainable natural resource management, management of, and title to, common lands within the area of influence of the village should be vested in the village authorities by the national government. Any transfer of these lands or distribution among village residents would require the consent of the national government.

The most acceptable way of defining village boundaries (followed by the Survey Department) is to base them on the residents' perceptions. This generally results in contiguous boundaries between villages. It is not desirable that some lands be "reserved" (that is, left outside the boundaries of villages) to place land at the disposal of Government for "development" . First, it would be difficult to control the use of these lands . Second, it would imply that the interests of the nation are at variance with those of the villagers. Third, it would provide a convenient source of rents for persons who have the authority to dispose of lands.

However, before village boundaries are finally demarcated, the use of natural resources within the proposed boundaries must be defined. If non-residents have traditional rights to the seasonal or regular use of resources within the village or rights of passage through the defined boundaries, any incorporation of the village should specify the nature of the rights and who is entitled to exercise them. This would be in the nature of a contract between the village and the Government, which third party beneficiaries (i.e. transhumant pastoralists) could enforce.

The national government also has an obligation not to alienate, acquire, or dispose of property within the boundaries of villages without the willing consent of the local authorities and discussion of any compensation to be paid.

Although common resources should be managed at the village level, the national government should design land-use policy which: (i) facilitates and encourages sustainable types of land-use through incentives; (ii) acknowledges the rights and existing use of natural resources by individuals or groups; and (iii) involves local communities/groups in the management of those resources. This partnership is particularly crucial in the semi-arid, arid, and coastal zones, as well as in riparian areas of the country.

C. The Rural Household

About 85 percent of all mainland Tanzanians own and operate farms. The actual share of the population officially classified as rural is unclear. In the 1967 census, 94.9 percent of the population was classified as rural. In 1978, 86.7 percent was rural. The 1988 census blurs the distinction, however, by including a large share (13 percent of the total) in a "mixed rural-urban" category. Thus, 75 percent of the population is incontestably rural, and 12 percent is undeniably urban. Where the final rural-urban divide is drawn depends on the allocation of the 13 percent outstanding. For the purposes of this report and numerical analysis, it was assumed that 75 percent of the "mixed" population was in fact rural. This puts the rural population at about 19.2 million persons, or 85 percent of the population, which closely coincides with the total population of small farming households identified by the Agricultural Sample Survey of 1989/90. With this assumption, the rate of growth of the rural population is 2.65 percent per annum, close to the rural population growth rate in the previous intercensal period (2.43 percent per annum). Also, it fits with the finding in the Cornell/ERB survey, where only 15 percent of the total population are urban without access to agricultural land. Drawing on the Cornell/ERB survey and other sources, this section will attempt to characterize the living standards, income, and consumption characteristics of the rural population.[61]

Average GNP per capita in mainland Tanzania was estimated at $ 100 in 1991.[62] This is one third of average per capita GNP in sub-Saharan Africa in 1990[63], making Tanzania, on the basis of comparative GNP data, one of the poorest countries in the world. The per-capita expenditure levels estimated from the household budget survey, however, are significantly higher. Average per capita expenditure is estimated at $ 281 (Tsh 61,564 of 1991[64]), over two and a half times the official per capita GNP estimate. This gives credence to the hypothesis that the official GDP estimates significantly underestimate national income and expenditure. It has been estimated that a minimum of 30 percent of total GDP takes place in the so called "second economy."[65] This sector of the economy includes production and sale of goods and services from the informal sector, or through barter transactions, and are never captured by accounting and taxation systems. The sector also includes rent-seeking activities, and traffic in exports, narcotics, and other illicit activities.[66] Inclusion of this kind of income-earning activity in official estimates of income would raise it by between 40 and 50 percent to around $ 150, still below the expenditure levels estimated in the survey.

A profile of the rural household is provided below, based on the Poverty Profile[67] prepared from the Cornell/ERB survey.

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61 The presentation is drawn from the draft "Poverty Profile" of December 1993, prepared by the World Bank in collaboration with the Economic Research Bureau of the University of Dar es Salaam and the Food and Nutrition Policy Program of Cornell University. The Poverty Profile draws on a household survey, based on the National Master Sample frame, undertaken by the Economic Research Bureau and Cornell University in August-October 1991.

62 World Bank, Atlas 1992, p. 19.

63 World Bank, World Development Report 1992, p.218.

64 Using the average official exchange rate for 1991 of Tsh 219.16 = US$ 1.00 provided in the International Financial Statistics of the IMF.

65 Maliyamkono, T.L.; Bagachwa, M.S.D., "The Second Economy in Tanzania", James Currey, London, 1990, p.61.

66 Maliyamkono, T.L.; Bagachwa, M.S.D., op.cit., p. 27.

67 World Bank, "Tanzania - A Poverty Profile", Report No. 12298-TA, Green Cover draft of December 1993, Population and Human Resources Division, Eastern Africa Department.

Table 2.17: Profile of Tanzanian Households

	Rural	Urban	DSM	Tanzania
Share of Population	73.5%	17.4%	9.1%	100.0%
Per Capita Household Expenditure	49,620	78,542	112,894	61,564
Adult Equivalent[68] Household Expenditure	77,246	108,988	158,695	91,509
Food	77.4%	63.6%	59.3%	73.1%
Clothing	5.5%	4.2%	4.2%	5.1%
Health	1.9%	4.3%	2.9%	2.6%
Education	0.6%	0.9%	0.8%	0.7%
Transportation	2.4%	3.3%	4.7%	2.8%
Rent and Utilities	0.3%	7.9%	10.1%	2.8%
Other	11.9%	15.8%	18.0%	12.9%
Total	100.0%	100.0%	100.0%	100.0%
Share of Food from Home Production	41.7%	17.9%	3.0%	33.1%
Household Size	6.6	5.4	6.0	6.3
Dependency Ratio[69]	1.25	1.03	0.75	1.15
Female Headed Households	5.8%	19.4%	13.1%	9.4%
Share of Population With Over 30 Minutes to Walk to Get Water	26.1%	3.9%	2.1%	19.3%
Adult Literacy	61.0%	79.4%	88.0%	67.8%

Source: World Bank, Poverty Profile.

Rural Tanzanians have bigger families than their urban counterparts. Their dependency burden is greater, and their income is less. Average rural per capita income is 63 percent of income in urban areas, and 44 percent of the average in Dar es Salaam. As will be shown below, poverty in Tanzania is a rural phenomenon. Rural families produce 42 percent of the food they consume. Over 25 percent of rural families have to walk more than 30 minutes to obtain drinking water. There are significantly fewer rural households headed by women (6 percent) than in urban areas. And adult literacy rates for the rural

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68 Household expenditure is shared amongst the equivalent number of adults in the family, with children counting for less than 1.

69 The Dependency Ratio reflects the degree to which the economically active population has to support other family members who are too young or too old to work. It is the ratio between the sum of family members younger than 15 or older than 64, and the remaining family members. The higher the ratio, the greater the burden on the working population.

households, at 61 percent, is high for Africa, but still significantly lower than the rates for urban dwellers (over 79 percent).

It is of interest to note in Table 2.18 that the variation in rural incomes is much greater than in urban areas. Even following a decade of villagization and efforts to induce income redistribution in rural Tanzania, the distribution of income is significantly more concentrated than in urban areas, as indicated by a rural Gini coefficient of 0.60 vs an urban coefficient of 0.48. The Gini coefficient for per capita rural expenditure in Tanzania increases from 0.30 in 1969, to 0.37 in 1976/77 to 0.60 in 1991.[70] It is not clear if the differences in distribution of rural expenditures are due to differences in factor endowments across regions, or due to differences in income earning capacity within villages. One explanation for the trend of increasing concentration of incomes is that the liberalization of agricultural production has had a more rapid effect in the more productive regions. Further research will be needed to determine whether this is true.

Table 2. 18: Distribution of Expenditure Per Adult Equivalent[71]

	Rural	Urban	Dar es Salaam	Tanzania
Gini Coefficient	0.60	0.48	0.39	0.57
Coefficient of Variation	2.41	1.20	0.81	1.89

D. Rural Poverty and Food Security

Drawing on the Poverty Profile, the following section identifies the poor in Tanzania in order to begin to formulate agricultural development policies that address poverty alleviation.

A poverty line expenditure level of Tsh 46,173 ($ 211[72]) per capita per annum in 1991 was set for Tanzania under the Poverty Profile.[73] This level of expenditure is 50 percent of the mean adult equivalent expenditure level (or 75 percent of the mean per capita expenditure level) and is well below the "one dollar a day" concept commonly used to define poverty. It is higher than the Tsh 31,000 income level which has been estimated by the ILO to just cover minimum food and shelter needs, and which defines the "hard core poor". Children and old people consume less than a working adult. In order to rank the population in terms of levels of expenditure and to determine their position relative to the poverty line, expenditure is adjusted to the person's age. Expenditure levels, in the poverty analysis, are thus calculated in **adult equivalent** terms. One characterization of poverty is to identify those whose adjusted adult equivalent expenditure levels fall below the poverty line. In the case of Tanzania, about 51 percent of the population live in households whose adjusted adult equivalent income is below the poverty line. A second characterization, which provides information on the depth of poverty, is to calculate the level of expenditure supplementation necessary to bring the expenditure of the poor, in adult equivalent terms, up to the poverty line. Thus if all the poor are only marginally below the poverty line, this quantity, expressed as a share of poverty line expenditure, will be small. This is the case in Tanzania (Table 2.19), where supplementation is equivalent to about 25 percent of the poverty line expenditure level.

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70 World Bank, "Poverty Profile", Table 2.3.

71 World Bank, "Poverty Profile", Table 2.2.

72 At the average official exchange rate for calendar 1991 of Tsh 219 per US dollar.

73 World Bank, "Poverty Profile", p. 16.

Table 2.19: Poverty in Tanzania

	Share of Population With Adjusted Adult Equivalent Incomes Below the Poverty Line (Tsh 46,173/annum)	Share of the Poor in Total Population	Depth of Poverty
Rural Villages	59.1%	85 %	29.9
Urban Outside DSM	39.3%	13 %	15.1
DSM	9.3%	2 %	3.1
Tanzania	51.1%	100.0%	24.9
Rural			
Farmers	59.1%	83 %	30.1
Business Persons	61.6%	1 %	23.1
Government Employee	28.7%	1 %	15.5
Urban Including DSM			
Self employed	33.7%	14 %	12.8
Business persons	8.4%	1 %	1.2
Government Employee	9.7%	1 %	3.5
Tanzania	51.1%	100 %	24.9

Source: World Bank, Poverty Profile

All indices of poverty show the rural population to be significantly more disadvantaged than the urban. About 85 percent of all poor people live in rural villages. Over 59 percent of persons living in rural villages (including farmers) are poor, whereas only 39 percent of non-Dar urban dwellers, and only 9 percent of urban dwellers in Dar can be considered poor (using the share of families with adult equivalent income under the povery line as a criterion). The incidence of poverty is higher for business persons, and lower for Government employees. Some 83 percent of all poor persons live in households where the main occupation is farming.

Poverty in rural areas is more severe than in urban areas. To bring the rural poor up to the poverty line would require about 30 percent of the aggregate income the rural poor would earn if they all were at the poverty line. In comparison, to bring the urban (non-DSM) poor out of poverty would only require 15 percent of aggregate poverty line income.

Access to land, per se, does not appear to be linked to poverty. The review of regional characteristics undertaken below, however, indicates that access to the lands with good agricultural potential may in fact be a determinant of expenditure levels. The above table reinforces the notion that poverty in Tanzania is a rural phenomenon. More of the poor have land than do the non-poor. The gender of the head of the household head does not seem to be significantly correlated with poverty levels. The Collier study traced over 50 percent of the differences in incomes between poor and non-poor to the differences in endowments available to each family.[74] About 21 percent of the total income differential between poor and non-poor was the result of inequality in the livestock endowment. Educational levels and land utilization levels are the next most important factors in explaining rural poverty. "If access to wage

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74 Collier, P. et. al., "Labour and Rural Poverty in Tanzania", pp. 95-96.

employment is regarded as an asset, then it is more significant contributor to inequality than landholdings." And access to high wage employment was found to be closely linked to educational attainment. The need to improve educational attainment is unavoidable: "**... the poor are poor because of low returns to labor rather than because of labor shortages. These low returns to labor can in turn be explained by the low endowments of non-labor assets owned by the poor." [education and livestock are the most important].."...resource redistribution within rural areas would appear to be capable of reducing the incidence of poverty without reducing output.**"[75]

Table 2.20: Characteristics of Poor Population

	Poor	Non-Poor
Adults Who Read and Write	59 %	75 %
HH With Over 30 Minutes to Water	23 %	16 %
Dependency Ratio	1.31	1.01
HH Size (persons)	6.8	5.9
Female Headed HH	9.3 %	9.5 %
Ha Cultivated per Capita	0.62	0.62
HH With Land	93 %	73 %
Share of Food From Own Production	32 %	34 %

Source: World Bank, Poverty Profile

Food Security

Government has done much to mitigate the effects of poverty since Independence. The infant mortality rate has dropped from 138 to 115 per 1,000 births between 1965 and 1990. Life expectancy at birth has gone up from 42 years in 1960 to 51 years in 1991. Adult literacy has increased from around 10 percent to 68 percent in 1991.[76] In spite of these improvements, the population still suffers from the poverty described above. Infant mortality rates are higher than the sub-Saharan Africa average (107 per 1,000 births), and significantly higher than the China and India average of 56 per 1,000). Life expectancy at birth is below the sub-Saharan Africa average of 51 years, and well below the China and India average of 65 years.

Tanzania has produced sufficient food to feed its population over the past 5 years. However, the averages conceal severe difficulties, across regions, and across age groups in rural areas, as the high degree of concentration in rural incomes would lead us to expect. Average caloric intake per capita in Tanzania is estimated at 2,206 Kcal/capita in 1989, above the 1,831 estimated in 1965. This level of food consumption is borderline acceptable. However, as a recent study indicates, the availability of food varies by farming system (and region).[77] The study shows about 2,200 Kcal/day available across the country, while calorie intake in the sorghum/millet system drops to 1,500 Kcal per capita.

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75 Collier et al, p. 106.

76 World Bank, "World Development Report", various issues.

77 URT and FAO, "Comprehensive Food Security Programme", October 1992. p.25.

Table 2.21: Food consumption per day by farming system.

Farming System	Zone	Energy in Kcal per day per capita	Protein in grams per day per capita
Cashew/Cassava	S. Coast	2,141	52
Maize, coffee, cattle	S. Highlands	2,510	76
Cotton, rice, sorghum	Central Semi-Arid	1,547	52
Agro-pastoralist	Agro-pastoral, Semi-Arid	2,168	80
Coffee, banana, dairy	N. Highlands	1,606	41

Source: ADIS

The main source of calories for Tanzanians is maize. In rural areas, maize, the preferred staple, provides 62 percent of total calories, and rice, the other preferred staple, contributes 8 percent. The rest of caloric intake comes from cassava (13 percent), sorghum (8 percent) rootcrops and bananas.[78]

The incidence of malnutrition among children is high. In rural areas, the incidence of children under 5 with below 80 percent of the standard weight for age is between 40 and 60 percent.[79] The incidence of severe malnutrition, children below 60 percent of standard weight for age, is between 4 and 9 percent.[80] Studies indicate that the likelihood of a child dying increases substantially if the child is malnourished. The infant mortality rate in rural areas is 138 per 1,000 live births. The mortality rate for children under five living in rural areas is 249 per 1,000 live births. Child mortality rates in urban areas are significantly lower. The very high child mortality rate in rural areas is due to inadequate consumption of food, as well as malaria, diarrhea and respiratory diseases.

Children under 5 and pregnant and lactating mothers are the most vulnerable groups in the population. Some 28 percent of the population suffer from protein energy malnutrition, with the incidence rising to 52 percent for children under 5. This type of nutritional deficiency is found mainly in the cassava based farming system. About 32 percent of the population is anemic, with the incidence rising to 80 percent for pregnant and lactating women. Anemia incidence was highest in maize based farming systems. Vitamin deficiency is highest amongst children under five, with the sorghum and millet based system being the one with the highest incidence of this disorder. Iodine deficiencies, affecting 25 percent of the population, are also problematic in the cassava based system.[81]

AIDS and Agriculture

In addition to the above-mentioned problems, it is estimated that about 3.2 percent of the population are currently infected with AIDS. Kagera, on the Western shore of Lake Victoria, is the region most affected by the epidemic, with over 10 percent of the adult urban population and over 3 percent of the adult rural population HIV infected. Rural sero-prevalence rates are well below those in urban areas, and are expected to increase over time. The rate of HIV infection, and AIDS related death, is predicted to climb dramatically in the next few years. Projections show HIV prevalence among adults climbing rapidly. Under different assumptions on modifications in sexual habits, the projections indicate that

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78 Ibid. p.24.

79 URT and UNICEF, "Women and Children in Tanzania - A Situation Analysis", November 1990, p.34.

80 Ibid., p.28.

81 From the URT and FAO, "Comprehensive Food Security Programme", op. cit., pp 27 and 28.

between 3.9 and 12.4 percent of the population will be infected by the year 2000. This will affect the rate of population growth, and impose an enormous cost on the society. The incidence of AIDS is affecting mothers, and their children. In 1989 an estimated 68,500 pregnant women were HIV positive. Transmission rates of 30 percent would lead to about 20,500 babies being born seropositive in 1989.

The increasing presence of the disease will be sharply felt in the agricultural sector. AIDS strikes males and females between the ages of 20 and 44, in the prime of their working lives. As has been argued previously, the smallholder agricultural economy in Tanzania is constrained by the availability of labor.[82] The onset of the disease can be analyzed by looking the effects of the decline in healthiness, and separately, the increase in deaths.[83] With the decline in health, labor productivity will fall among the infected population as well as those that care for them. Health related costs will surge, putting increased burdens on the extended family budget, and forcing reductions in expenditures on improved tools and other resources used to increase agricultural productivity. As morbidity amongst the working age population increases, caring for orphans and other survivors of decimated families will add to the dependency burden of the extended family. This will lower savings and investment. The rate of population growth will slow, slowing the rate of growth in agricultural output for reasons to do with both a reduced supply of labor, and a decline in demand. The age structure of the population will shift towards youth, whose savings rates are lower. The loss of human capital, coupled with the declines in the share of the population which is economically active, will also affect economic growth. It has been estimated that the epidemic could reduce annual GDP growth by 0.6 to 1.1 percentage points over the next 15 years.[84]

Rural Women[85]

The power of women in rural Tanzania has been eroded with the gradual commercialization of agriculture. Prior to the colonial period, work was apportioned by sex. Men were responsible for land clearing, perennial plants, procuring meat, large domestic animals and providing housing. Women were responsible for the husbandry and harvesting of annual crops, smaller domestic animals, food preparation, wood and water gathering and the children. Men and women had rights and obligations protected by customary law. The commercialization of agriculture, which began during the colonial period, affected land rights and the division of labor. With the gradual intensification of agriculture, land rights shifted from collective towards individual ownership, with the men as the owners. Women continued to be regarded as legally incompetent. In the division of labor on the farm, men took over cultivation of all cash crops, including annuals, and the use of new technology. The role of the clan, and its guarantee of women's rights, declined.

The Tanzanian constitution guarantees men and women equality under the law. But there are various legal instruments which frustrate this objective. The Marriage Act permits polygamy, which is widely practiced in rural areas, and acknowledges the "bride price". Both of these put rural women, especially, at a disadvantage with respect to their husbands. The old Cooperative Act restricted the formation of primary societies. This meant that the male dominated cooperative went uncontested. This situation has changed under the 1991 Cooperative Act, which permits competing societies to be established. The provisions of land legislation conferred tenure to village authorities, who convey this right to households. The right of occupancy would be held by the head of the household, often, but not always, the male. The main difficulty regarding land tenure has to do with customary law, which as we have seen

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82 Collier et al, "Labour and Poverty in Rural Tanzania", op. cit., p.44.

83 World Bank, "Tanzania - AIDS Assessment and Planning Study", op.cit., pp 49-58.

84 i.e. projected growth rates would drop by 15 to 27 percent.

85 This section draws on World Bank Report No. 9108-TA, "Tanzania - Women and Development", June 1991.

previously, still dominates land transactions among small farmers. Customary inheritance rights follow the male line. Women are only permitted to obtain land through purchase or other commercial means.

The Poverty Profile based on the Cornell/ERB survey indicates that 6 percent of rural households were headed by women. This estimate is considerably below that found in other studies. The ratio is likely to be between 15 and 25 percent. Rural women are reluctant to be identified as "head of household" to outsiders for many reasons: fear of taxation or village labor call-ups, only men are suitable representatives of the family to officialdom, and only men control land. An elder male relative, even if he makes little contribution to the household, may be considered the "head" because only men can hold land. Some surveys make a distinction between *de facto* head of household, (with no male partner present, i.e. widows, divorced women, single mothers, etc.) and *de jure* head of household, which encompasses households where the male partner is absent or makes a very marginal contribution to the economic maintenance of household. The IFAD State of Rural Poverty report finds 25 percent of rural households headed by women (probably including *de jure* households). The IFAD "Household Income Security Project for Marginal Area Formulation Report" of May 1990 gives the figure of 20 percent on *de facto* female-headed households for various regions of the Central Plateau. The "Extension and Rural Financial Services Project for the Southern Highlands Formulation Report" of June 1992 gave the figure of 14-15 percent for the Southern Highlands (with regional variations from 12% to 32%). It is not clear whether these estimates are *de jure* female-headed households. The ADIS Survey covering a number of agroecological zones in rural Tanzania found 15% of its survey identified themselves as female-headed, and another 5% "holders", with decision making power over their agricultural activity.

Farm level survey data indicates that women (in Haya) were putting in a significantly longer workday: about 10.4 hours vs 7.8 hours for men.[86] The difference lay in the non-agricultural work, as mentioned above. In a study of transport demands for rural households, a further study showed women spending three times as much time as men transporting water, firewood and crops around during the year.[87] The need to care for the sick as the AIDS epidemic spreads, will add to this burden.

On the other side of the ledger, the Education Act of 1978 can be credited with having dramatically increased girls' access to primary school. Primary education became compulsory from age 7, and it became an offense to prevent girls from attending school. In spite of this, the literacy rate for adult rural women (61 percent) lags behind that of the men (76 percent).[88] The Employment Act guarantees equal access to employment to both sexes, as well as provisions to safeguard a women's role as mother.

E. Regional Characteristics

There are significant differences in agricultural potential, population, and incomes across regions. Table 2.6 has already provided indications of the differences in agricultural potential and land use. Table 2.22 below provides evidence of the differences in regional income and poverty. It is surprising how different the incomes and levels of poverty are across regions. Less than 40 percent of the population are below the poverty line in Arusha, Kilimanjaro, Kagera and Mara. Over 90 percent of the population are poor in Shinyanga and Lindi.[89] While income levels more or less reflect the availability of land of good

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86 World Bank, "Tanzania - Women and Development", op. cit., p. 14.

87 Barwell and Calvo, "The Transport Demands of Rural Households", ILO, 1989, p.81, in World Bank, "Women in Development", op.cit., p. 15.

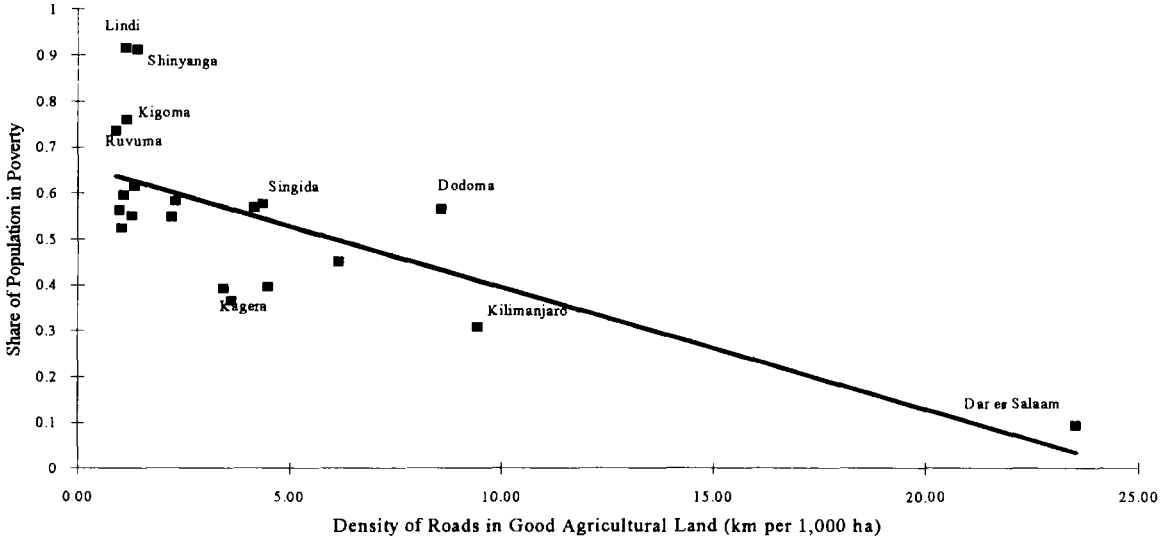
88 Cornell/ERB household survey in the World Bank, "Poverty Profile", op.cit. Table 4.2.

89 The Cornell/ERB survey sample frame was designed to represent Tanzania, as a whole, and is inadequate to provide more than indicative data on regional characteristics. The draft report of a recent World Bank study titled "Promoting Economic Opportunities for the Rural Poor During Economic Reform, the case of Tanzania", T. Addison, March 1994, page 11 indicates that in fact Shinyanga ranks as one of the better off regions on other social indicators

agricultural potential, it is access to markets and inputs, coupled with the availability of land of good potential, actually determine incomes. In a labor-constrained smallholder economy, access to inputs, from fertilizer to ploughs, which increase the marginal product of labor, will affect incomes. Lower transport costs and more competition for produce mean higher prices for output, increasing incomes. The relationship between poverty levels, and the density of roads per square kilometer of good agricultural land is illustrated in Figure 2.4 below.

The correlation between the level of poverty in a region, and the road density/agricultural potential variable is reasonably good.[90] This variable alone explains over 50 percent of the variation in poverty across regions. While there seems to be an association between infrastructure density on high potential land, and poverty alleviation, the line of causality between these two variables is not clear. It may be that the richer farmers are more able to exercise political power and increase the investment in roads in their area. The contribution to poverty reduction from the roads network may be both through income, as noted above, or through a redistribution effect, democratizing access to markets and diminishing the rather high concentration in rural incomes noted previously. The gini coefficient for rural income distribution was 0.60. Whether this degree of inequality is due to differences across regions, or within regions, is still to be determined.

Figure 2.4: Poverty, Roads and Agricultural Potential



Source: Table 2.22

such as percentage of children stunted (relatively low), percentage of children undernourished (low), percentage of women at nutritional risk (low), and percentage of women with chronic energy deficiency (low).

90 Statistically significant at the 95 percent confidence level. If the Dar es Salaam (rural) observation is removed, the quality of the relationship, and its confidence level, drop. It is felt, however, that the rural Dar es Salaam observation is appropriate, as an example, however extreme, of how important the links with infrastructure and market are in support of high intensity agricultural growth.

Table: 2.22: Regional Characteristics of Population, Income, Poverty, Roads and Population Density[91]

Region	Farming Population 1988	Per Capita Income, Adjusted to Adult Equivalent 1/ 1991	Population Below Poverty Line (Tsh 46,173/annum) Adult Equivalent 1/ 1991	Length of Earth and Gravel Roads 1993	Road Density on High Potential Land (Less Reserves)	Rural Population Density, per Sq Km of Land of Good Potential (Net of Reserves)
				Km	*Km/'000 ha*	*Inhab/Km2*
Dodoma	1,140,410	54,183	57.7%	629	4.37	792
Arusha	1,221,239	220,133	39.6%	1,288	4.49	426
Kilimanjaro	964,343	114,355	30.8%	510	9.44	1,786
Tanga	1,096,567	143,900	45.1%	974	6.16	694
Morogoro	1,017,040	61,229	59.6%	1,084	1.09	102
Coast	589,463	68,591	54.8%	709	2.22	185
Dar es Salaam	224,174	158,695	9.3%	306	23.54	1,724
Lindi	586,695	14,191	91.2%	668	1.41	124
Mtwara	802,805	45,770	56.9%	887	4.16	377
Ruvuma	704,137	35,189	73.5%	1,028	0.90	62
Iringa	1,126,566	60,330	52.4%	1,148	1.05	103
Mbeya	1,279,576	68,368	55.0%	1,300	1.27	125
Singida	733,656	82,497	56.5%	893	8.59	705
Tabora	906,022	63,414	61.5%	907	1.34	134
Rukwa	601,753	99,904	56.2%	967	0.99	61
Kigoma	759,417	37,595	76.0%	626	1.15	140
Shinyanga	1,685,553	30,243	91.5%	652	1.14	294
Kagera	1,249,555	108,182	36.5%	1,226	3.62	369
Mwanza	1,617,151	76,050	58.2%	1,240	2.32	302
Mara	889,750	89,956	39.2%	652	3.45	471
Total	19,195,869	91,509	51.1%	17,694	1.80	195

Source: Bureau of Statistics, Poverty Profile.

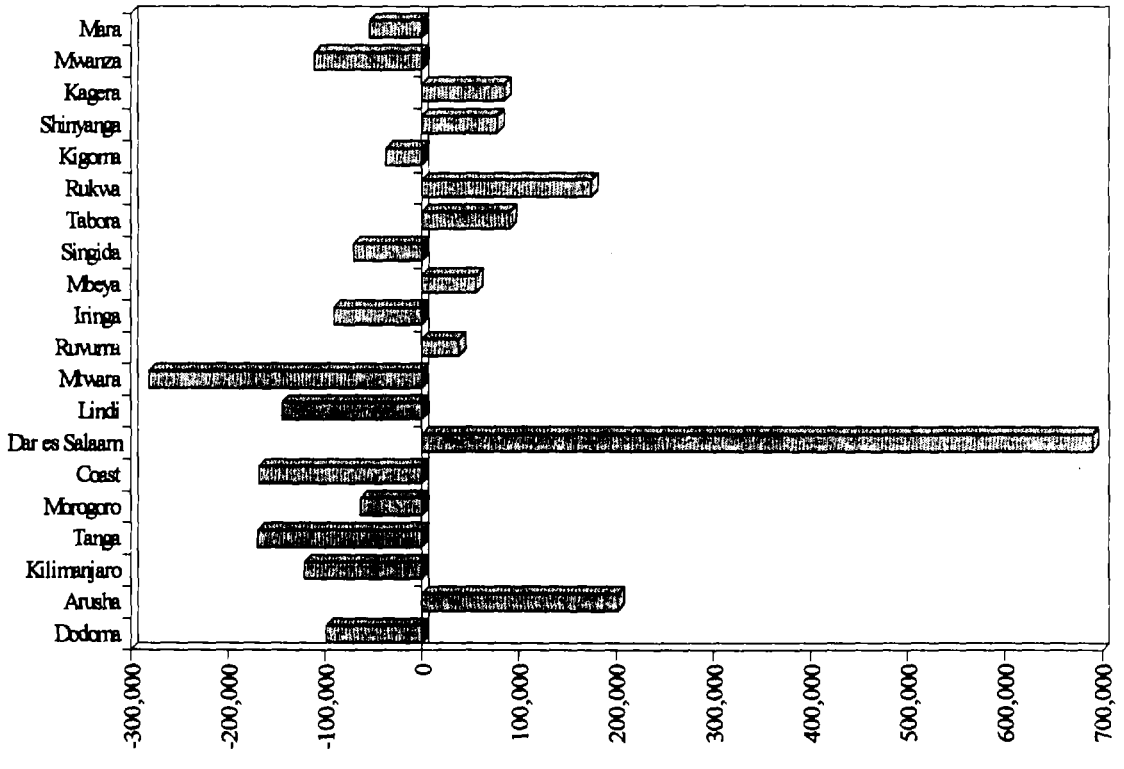
The differences between rural and urban income, and the differences between regional income, induce migration. A comparison of inter-regional population movements between the 1967 and the 1988 census reveals the rapid growth in Dar es Salaam (Figure 2.5) Net population movement is calculated by comparing population growth, by region, with the average growth for the country. Regions with growth rates exceeding the national average show up on the right hand side of the graph. The flow of population appears to be induced by two factors. First the normal forces of rural-urban migration are causing shifts in the population towards Dar es Salaam. With one of the highest per-capita incomes in the country, Dar es

91 Data on income and poverty are based on the Cornell/ERB survey. This was designed based on the National Sample Frame, and is not intended to accurately represent regional characteristics, due to the small number of observations per region.

Salaam has received the largest number of internal migrants. Second, the rural population appears to be responding to the shortages in good agricultural land, and to be migrating to new areas with good agricultural potential. The net growth in Arusha, Rukwa, Mbeya and Ruvuma may be for this reason. Pressure on the good land may also explain the exodus from Kilimanjaro, Tanga, Singida, Mara, and Mtwara. Regions such as Lindi, Morogoro, Iringa, Shinyanga and Kigoma all have a very low level of infrastructure development, and very low income levels, which are probably causing out-migration (see Figure 2.5). This process of voluntary migration can be managed indirectly, through the strategic location of investment in roads, communications, schools and hospitals, to gradually open the areas of high potential, where sustainable agricultural development is possible.

There is a process of voluntary migration out of villages, and back again, described by Collier et.al. [92] Some 27 percent of the households surveyed had family members who had left the village. Most of them left to seek work, principally in Dar es Salaam, as the above figure shows. Those who moved to other villages went in search of more land, or for marriage. Of those who had left the village, some 39 percent returned. Returnees typically earned less than other migrants, but had made much larger remittances back home during the course of their absence. This circular flow of migrants would serve to keep villagers fairly well-informed of work opportunities, as well as access to land possibilities around the country.

Figure 2.5: Net Population Migration 1967 - 1988



Source: Bureau of Statistics

92 Coller, P., et al, "Labour and Poverty in Tanzania", p. 35-40.

F. Rural Labor Markets

Farming is the main occupation of over 70 percent of the population.[93] So far this review of the rural economy has pointed to labor as the resource which constrains increased agricultural production. For an agricultural economy of smallholder, family labor-based production systems, where cash is in short supply, it is not surprising to find the development of the rural labor market is limited. After labor absorbed on the family farm, communal farms and other village activities is taken into account, Collier et.al. conclude that "there is little labor surplus in the village", and that very few households participate in the labor market.

The situation appears to have changed somewhat since 1980. The 1991 Cornell/ERB survey shows that between 10 and 12 percent of the rural population earned cash wages, either in the agricultural labor market, the non-agricultural labor market, or both.[94] Of all wage income, about 20 percent was earned in agricultural activities, the balance was earned off farm. The ADIS survey confirms that wage labor has come to play a larger role in the rural economy. The share of holdings hiring labor varied by farming system: between 16 and 40 percent in 1988/89, and between 20 and 43 percent in 1990/91. Wage rates were differentiated by region, as the Table 2.23 shows:

Table 2.23: Average Wages Per Day, for Agricultural Labor (Tsh)

Farming System	Zone	1988/89	1989/90
Cashew/Cassava	S. Coast - Mtwara	184	328
Maize, coffee, cattle	S. Highlands - Mbeya	261	447
Tobacco, rice maize	W. Plateau - Tabora	450	578
Cotton, rice, sorghum	Central Semi-Arid - Mwanza	717	827
Agro-pastoralist	Agro-pastoral, Semi-Arid - Dodoma	251	317
Coffee, banana, dairy	N. Highlands - Kilimanjaro	303	414

Source: ADIS

There are clearly large differences in rural wage rates across regions. The largest wage increase was in Mtwara, where the resurgence of the cashew production has probably increased the demand for hired labor. While the system in Mwanza region had the highest relative wage, this is probably due to the proximity of the survey district (Kwimba) to Mwanza town. The relatively large increases from one year to the next are indirect evidence of a resurgence in the rural economy, resulting from the price and marketing liberalization measures underway.

One of the key differences between the rural poor and non-poor identified by Collier [95]is the return to wage labor in non-agricultural activities. The non-poor have easier access to high-return, non-agricultural wage employment, due, according to the Collier survey, to increased levels of education. This hypothesis is borne out in the Cornell/ERB survey, where 28 percent of the non-poor engage in wage labor in non-agricultural activities.[96] Only 20 percent of the poor do so. Literacy and educational attainments by the poor are significantly below those of the non-poor.

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93 Both the Cornell/ERB survey in 1991, and the Collier survey in 1980 confirm that between 70 and 73 percent of the respondents gave farming as their main occupation.

94 World Bank, "Poverty Profile", Table 4.15.

95 Collier, op. cit., p.93.

96 World Bank, "Poverty Profile", op.cit. Table 4.13.

G. Summary

This chapter sets forth the natural resource base which defines the constraints and opportunities for agricultural development. It assesses the availability of land suitable for agriculture, and argues that the process of horizontal expansion which has characterized growth to date has limits which will begin to be felt in twenty to thirty years time. The intensity of natural resource use, and the need to guard against degradation and irreversible productivity declines, are found to vary considerably across regions. It is argued that the "headroom" for agricultural growth based on sustainable natural resource use can be dramatically increased, through the use of improved production technology which is currently available. Emphasis is placed on the need for accurate information on the availability and quality of natural resources, in ever increasing detail, to monitor their quality and use. Improved information and monitoring will permit the accurate location of the infrastructure which makes land and water available, and governs their use. This information will also permit Government intervention in areas where resources are being over-exploited, polluted, degraded, and otherwise mined to the detriment of society. In addition, the information will permit the establishment of participatory local organizations to manage natural resources in the best interests of the communities who depend on them. Emphasis is placed on the need to strengthen the Government agencies charged with this type of intervention. The chapter also outlines the characteristics of the rural population, showing it to be the poorest segment of Tanzanian society. The distribution of rural incomes is shown to be highly concentrated. Poverty does not seem to depend on access to land, but rather on access to education, health, off-farm employment and markets. The analysis attempts to rank regions by degree of poverty, and compares levels of poverty with the degree of investment in infrastructure. The need for complementary investment in human capital in education and health is also stressed. The argument is made that broad-based agricultural growth, especially through measures which raise the returns to labor in the production of food crops, cashews and cotton, has to be part of the strategy for poverty alleviation.

III. AGRICULTURAL SERVICES

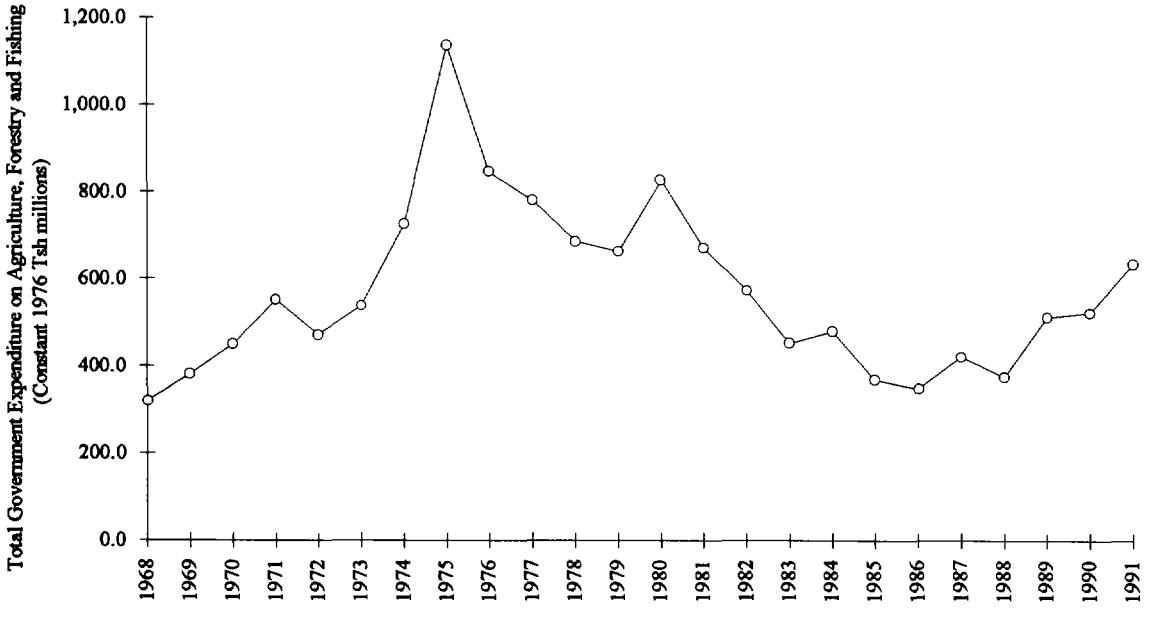
Government has played a large role in providing services to smallholder agriculture. Research, the key public good in the agricultural sector, continues to be almost completely Government funded, but the stage is set for increased private participation, through the contracting of specific research work. Extension services for smallholders who grow food and cash crops have been and will continue to be Government-funded. Where smallholder extension can be linked to specific crops and processing arrangements, such as in tea and tobacco, it may be delegated to the private sector. Larger estates have been able to fund their own extension efforts and to finance some of their most important research requirements. The gradual opening of agricultural and related markets to the private sector has seen an increase in non-government support. Marketing of foodstuffs is now largely in private hands, with the exception of the Strategic Grain Reserve. Cash crop marketing and processing continues to be controlled by the cooperative unions and primary societies. Financial services are still linked to cooperatives, or controlled through the Government-owned banking system. The supply of agricultural inputs, while still dominated by parastatals (one each for seeds and one for fertilizer), the Ministry itself, and newly-established Government-owned agrochemicals plant in Moshi, has seen the gradual re-entry of cooperatives and private merchants at different levels of the trade.

A. Government Funding for Agriculture Services

Despite the importance of agriculture to the national economy, funding for key Government agricultural services has been declining in real terms for a decade.

Figure 3.1: Total Government Expenditure on Agriculture, Forestry and Fisheries

(Constant Tsh millions of 1976)



Source: Government of Tanzania

These declines, with a static level of services and employees, have caused a dramatic reduction in real salaries, coupled with a reduction in the real resources available per staff member for operations (vehicle operating expenses, per diems, materials). As a result, the effectiveness of the research and extension services has declined considerably. The Public Expenditure Review of 1988 found that "real pay in cash terms in the public sector appears to have declined to one fifth the level of the early 1970s. Present levels are insufficient for most public officers' families to survive, requiring official pay to be supplemented in one form or another."[97] Along with the decline in salaries has come a compression of salary scales, which diminishes incentives for advancement within the bureaucracy. As a result productivity across the Civil Service has declined. Agriculture is no exception.

Total Government expenditure as a share of GDP follows a U-curve through the 1980s, going from some 32.7 percent in 1980/81 to about 23.1 percent in 1986/87, and increasing to 26.4 percent in 1991/92, in part from the effects of devaluation. The trend is one of continued increase. Yet central Government expenditure on agriculture and natural resources has remained below 2 percent of GDP since 1984.

Figure 3.2: Total Government Spending on Agriculture and Natural Resources
(Constant Tsh million of 1976)

Source: Government of Tanzania

The Tanzanian Government needs to spend more, in absolute terms, on agriculture-related activities. In the first place, it is extremely dependent on agriculture for income and export growth. In addition to being its dominant economic activity, the level of technology and productivity in agriculture is extremely low. At this stage of the normal economic growth process, as has been argued by Timmer[98] among others, a heavy Governmental contribution is required to generate production and productivity increases. Government should intervene in the development of infrastructure, in the generation and dissemination of technology, in regulation to ensure the sustainable use of natural resources, and in providing incentives for investment and growth. Only as agricultural productivity increases is it possible,

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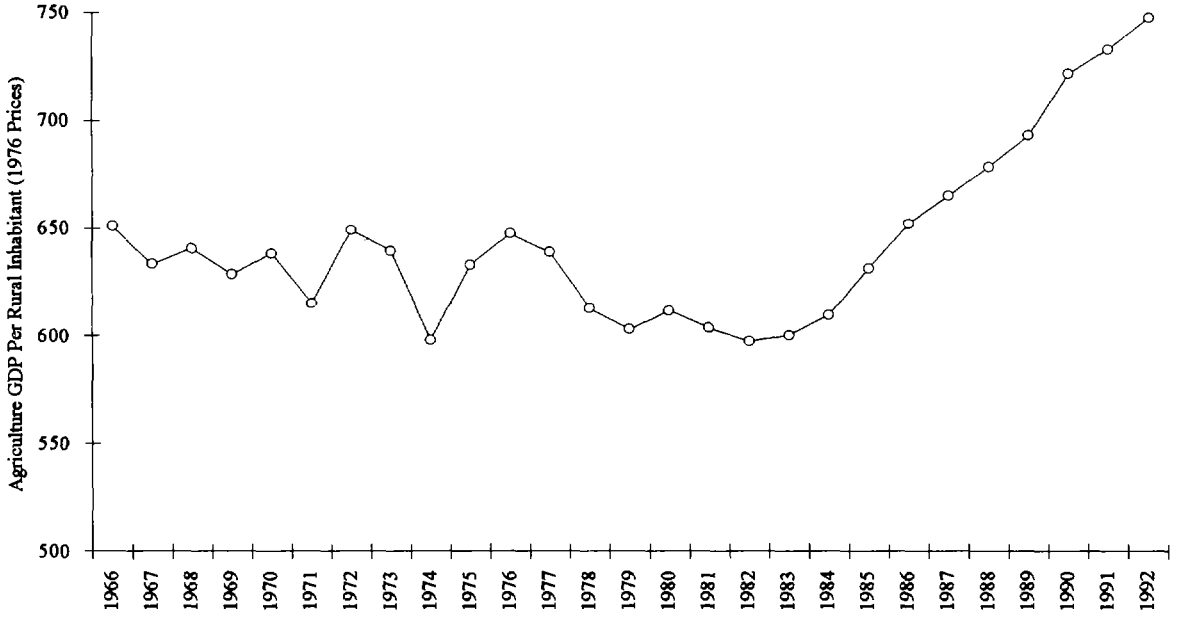
97 World Bank, "Tanzania - Public Expenditure Review", Report 7559-TA, Volume I, p. 17

98 Timmer, C. Peter, "The Agricultural Transformation", in "Handbook of Development Economics", Vol I, edited by H. Chenery and T.N. Srinivasan, Elsevier, 1988, p.279.

and advisable, to tap the "surplus" generated by agriculture to fuel investment in other, higher-productivity industries. The evolution of agricultural productivity per rural worker can be viewed below. Productivity has recovered from the decline suffered in the late 1970s and early 1980s caused by the disincentive policies of that period. However, per capita income (and output) levels are still extremely low, leaving little available for transfer to other sectors of the economy.

At first glance Tanzania's allocations of Government spending on agriculture seem to be on target. In a recent study of 40 developing countries, the average share of the central Government budget allocated to agriculture between 1984 and 1988 was 7.2 percent. For Tanzania, over the same period, it was 6.2 percent. However, the same study shows that for the same selection of 40 developing countries over the same period, central Government expenditure on agriculture was 11.6 percent of agricultural GDP. In Tanzania it was 2.7 percent. This is clearly inadequate, especially in light of the importance of agriculture in the economy. In the 40 developing countries under review, agriculture represented only 23.6 percent of total GDP whereas it represented 58 percent for Tanzania. In Kenya public expenditure on agriculture has averaged 4.2 percent of agriculture GDP over the past six years, and 3.6 percent in Ghana. On the other hand, for highly industrialized countries over the same period resource flows have reversed, and central Government expenditure on agriculture was 22.5 percent of agricultural GDP[99] while agriculture represented only 3.8 percent of GDP.

Figure 3.3: Agriculture GDP per Rural Inhabitant (in Constant Tsh of 1976)



Source: Government of Tanzania

Tanzania is at the beginning of the cycle of agricultural transformation. The sector has not yet reached levels of productivity sufficient for a forced transfer of resources to the rest of the economy without severely constraining growth. The experience of the recent past (where the agricultural sector was taxed through the overvaluation of the exchange rate under-paying farmers for export produce, and overcharging them for imported items) led to widespread declines in output and investment. (The adjustment of the incentive structure will be discussed at the start of Chapter IV.) Clearly a higher level of Government spending on agriculture is appropriate. The question is, where should the money go?

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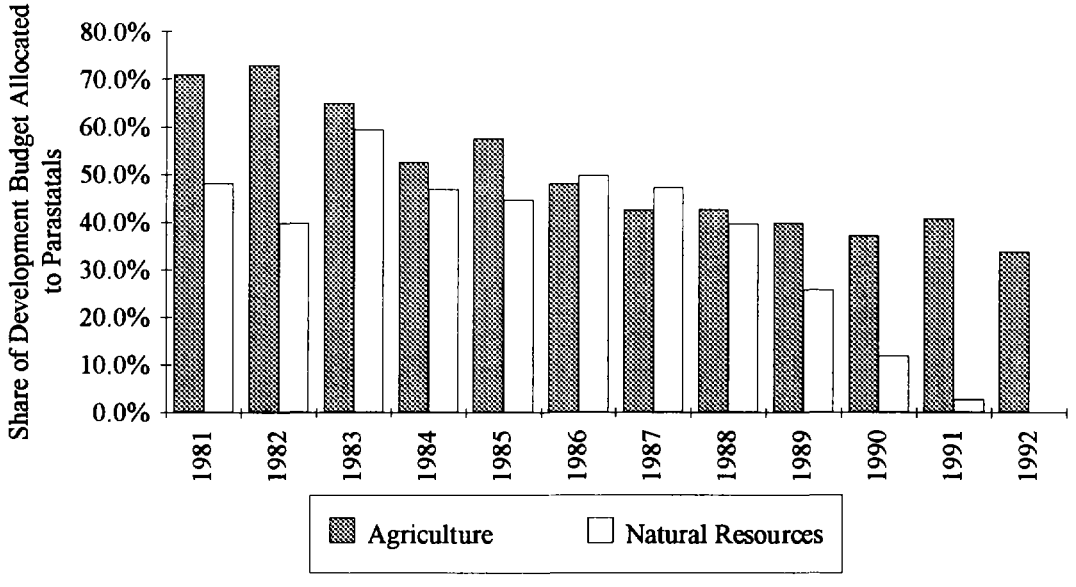
99 von Blarcom, B. Knudsen, O.; Nash, J.; "Reform of Public Expenditures for Agriculture", February 1993. p.6.

A large share of Government expenditure on agriculture has gone to support parastatals. These organizations have been notoriously inefficient.[100] About 67 of the 290 commercial parastatals were in the agriculture and natural resources sectors.[101] As Figure 3.4 below shows, they took up some 70 percent of the Ministry of Agriculture development budget in the early 1980s, and almost 50 percent of the development budget in the Natural Resources sector. This share has declined, more rapidly for those parastatals linked to natural resources, with the gradual shift away from Government control of the agricultural economy. The decline has occurred because of the inability of the parastatals to compete with a resurgent private sector. Also, Government shifted the mechanisms used to support loss-making parastatals, reducing direct budget subsidies and increasing the use of tax exemptions, non-collection of debt, and non-collection of local currency requirements for imports financed from donor aid.

Figure 3.4: Share of Agriculture and Natural Resource Development Budget Allocated to Parastatals



Source: Government of Tanzania

The Government is engaged in a gradual process of privatization and reform of the public enterprise sector designed to increase productivity, reduce their drain on Government finances, and enhance a culture of private enterprise through direct ownership. The process has been slow. "Over the six years prior to 1991, as a result of gradual erosion rather than systematic policy, about 20 private enterprise divestitures, mergers or closures had taken place, largely in agriculture."[102]

Reform of Agricultural Parastatals

Government policy regarding parastatals is provided in the Parastatal Policy Statement of January 1992. Under this policy, public enterprises would be classed as "commercial', "utility" and "social services". Privatization would be open to all in the first category, while utilities would remain public, subject to review. Social services would be reabsorbed into Government departments. A series of donor-

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100 See analysis in World Bank Report No. P-6040-TA, Memorandum of the President in Support of a Public Sector Adjustment Credit, pp 17- 26.

101 The negative effect of these inefficient public enterprises on agricultural development was an important theme in the Agriculture Sector Report of 1983, Report No. 4052-TA.

102 World Bank, Report P-6040-TA, p. 24.

funded operations focus on restructuring and improving efficiency of utilities and regulated public monopolies in railways, ports, electricity and telecommunications. The focus of the IDA supported Public Sector Adjustment Program is on moving all commercial public enterprises out of the public sector. The objective is to complete this process within 10 years. The Government's Policy Statement on Public Enterprises, made on January 1992 established the Parastatal Sector Reform Commission to coordinate the program. The Loans and Advances Realization Trust Act passed in 1991, will accelerate the disposal of enterprises with major defaults to the banking system. The Treasury Registrar Ordinance provides for public enterprise performance contracts to enhance the profitability of the public enterprises which are retained. The 1992 Public Corporations Act will be revised to strengthen the Parastatal Sector Reform Commission and improve its management oversight over retained public enterprises. In addition Government is revising the Companies Ordinance and plans to introduce capital market legislation to facilitate the privatization process. These broad measures, coupled with the fact that commercial public enterprises were all established under the Companies Ordinance, means that separate legislation on privatization will not be needed.

Within the agriculture sector, the Tanzania Fertilizer Corporation and the Agricultural and Industrial Supplies Corporation are slated to be transferred to LART for liquidation, opening up the fertilizer and inputs supply market to private sector competition. The National Milling Corporation is scheduled for rationalization and sale by tender, which finalizes the liberalization of maize marketing. Tanzania Tea Blenders, Tanzania Cordage Company (sisal), Tanzania Seed Company and Kagera Sugar are in the process of negotiating joint ventures with the private sector. Government's "Bagamoyo" and "Mbozi" farms will be transferred to an investment holding company.

Despite the ambitious plans under discussion and the significant action on the institutional side, progress on actual deals has been slow for political and technical reasons. Public debate on the issue has intensified, however, and the likelihood of significant progress will be enhanced through the preparation of an IDA-supported Structural Adjustment Credit, due for presentation to the Board during 1994/95, which contains significant conditionality on Parastatal Reform.

Institutional Development in Agriculture

Constraints. Management of the agricultural sector through the Ministry of Agriculture has been weak, for three reasons. First, the Government has attempted to do too much with declining resources. Its involvement has ranged from investing in and managing public enterprises, to controlling and running cooperatives, providing agricultural mechanization services, veterinary services, selling agricultural inputs (at subsidized prices), and providing research and extension services. The Government ought to limit itself to critical services where it has a comparative advantage, or where the private sector would have little incentive to meet demand, as is the case with research and the general agriculture extension services. Moreover, user charges could be levied for some of the critical services the Government continues to offer, to improve financing and make users more accountable.

Second, there has not been any attempt to build institutional capacity on a long-term sustainable basis. Institutional support by donors, including IDA, has been motivated by and directed at addressing short-term concerns. IDA's first Technical Assistance Project was driven by the need to implement the Export Rehabilitation Program of 1980 and to prepare a Structural Adjustment Program. The second Technical Assistance Project was prompted by the poor performance of agricultural projects and was designed to improve policy and project planning and monitoring. The technical assistance component of Agriculture Sector Adjustment program was driven by the need to support reforms in the sector. The institution building effort has been uneven, requiring last minute requests for yet more technical assistance to address emerging institutional challenges. While the technical assistance financed under Agriculture Sector Adjustment program has done a creditable job implementing sector reforms, the institutional

capacity to prepare and implement the next phase of reforms is still inadequate, and requires yet another project.

Third, institutional strengthening in policy management has been made ineffective by an institutional and policy environment which emphasized direct intervention in the agricultural economy rather than management through indirect policy measures. The staff trained in policy analysis over the last ten years have been expected to plan, control and direct the economy rather than engage in policy analysis or the liberalization of markets and the business environment.

IDA has financed two technical assistance projects in the agricultural sector (Cr. 1206-TA; and Cr. 1524-TA). Two of the lessons highlighted by the project completion reports are that (i) institution building and personnel development require long-term assistance and continuity of implementation, and (ii) the success of capacity building projects is enhanced if assistance focuses on the strategic functions of the relevant institutions. These two lessons are also highlighted in an OED study.[103]

Strategy. Much thought has been given to Government's role in supporting the development of the agricultural sector. In the "Letter of Development Policy" signed recently by the Minister of Finance, for the IDA funded "Agriculture Sector Management Project",[104] it is noted that:

> "The Government's strategic vision for institutional development of the agricultural sector calls for changes so that (i) the legal and regulatory framework promotes an enabling environment for the expansion of production, trade and investment by the private sector; (ii) Government organizations phase out, through an orderly process, functions best carried out by the private sector, after which the Government will provide only those goods and services that are public in nature and that serve as catalysts for agricultural growth, in line with national objectives; and (iii) the institutions internal incentive and resource allocation systems promote and facilitate high quality performance in these areas where the Government has a critical role to play."

The key elements of the Government's institutional development strategy are outlined below:

- Revising the legal and regulatory framework to encourage growth of private sector agricultural production, trade and investment. An example is the 1991 revision of the Cooperative Development Act. Other revisions will follow to enable effective implementation of the agenda proposed for institutional and policy reforms.

- Phasing out the provision of certain goods and services by the public sector. The Ministry of Agriculture has recently identified 48 such functions which could be taken over by the private sector, or carried out on a joint basis. In 1993/94 the Government will put in place a self-managed participatory process under which it will phase out functions which are undeniably commercial, such as seed production, the sale of veterinary drugs, tractor hire services, heifer production, and the sale of agrochemicals. This process will continue over the next five years.

- Divesting the Government of agricultural parastatals with commercial potential, or whose activities are no longer justified. MOA has prepared a list of candidates for divestiture or

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103 World Bank, Operations Evaluation Department, "Free-standing Technical Assistance for Institutional Development in Sub-Saharan Africa", 1990.

104 World Bank, Report No. P-6047-TA, Agriculture Sector Management Project, June 15, 1993, due to go to the Board on July 20, 1993.

closure and is working closely with the Presidential Parastatal Sector Reform Commission by supporting preparation up to the point of sale. Sales will be managed by the Commission.

- Strengthening the rolling plan and forward budgeting process, to reallocate MOA human and financial resources according to the need to strengthen core Government functions. Existing projects and donor aid programs would be realigned to the new priorities.

- Strengthening the policy formulation and planning activities of the MOA. To support this function, the accuracy and periodicity of the basic agricultural statistics should be enhanced and periodic information on metereological phenomena, and the use of natural resources, especially surface water, should be improved.

- Improving the collection and dissemination of price and volume information from crop and livestock markets around the country, and from international markets.

To support this process of institutional strengthening, IDA is funding an Agricultural Sector Management project (Credit 2537 TA) which started implementation in the second half of 1993. Care will be taken to study and support an orderly transition as important agricultural support services are transferred from the public to the private sector.

Agricultural Research

Crop and livestock research has been undertaken in Tanzania since the turn of the century, improving agricultural productivity and promoting diversification. Following the Arusha Declaration in 1967, the research establishment was reorganized into four parastatals: the Tanzania Agricultural Research Organization for crops, the Tanzania Livestock Research Organization, for livestock, the Tanzania Pesticides Research Institute, and the Uyole Agricultural Center for agriculture in the Southern Highlands. Agricultural research is also carried out by the universities, private estates and agricultural parastatals. In 1989 the agricultural research establishment was reorganized into its present structure, with the parastatals managing agricultural and livestock research brought into the Ministry of Agriculture, as the Department of Research and Training.

The Returns to Research. Agricultural research plays a vital role in supporting agricultural growth. For resource-poor smallholder farmers, technological change embodied in improved chemical inputs, in more effective husbandry techniques, or in inexpensive, higher-yielding disease-resistant planting materials, can provide one of the few means of raising incomes and output. In the export industries, where international competitiveness is determined by farmlevel efficiency, research results that increase profitability by raising yields, reducing inputs costs, increasing disease resistance, or improving crop quality, are of fundamental importance. Research will also be essential to support the profitable development of non-traditional agricultural exports.

There have been a series of recent studies, however, which explore the effect of expenditure on agricultural research (and extension) on agricultural production and productivity change. All of these studies show a strong positive relationship between expenditure on agricultural research, and productivity change, implying high rates of return. A recent study indicates a positive marginal rate of return of over 45 percent to investments in public agricultural research in the USA (1950-1982). The return to privately-funded agricultural research is also positive. The study disaggregates investments into pre-technology research, and applied research, showing that the returns to the former are much higher than the latter. The

interactions between research and extension are not always complementary.[105] Further work on the sources of total factor productivity growth in India, Bangladesh and Pakistan demonstrated that public sector expenditure on research and extension have significant and positive effects on productivity change. For India, it has been estimated that over 30 percent of total factor productivity growth in crop agriculture between 1956 and 1985 was due to public expenditure on agricultural research. Another 25 percent of the increase in total factor productivity was due to the publicly financed extension effort. Marginal internal rates of return to investments in agricultural research in these three countries are estimated to be high, above 50 percent. [106] A study on Africa in 1986 showed that the positive effect of expenditure on national agricultural research programs on the productivity of several commodities (wheat, rice, maize, sugar, potatoes, sweet potatoes and groundnuts) was larger and more consistent for Eastern and Southern Africa than for Western Africa, although below the effects identified in a separate study on 24 developing countries.[107]

Current Status. The agricultural research system in Tanzania includes more than 50 research institutes, stations and substations, staffed by 350 graduate level researchers, 550 diplomate level technicians, and 760 certificate level assistants. The network is divided into seven zones, defined by agro-ecological criteria, each with a lead station and substation. A few institutes have a national mandate, such as Mlingano (soils), Temeke (animal disease) and Tanga (tsetse).

At the time of the 1989 reorganization, a large project was approved to assist the Ministry in the restructuring process. The project is valued at $ 25.3 million over 6 years, with funding from a wide range of donors including IDA (Cr-1970-TA), the African Development Fund, Germany, and the Netherlands. Restructuring the National Agricultural Research System has taken much longer than envisaged. The initiation of the rehabilitation works, and the adjustments in structure and function were contingent on two studies: the National Research Masterplan to set forth national priorities for agricultural and livestock research, and the Report on Organization and Management, which recommends on organizational structure and management systems for the Department of Research and Training. These reports were not finalized until mid-1991, and late 1992, respectively. The rehabilitation of physical facilities, and the re-definition of salaries and operating procedures had been postponed, pending the guidance provided by the reports. As a result, research activities have languished and staff morale has fallen.

Constraints. The research system has faced severe constraints in the past ten years. Some of the main ones include:

- Programs were fragmented and lacked coordination. This was exacerbated by the independence of the different parastatals involved in research prior to 1989. The consolidation of agricultural research under one department should diminish this problem and enable a more efficient and directed use of extremely scarce human and financial resources. Difficulties of communication across the country will continue to pose a problem for the smooth interaction of the various programs.

- Inadequate funding has plagued the system. A review of recent recurrent budget requests shows that actual allocations in the three years since 1990/91 were 80 percent, 72 percent

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105 Huffman, W.E. and Evenson R.E., "Contributions of Public and Private Science and Technology to U.S. Agricultural Productivity", AJAE, Vol 74, No. 3, August 1992, p.751.

106 Rosegrant, M.W. and Evenson, R.E., "Agriculture Productivity and Sources of Growth in South Asia", AJAE, Vol 74, No. 3, p.757.

107 Evenson, R.E., "Agricultural Research and Extension in Eastern and Southern Africa. Comparisons with West Africa and Other Developing Countries". December 1986. A consultant paper prepared for a Workshop on Eastern and Southern Africa, Nairobi, Kenya, December 11-16, 1986, page iii.

and 64 percent of requested amounts. Funding out of the recurrent budget for agricultural research has risen by 12 percent between 1990/91 and 1992/93, from Tsh 418 to Tsh 467 million. With inflation at about 20 percent per annum over the same period, the result is a reduction of about 30 percent in the real value of the goods and services that can be purchased. Salaries for researchers have declined in real terms, as have those of the remainder of the civil service, forcing research staff into the job market to find sufficient money to survive. This has serious negative effects on the time a researcher can devote to his Government job, and severely reduces the quality and quantity of research results. Indeed, it is surprising the research system continues to function at all given the constraints its staff are under. Under the 1992/93 budget, allocations for agricultural research total Tsh 467 million from the Recurrent Budget, and Tsh 1,181 million from the Development Budget, including donor contributions. This amounts to 0.3 percent of estimated agricultural GDP, which is low by international standards. Semi-industrialized and industrialized countries spend between 1 and 1.5 percent of agriculture GDP on agricultural research and extension.[108]

- Lack of research priorities has constrained the ability of policymakers to focus on the direction and effect of research. In the past, a limited budget has been spread thinly over a wide variety of research programs. Donors have contributed to programs of particular interest, with little regard for national priorities. The Masterplan should correct this. The consolidation of funding into a central research fund, from which high priority programs will be financed, will enable enforcement of priorities and evaluation of results against expenditure. Members of the Special Program for African Agricultural Research have agreed that all agricultural research funding will be channeled through a central mechanism.

- The interaction between the research establishment, the extension service, and the farmers has been poor. To improve it, research stations have started to put farming systems research programs in place, and to run trials on farmers' fields. The relationship with the extension service remains personalized, sparse and ad hoc, confined to bi-annual field days and the odd conference on research results.

- Fragmentation of the research service, deteriorated infrastructure and inadequate levels of funding and work incentives have made the environment for managers of the research system intolerable. The design of an improved management system has at last been completed. Funds are available for undertaking the rehabilitation of the buildings and equipment, and for covering operating costs. The missing link is agreement on a new Scheme of Service for research personnel.

Strategy. Following the mid-term review of the research project held in April 1993, the stage is set for the research system to move forwards. With the Masterplan and the Organization and Management Report reviewed and agreed to, backing has been obtained for the consolidation of buildings, as well as the reallocation of sufficient staff to respond efficiently to national priorities. Some $ 19 million in donor money remain available under the National Agriculture and Livestock Research Project to support these changes.

The Masterplan provides (i) priorities for the research program, (ii) guidelines for improved financial operations, (iii) a plan for the rationalization of the research network and the rehabilitation of

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108 Schwartz, Lisa A., and Kampen, Jacob, "Agricultural Extension in East Africa", World Bank Technical Paper No. 164, p.12.

physical infrastructure, (iv) a proposal for changes in the organizational structure, to complete the restructuring initiated in 1989, and (v) a proposal for improving the conditions of service for research personnel, linking human resource development to the revised program. Top priority in crop research will be given to the stations working in key export crops: coffee, cotton, rice and tea, where plant and equipment will be fully rehabilitated, and the staffing complement reinforced. Second priority will be accorded to research in roots and tubers, Phaseolus beans, grain legumes, oil seeds, maize and vegetables — the country's main food crops — and areas where productivity enhancement will have important nutritional and poverty alleviation consequences. Third priority for Government funding includes a series of crops which support agro-industrial ventures and from which private sector finance to support research should be forthcoming. These crops are sugarcane, cashew, coconut, millet, pyrethrum, sorghum, sisal, tobacco, wheat and barley. Based on these priorities, research stations and substations will be rehabilitated, shifted to new uses, or closed down.

In livestock top research priority is given to increasing productivity in ruminant meat and milk production, for stations at Mpwapwa, Kongwa and Tanga. Programs include research in livestock nutrition, use of residues and crop byproducts, forage crops and pasture improvement, low-cost mineral supplements, strategies for low cost preventive veterinary care, and identification of breeds most suited to the local fodder and disease environment. Top priority is also given to research into animal diseases, to be conducted at Temeke (the Animal Diseases Research Institute) and trypanosomiasis research in Tanga.

Special programs in soil and water management, the National Soils Service Project and research into agroforestry are given top priority as well. All will be funded from the centralized financing facility. A farming systems research unit has been established, to bring the results of the various research programs together at the farmers level. This unit plays a key role in **interacting with the extension services** and making the research system more responsive to farmer needs. A lack of funding and facilities has severely constrained its effectiveness.

The Organization and Management report provided guidance on the organizational structure of DRT, the management of research programs, and the improvement of the accounting, management information and procurement systems. Further attention to the Scheme of Service for research personnel is still necessary. The physical environment, while important and conducive to agricultural research, is insufficient to motivate research staff. If quality results are to be obtained from the system, researchers have to be able to devote their working life to their intellectual endeavors, without having to worry about where their next meal is coming from. Government has to approve a scheme of service that provides competitive salaries and allowances for satisfactory work. Such a scheme should define a career track and professional goals so that competent researchers will be retained within the system. It will be necessary to give special status to the Department of Research and Training to pursue this objective.

Agricultural Extension

Current Status. Agricultural extension is one of the key functions of the Ministry of Agriculture, using 7,500 of its 9,400 staff. One out of every two of the 8,800 villages in the country has a Village Extension Worker resident. Extension efforts, including livestock-related activities, absorbed some 42 percent of the MOA budget in 1992 and 1993, up from 30 percent in 1991. Disseminating improved technology and assisting subsistence farmers with more commercial farming practices has always been one of the Ministry of Agriculture's roles. However, in 1972, this function was decentralized to Regional and District Government, leaving the Ministry in a policy making, regulatory role. In 1983, the extension function was centralized in the Ministry of Agriculture again. Presently 89 percent of the funding for Government agricultural services is provided through the central Ministry.

Since 1988 the extension service in select regions has been supported by the National Agriculture and Livestock Extension Rehabilitation Project, funded by IDA credit No. 1994-TA and other donors. By 1993 this project had established the Training and Visit extension methodology in 13 of the 20 regions.[109] Some 4,400 Village Extension Workers had been trained in the new methods. The ratio of frontline extension workers to farmers in these regions is about 1 to 450. The project appears to have made much progress resolving the problems of inadequate resources, low staff motivation, inadequate technical expertise, and poor supervision, monitoring and evaluation, that hampered the extension system. This project, coupled with the 1980s' liberalization of the food market, have contributed to high growth rates in the agricultural sector for the past 6 years.

The Mid-Term Review. The Mid-Term review carried out in early 1992 noted a series of strengths and weaknesses in the present system. A major achievement of the project has been the unification of the crop and livestock extension efforts to a single, broad-based Village Extension Worker. This has increased cost effectiveness and improved the extension agent's ability to respond to all of a farmer's concerns. However, there are still some problems with the existing management structure. There is concern that the effectiveness of the general extension service is diminished by the inability of the more specialized departments to respond to requests for technical advice in specialized areas such as irrigated agriculture, veterinary services, mechanized agriculture and plant protection. Many of these departments are underfunded and unable to react to such requests. Also, a response from the specialized areas can only be elicited by having the regional agriculture officer contact the head of the Agriculture and Livestock Development Department. The solution hinges on the creation of a direct line of command for the extension service, from the Director of Extension Services down to the Village Extension Worker, paralleling the current structure. [110]

There is a wide disparity in Village Extension Worker abilities. The unification of the extension service has meant that many village level extension agents, originally trained in only in livestock or crop development techniques, have had to broaden their skills and understanding. Some of the extension workers, who total up to 50 percent of the agents in some districts, have proven untrainable. It is recommended that such personnel be laid off, and new persons brought in who could be trained in the more broad-based approach.

Management supervision has been lax, with the field personnel seeing little feedback, or action, from the visits of their supervisors. A tightening-up of the feedback and responsiveness of supervisors to field agents' concerns should be instituted. There is also a need to strengthen the supervision of the extension activities. A survey conducted in preparation for the Mid-Term Review noted that, across seven regions, only 50 percent of contact farmers were aware of the visitation schedule of their extension agent. This ration was as low as 22 percent in Lindi and 6 percent in Mara. On average extension agents were reaching 34 contact farmers in their two week visitation cycle. The ability of contact farmers to influence non-contact farms was quite limited, averaging 3.1 farms per contact farmer. Adoption rates were between 32 and 64 percent across the seven regions surveyed for the simple technologies put forward by the extension system: improved seed, better spacing, early planting, better weeding. More sophisticated techniques requiring cash outlays for fertilizer or pesticides had lower adoption rates, due to shortages of both cash and product.

The linkage between research and extension has been weak. Coordination of research and extension activities has been left to the regional extension officer, and has been ineffectual, with researchers

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109 Four of the regions not covered by this project are included in the IFAD Southern Highlands project, which funds an extension system using the same methodology.

110 URT, MOA, "The National Agricultural and Livestock Extension Rehabilitation Project - Mid-Term Review", February 1993, pp 19-22.

and extension agents visiting farms at different times. Research participation in the training sessions for extension agents has been sporadic. Extension staff , however, have assisted in the supervision of on-farm trials which is probably the best example of institutional cooperation. Extension participation in farming system surveys has been limited to organizing and interviewing groups to answer questionnaires which are then analyzed by researchers in isolation.

There is a paucity of women at the higher levels of the extension service. It is recommended that technologies which relieve the labor constraints faced by rural women be identified and included in the standard training.

Strategy. The returns to agricultural extension are high, and the returns to the use of the Training and Visit method appear to be even higher. [111] The use of the improved extension methodology seems to result in substantial increases in effectiveness. The country would be well advised to:

- consolidate the training and visit system, with its intensive use of staff and vehicles, in those areas of best potential, and highest returns;

- make decisive efforts to link extension more effectively to the research effort, so that agents can be kept up to date with improved technologies. This will be achieved by including the zonal research coordinators in the meetings of the regional and district agriculture officers. The zonal Farming Systems Coordinators would provide the research input into the annual work plans of extension. Where possible, MOA should institute temporary swaps in personnel and encourage research participation in the training of extension agents and farm level demonstrations. Regional extension subject matter specialists and crop and livestock extension officers should participate in zonal technical committee meetings and National Commodity and Farming Systems Research meetings.

- increase the level of funding in real terms to guarantee staff access to perdiems, vehicles and materials; target a funding level for agricultural research and extension of 1.5 percent of agricultural GDP.

- conduct a critical review of the commitment, technical capabilities and retraining potential of the existing Village Extension Workers, replacing those unable to be effective in a unified, crop and livestock extension system.

B. Farmer Cooperatives

Current Status. There were 8,465 cooperatives registered as of 1991. Of these, 5,616 were rural primary cooperatives, and 27 were cooperative unions involved in agricultural processing and marketing. Cooperatives play a central role in the marketing and processing of export crops. This is particularly true for coffee and cotton, as well as for tobacco and cashew nuts. Cooperatives have also been involved in the marketing of major food crops, although activities here have declined with the revival of the private sector.

There are five coffee curing plants in Tanzania with a total capacity of 137,500 metric tons. Of these, two (Bukoba and Mara) are each owned by a cooperative union. They are reported to have a capacity utilization of about 90 percent. The plant in Moshi is owned jointly by the unions in the Northern zone and the Tanganyika Coffee Growers Association and is reported to have reached the level of 38.5 percent. The remaining two plants in the Southern part of the country are owned by the Coffee Marketing

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111 Bindlish, V. and Evenson, R., "Evaluation of the Performance of T and V Extension in Kenya." Agriculture and Rural Development Series No. 7, March 1993, pp A13-1 to A13-3.

Board. The latter two have a joint capacity of 62.5 metric tons and report a utilization rate of 24.5 and 32 percent respectively.

There are 34 cotton ginneries in Tanzania with a total of 814 gins. Most (23 ginneries with 689 gins) are in the western cotton growing area. Most of the ginneries are old and in poor condition. The total installed ginning capacity is estimated to be 674,245 bales, while the "effective capacity" is fixed at 375,000 bales. The overall capacity utilization rate was estimated to have been 56.3 percent of the effective capacity during the 1990/91 season, although the Nyanza Cooperative Union reported that all except their oldest ginnery have reached capacity utilization rates between 60 and 80 percent.

History. To understand the current predicament, it is useful to review the history of the cooperative movement in Tanzania. In 1925 a group of smallholder coffee farmers in the Kilimanjaro region formed an association called the Kilimanjaro Native Planters' Association. The objectives of the association were to protect and promote the interests of the native coffee growers as well as to improve quality and guard against pests and diseases. Cooperative legislation was introduced in 1932 when the first Cooperative Ordinance was enacted. This was soon followed by the registration of the first cooperative union, the Kilimanjaro Native Cooperative Union (1933), which is still in existence. With the introduction of cooperative legislation, cooperatives spread fast to other regions, especially those with cash crop production. In 1952 there were 172 registered societies. In 1961 their number had reached 857. The expansion of the cooperative movement outside the major cash crop growing areas was much slower, however. In those areas small farmers still lived in a subsistence economy and the volume of marketed crops was limited.

Cooperatives during this period were owned and controlled by the members on a democratic basis. By the early 1960s they had seriously challenged the proprietary firms and the results for the farmers were good.[112] They had de facto reached a near monopoly position alongside the export marketing boards. The 1960s were a period of rapid expansion for the cooperative movement. By 1976 the movement consisted of about 1,400 primary cooperative societies and 21 cooperative unions. After the 1967 Arusha declaration, however, the cooperatives were perceived as vehicles for enacting socialist policies. This led to increasing political pressure to form economically nonviable cooperative societies. One major outcome was the liquidation of the relatively successful Cooperative Bank without compensation to the members. The Cooperative Act of 1968, although liberal compared to what was yet to come, provided a legal basis for this interference.

Political interference in the affairs of the cooperative movement reached its peak in 1976, when cooperative unions and the agricultural marketing societies were dissolved. The over 8,000 registered villages were declared agricultural producers' cooperatives. The agriculture-related functions and assets of the unions were handed over to parastatal crop authorities, which were to collect the crops from the villages. This policy was a logical outcome of the villagization policy initiated after the Arusha Declaration. The legal framework was provided by the 1975 Village Act. The villages were considered multipurpose cooperative societies, with major emphasis laid on collective production. Previously marketing had been the main function of primary societies. The restructuring had a disastrous impact on the movement. Villages in most cases were too small to support economically viable societies. At the same time, it was impossible to recruit sufficient managers of these new entities. The marketing boards, who had inherited the assets of the old cooperative system, were unable to manage the marketing and processing operations efficiently.

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112 Agricultural Cooperative Development International: Review of Cooperative Development in Tanzania as it Relates to Agriculture; 1982; a study commissioned by USAID.

By 1980 the problems related to the new set-up had become so alarming that the Government decided to re-establish the cooperative movement it had dissolved only four years earlier. The legal basis for this was the Cooperative Act of 1982. This act retained some of the features of the Village Act, including the principle of automatic membership. The act did not mention the need for share capital for the primary cooperative societies or unions, which had serious consequences for the financial viability of the cooperatives, and for member loyalty. The Party became politically involved in the re-establishment of the cooperative movement, screening office holders, and removing all semblance of independence from the movement. The major features were:

- The primary societies were to be based on the area of only one village, irrespective of size or market considerations.
- Economic feasibility was scrapped as a criterion for registration.
- The cooperatives were not primarily considered business enterprises, instead as vehicles for implementing socialist policies and introducing "scientific" agricultural methods.
- The primary societies were to be multipurpose, production-based organizations in contrast to the traditional marketing-based service cooperatives.

This policy also led to chaos. Primary societies and unions were hastily formed, without regard for economic viability or managerial capacity. Crop marketing and processing systems lapsed into disrepair. Large debts were incurred with the banking system. It was soon realized that fundamental changes were again required. Parallel to the developments in the cooperative sector, important changes were taking place in the general economic environment. This led to the Cooperative Act of 1991, which provides for the formation of an independent, member-controlled, cooperative movement based on international cooperative principles. The process of restructuring the movement is now underway.

Cooperative Unions

Many of the cooperative unions face severe financial difficulties. Management, as well as physical and financial controls are poor. In addition the unions faced the following external pressures:

- The disruption caused by the expropriation of assets in 1976. Operational capacity was reduced and costs rose as a result.
- In the hasty reconstitution of the unions in 1984, unqualified personnel were put into management, and primary society commitment to improving their union was minimal.
- Until recently, farmgate prices for export crops and most food crops were set independently by the Government, causing financial losses to the unions, if set too high.
- Agricultural inputs were forced on the unions by Boards and other entities at inopportune times, causing losses and discontent among members.
- Delays in payment for export sales by the marketing boards lengthened the time the crops were financed by the unions, increasing financing costs.

The financial situation in the unions as of June 30, 1992 is shown below:

Table 3.1: Debt Position of Cooperative System, June 30, 1992[113]

UNION	CRDB DEBT (Tsh millions)	NBC DEBT (Tsh millions)	TOTAL (Tsh millions)
ACU		1.140,16	1.140,16
BCU	15,21	620,05	635,26
BUHA	311,00	289,31	600,31*
CRCU	52,27	1.085,32	1.137,59
CORECU	39,16	968,20	1.007,36
DARMCO	5,08	605,88	610,96
IMUCU	856,56	371,07	1.227,93
KCU	9,89	2.103,22	2.113,11
KDCU		1.296,97	1.296,97
KNCU	2.923,92		2.923,92
KYERUCU	58,76	792,97	851,73*
LIRECU	-0,97	734,58	733,61
MACU	28,05	4.654,87	4.682,92
MARCU	29,45	812,34	841,79
MBECU	445,05	3.123,44	3.568,49
MBICU		1.546,46	1,546,46
MORECU	1.834,18	361,65	2.195,83
NJOLUMA	758,40	669,73	1.428,13
NCU	215,84	9.167,94	9.383,78
RCU	654,79	2.297,37	2.952,16
RIVACU	130,17	627,80	757,97
RURECU	311,61	982,33	1.293,94*
SIRECU	2.206,21	0,00	2.206,21
SHIRECU	60,41	8.721,00	8.781,41*
TARECU/tb	1.021,76	2.323,68	3.345,44*
TARECU/tg	1.067,16	187,17	1.254,33
VCU	0,06	320,55	320,61
TOTAL	13.034,32	45.807,04	58.841,36

Source: MOA, Cooperative Dpt.

Individually, and in an aggregate sense, the cooperative unions are insolvent. However, the situation is not as gloomy as these figures would imply. Some of the unions could be viable commercial concerns. Prior to 1991/92, seven of the largest of the 27 unions were still solvent, in spite of all the obstacles. It was Government pricing policy for coffee in the 1991/92 season, and thereafter, which broke the back of even the strongest unions. The effect of Government pricing policies on union viability will be investigated in the discussion of cotton and coffee. The loans outstanding to the cooperative system form a substantial portion of the bad loans in the agricultural sector held by the National Bank of Commerce and the Cooperative and Rural Development Bank. Some of these loans have been declared irrecoverable, and these, with attached assets, have been transferred to the Loans and Advances Realization Trust (LART) for appropriate legal action.

The financial position of many unions would look substantially better, if: (i) assets were revalued to market value; (ii) compensation were received for assets expropriated in 1976; (iii) claims on primary societies were carried as assets, and repayment followed through; and (iv) the very inadequate capital contributions from member societies were increased. The restructuring of the cooperative system must progress further, and the commercial viability of the unions must be established before this can occur. Only three of the 13 unions active in Northern, Central and Eastern Tanzania showed a profit in 1990/91. The situation was the same for a few years prior as well.

The Cooperative Act. The present Cooperative Act was passed in 1991. It differs from the previous Act, in that it recognizes cooperatives as private institutions established and managed by the members. It also explicitly decrees that the cooperative movement in Tanzania is based on the international cooperative principles adopted by the International Cooperatives Alliance. The Act does not lay out a

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113 Those unions whose totals have an asterisk (*) have been transferred to LART for liquidation.

prescribed cooperative structure, which is left to the members to determine. Another important difference from the previous Act is the possibility of forming single purpose societies at different levels. Economic viability is explicitly mentioned as a condition for registration. Much of the Act, however, still concerns the powers of the registrar to supervise and guide the movement. Whereas the Cooperative Societies Rules (section 24) implies that the role of the registrar should gradually decrease as the duties of promoting, advising, educating and training the movement are delegated to the movement itself, issues like inspection and audit are not slated for delegation.

One of the most fundamental differences between the two Acts is found in the preambles, where the reference to the use of cooperative societies "as instruments for the policy of socialism and self-reliance" has been removed. The other three important differences are share capital, economic viability as a criteria for registration, and the geographical area of operation for a primary societies.

In contrast to the 1982 version, the 1991 Cooperatives Act treats the share capital as a normal feature of business for a cooperative enterprise. Members are not in a position to exercise their rights until they have made payments in respect to shares, entry fees and any other dues prescribed in the rules or by-laws of the society. On the other hand, the new Act does not go so far as explicitly stating that payment of share capital is a condition for registration. Again, in contrast to the 1982 Act, the present law clearly states that the society must appear commercially viable to be registered. A feasibility study has to be submitted with the application for registration. Under the 1982 Act, with its policy of implementing socialism, the norm was for one society for each village to be established regardless of the economic consequences. Establishment under the new Act is based on purely economic criteria and members' choice, and consequently the area of operation is not defined in terms of administrative boundaries. Another key difference between the two Acts is the definition of the cooperative society; the new Act endorses the voluntary nature of association. This is a fundamental change in philosophy and will permit the re-initiation of a genuine cooperative movement.

> The unions are obliged by the 1991 Act to procure, process and sell all the products of their members. However, members of a primary society are not obligated to sell all their produce through their society. The by-laws of an individual society may or may not oblige the member to do this. The new Act represents a big step forwards, however, certain modifications would improve the viability and independence of the movement, as noted in para. --, below.

Strategy for Consolidation of the Cooperative System. Under to the policy of "one village-one society," far too many primary societies have been registered. They all face problems of limited markets, inexperienced management, limited capital and unenlightened membership. Following the passage of the 1991 Cooperative Act, a process of review and restructuring was initiated by the Cooperative Department in the Ministry of Agriculture. The review began at the bottom, primary society level. This process is as follows:

- preparation of financial statements, and statements of affairs, undertaken by the Cooperative Audit Services Corporation and two consulting firms. This process has been completed for the Unions.

- meetings with the members of the societies to explain the 1991 Act, describe the financial situation, and outline potential future courses of action for the society.

- determination of economic viability; this is undertaken by Cooperative Department personnel and the officials of the society.

- discussion and agreement with society members on the course of action: either continuation, if the society is potentially viable, or amalgamation or liquidation, if not.

Once agreement has been reached, the Cooperative Department proceeds with the legal aspects of registration, and amalgamation or liquidation. After a preliminary rationalization exercise, about 1,860 viable, primary societies remained in December 1993, many of them amalgamated out of the original 4,900 active societies. Once the primary societies have been restructured, the focus will shift to the 27 cooperative unions. The primary societies will have to decide if they want to continue to support a union for processing, marketing, finance, inputs or other services, or if they would prefer to deal directly with the private sector.

Cooperatives are the only commercial organizations with a national network at the grass-root level. Their members are small scale farmers, responsible for most of the agricultural production, who have very little bargaining power in their commercial relations with suppliers and buyers. Primary societies bring economies of scale to buyers who do not have to deal separately with each individual farmer. Cooperatives can and should be given the opportunity to revitalize their activities so they may play a needed role in rural development. Institutions which can compete effectively with other private sector ventures, free from political interference and detrimental Government policies should be established. During the transition period, additional assistance to the cooperative sector should be provided where necessary, to ensure continuity in vital industries. However assistance should only be provided to those cooperatives with prospects for economic viability in a competitive, market based agricultural economy.

A strategy to restructure the cooperative system should include the following measures:

- The 1991 Cooperatives Act provides a reasonable framework for restructuring the rural cooperative system on an independent, voluntary, economically viable basis. The restructuring and consolidation of the primary societies into democratically-run, economically-viable rural institutions has already begun. This process should be continued throughout the hierarchy, with the members at each level determining the characteristics of the next highest group.

- The Cooperative Act of 1991, or to its rules and regulations, need certain modifications to: (i) state clearly that primary societies and their members are free to buy or sell produce on the open market, contingent on clearing their debts with other members of the movement; and (ii) clarify that the regulatory and control functions of the Registrar will diminish as the cooperative system develops its own internal review capacity.

- A Promotional Paper on Rural Cooperative Movement Rehabilitation should be prepared to state the objectives of the Cooperative Act of 1991 and describe the strategy to be followed by the Cooperative Department of MOA, the banking system and other entities to restructure, consolidate and democratize the rural cooperative system. This policy statement should also describe the process set out in Section 24 of the Cooperative Societies Rules, which stipulates that the Registrar shall gradually delegate his duties of promoting, advising, educating, and training to the cooperative movement, after the movement has fulfilled ten criteria designed to ensure it has the necessary technical and financial capacity.

- In the process of restructuring primary societies and unions, the Registrar should include measures to:

- drastically cut union operating costs by reducing staffing and administrative expenses;
- streamline operations by reducing the number of activities and concentrating on those directly relating to their main business;
- introduce proper accounting, financial control and budgetary follow-up;
- introduce genuine member control, which itself should result in increased financial accountability by management. Committees should also understand that the unions are in the final analysis private business enterprises responsible to their members ("shareholders").

- The Cooperative Department of the Ministry of Agriculture should be strengthened so that it can take the lead in the process of consolidation and democratization of the cooperative movement. To improve coordination and control during the three year transition period, it is recommended that the relevant regional and district level staff be transferred to the Department. Given the smaller number of societies envisioned after consolidation, and given the extreme financial difficulties faced by the Treasury, it is recommended that two-thirds of Department staff be relocated or retrenched, with promotional staff returning to the regional administrations. The savings in salaries and allowances would provide funds for the remaining 500 professionals, mainly auditors, to complete the restructuring exercise efficiently. Similar steps should be taken with the Cooperatives Audit Services Corporation.

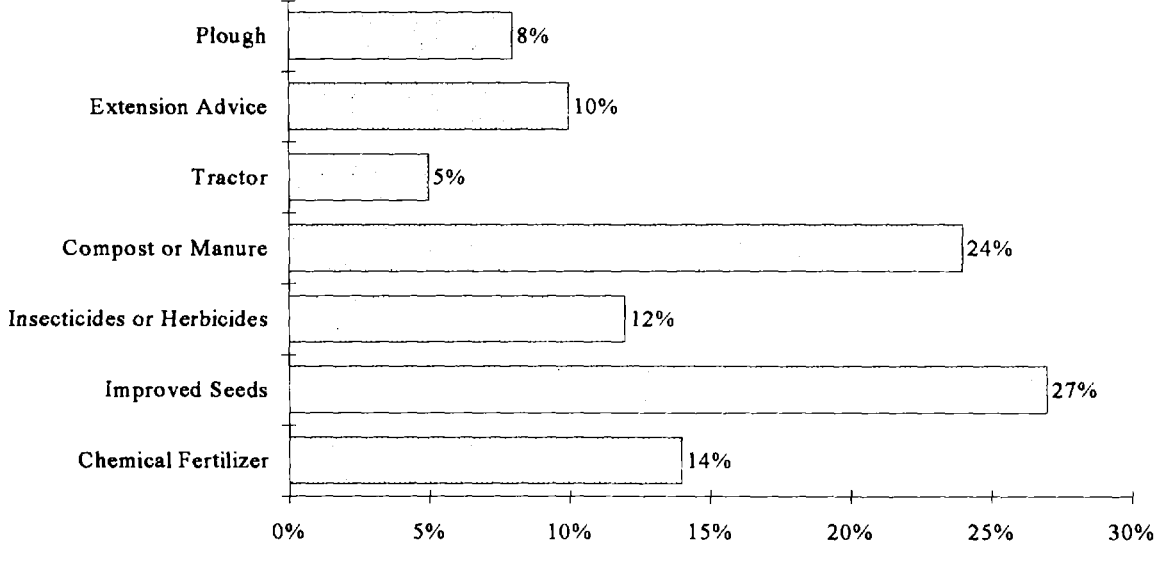
- Following completion of the consolidation and restructuring exercise, the Department should be transformed into a much smaller Office of the Registrar, which would be in line with the 1991 Act.

C. Supply of Agricultural Inputs

The ADIS survey of six farming systems across the country concluded that "improving supplies of inputs to farmers in areas of high or moderate natural potential is the single most important measure that can be taken in the short term to stimulate agriculture in Tanzania."[114] In three out of the six regions surveyed, a plurality of the farmers interviewed indicated that the first priority for Government action in support of agricultural growth should be to improve the timeliness of supply. This was distinguished from price, an important but lesser concern. **Timely availability of the appropriate input is more important to the farmer than price**. In the survey of constraints to production in the food and cash crops subsectors, a plurality of farmers in three of the six farming systems (overlap of two) indicated that **inputs supply and price was the most important impediment to increased output**. In all cases, farmers in the maize and coffee system in the Southern Highlands (Mbozi) had a plurality indicating inputs supply as the key constraint. Farmers in the maize, rice, tobacco system on the Western Plateau (Tabora) also had a plurality who chose the supply of inputs as the greatest constraint. The third system where inputs supply was identified as a key problem by a plurality of farmers, not surprisingly, was in the coffee, banana system in the Northern Highlands (Hai). Whereas a plurality of farmers in the cassava, cashew and coconut system on the Southern Coast (Newala) had identified lack of finance (for sulfur dust probably) as the key production constraint, when it came to priorities for Government action they chose interventions to improve the supply of inputs. For Government action, the farmers in the Northern Highlands chose to credit.

Data from the 1986/87 Agricultural Sample Survey of Tanzania indicate that about 14 percent of farmers in Tanzania used chemical fertilizers; 27 percent used improved seeds,[115] 12 percent insecticides or herbicides, and 24 percent farmyard manure. In comparison with Uganda and Ethiopia, the use of inputs to is fairly widespread. Levels of intensification lag behind those in Kenya, however.

Figure 3.5: Share of All Households Owning and Operating Farms Using Indicated Input (1986/87)



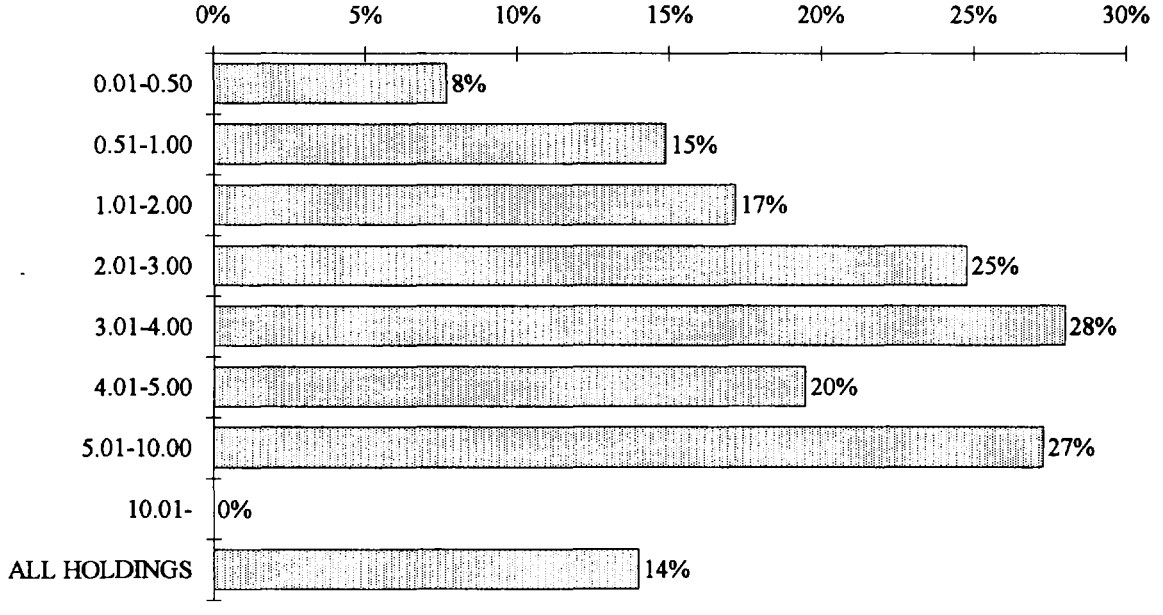
114 ADIS, op.cit., Volume I, p.69.

115 Not certified seeds.

Chemical Fertilizers

Chemical fertilizer use varies by income levels. Forty percent of farmers above the poverty line used fertilizer, against 30 percent of those below the poverty line. Fertilizer adoption rates also differed by the size of the holding, as shown below, with the higher adoption rates occurring among the larger farmers.

Figure 3.6: Fertilizer Use Among Farm Operators, by Farm Size



Source: Bureau of Statistics

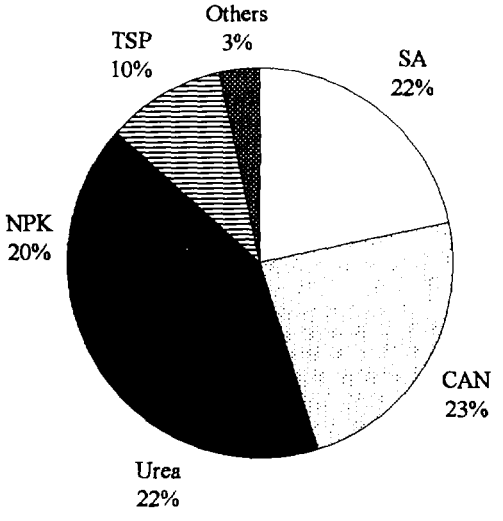
It should be noted however, that the distribution of all farmers who use fertilizer is heavily weighted towards the smaller holdings. Of all farmers who report using fertilizer, 74 percent had farms of up to 2 ha.

Preliminary indications from the data used in the Poverty Profile indicate that input use levels average about 21 Kg per ha of fertilizer, well below the optimum level determined by research, but not necessarily so far from optimum in the very constrained smallholder context. The level of fertilizer use varies slightly by literacy level. Farmers who can read and write use slightly over the mean amount (23.2 Kg/ha) and farmers who cannot read or write, use slightly less (18.8 Kg/ha).[116]

The main fertilizers used are Sulfate of Ammonia (SA), Calcium Ammonium Nitrate (CAN), Urea and different formulations of NPK, and Triple Superphosphate (TSP). The figure below gives market share for 1991.

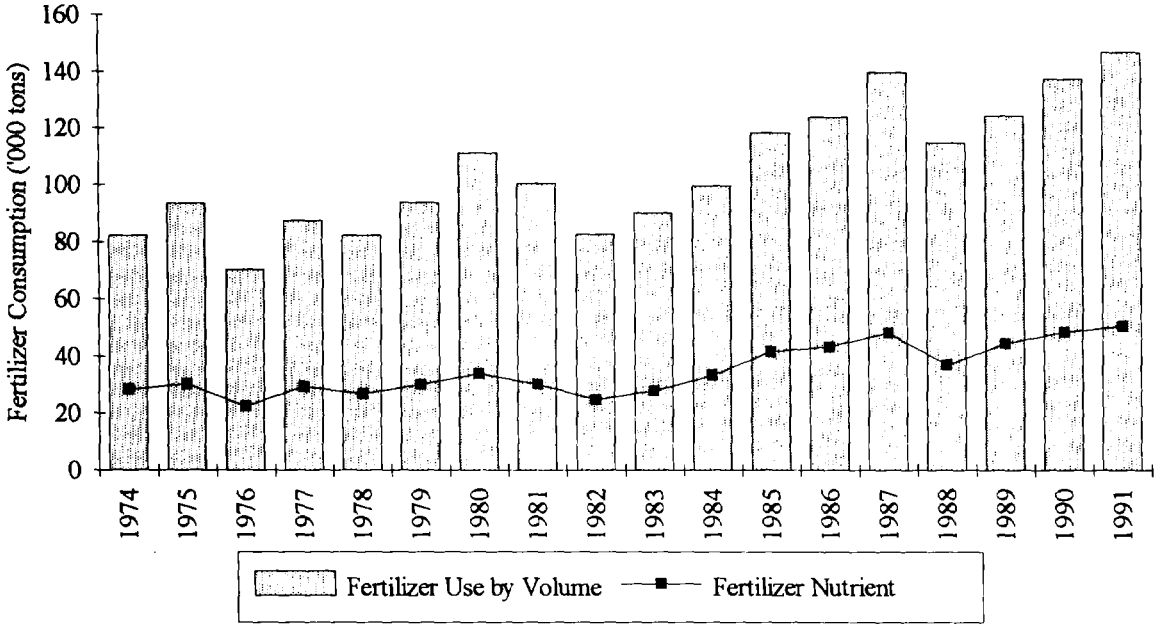
116 Whether these differences are statistically significant has not yet been tested.

Figure 3.7: Fertilizer Consumption in 1991, Estimated at 146,000 tons, in Tons of Gross Product.



The long-term growth in fertilizer use is shown below. Growth has been somewhat erratic, but use in the 1991/92 season was estimated at 146,000 tons . Between 1974 and 1991, fertilizer use has increased at an annual rate of 3.4 percent per year.[117] The use of high analysis fertilizers, has increased slowly, so nutrient consumption grew more rapidly, at 3.8 percent per annum.

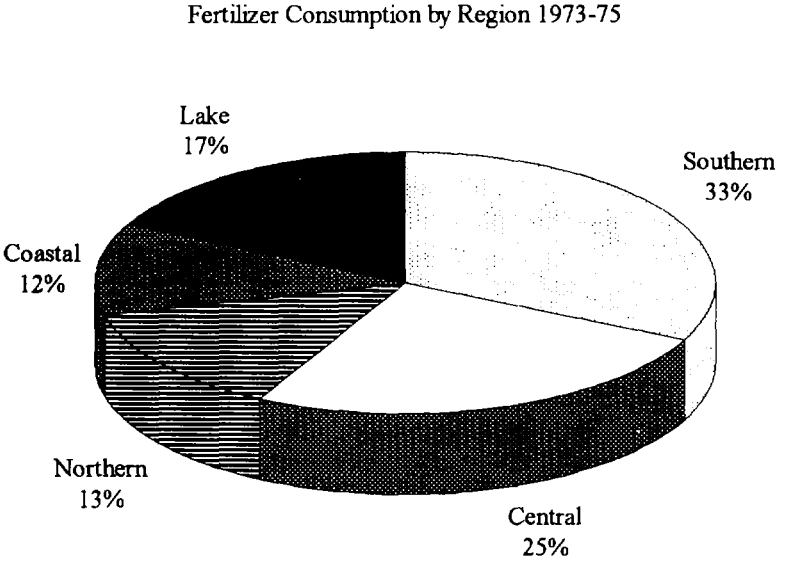
Figure 3.8: Fertilizer Consumption 1974-1991 (Tons Gross Product)

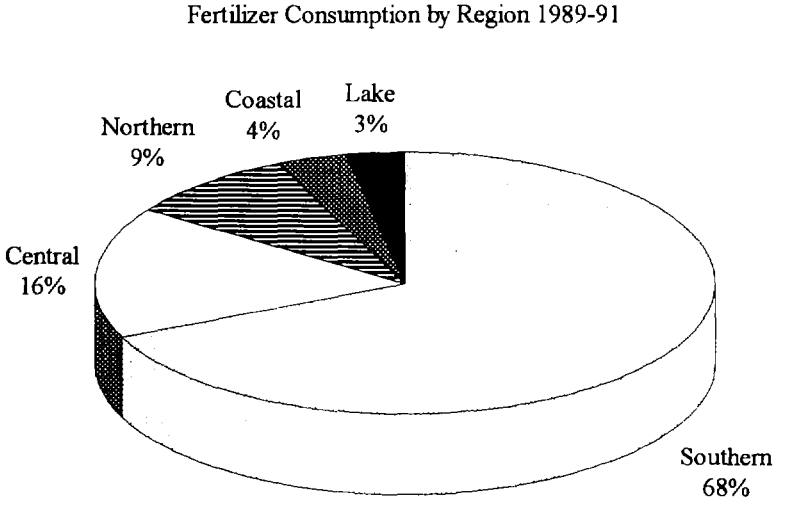


117 Calculated using least squares trend line.

The increase in fertilizer use has been with "straight" products rather than compound fertilizers. Fertilizer is used principally on maize, especially in the Southern Highlands (see Table 3.9). In the early to mid-1970s, that region accounted for around one-third of the national consumption of around 80,000 tons. By the late 1970s, this proportion had increased to 60 percent of national consumption of around 100,000 tons and it has remained at between 60-70 percent to the present, with national consumption continuing to increase. The Central Zone accounts for around 18 percent of national fertilizer use. In that zone 35-50 percent of fertilizer use is on tobacco (compound fertilizers), with the balance mainly on maize. The Northern Zone takes around 9 percent of total fertilizer supplies, maize apparently receiving much of the straight products, with coffee and horticultural crops receiving the compounds.

Figure 3.9: Comparison of Fertilizer Consumption Across Regions 1973-75 and 1989-91





During the years when fertilizer use was increasing, fertilizer prices were subsidized to varying degrees. From 1976 to 1984, subsidy policy reduced farm gate prices by around 50 percent. While there was no explicit subsidy from 1984, repeated currency devaluations overtook the increases in the fertilizer selling price permitted to the Tanzania Fertilizer Corporation (TFC) so that by 1988/89 there was an implicit subsidy of up to 80 percent. It should, however, be noted that the cost of fertilizer to TFC exceeded world prices, as a part of its supplies were from its high unit cost production plant at Tanga.

In late 1989, due to increasing pressures on the budget, Government decided to phase out the subsidy, starting in 1990/91 (70 percent subsidy), and then reducing to 55 percent, 40 percent, 25 percent and to zero from 1994/95 on. Coinciding with continued devaluations, the price to farmers has risen, for instance by an average of 85 percent in 1991/92 and 32-91 percent in 1992/93 (depending on type). Open market producer prices for maize are thought to have increased from 1990 to 1991 to a similar degree, but not so in 1992. To end 1991, fertilizer consumption had not reacted to the reduction in subsidy (see Table 3.10). This makes sense if, at the prices prevailing to date, demand exceeded supply. The relative increase in the price of fertilizer in later years is likely to have affected consumption.

Sources of Fertilizer Supply

Local Production. TFC's fertilizer plant at Tanga entered production in 1972, producing mainly SA, TSP and compound fertilizers. Until 1981, the plant contributed around half Tanzania's total fertilizer supplies. Technical problems, increasing with time, caused production to decline (Table 5). The rising consumption of fertilizer during the 1980s was derived largely from commodity aid, with average grants of 100,000 tons per year from 1982 to 1990.

With donors transferring their balance of payment support from commodity aid to foreign exchange assistance under the Open General License (OGL) system, recently fertilizer grants have become much less available to Government. In 1991, 42,000 tons of fertilizer were donated, 80,000 tons imported commercially and 21,000 tons produced at the Tanga plant. TFC ceased production indefinitely during 1991, when its sulfuric acid plant suffered major damage.

Several studies have been undertaken by Italian, Indonesian and South African companies, as well as by TFC, on rehabilitating or replacing the plant at Tanga. Investment costs are estimated at between $17 and $80 million. A 1991 study by TFC projected selling prices of up to 20 percent above imported fertilizer prices to make a rehabilitated plant viable. The same study assumed 80 percent capacity utilization. In 1987 the Tanga plant averaged 30 percent utilization and produced TSP and SA at 29 percent and 46 percent respectively above the world price. Rock phosphate deposits at Minjingu were used for production of TSP in the Tanga plant from 1983 to 1992 after some investment in infrastructure. If the Tanga plant is not revived, ground rock phosphate may find a limited market for direct use. Tanzania has offshore natural gas reserves at Songo Songo. However, these have been earmarked for power generation. Large investments would be needed to use these reserves for fertilizer production. While the possibility of producing fertilizer in Tanzania cannot be ruled out, at present international prices the investment needed to rehabilitate local plants does not appear viable. For the next few years the main source of fertilizer will continue to be imports.

Financing Fertilizer Imports

The securing of commercial imports of fertilizer is essentially an issue of financing. Until 1992 only TFC imported fertilizer. Legally the market has been open to all comers since 1990, but difficulties in securing the subsidy funds from Government have restricted access to TFC. Recently the Tanzanian Farmers Association imported some 20,000 tons and private companies have expressed an interest. Sources of import finance for local companies include: (i) own resources; (ii)suppliers credit; or (iii)

overdraft facilities from either the National Bank of Commerce or from a private bank (Standard Chartered is due to start business in 1993).

Own finance is usually not sufficient to cover total requirements, estimated at around $30 million for a commercial import volume of around 150,000 tons. The seasonality of the requirements makes it harder, bunching finance into one brief period. Access to finance from local banks is also limited. These banks have recently had to recognize extremely large losses, and operations are being scrutinized very closely. Limitations on credit expansion, and on exposure in a single sector will delegate the local financial system to only a portion of total demand.

Supplier's credit appears to be an interesting alternative. With the liberalization of the exchange rate regime, and the possibility of servicing foreign currency obligations, large fertilizer companies that used to operate in Tanzania should be encouraged to return and self-finance imports, or to finance imports to recognized local representatives. The reduction and eventual elimination of the subsidy will reduce uncertainty in the local market and diminish the chances that a non-parastatal supplier will get undercut by a parastatal with access to the subsidy. Provided the subsidy is phased out completely and Government does not intervene in pricing, the companies' main concern might be to avoid holding local currency from fertilizer sales, which could depreciate before converted back into forex. If such companies were given incentives to become involved in commodity buying in Tanzania (in coffee, cotton, tea, tobacco), this would reduce their exposure to local currency depreciation.

The Demand for Fertilizer

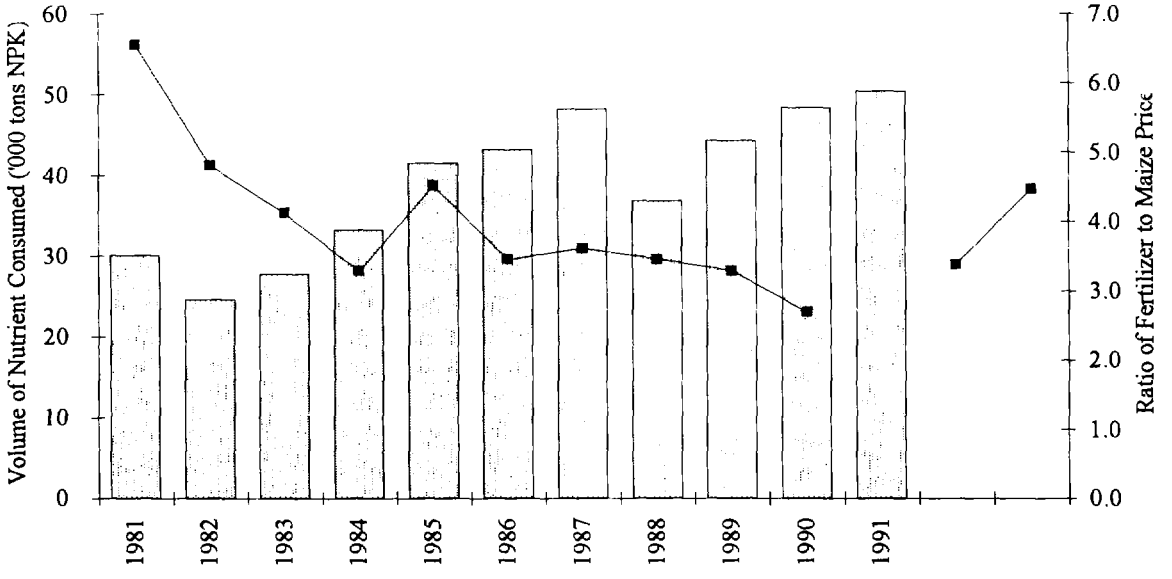
Over 70 percent of the fertilizer in the country is used in the Southern Highlands, mainly for maize production. Another 10 percent of total supplies are used in Tabora and Ruvuma for tobacco production. The remainder is used for maize, tea, cotton, and sometimes coffee. This review of the fertilizer market will focus on two key characteristics:

- Recently, fertilizer consumption has been well below demand, constrained by timely availability.

- The consumption of fertilizer is a function of the **ratio** between fertilizer and output [maize] prices.

Fertilizer received after planting, or at latest tasselling season, is useless. The Government supply system is notoriously tardy. Through the early 1980s, the supply of fertilizer, at subsidized prices, has been determined by the availability of foreign exchange. With foreign exchange more readily available in the late 1980s and early 1990s, the constraint has become the availability of Government funds to cover the cost of the annual subsidy. In addition, with the restructuring of the financial system (and severe IMF guidelines limiting credit expansion), access to credit in local currency to purchase foreign exchange is difficult. Thus, in 1992/93, fertilizer supply is clearly limited by factors which leave it well below demand at current subsidized fertilizer prices and the current maize price. This conclusion is borne out by the farmers' insistence on action on the fertilizer front identified in the ADIS survey. The emphasis on supply is hardly surprising in a situation where the [subsidized] fertilizer to maize price ratio has been declining since 1980 (see Figure 3.11, below). The Final Report of an FAO Fertilizer Project (FAO, 1986) estimated demand in 1985 at 171,000 tons (62,000 tons nutrients) while fertilizer distributed in that year was 118,000 tons (41,500 tons nutrients). "Orders" placed with TFC by the Cooperative Unions, parastatals, and TFA were in the range of 132-157,000 tons during the 1985-89 period, while the quantity supplied by TFC each year was 10-30,000 tons less. Anecdotal information from the field suggests that farmers have paid prices around 30-40 percent above the recommended prices this year.

Figure 3.10: Fertilizer Consumption, and Ratio of Fertilizer Price Over Maize Price at Farmgate



Source: MOA

The situation has definitely been supply-constrained in the 1992/93 crop season because of difficulties in financing imports. Even with carry-over stocks from the previous season of 41,000 tons, supplies available by the time they are needed during 1992/93 may be no more than 100-120,000 tons. A downturn in use is therefore expected this season.

The planned elimination of fertilizer subsidies, estimated to have been equal to 80 percent of the farm gate cost in 1988/89, has generated considerable concern. Observers anticipate reduced fertilizer use and lower maize yields, less maize sold to traders and higher urban maize prices. The Southern Highlands is the focus of concern because if maize as a cash crop becomes unprofitable for most producers there, Tanzania's food security conditions will worsen and greater amounts of foreign exchange will have to be spent on food imports. There is also concern for the well-being of the maize growers in the Southern Highlands. Net sellers of maize, especially those in distant or less accessible areas, stand to lose the sizable transfers made to them through the government's maize and fertilizer price policies.

A static analysis indicates that, at current prices, removing the fertilizer subsidy and pan-regional pricing still leaves some room for profit in maize production in the Southern Highlands, depending on access to markets and current yield levels. Returns to labor are reduced by around 10 percent in less remote areas (e.g. Mbeya), and by 20-25 percent in more remote areas (e.g. rural Songea). However, in Mbeya returns per labor day remain well above open market wage rates (around Tshs 300/day), with the maize yields of 0.75, 4.5 and 5.0 tons per ha corresponding to low-, medium- and high-input technology. In rural Songea, where wages are somewhat lower (perhaps Tshs 250/day) returns to labor in maize production still appear to at least match open market wages. Removal of subsidy appears to keep the incremental benefit/cost ratio of moving from low- to medium input technology rewarding for farmers in the more accessible districts of the Southern Highlands. At high-input levels, where the main cost increase arises from heavier use of fertilizer, the incremental net returns appear to be reasonably positive for Mbeya, with a benefit/cost ratio of 1.5:1. In the more remote areas, with lower prices for maize, low-input technology appears to be unprofitable, although the incremental returns to moving to medium-level

technology are good. In the outlying regions, moving to very high levels of input use does not appear to be justified at nonsubsidized fertilizer prices and the prevailing, low maize price.

Table 3.2: Incremental Benefit/Cost Ratios at Nonsubsidized 1992/93 Fertilizer Prices

	Maize Price (late 1992)	Low to Medium Technology (0.75 to 4.5 tons/ha)	Medium to High Technology (4.5 to 5 tons/ha)
Mbeya	Tsh 35 per Kg	2.9	1.5
Songea	Tsh 25 per Kg	1.8	0.9

The returns to adoption are very sensitive to maize price and yield levels. Thus, the above data is only indicative. Similar calculations using yield increases from the FAO fertilizer trials yield substantially higher ratios (and incentives). These point estimates, while indicative, should be combined with a more market-based approach, which is presented below.

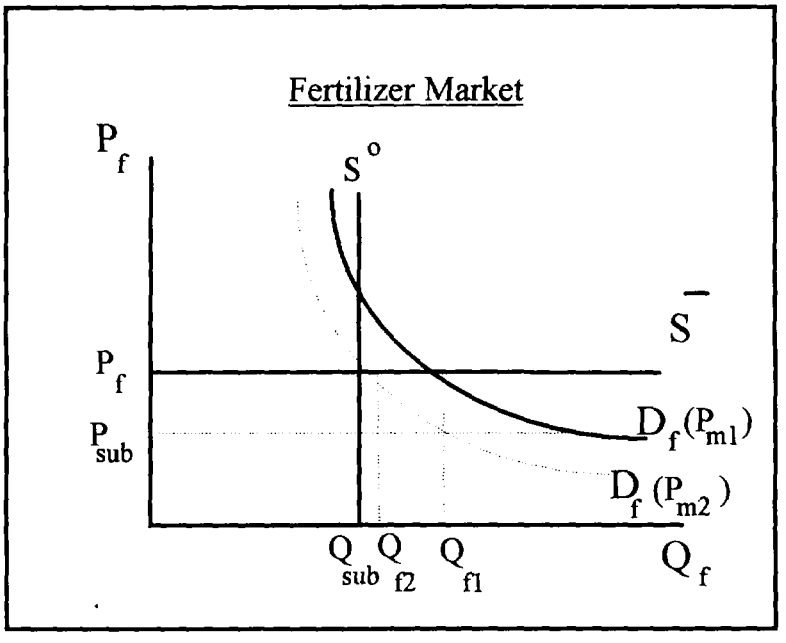
In a more **dynamic analysis**, the demand for fertilizer, (technology and other aspects held constant), is negatively related to the price of fertilizer, but positively related to the price of maize. To investigate the effects the subsidy reduction on the demand for fertilizer, we look first at the effects on the fertilizer market, and then at the effects on the maize market.

- With the removal of the subsidy, the main constraint to private sector importation and distribution (i.e. the shortage of budgetary funds for the subsidy) is removed.

- Assuming that foreign exchange remains available (at market prices, in now fully liberalized forex market), the private sector will increase timely supplies to cover currently unsatisfied demand, at a price determined by foreign exchange and transport costs. At the new price, virtually unlimited supplies of fertilizer (in the Tanzanian context) are available.

- At the same time, the increased price (due to the removal of the subsidy) will cause demand to diminish. Whether consumption, at the higher price in an unconstrained market is above or below current levels will depend on the nature of the demand function for fertilizer.

Figure 3.11: The Effect of Fertilizer Demand and Supply from Releasing the Constraints on Supply



Thus theoretically, if the change in the price of fertilizer causes a reduction in fertilizer consumption, below the 50,000 tons of nutrient consumed at present, maize production is also likely to drop. This will normally raise the price of maize. The increase in the price of maize will again affect the profitability of fertilizer use, causing fertilizer demand to increase. Fertilizer prices do not change (in terms of foreign exchange) with fluctuations in consumption, as supplies are imported. More fertilizer again affects maize production and prices, resulting in another (smaller) round of adjustment. In the scenario where, even with the increase in price, the Government exit from the fertilizer market causes an increase in fertilizer use, a similar but inverse series of adjustments takes place.

Whether fertilizer consumption, and hence maize output, increases or decreases depends on the nature of the demand function for fertilizer. A preliminary estimate of this demand function for fertilizer, based on behavior in the Southern Highlands maize-producing regions, indicates that, due to the size of excess demand at current prices, the removal of the subsidy on fertilizer, and hence the removal of Government intervention in the market, will result in a net **increase** in fertilizer use (see Figure above).[118] The magnitude of the increase depends on how quickly the supply of fertilizer is allowed to respond. An indicative scenario, assuming the share of the fertilizer market in Southern Highlands remains the same, is that consumption would reach 200,000 tons of gross fertilizer following a four-year period of subsidy reduction and adjustments in the maize and fertilizer markets.

If the functioning of the fertilizer market is to improve, it is strongly recommended that the fertilizer subsidy be removed completely by 1994/94 (or earlier if possible). The constraint to the smooth functioning of the market is not so much the subsidy but the presence of Government in market. Government presence creates uncertainty associated with: (i) whether the subsidy will indeed be forthcoming for non-parastatal competitors; (ii) whether the Government will take other arbitrary measures

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118 Supply of imported fertilizer, when unconstrained, shifts from S^0 to S^-. At the new price, P_f demand increases to Q_{f1}. In a potential second round effect, as fertilizer use increases, maize production goes up, lowering maize prices and causing a reduction in fertilizer demand to Q_{f2}.

to protect its market share. The consequences of the subsidy reduction on the fertilizer and maize markets will not be as disruptive as has been feared.

Another way of keeping the ratio between fertilizer costs and maize prices low is to use measures to expand markets for maize. The price of maize differs dramatically across Tanzania. Differences between regions, since the liberalization of maize marketing, are fairly constant and more or less reflect transportation costs from surplus to deficit areas. It is fortunate for the maize economy that the high production, low price areas are on major trading routes to maize deficit countries in central and southern Africa. Valuing maize at Malawi or Burundi import parity levels will provide strong incentives for expansion (and fertilizer consumption) in the Southern Highlands. For this reason it is recommended that:

- In addition to its policy of subsidy removal for fertilizer (and other inputs), Tanzania should follow an open trade policy which takes advantage of its favored position for supplying food to landlocked countries in Eastern and Southern Africa. Food security policy should take this into consideration, while taking advantage of Tanzania's easy access to international sources of supply.[119]

To estimate future demand for fertilizer, the key sector is maize. If fertilizer use on maize in the Southern Highlands remains profitable, there appears to be plenty of room for increased utilization rates. Intensification of existing maize acreage, or support for an expansion in area would both increase fertilizer use. In 1991/92, 86,000 tons of different fertilizers were used in the Southern Highlands. Of this, around 80,000 tons was used on the estimated 676,000 ha of maize. The average application rate of 120 kg of fertilizer per ha is less than half the physically optimum levels, normally 200-300 kg per ha. Whether these are profit-maximizing levels is still to be demonstrated.

Fertilizer is also used on tobacco (8 percent of total consumption in 1991/92), coffee, tea and rice. Charges for fertilizer are below 20 percent of total production costs for all but rice production. The removal of the subsidy, given the current undersupply situation, should not affect consumption that severely. In the case of rice, utilization rates may be affected. This is a very small portion of total demand, however.

Distribution Channels

Prior to 1992, the Tanzania Fertilizer Corporation was the sole importer, producer and distributor of fertilizer. As of 1992, the Tanzania Farmers Association had imported 20,000 tons, and a private supplier another 45,000 tons. Despite the monopoly at the wholesale level, there has been a major change in the retail network. Following deconfinement of fertilizer distribution in 1988/89, and to overcome problems associated with the financial insolvency of many cooperative unions, TFC, the normal retail channel, contracted with private stockists. As the table below shows, stockists have emerged rapidly in the Southern Highlands.

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119 The need for open trade in maize with landlocked countries will be dealt with in Chapter IV in the section on markets and on maize.

Table 3.3: Fertilizer Distribution by Public and Private Stockists[120]
(percentage shares of total distribution by weight)

	Iringa	Mbeya	Ruvuma	Rukwa
		1989/90		
Parastatals	29.4	67.0	52.4	100
Private Stockists	70.5	33.0	47.6	0.0
		1990/91		
Parastatals	22.2	31.3	57.1	100
Private Stockists	77.8	68.7	42.9	0.0

By 1991/92, over 95 percent of the fertilizer in Iringa was sold through some 90 stockists. The retailers are allowed a fixed markup of 20 percent. Outside of the Southern Highlands, the build-up of the private trader network has been slow. Ten of the fertilizer traders (handling 30 percent of the trade) have been assisted with loans from a special CRDB line of credit.

Other Agrochemicals

Coffee and cotton dominated the use of agrochemicals, mainly fungicides, insecticides and herbicides, through 1987/88. They accounted for about 50 percent of procurement, down from 83 percent in 1984/85. Chemicals were purchased through the two produce boards and distributed by the cooperative unions. Payment was deducted from crop receipts after harvest. From 1988/89 on, the two Boards have faced financial constraints and have been unable to sustain the same levels of purchases. Since then, imports by private sector companies for the tobacco, tea, horticulture and cereals sectors, and recently for the cashew sector (sulfur fungicide), have increased steadily.

Until the mid-1980s the size of the total agrochemicals market has been around $30 million annually . Import data do not closely reflect year to year levels of use. The Boards and the Cooperative Unions have held considerable stocks, increasing interest charges and adding to farmers costs. Imports of fungicides exceeded insecticides in volume terms in most years. The fungicides are used largely on coffee (or smuggled across the border). Insecticides are used more on cotton than on coffee; they are also used in maize production and storage, as well as on other crops. Herbicides are used much less, accounting for only around 5 percent by volume.

Agrochemicals are not produced within Tanzania. The trade depends on imports of final products, or ingredients for local formulation. During the 1970s, five companies formulated agrochemicals. Two of these ceased production in the early 1980s. Of the remaining three, Twiga/ICI and Hoechst are the most active, but their capacity utilization is low and variable from year to year. The three companies' aggregate annual capacity is 6.3 million litres of liquid formulation and 7,800 tons of powder. This formulation capacity exceeds current consumption. In 1991/92, only 630,000 litres of liquids and 160 tons of powders were formulated locally. The activities of local companies have been constrained by: (i) taxation of

120 Mahundaza, Mollel and Bhahebura, "The Study on Input Supply, Distribution and Performance of Liberalization of Input Distribution Systems", Draft Report in Five Volumes, March 1992, Volume II.

ingredients and packaging; (ii) lower cost of imports; and (iii) competition from donor-funded commodity import programs.

Formulation capacity has recently increased with the completion of the Moshi plant of Tanzania Pesticides Ltd (a parastatal). The plant is intended to produce 3,000 tons per year of copper oxychloride, 3,000 tons of wettable powder insecticides, and 1,500 to 3,000 tons of liquid herbicides. The country has more than enough capacity to formulate agrochemicals. Local firms should be forced to face the competitive test of nonsubsidized imports. As long as imports use the market rate of exchange, competition with local firms should not be restricted, so that farmers pay the lowest possible price for a timely input.

Prospects in the agrochemical market are not good. Coffee and cotton, the principal source of demand, are in severe financial difficulties. Farmers are likely to use well below the recommended levels of these chemicals until the product price increases. Although it will not compensate for the decline in coffee and cotton, demand for agrochemicals for the production of flowers, vegetables and other high-value crops is likely to increase, especially in the Kilimanjaro and Arusha areas. Similarly the demand for sulfur fungicides for the cashew industry is increasing with the liberalization of cashew marketing.

Environmental Effects

Tanzania has a registration system for agrochemicals, which is controlled by the Tropical Pesticides Research Institute (TPRI) at Arusha. Only five insecticides, three fungicides, two herbicides and one plant growth regulator have full registration. There are many products with provisional, restricted or experimental registration. TPRI has performed effectively in its registration responsibility. For example, the new agrochemicals plant at Moshi had applied to formulate paraquat, diquat, BHC/lindane, aldrin, dieldrin and carbaryl. TPRI withheld approval for the organo-chlorines because their use is being phased-out in Tanzania.

Promotion of multichannel distribution makes monitoring and training in the use of correct practices even more necessary. TPRI has the mandate for these functions, and in 1993 is starting training courses on the safe handling and use of pesticides. However, TPRI does not have the resources for effective monitoring within the distribution channels. The Produce Inspectors of the MOA, posted to all districts, should undertake a monitoring and advisory function with distribution agents (traders/stockists and cooperatives). TPRI intends to train the Produce Inspectors, though funding does not appear secure. The private companies also recognize their responsibility to seek proper practices at their sales outlets.

Overall concern about the use of agrochemicals is on the killing of non-target, beneficial organisms; the development of resistance among target species; and the disruption of ecological equilibria. The ecosystems most vulnerable to agrochemicals and fertilizer are thought to be Lake Victoria and the Northern Zone. The southern part of Lake Victoria is adjacent to Tanzania's Western Cotton Growing Area In addition to the possibility of resistance developing among cotton pests and beneficial species being killed, the potential risks on the lake ecosystem are damage to fish populations (endosulphan is especially toxic to fish), and water hyacinth growth being stimulated by fertilizer run-off. The absence of aerial spraying, and also the growing use of ultra-low volume (rather than knapsack) spraying reduces the risk of pesticide drift and run-off. The possible fertilizer effect on water hyacinth is associated much more with the Kenyan areas by the Lake; use of fertilizer in Tanzania's Western Cotton Growing Area is small. The potential ecosystem risks in the Northern Zone relate to run-off of copper fungicide and of insecticides, used on coffee around Mount Kilimanjaro and Mount Meru. Some farmers claim that maize yields are declining in fields adjacent to coffee plots because of spraying. Levels of copper in the soil have increased, and it is conceivable that this could, over many years, inhibit soil micro-organisms and so affect soil structure and fertility. However, there is said to be no evidence from Kenya to support this.

Certified Seeds

At present, certified seeds represent 2% of seeds planted. The market for certified seed is shared by Tanseed, a Government parastatal which produced some 1,400 tons of maize seed in 1992/93, and Cargill, a private sector company, which produced some 800 tons in the same year. Farmers are willing to pay higher prices for a good product, as indicated by Cargill's ability to charge 400 Tsh per kg, vs the 285 Tshs/kg charged by Tanseed. Low usage of certified seed indicates that there is a large potential market for good quality seeds Under the Government system, foundation seed are multiplied up at five national Foundation Seed Farm's to meet the requirements of Tanseed. However, due to uncertain demands for certified seeds, Tanseed, at times, does not honour its contracts, leaving the Foundation Seed Farms holding excess seed. This factor has contributed to difficulties in getting new varieties to the farming community. Foundation Seed Farm facilities are also used as contract growers for certified seeds production by Tanseed. The quantity and quality of seeds produced at Foundation Seed Farms has been declining due to several factors including the close linkage with Tanseed, prices set well below productin costs, the inflexibility of Government management and control, the paucity of funds, deteriorated assets (machinery, equipments, storage facilities etc), and lack of a professional commercial attitude.

In response to these deficiencies, a new strategy has been designed to guide the development of the seed industry based on concepts of demand-led production, private initiative, competition and market pricing. Key actions will involve liberalization of production and marketing, and a deregulated legal framework for the flow of seed research ingredients and seed itself to the private sector. The public sector will withdraw from several activities--production and distribution and marketing-- with public roles, resources and personnel refocused on research, quality assurance and control, training and promotion. The reform program would include:

- the withrawal of the public-sector from the "business" of seed production and distribution for most crops over time. The likelihood of withdrawal varies by crop. For vegetable, forage, specialty crops, and hybrid seeds, all of which have good profit potential and are well-suited to privatization, devastiture could be immediate;

- the privatization, to the extent feasible, of self-pollinated cereal grain, grain legume and oilseed crops based on conducive policies and incentives. Public-sector seed production and marketing should be limited to residual crops and areas for which there is insufficient private sector interest. In cases where the public and private sectors might compete as seed suppliers, a "level playing field" should pertain;

- the phase-out of all public subsidies for seed production. Public expenditure should be used, more appropriately on crop research;

- the liberalized acquisition and utilization of breeding lines and improved seed products of foreign origin;

- the establishment of a more favourable legal and regulatory environment, especially for phytosanitary requirements, plant quarantine, variety registration and certification;

- the protection of intellectual property rights related to crop agriculture;

- permitting the entry of international seed companies under reasonable arrangements concerning equity ownership, joint ventures, access to hard currency, repatriation of capital, and security of genetic lines and proprietary products;

- the provision of information and training to small, local-based seed producers as well as general extension services for the sector as a whole.

The public sector should support the effectiveness and market responsiveness of the private and informal sectors. The public sector functions noted below will have to be strengthened:

- public sector institutions in crop research will require broadened scope, higher-level training, and improved productivity in order to participate more effectively in the global market for genetic technology;
- quality and phytosanitary controls, seed entry and certification methods all require upgrading;
- public sector personnel in the extension services will have to keep pace as new technologies develop and the need for technology transfer speeds up.

Veterinary Drugs, Vaccines, Chemicals and Equipment

Drugs, vaccines and acaricides are virtually the only cash imports to the traditional livestock sector. They are also important to the commercial sector. Around 90 percent of drugs, vaccines and acaricides have been procured by Government under commercial tender, with additional supplies received sporadically through donor grants. In the mid-1980s, annual purchases were $6-8 million, adding to major donations of vaccines. In more recent years, the value of annual purchases fell to $2-3 million and donations also declined. Imports of animal health inputs by the private sector increased sharply in the last three years, from around 10 percent of the total procurement (Government plus private) in 1990, to around 40 percent in 1992. Of current private sector imports, one fifth are for the expanding poultry sector. It is unclear what are the main items in the remaining four fifths; they appear not to be trypanocides and acaricides (provided classification of the import data is valid), but include anthelmintics.

The potential for growth in this market should be good. Among cattle-owners surveyed by the ADIS survey in the main cattle-owning zones, 74 percent of the Mbeya farmers had purchased veterinary drugs. "Almost all" had bought drugs in the sample in Kilimanjaro Region, but there was no reported expenditure on such inputs in the Dodoma Region sample (where capital is scarce). Animal health products are vital to commercial livestock production systems. Because they account for only 5-10 percent of the total costs, their use can be expected to expand with the development of production. Although data are poor, the small-scale dairy sector and commercial poultry sector are believed to be growing rapidly.

Agricultural Equipment and Machinery

It is estimated that 70 percent of Tanzania's crop area is cultivated by hand hoe, 20 percent by ox plough and 10 percent by tractor. The table below presents data from the ADIS survey for different agro-ecological zones. Oxen are used by over 70 percent of the farmers on at least one plot in parts of the Southern Highlands and Sukumaland (Mwanza and Shinyanga Regions). In parts of Kilimanjaro Region, almost two thirds of farmers have a plot prepared by tractor, mainly for maize. In at least some agropastoralist systems (e.g. in Dodoma Rural District), almost all cultivation is by hand, as is the case also in the cassava-cashew-coconut systems of the south-east.

Table 3.4: Methods of Land Preparation
(% of holders with at least one plot cutivated by the method noted).

Farming System	Zone	Tractor	Oxen	Manual
Cashew/Cassava	S. Coast (Newala)	0	1	99
Maize, coffee, cattle	S. Highlands (Mbozi)	10	74	76
Tobacco, rice maize	W. Plateau (Urambo)	1	9	92
Cotton, rice, sorghum	Central Semi-Arid (Kwimba)	2	72	43
Agro-pastoralist	Agro-pastoral, Semi-Arid (Dodoma)	0	1	93
Coffee, banana, dairy	N. Highlands (Hai)	65	5	37

Source: ADIS

The hand hoe and the ox-plough are clearly more important across the board than the tractor. However, supporting the Boserup hypothesis, in areas where land is scarce (Southern and Northern Highlands), intnsification has caused increased use of tractors. Data on annual sales of inputs is given below. The quantities distributed appears to be declining. Whether this is a problem of data gathering (as supply moves out of Government into private hands), or whether it demonstrates some supply constraint is not clear. Two studies have concluded that supply is a problem.[121] However, observations in the implement market suggest that, at current prices, there are no problems of availability.

Table 3.5: Quantities of Farm Implements Sold per Year, 1975-1990, in thousands of units.

	Hoes	Ploughs	Machetes	Axes	Others	Total
Avge 1975-80.	1,818	9	597	75	93	2,592
Avge 1981-85	2,003	27	448	83	238	2,799
1986	1,632	25	381	60	240	2,338
1987	1,853	22	40	140	224	2,279
1988	1,052	5	582	55	204	1,898
1989	1,323	14	366	161	135	1,999
1990	682	15	267	171	57	1,192
Avge 1986-90	1,308	16	321	117	172	1,941

Source: ADIS

Animal Traction. Animal traction provides the capability, in a land-abundant agricultural economy, to increase output and the returns to labor by using a simple, known and accessible technology. While opening new land presents environmental and sustainability issues, studies show that there is good potential agricultural land available. The limitations are access and labor availability. Animal-drawn vehicles and tools can resolve access problems and decrease the need for labor. This approach can proceed independently of the establishment of the more sophisticated financial and logistical systems to provide fertilizers and agrochemicals. In addition, the limited number of all-weather rural roads means that animals are called on to provide for much of the country's rural transport needs. About 1 million draft oxen are employed in the ploughing of maize, sorghum, rice and cotton over perhaps 20 percent of the land area. The main implements are simple mouldboard ploughs, manufactured locally. About 300,000 are in

121 Mahundaza, et. al., op. cit, for hand held implements, and Scandinavian Institute of African Studies, 1984 for ox-ploughs.

use, and annual demand is said to be about 35,000. In addition to oxen, some 250,000 donkeys are used as pack animals,and increasingly to pull carts and cultivation implements.[122]

The use of draft animals appears to be expanding. The key limitation is the presence of trypanosomiasis, which weakens animals until they are unable to work. Also, a significant outlay is required for the purchase of a plough (Tsh 15,000). The use of animal-drawn harrows, planters, ridgers and weeders is small. This is partly due to the lack of suitable designs. The use of animal drawn sledges and carts is gradually expanding. Such vehicles can play an important role in facilitating the growth of rural communities, and the potential for expansion is large. An initiative under the proposed Second Integrated Roads project, to be appraised by IDA in June 1993, includes a component to promote village transport and travel facilities.

Lack of appropriately simple, inexpensive, cheap, but effective design seems to be hampering the development of animal-drawn implements. An intensive program of farm-based research, in collaboration with the farming system programs in local and regional research institutes, should be used to produce improved designs, particulary for women. The small-scale manufacturing sector has been developing gradually following the increased availability of imported raw materials since 1986. With volume orders, the industry should be able to grow in response to demand.

It is esimated that there are some 19,000 tractors in the country. Supply is constrained only by the ability to raise finance and gain access to foreign exchange. As long as foreign exchange is not underpriced, the market will determine where tractors are more appropriate than draft animal power. It is unlikely that the use of tractors will expand rapidly outside of the high potential areas in the Northern and Southern Highlands. The experience to date with the highly mechanized production of wheat in Arusha has not been satisfactory. While the use of tractors for mechanized wheat production in selected areas will no doubt continue, the high cost of mechanization will limit its expansion to other crops.

Policy Recommendations on Inputs Supply

Labor-augmenting technology is a key to rural income agricultural growth in Tanzan. Unlike some of its neighbours, increasing labor productivity in a land-abundant economy can take place both horizontally or vertically. The use of fertilizers (chemical or organic) and other agrochemicals, coupled with draft (or tractor) power, will play an important role. Some of the policy recommendations on inputs supply are as set out below.

The development of an inputs supply market based on the private sector will depend on the credibility of Government's withdrawal, and the even-handedness with which parastatal and private sector competitors are treated. Thus subsidy funds, foreign exchange, local finance, access to storage space, railway transport facilities and other services should be made available to both private and parastatal sector competitors on equal terms.

- Subsidies on fertilizer and pan-territorial pricing should be removed. Government interference in the fertilizer market constrains supply by both parastatal and private sector suppliers. The Government removed the subsidy as of the FY 94/95 Budget.

- Following an open trade policy which takes advantage of Tanzania's favored position for supplying food to neighbouring landlocked countries in Eastern and Southern Africa. This

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122 See URT, Starkey, Paul, and Mutagubya, Wilson, "Animal Traction in Tanzania: experience, trends and priorities", MOA, 1992 for more information.

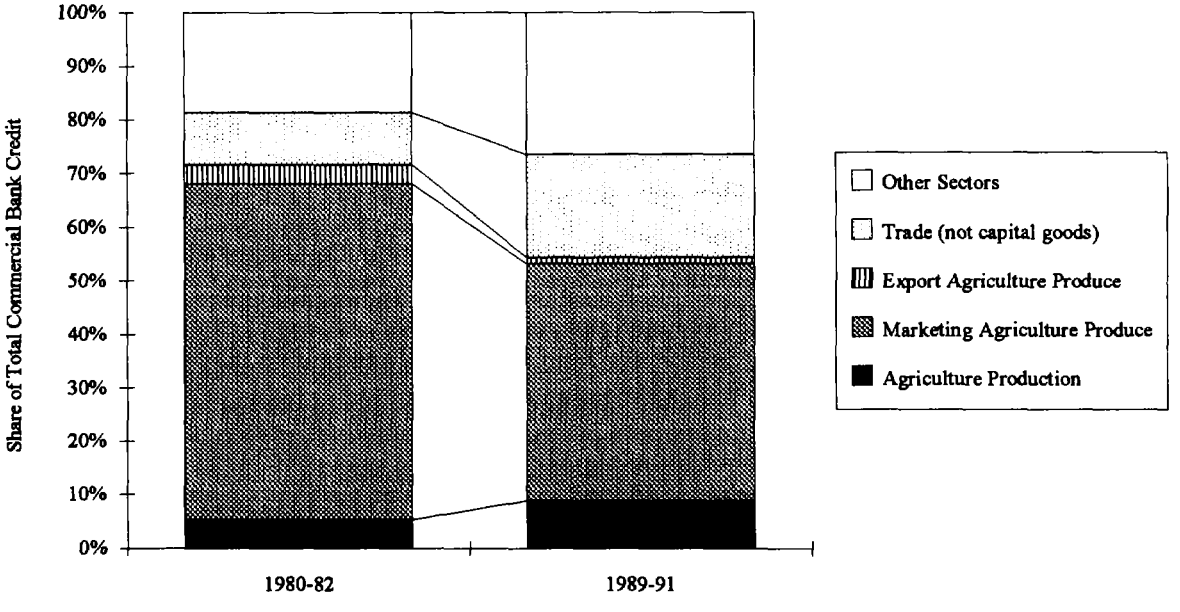
would support maize production in the Southern Highlands and help counteract the reduced profitability of maize production caused by the removal of the fertilizer subsidy.

- Importation of agricultural inputs (fertilizers, pesticides, insecticides, tractors) should be permitted, at the market rate of exchange, free of duty. Donations of fertilizers and other inputs should be auctioned at the port of entry. Local firms (both Government-owned and private) that want to enter the market importing and mixing (or assembling) intermediate goods) should do so in competition with imports, without the assistance of trade barriers. Trade in inputs has been liberalized as of mid 1993.

D. Rural Finance

The rural financial sector is intended to provide a range of services to the rural population. These include financing for crop purchases and input distribution, medium- and long-term credit for agricultural investments by estates and agroprocessors, and support for the smallholder sector. Short-term financing for crop purchases and input distribution form the bulk of formal sector lending to agriculture, accounting for over 80 percent of total bank lending to the sector. Customers for crop and input financing have traditionally been cooperative unions and the marketing boards, though borrowing by the latter has been curtailed since 1991, when marketing reforms reduced their buying functions. Lending for crop buying has been about Tsh 27 billion in recent years, while input borrowing has been in the range of Tsh 3 to 5 billion.

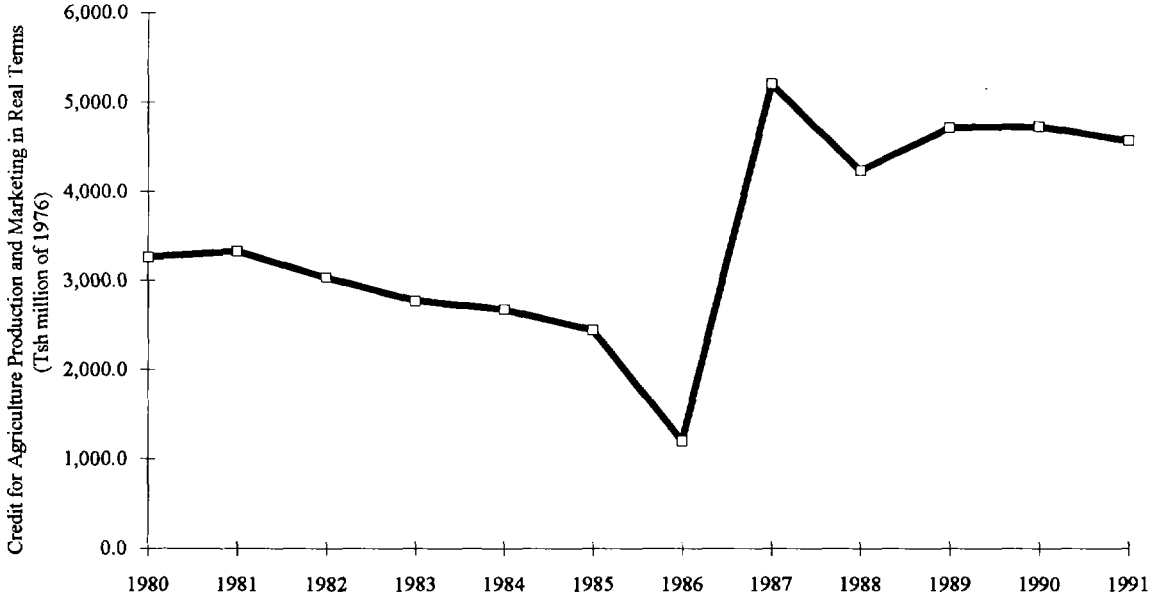
Figure 3.12: Distribution of Commercial Bank Credit (NBC and CRDB), 1980-82 and 1989-91



Lending for activities related to agriculture (exports, crop marketing or production) appears to have declined dramatically as a share of the total because of the decline of lending to single crop parastatals such as the National Milling Corporation. However, the increase in miscellaneous trade finance, which goes largely to the private sector, substituted somewhat for the decline in crop finance through Government-owned enterprises. The increase in trade finance also eased farmer cash flow, by providing increased credit for purchase of consumption goods and inputs. In real terms, lending for agricultural

production and marketing declined through 1986, before jumping in 1987 to a new plateau determined by the need to finance increased levels of agricultural exports. [123]

Figure 3.13: Lending for Agricultural Production and Marketing in Real Terms (Tsh million of 1976)



The use of formal credit is rare at the farmer level. While the ADIS survey shows that farmers consistently make cash outlays for improved seed, fertilizers, hired labor and implements, little of these funds comes from "formal" sources (i.e. banks or co-ops).[124] As the table below indicates, credit only played a role in Mbozi, the coffee/maize system in the Southern Highlands, and in Urambo, the tobacco/maize system in the Western Plateau.

Table 3.6: Sources and Uses of Credit at Farm Level

(Percent of holdings in each category)

Farming System	Zone	Obtained Credit	Source of Loan		Purpose of Loan		
			Coop	Other	Inputs	Labor	Other
Cashew/Cassava	S. Coast (Newala)	8	38	62	43	43	14
Maize, coffee, cattle	S. Highlands (Mbozi)	25	81	19	85	11	4
Tobacco, rice maize	W. Plateau (Urambo)	50	96	4	98	1	1
Cotton, rice, sorghum	Central Semi-Arid (Kwimba)	5	9	91	9	82	9
Agro-pastoralist	Agro-pastoral, Semi-Arid (Dodoma)	3	0	100		33	67
Coffee, banana, dairy	N. Highlands (Hai)	2	40	60	40	40	20

Source: ADIS

123 From Bank of Tanzania, "Economic and Operations Report for the Year Ended 30th June, 1991", p. 81.

124 ADIS, Volume I, p.98-99.

Other sources indicate that some 65 percent of a farmers' funds come from own savings. Relatives and friends provide perhaps 18 percent, the formal system 12 percent and moneylenders 5 percent.[125] Credit is not available to most farmers, but there is also a lack of awareness, and a fear of indebtedness in rural communities. Of the six representative farming systems surveyed by ADIS, two, the cassava/cashew system in Newala in the Southern Coast and Kwimba, and the cotton/maize system in the semi -rid Western Plateau, had a majority of farmers identify lack of finance as the most important constraint for both food and cash crop production..[126] Informal credit terms vary with the source. Interest rates range from zero percent for loans from family and friends up to 100 percent per annum for short-term credit from money lenders. Merchants sometimes exchange inputs in kind for sole access to the farmers crop when it is time to market. Credit secured from informal sources is used both for consumption and investment purposes such as school fees and farm inputs.

Institutions

Financial institutions in the formal sector that provide rural finance include the Bank of Tanzania (BOT), the National Bank of Commerce (NBC), and the Cooperative and Rural Development Bank (CRDB). Both NBC and the CRDB operate as commercial banks providing deposit taking and credit facilities. The Tanzania Postal Bank has also been established recently to raise deposits and undertake lending. The Bank of Tanzania functions as the central bank. It serves as banker to the Government and the commercial banks and provides rediscount facilities to the banks as lender of last resort. It manages Government monetary and credit policies and has statutory authority for prudential regulation and supervision of the banks.

The National Bank of Commerce was established as a state-owned bank in 1967, following the nationalization of several foreign banks. It is the largest bank in the country, accounting for over 80 percent of the total assets in the banking sector. It has an extensive national coverage with 204 branch offices, 295 mobile agencies and 20 regional offices. NBC takes different types of deposits, provides short-term credit and a limited number of term loans to parastatals, cooperatives, firms and individuals in agriculture, industry and commerce.

Agriculture accounts for about 55 percent of NBC's total loan portfolio. Overdraft facilities to cooperatives and parastatals for the marketing of primary commodities have traditionally accounted for nearly 90 percent of NBC's agricultural lending. This concentration of lending to the cooperatives and parastatals has limited the amounts of lending by NBC to the private sector enterprises in agriculture. Loan recovery for crop finance has been poor, averaging just over 27 percent between 1984 and 1990, largely because of continued lending to inefficient, undercapitalized parastatals and cooperatives at the direction of Government, as well as poor recovery mechanisms. Incentives to recover overdue loans were lessened by the bank's recourse to the rediscount window of the BOT, which had provided fresh credits at the beginning of each crop year.

NBC offers a variety of savings schemes for customers but its deposits did not kept pace with the expansion of its lending activities in the late 1980s. In 1987 the ratio of its deposits to advances was 92 percent, this declined to 68 percent by 1990. Poor deposit mobilization, coupled with poor loan repayments, made NBC even more reliant on borrowing from the BOT to cover its lending activities. By 1990 much of its portfolio of loans was non-performing, and its provisions for bad debt grossly insufficient. It also had a poor record of providing customer service, poor staff morale due to bad pay and benefits, and inadequate accounting, information and management systems.

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125 Malkamaki, Markku, Agricultural Survey in "Rural Informal Financial Markets in Tanzania", February 1992.

126 ADIS, Volume I, pp 67 and 68.

The Cooperative and Rural Development Bank was established in 1971 to provide banking services to the cooperative and rural sectors. It has 15 regional offices 17 branches and a total staff of about 1,300. The bank mainly provides lending for seasonal inputs, farm mechanization, livestock, rural transport, fisheries and other rural activities. Since 1987 it has also provided limited financing to cooperatives for crop purchases. It share capital is held by Government (67 percent), BOT (25 percent) and cooperative unions (seven percent).

CRDB's portfolio increased steadily until reaching 1.5 billion in 1990. The largest share of loans went to rural transport, followed by farm machinery, small scale industries, livestock and seasonal inputs. Unlike NBC, nearly 50 percent of CRDB's lending was to individuals, with the remaining borrowers mainly coming from the cooperative and parastatal sector. CRDB has been plagued by the same problems as NBC in managing its portfolio; by 1990 nearly two thirds was considered irrecoverable. CRDBs has given considerable emphasis to deposit mobilization but the volume of its deposits remains modest, requiring CRDB to depend heavily on borrowing from BOT and support from donors. IDA is channeling support through CRDB for two lending initiatives. The largest is a $26.7 million line of credit for projects intended to increase agricultural exports. The line of credit was approved in 1988 and will be disbursed over an eight-year period. Some 34 projects valued at $18.9 million have been appraised and 26 projects totalling $14.5 million have been approved. Most of the borrowers are in sisal, tea, and non-traditional exports including high-value vegetables, flowers for essential oils, and prawn farming. The other credit line is a $2.2 million line to test alternative lending mechanisms for smallholders. Some of the credit line was channeled to private stockists in Iringa to enable to stock inputs for distribution to farmers. Financing was also provided for a line of credit to individual farmers under close supervision from CRDB staff. The results were mixed, with loans to 240 cashew nut farmers yielding an 85 percent on-time repayment rate. But similar lending in two other instances only yielded repayment rates of 30 percent. The third mechanism tested under this credit line was to lend through informal farmers groups. Members of the groups were jointly and severally liable for the loans of all members and in some instances guaranteed by the village government or the local cooperative societies. In all some Tsh 65 million was advanced to the groups largely for seasonal inputs and were fully repaid by the end of the season. These results have encouraged the project staff to extend the program in other areas.

Tanzania Postal Bank (TPB) was recently established to succeed the former Post Office Savings Bank. Unlike the former institution, TPB is empowered to undertake lending activities as well as mobilize deposits. TPB will continue to operate out of 191 post offices throughout Tanzania and is initially concentrating on building the deposit base, which totals over Tsh 5 billion from a number of different saving schemes.

Smallholder Lending Initiatives

Smallholder access to formal lending mechanisms through the existing financial institutions is limited by the high transactions costs associated with lending small amounts to a large number of smallholders, and by the lack of collateral such as land. However, a number of initiatives (including the IDA-financed one described above) are now underway to test mechanisms for providing formal credit directly to smallholders. In terms of coverage the largest initiative is the Rural Credit and Savings Schemes. There are some 444 cooperative rural savings and credit schemes operating mostly in Arusha, Kilimanjaro, Mbeya and Iringa. They have a total membership of over 78,000 and aggregate savings of Tsh 292 million with outstanding loans of Tsh 69 million. The schemes are run by primary co-operative societies (PCS) which operate savings accounts for society members. The PCS's open a Group Savings Account on behalf of the scheme members with either CRDB or NBC. Each member is given a passbook where deposits or debits are recorded. For societies that also market farmers' crops, payments for crop sales are credited in the passbook instead of being made in cash. Although the schemes have made good progress in mobilizing savings, they are just beginning to gain experience in loan administration. Scheme

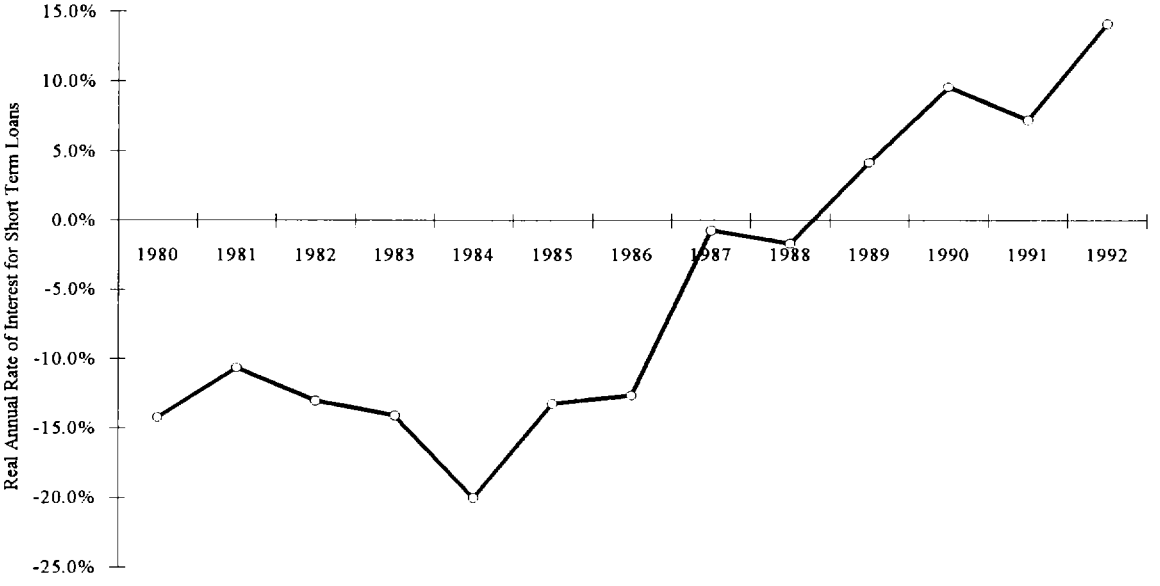
account holders who wish to borrow from the scheme are required to complete a loan application which is signed by two guarantors and evaluated by a credit committee. Limits on borrowing are set at twice the amount on deposit and loan supervision is undertaken by the credit committee.

A number of other schemes employ group lending methodologies and mechanisms for savings mobilization to reach smallholders. One scheme, PRIDE (Promotion of Rural Initiatives and Development Enterprises), operated by an NGO, is just beginning operation in Tanzania with plans for the establishment of three branches in the first two years of operation. Each PRIDE branch will extend short-term loans (repayable over 50 weeks) to clients who are self-employed or operate small enterprises in the informal sector. It is intended that about half of the borrowers will be women. To qualify for loans, clients must contribute to a Loan Insurance fund which is intended to cover bad debt and also serves as a mandatory savings scheme. Participants in the scheme are expected to "graduate" to become clients of the formal banking sector in three to five years. At full development after five years, a country-wide network of 20 PRIDE branches is envisaged serving a potential client base of 20,000 small-scale enterprises. Several similar schemes, including some that are aimed exclusively at women, are supported by ILO, UNICEF, UNDP and several bilateral donors but the coverage is small with only several hundred participants. Responsibility for these schemes lies with the Ministry of Community Development, Women and Children. The BOT is also supporting a pilot initiative to establish three "Rural Community Banks" in Kilimanjaro and Arusha regions. The banks are intended to mobilize resources in rural areas and will raise their capital base from equity contributions from local individuals and institutions. The Banks, once established, would engage in lending based on the group methodologies currently being tested by others. BOT intends to initially offer organizational and possibly financial assistance, but the intention is to make the banks viable, self-standing institution.

The Financial Sector Crisis

The formal financial sector above is only now beginning to emerge from a major crisis which essentially rendered the banking system insolvent. At root of the crisis was the system of crop marketing that required the banks, at Government direction, to lend to undercapitalized and inefficient marketing monopolies (the marketing boards and cooperatives). The result was accumulated arrears on crop marketing overdrafts that totalled over Tsh 66 billion ($300 million, equivalent to 18 percent of agriculture GDP) by the end of 1991, of which about 45 percent was over two years old. With such a high proportion of their portfolios non-performing and lagging deposit mobilization, the banks were increasingly forced to borrow from BOT to finance crop buying and input distribution. In 1989 the Government established A Presidential Commission on Banking Reform to evaluate the troubled sector and develop a reform program. On top of the financial system's troubled development during the 1980s, ceilings on lending and deposit rates held them well below inflation, decapitalizing banks and savers.

Figure 3.14: Real Lending Rates of Interest for Agriculture at Commercial Banks.



The Banking Reforms. In 1991 the work of the commission resulted a new Government Policy being issued for the financial sector, as well as a revised Banking and Financial Institutions Act which laid the basis for the reform program. The existing commercial banks were to become strictly autonomous institutions operating solely on the basis of commercial criteria and with no interference from Government. The banks would be assisted by Government to restructure their balance sheets through the transfer of irrecoverable debt to a Loans and Assets Recovery Trust (LART), while provisioning for other doubtful debts and recapitalization. The Banks were also to streamline their operations and improve performance to qualify for banking licenses under new and more stringent licensing requirements. The bank licensing regulations also allowed for private banks to re-enter Tanzania in competition with the existing Government-owned banks. BOT supervision and regulatory functions were also to be strengthened through new prudential regulations (provisioning requirements, capital adequacy regulation, loan limits, etc) and institutional strengthening. Interest rates were deregulated with only a discount rate for borrowing by commercial banks from BOT, and the maximum lending rate fixed by Government. Twelve-month deposit rates had to be positive in real terms. In addition, strict limits have been placed on access by the banks to the BOT's discount window.

Considerable progress has been made in the reform program. The recapitalization process for NBC and CRDB is well underway and both banks have begun institutional restructuring. Lending patterns over the last two years suggests that the banks do have greater autonomy in making loans. Licenses have been granted to Standard Charter Bank and Meridien Bank, both of which were operational in mid 1993. BOT is in the process of strengthening its Banking Supervision Directorate and reviewing the Central Banking Act. It has drafted nearly all prudential guidelines. Lending rates of interest were completely liberalized in mid 1993.

The Government banks face the dilemma of being directed to operate solely on commercial criteria, yet their major client base remains largely uncreditworthy cooperatives which retain market monopolies for the main export crops. The banks have responded by establishing strict procedures for approving and supervising credit lines extended to the cooperatives. For instance, banks now have agreements with the cotton, coffee and cashew unions setting the prices to be paid to farmers, and establishing a system of stock verification prior to disbursement, which delays payment to the farmer. As competition increases amongst

entities seeking to purchase, process and export these primary commodities, this price-setting behaviour by the banking system will gradually become ineffective, to the benefit of the farmer.

The Future of Rural Financial Markets

The banking crisis of the last few years and the current banking and agricultural marketing reforms provide the Government of Tanzania with a unique opportunity to reshape the rural financial system. The restructuring of the banks, coupled with ongoing reforms in marketing and the cooperative sector should lead to a more sustainable and efficient financing system over the next five to seven years.

It is envisaged that a multi-channel system of autonomous institutions responding to commercial opportunities in different market niches will evelove out of the current reform process.. Key elements of the formal system would include the commercial banks (both existing banks and private sector entries to the system), non-bank financial institutions, and special initiatives to finance smallholder investment directly. The informal sector would also be expected to play an important role in financing investments by the smallholder sector.

Commercial Banks will continue to be a major source of financing for crop purchases and input distribution, though the client base should gradually diversify as market reforms are implemented which encourage private traders to compete with the cooperatives. However, the amounts required to finance a diversified client base may actually decline as much of the activities by private trade may be self-financed. The reforms in grain trade over the last four years is instructive. Private merchants have completely taken over the role of the National Milling Corporation (NMC) in the internal distribution of grain crops. Yet no overdrafts have yet been provided to private traders to finance crop purchases by the banks, compared to the Tsh 3-5 billion required annually by NMC to finance purchases prior to 1990.

NBC and CRDB already have an extensive branch network and the entrance of competing private banks should gradually expand the level and type of banking services available in the rural areas. Aside from short-term finance for crop purchases and input distribution, trade credit for rural shopkeepers and wholesalers will form part of the services provided by the commercial banks. Another important service would be rural enterprise loans to finance investment of any kind by rural entrepreneurs in regional and larger district towns. Although this type of finance is not necessarily directed to smallholder agriculture, it would help stimulate the rural economy through employment generation, increased demand for food and other agricultural production and the provision of consumer goods. Term finance directly for larger agroprocessors or the estate sector would also form part of the commercial bank's loan portfolio.

The types of lending envisaged for the commercial banks in the rural area is not different from what is already mandated. But directed lending to the parastatal and cooperative sectors has squeezed out other borrowers. Successful cooperative, marketing and parastatal reform should begin to free resources enabling the commercial banks to finance a wider range of rural investments with higher rates of return. Aside from lending activities, the rural branches of commercial banks would continue to be a major source of resource mobilization through their deposit facilities.

Commercial banks will be a source of term finance, but other non-bank financial institutions are expected to play a role in financing term investments for larger farms, agroprocessors and other rural-based businesses. With the liberalization of the financial sector and the gradual development of capital markets, venture capital companies, investment banks, and securities market will develop to help meet the need for investment financing. Donor-supported institutions such as IFC, EIB, CDC, FMO and others will begin to play a more active role as investment opportunities grow in an expanding economy.

A major concern of policy makers is the provision of financial services, particularly credit, directly to smallholders. Traditionally the formal sector has provided financing to the smallholder through the

financing of crop purchases and input distribution, largely via the cooperatives. When the system works well farmers are paid for their crops in full and on delivery so they have the cash needed for household and school expenses as well as finance for the next crop year. But the system has rarely worked well in the past. Farmers often receive payments late and are paid prices that are only a fraction of world market prices. With up to 65 percent of smallholders relying on their own resources, such market failures have a negative impact on farmers ability and incentives to invest in expanded production. Thus marketing and cooperative reforms are required to proceed in parallel with the banking reforms.

Increased medium- and long-term financing directed at rural enterprises should have spin-off effects for the smallholder sector through the creation of demand for agricultural products and better employment opportunities. Heightened economic activity and improved liquidity should increase the resources available to the informal sector for lending to support smallholder agriculture. In addition, efforts supported by NGO's and donors to lend directly to smallholders should be encouraged. Initiatives such as the Pride International project and schemes supported by UNICEF and other donors show promise. These schemes should emphasize:

- the formation of groups to guarantee loans to group members;
- payment of market rates for deposits, to mobilize savings by members of the groups;
- making loans at rates of interest which cover operating costs and costs of funds; and
- careful supervision and follow-up of loans.

While such initiatives are promising, it should be remembered that they are costly to administer and as such are unlikely to form a significant proportion of commercial banking activity in rural areas. Nevertheless, such schemes supported by NGO's and donors can fill an important niche in providing smallholders access to financing for expanded on-farm activities or income generating activities.

Actions Required. Continued Macro-Economic Reform: Continued efforts by Government to reduce budget deficits, and control rates of inflation are essential preconditions for development of the financial system. Recent liberalization of interest rates will also help in this regard. Further reforms are envisaged aimed at making the commercial banks more independent from the BOT and requiring them to rely more heavily on deposit mobilization and loan recoveries as their source of financing. Refinancing from the BOT will be limited to the provision of short-term liquidity . BOT will set indicative quarterly ceilings on the use of the discount window by the commercial banks in line with monetary targets and it will rely increasingly on the discount rate as the primary tool of interest rate policy.

Banking Sector Reform Restructuring of the existing banks must be completed so that they are better placed to serve rural areas and face the competition from new entrants into the sector. Of particular importance is completion of institutional reforms, and decisions on the future ownership and structure of the banking system. The start of operations by Standard Charter and Meridien Bank will put needed dynamism and competition into the sector.

Marketing and Cooperative Reform must be accelerated so that the Bank's client base becomes more commercially oriented and creditworthy. The financial system can play a role in facilitating competition in a multichannel export processing industry by providing financing for investment in new processing facilities, as well as the traditional crop finance. The private trade is likely to make more use of self-generated working capital, thereby lowering the overall overdraft requirement from the banks. Nevertheless, private traders will need access to financing as production increases and new instruments may be required to secure that financing. One possibility would be to use warrants issued against stocks held in bonded warehouses to secure such financing.

Strengthened Rural Lending Capacity. As the commercial banking sector is restructured there will be a need to strengthen the capacity to lend for rural-based savings mobilization and investment. The skills needed to identify, prepare, appraise and supervise investments are lacking and specific training in these skills will be required. Also, the provision of donor funding to help finance detailed studies of markets, production techniques and project administration could be a means of building a pipeline of "bankable" projects. Continued donor assistance to provide finance and technical asssistance in the formation of rural financial institutions, or to fund medium term credit lines for rural investment can be justified. The development of new rural financial institutions will require a concomitant strengthening of the Bank of Tanzania's prudential supervision and monitoring functions. As the rural financial network develops, steps can be taken to improve the payment and fund transfer mechanisms across regions. Given the sizable spin-off effects of many types of rural investments minimum restrictions should be placed on the types of investments that can be financed. Government could also study ways to provide assistance, or remove obstacles, to the development of informal credit markets. One experience of potential relevance to Tanzania is that of the Bank Rakyat Indonesia. This Indonesian bank does a profitable business making very large numbers of small and medium loans to rural enterprises in villages and rural areas. It started life as a development bank, with a wide network of rural branches, and a non-performing portfolio. By changing its product to providing savings and lending instruments of very small and medium size at (or above) commercial interest rates, this rural Indonesian bank has built up a profitable business with thousands of customers. Lending is self financed, from savings deposits. With the appropriate leadership and support, it may be possible (over an extended period) to transform a Government-owned financial institution into such a rural-oriented, small-scale enterprise bank.

Support for Group Lending Opportunities. Initiatives currently being tested by NGOs to deliver credit and other banking services to the small farmers and rural enterprises should be encouraged. While the financial requirements of this group is small and mostly met from own income or informal markets, there is a role for more formal financial services.

Adjustments in the legal system to improve the efficacy and lower the cost of enforcement of contractual arrangements and provide greater security of assets would also make rural lending easier.

E. Rural Infrastructure[127]

Tanzania has a road network of 88,000 km. Of these roads, about 10,300 are trunk roads, 17,730 are regional and 32,000 km are district roads. The remainder are unclassified. Details are given below:

Table 3.7: Characteristics of Tanzania's Road Network

Surface Type	Trunk	Regional	Total
Asphalt concrete	1,036	7	1,043
Surface dressed	2,216	90	2,306
Gravel	2,645	6,665	9,310
Earth	4,384	10,968	15,352
TOTAL	10,281	17,730	28,011

Source: World Bank

127 Drawn from World Bank Report No. 12536-TA, Staff Appraisal Report, "Second Integrated Roads Project", March 17, 1994. pp 18-26.

The road network can be best described in terms of traffic corridors connecting major urban areas, ports, border crossings, and regions of high agricultural production. These are shown below:

Table 3.8: Transport Corridors and Traffic Levels.

Corridor	Km	AADT[128]
Tanzania-Zambia (Dar-Mbeya-Tunduma)	989	up to 1,500
Northeast (Dar-Tanga-Moshi-Kenya)	672	up to 1,500
Central (Dar-Dodoma-Nzaga-Burundi/Rwanda)	1,076	up to 400
Lake Circuit	809	up to 200
Southern Coastal (Dar-Mtwara)	454	up to 400
Southern (Mtwara-Songea)	850	up to 100
Western	4,042	up to 50
Great North	773	up to 50
Mid-West	746	up to 50

Source: World Bank

It can be seen that the East-West corridors, the ones through which food supplies for urban Dar es Salaam are shipped (Tanzania-Zambia corridor) or through which cash crops are exported (Northeast corridor) are those with most traffic. The traffic on north-south corridors is minimal. And traffic in the South is low, reflecting the low level of development in the region, and possibly access to the seaport at Mtwara.

The density of the 17,700 km regional road network is provided in Table 2.22. The density of regional roads, per hectare of high potential agricultural land, varies tremendously across the country, and is associated roughly with the level of rural income per capita (and hence the level of development). Densities go from 0.90 - to 1.10 km per ha of good land in Rukwa, Ruvuma, Iringa, and Morogoro to 6.00 to 10 km per ha in Kilimanjaro, Tanga, Singida. The ratio in rural Dar es Salaam is of course much higher. Recent studies by USAID and the Government on the effects of the rehabilitation of the Kwa Sadala-Mbweera rural road in Kilimanjaro region indicate a internal rate of return of 30 to 40 percent on the investment in roads, resulting from the increased traffic, reduced transport costs, improved access to agricultural inputs and better prices of agricultural output.[129]

Little maintenance work was undertaken on the road network during the 1970s and 1980s, and road surface quality deteriorated significantly. Since the initiation of the Economic Recovery Program in 1986 Government and Donors have worked together to rebuild the road network. It was estimated that only about 15 percent of the trunk and 10 percent of the rural roads were in good condition at the start of the Integrated Roads Program in 1990. As a result of efforts financed under this program, in two and a half years the proportion of trunk roads in good condition has more than doubled to over 30 percent. Also, the proportion of rural roads in good repair has been raised to 15 percent, an increase of 50 percent.

Development strategy for the roads sector envisions:

- Real increases in public expenditure for roads, with a target of 20-25 percent of total public expenditure. This is close to being achieved, and expenditure on roads is now between 15 and 20 percent of total public expenditure (1992/93).

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128 A measure of vehicle traffic per period.

129 Ibid., p.3.

- Road works were to focus on rehabilitation and upgrading of priority trunk and rural roads essential for evacuation of agricultural products, or ports for export.

This strategy will be continued, with a gradual shift towards roads supporting tourism, mining and other significant economic activities. Within the Ministry of Works, the priorities for investment in roads are: (i) completing rehabilitation of the strategic corridors; (ii) ensuring connectivity between different levels of the network; (iii) carrying out spot improvements in order to remove transportation bottlenecks on lower priority routes; (iv) rehabilitation to minimum standards road sections with low rates of return, but strategic importance in the supply of food deficit regions. These objectives are to receive additional financial support under a donor (and IDA) funded Second Integrated Roads Program, appraised in July 1993. Under this program, a special component will address village transport and travel constraints, on a pilot basis, using different types of appropriate technology.

Due to its overwhelming impact on rural life and agricultural development possibilities, Ministry of Works planning of rural road rehabilitation and improvement programs should be closely linked to Ministry of Agriculture plans for promotion of production or development. Road construction or improvement should reflect agricultural potential, as well as the need to protect reserved areas from encroachment, and reduce the influx of population to regions of low potential and susceptibility to soil degradation.

F. Summary

This chapter reviews the status of the institutions, public and private, which support agricultural intensification. It is shown that the dominance of the state-owned parastatals in the provision of fertilizer and other inputs which characterized the early 1980s has changed. Parastatal production and trade organizations still control the agricultural inputs markets, but their influence is declining. Their access to budgetary support has been sharply reduced, and their limited ability to compete with private sector enterprises is forcing a reduction in their importance. However, the fertilizer market, the small tool industry (hoes, pangas, axes, ploughs), the veterinary drugs market, and the agrochemicals market still retain a large Government presence. A key issue in this as in all markets dominated by parastatals, is the management of the transition to a more pluralistic, diffused market structure, where private sector enterprises and cooperatives can compete.

The theme of a measured reduction in Government influence is echoed in the cooperative sector. Here a reform movement under the new Cooperative Act of 1991 has led to a democratic reassessment of the viability of the country's 4,800 primary societies, and their consolidation into a much reduced set of entities, which have a chance for competitive survival. This process of restructuring and reassessment has still to be extended to the cooperative unions.

The financial sector is still dominated by the two Government owned banks, both of them in the process of redefinition and restructuring. The effect of competition from two private sector entrants is only gradually being felt. These more sophisticated institutions have still to adjust to the more demanding requirements of a market economy, and it is likely to take a few years before the improved efficiency of financial institutions is felt in the rural areas. However, the freeing of interest rates has generated increased financial savings, and the opening of the foreign exchange market has increased the alternative sources of funds available to investors. In both the inputs supply and financial markets, as Government's position as a participant winds down, its role as regulator should be greatly strengthened. There is a vital need for close prudential supervision if large-scale misappropriation of funds in the financial sector is to be avoided. Similarly, there is a need to closely monitor the agrochemicals sanctioned for use in the country, to prevent irreparable damage to the environment and human life.

IV. SOURCES OF GROWTH

Tanzania is still far from the production levels in agriculture which are possible with existing technology and available resources. A series of reforms in the structure of cash crop marketing and processing systems, and in the pricing of key factors (such as foreign exchange), will induce growth as costs are lowered and returns from expanding into existing domestic and international markets increase. The possibilities for expansion into various markets for agricultural produce (both foreign and domestic) are explored below. The effects to date of the economic reform program on the agricultural sector are also explored, setting the stage for the recommendations for policy change presented in Chapter V.

Technological advancement must also form part of the growth strategy for the agricultural sector. Productivity levels, while increasing rapidly for the rural population, are still very low by international and African standards, and low compared to what they could be in the areas of good agricultural potential. The recent pace of technological change is also reviewed to help define its role in the sectoral development strategy.

A. Market Prospects for Tanzania's Agricultural Produce

International Markets and Prospects for Traditional Agricultural Exports

Tanzania still relies on traditional export markets for 45 to 50 percent of export revenue. While their share in total export revenue has declined from highs of 70 percent in the mid-1980s, exports of coffee, cotton, tea, cashewnuts, and to a lesser extent tobacco, sisal and pyrethrum, still play an important role. Tanzania faces a problem common to most countries in sub-Saharan Africa. Income terms of trade for the nine major traditional commodity exports have declined at an avert rate of 4.2 percent per annum between 1975 and 1990. Over the past three years, prices for these commodities have remained lower than they have been in any similar period during the last thirty years. Prospects for price increases are not that good. In no case does the forecast for 2000 show prices returning to the levels of the 1970s. How much importance should Tanzania give to increasing production for commodities facing inelastic world demand, and a secular deterioration in world prices?

More background on the international market situation is necessary to answer these questions. International prices for coffee, cotton and tea, have dropped considerably since the 1970s and 1980s, as the figure below indicates. Coffee and cotton prices are below 50 percent of what they were in 1980, in real terms. Projections of price trends in the short term (1995) and the medium term (2000) show some improvement, but in no case do they return to their previous real values. The decline in prices is a function of growth in production at a rate which exceeds that of world demand. High productivity competitors in East Asia and Latin America have undercut and taken market share away from African producers such as Tanzania. Sub-Saharan African countries, with some exceptions,[130] have only recently responded to this competitive challenge. Through the mid-1980s they taxed their traditional export crops severely. Recent studies estimate the taxation of agricultural exports in sub-Saharan Africa at 50 percent between 1960 and 1984, a little more than half of it from indirect measures such as overvalued exchange rates, and somewhat

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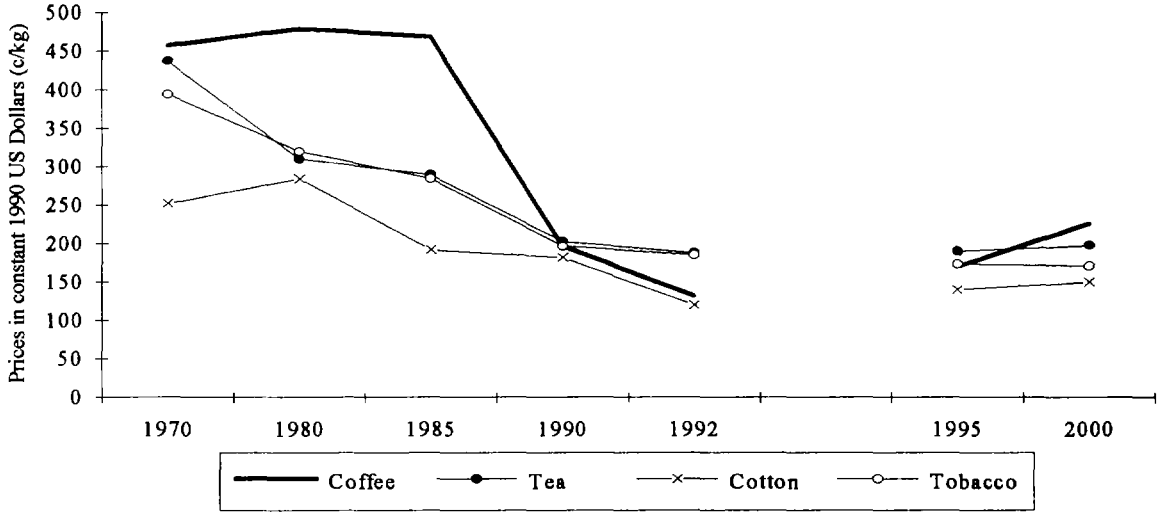
130 See Kevin Cleaver, "A Strategy to Develop Agriculture in Sub Saharan Africa and a Focus for the World Bank", World Bank Technical Paper No. 203, pp 37-39.

less than half from direct measures such as price controls, and direct taxes.[131] Levels of taxation have diminished substantially since the mid-1980s, however, as African governments started to respond to the loss in export market share,[132] devaluing currencies and raising or freeing producer prices.

Figure 4.1: Recent and Projected Real International Prices for the Principal Tanzanian Exports (in 1990 USc/kg, Deflated Using the G-5 MUV)



A recent paper explores the world market for the nine major traditional sub-Saharan Africa agricultural exports, including those that are important to Tanzania.[133] The paper addresses the so called "adding up" problem, or "fallacy of composition" that arises because of the alleged effect of price inelastic demand on export revenue. If all sub-Saharan African countries strive to increase output and market share in the same few commodities, the result will be severe price drops, lowered net revenues and "immiserizing growth".[134] If this were indeed true, then the policy for sub-Saharan Africa should be to restrict exports, and capture a revenue increase. To evaluate this effect, the paper argues, the correct measure is the elasticity of export revenue to export volume. If this is positive, increasing export volumes will increase revenues, although less than proportionately in most cases.[135]

For Africa as a whole, the results do indicate a serious "adding up" problem for cocoa, and less serious ones for coffee, sisal, tea and tobacco. Even in these cases, however, "it is profitable to increase production for these commodities so long as the production cost of the additional output

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131 Krueger, A.O., Schiff, M., Valdes, A., "The Political Economy of Agricultural Pricing Policy - Africa and the Mediterranean", Johns Hopkins, 1991, p.11.

132 Jaeger, W.K., "The Effects of Economic Policies on African Agriculture", World Bank Discussion Paper 147, 1992, p.8.

133 Akiyama, Takamasa, and Larson, Donald F., "Adding Up Problem - Strategies for Primary Commodity Exports in Sub-Saharan Africa," Draft, April 1, 1993. The nine exports are coffee, cotton, tea, tobacco, sugar, sisal, vegetable oils, oranges, pineapples, cocoa.

134 Bhagwati, J., "Immiserizing Growth: A Geometrical Note", Review of Economic Studies, 25, June 1988, pp 201-205.

135 The elasticity of export revenue to export volume is a function of a country's market share, the price elasticity of world demand, and the price elasticity of world supply. A value of 1 indicates that international prices are not affected at all, because the country's market share is so low. A negative value means that total revenue drops, as volume increases.

is less than about 80 percent of the world price."[136] This has serious implications for policies to increase export volume. Subsidization of producers is clearly not sustainable. The export sector must serve as a source, not a sink, for the country's investible surplus. Area expansion is also not appropriate, unless new areas are considerably more fertile and productive than the old, thus reducing marginal production costs. Clearly, output should be increased through technological change. There must be a strong effort to increase farm level productivity through: (i) improved agricultural research into higher yielding, disease-resistant varieties; (ii) improved supplies of agricultural inputs and implements; and (iii) better extension services to improve the application of research results and of appropriate agrochemical inputs and implements.

Calculations of this coefficient for Tanzania's key exports (Table 4.1 below) indicate that it does not face an "adding up" problem, and that expansion in export volume, if done appropriately, will result in increased revenues.

Table 4.1: Tanzania's Share of World Production, and Export Revenue Elasticity

	Share of World Production	Elasticity of Revenue as Export Volume Increases.
Coffee	0.9	0.99
Cotton	0.4	0.99
Tobacco	0.2	1.00
Tea	1.0	0.98

In addition to an expansionary policy based on productivity increases, other policies which are recommended include:[137]

- maintaining a market exchange rate to provide healthy incentives for growth of the export sector;
- keeping export taxes low (except in the case of those countries with "adding up" problems) will improve the long-term productivity of the export sector. Government should be induced to look elsewhere for tax revenue;
- improving the efficiency of export crop processing and marketing services;
- removing Government intervention in the fixing of farmgate export crop prices.

The paper also strongly supports diversification because, as was noted previously, the prospects for traditional export commodities are not good. But the shift into the new markets, especially for high value produce such as vegetables, fruit or flowers, is not easy nor quick, especially for countries in sub-Saharan Africa where infrastructure is poor, communications are difficult and financial markets are thin.

The "adding up" problem does not appear to hold for the nontraditional agricultural exports as well. The paper reviews the elasticity of export revenue with respect to supply for sub-Saharan Africa, for vegetable oils, oranges, pineapples and sugar, all of which are greater than

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136 Akiyama and Larson, op.cit., p. 26. The long-term export revenue elasticity of supply for cocoa is 0.33 (based on subSaharan Africa's production share), whereas for coffee it is 0.80, for tea 0.83 and for cotton and tobacco, 0.95.

137 Ibid. pp 45-46.

0.95. In the long term, based on shares in world production, sub-Saharan African producers do not seem to face a market constraint. [138]

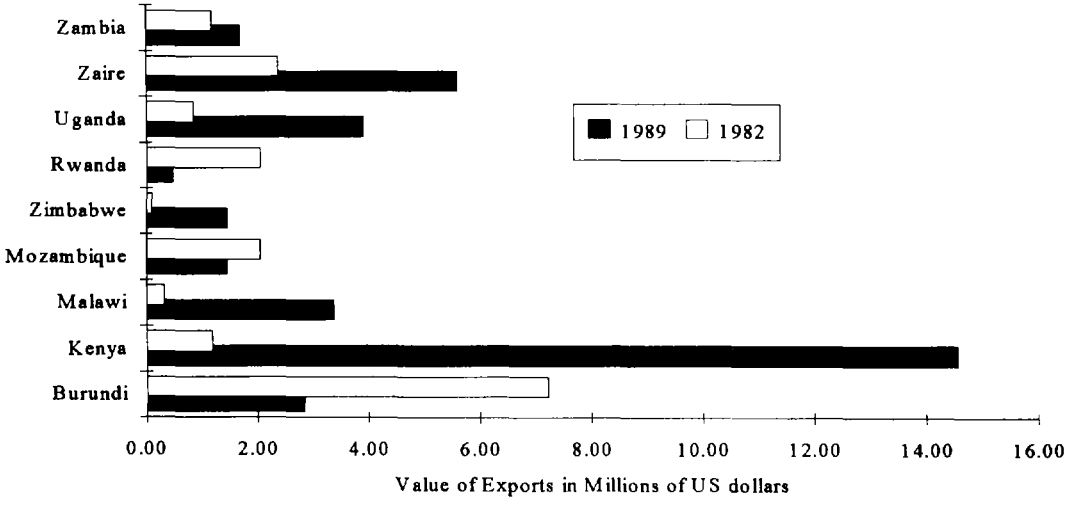
Tanzania has started to implement an export promotion policy based on these principles. It has the potential for being a low-cost producer in most of the traditional commodity markets it competes in. Transport costs, while high, can be brought down and the country has its own ports, and hence controls its own export routes, unlike the landlocked countries to the west. At the same time, efforts to develop new, nontraditional agricultural exports have been fairly successful over the past few years.

Regional Markets

For many of the countries in Central Africa, access to the sea is via Tanzania. Some of these countries, on occasion, suffer from shortages of food. Malawi, Rwanda, and Burundi, for example, have exhausted their high-potential land. With rapidly increasing populations, they are chronically food deficit countries. Tanzania, due to the wide geographic spread of its productive areas, and the variety of its agro-ecological climates, rarely suffers a drought across the whole country. It could make better use of food production in its southwestern regions by servicing the markets of the countries on its western border. From the Southern Highlands regions, Tanzania could produce and supply maize and other food to Malawi or Burundi considerably more cheaply than imports through Dar es Salaam or Tanga. This policy would help maintain the maize market for those producers, far from Dar es Salaam, who will be most affected by the reduction in fertilizer subsidies and pan-territorial input pricing.

Trade with Tanzania's neighbors has been growing rapidly. While food is an obvious candidate for trade, other commodities are also being sold. The rapid increase in the value of exports of domestic products (as opposed to re-exports of transit goods) to these countries can be seen from the figure below. Tanzania maintains a net trade surplus with all the countries listed below with the exception of Kenya, a favored trading partner. Exports to Kenya, were about 50 percent of imports in 1989. Further expansion should continue to be explored, and trade policy should be adjusted to take advantage of these markets.

Figure 4.2: Growth in Regional Trade 1982 to 1989 in Millions of Nominal US dollars



138 Ibid., p. 26.

Domestic Markets

The domestic market absorbs all but 10 percent of Tanzania's agricultural output. About one-third of total food consumption is produced on the family farm. The ratio is 42 percent for rural families, and 18 percent for urban.[139] The prospects for growth in this market are good. GDP growth has averaged 3.8 percent per annum since 1986, and GDP should continue to grow rapidly under the impetus of continued adjustment in the agricultural export and manufacturing sectors. The income elasticity of demand for food is estimated to be between 0.95 and 1.05 for a low-income country such as Tanzania.[140] With population growing at a minimum of 2.8 percent per annum,[141] and per capita income growth at 1.0 percent per annum, the overall demand for food can be expected to increase at between 2.5 and 3.0 percent per year. This is the rate at which supply would also have to grow, to keep relative prices even. The long-term trend growth in agriculture GDP (1966- 991) has been about 2.65 percent per annum.

The demand for livestock products, while quite weak at present, should increase more rapidly than the demand for cereals and staple foods. The income elasticity of demand for livestock products is normally well above 1 and possibly as high as 3, [142] which will provide a needed boost to the dairy, beef and poultry industry.

The domestic economy also absorbs agricultural raw materials. Purchases of cotton lint by the local textile industry have been between 10,000 and 16,000 metric tons during the 1980s, and can be expected to increase as the demand for cotton goods increases with income growth. Tobacco is another domestically consumed agricultural raw material. About 5,000 tons of processed tobacco are absorbed annually by the local market, between 30 and 40 percent of the crop.

B. Diversification and Expansion of Exports

This section reviews each of the export crops, assesses current problems, and proposes specific measures for addressing the constraints and increasing output. First the competitiveness of Tanzania's agriculture in international markets is reviewed by assessing the returns to different crops across the board, prior to entering into an assessment by subsector.

Comparative Advantage and Export Competitiveness

An assessment of the competitiveness of Tanzania's exports using domestic resource cost methods, shows that, at border (or "economic") prices, with distortions in the exchange rate and in the domestic economy removed, all of the current set of export crops are potentially profitable (i.e.

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139 Poverty Profile, Table 2.1.

140 Harold Alderman, "The Effects of Food Price and Income Changes on the Acquisition of Food by Low Income Households", IFPRI, Washington D.C., May 1986, p.38. Estimates in Sarris, A.H. and van den Brink. R., "Economic Policy and Household Welfare during Crisis and Adjustment in Tanzania", Cornell University Food and Nutrition Policy Program, 1993 (forthcoming), p.178 have rural expenditure elasticity of demand for food at 0.97 for the rural population.

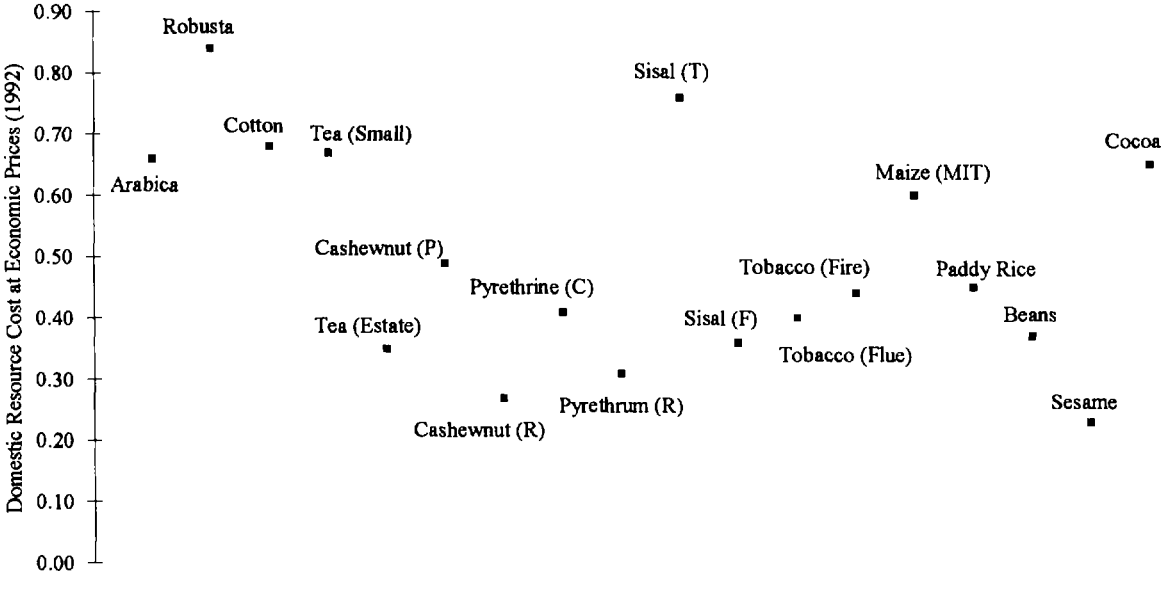
141 The intercensal growth rate: 1978 - 1988.

142 Joachim von Braun, Hartwig de Haen, and Juergen Blanken, "Commercialization of Agriculture Under Population Pressure: Effects on Production, Consumption and Nutrition in Rwanda", IFPRI, Research Report 85, 1991, p.66.

all of the DRC ratios are less than 1).[143] The evaluation assumes, however, current yield levels and processing costs and margins. As the figure below indicates, Tanzania's two most important crops, coffee and cotton, are competitive at the market rate of exchange, but not by much. Improvements in productivity at both farm and processing level will be needed to bring the competitive advantage into a more reliably profitable range.

The figure also indicates the differences in international attractiveness of processed versus unprocessed products. For sisal and pyrethrum, the processed product is significantly more profitable than the raw material. In the case of cashewnuts, however, the reverse is true. This is due to the inefficiency and underutilized capacity in Tanzania's cashew nut factories, which cannot compete with their Indian counterparts. Sesame, one of the fastest growing nontraditional exports, is extremely profitable, at non-distorted prices.

Figure 4.3: Domestic Resource Cost Ratio at Economic Prices[144]



The table below indicates the effect of the current set of distortions in agricultural prices on the profitability of different subsectors. The main distortion is in the exchange rate applied to agricultural exports. Financial DRC's are calculated at the official exchange rate, and market

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143 Domestic resource cost analysis compares the net returns to domestic factors of production valued in foreign exchange--after the cost of imports has been deducted--to their domestic "scarcity value." The DRC ratio is the scarcity value of domestic factors of production divided by the foreign returns to these factors--both in domestic prices. The ratio's size depends on the exchange rate used. The analysis discussed above was done used "economic" prices and exchange rates, with distortions removed, to establish a benchmark. The lower the DRC ratio, the more competitive a country's exports. An "economic" DRC ratio of one or less means that--at the market exchange rate--the product can compete effectively on the world market.

144 The letters in brackets alongside the crop name mean: Sisal (T): rough fibre, (F) finished twine; Pyrethrum (C): crude, (R): refined; Cashewnuts (P): processed, (R): raw; Maize (MIT): medium input technology; Coffee (A): arabica, (R): Robusta.

prices and costs as currently observed. They reflect the returns to local resources of producing a unit of foreign exchange. Clearly coffee, cotton and smallholder tea (all processed by cooperative unions or parastatals) are loss makers for those in the production chain, at the current rate of exchange. The loss may be invisible in some cases, as it is borne at the farm level with family labor receiving less than their opportunity wage for their efforts.

The most important aspect of the calculations shown below is the **relative position** of various crops. Robusta coffee, for example, is at the bottom of the profitability ranking. The difference in the returns between raw sisal fiber (a loss making export) and spun sisal cord, can be noted. The relative profitability is due to the sharp difference in the international prices for the two products. Better use could be made of idle sisal spinning capacity which is in the hands of the sisal parastatal. Sesame, even at financial prices, is in a highly attractive position.

Table 4.2: Domestic Resource Cost Ratio for Key Crops

	Financial DRC Ratio	Ranking	Economic DRC Ratio	Ranking
Coffee(A)	1.15	15	0.66	14
Coffee(R)	1.51	18	0.84	18
Cotton	1.28	17	0.68	16
Tea (Growers)	1.20	16	0.67	15
Tea(Estate)	0.53	3	0.35	4
Cashew nut (P)	0.94	12	0.49	11
Cashewnuts(R)	0.50	2	0.27	2
Pyrethrine(C)	0.81	10	0.41	8
Pyrethrine(R)	0.60	6	0.31	3
Sisal(T)	1.15	14	0.76	17
Sisal(F)	0.56	4	0.36	5
Tobacco(Flue)	0.69	7	0.40	7
Tobacco(Fire)	0.78	9	0.44	9
Maize(MIT)	0.95	13	0.60	12
Paddy(rice)	0.77	8	0.45	10
Beans	0.59	5	0.37	6
Sesame	0.42	1	0.23	1
Cocoa	0.91	11	0.65	13

Crop Returns

The total returns to labor in the cultivation of various important crops is shown below.[145] The going wage in rural areas was between Tsh 250 and 300 per day in November 1992, depending on the remoteness of the area. This is equivalent to $0.63 and $0.75 at the market exchange rate of Tsh 400 to the US dollar. These are representative estimates of the returns faced by the small farmer in late 1992, when evaluating alternatives. While coffee, cotton and low-technology maize do not look very attractive when compared to the going wage, allowances must be made for how concrete the opportunities for wage employment are. Thus, low return activities which make use of time that has no alternate value will sometimes be attractive.

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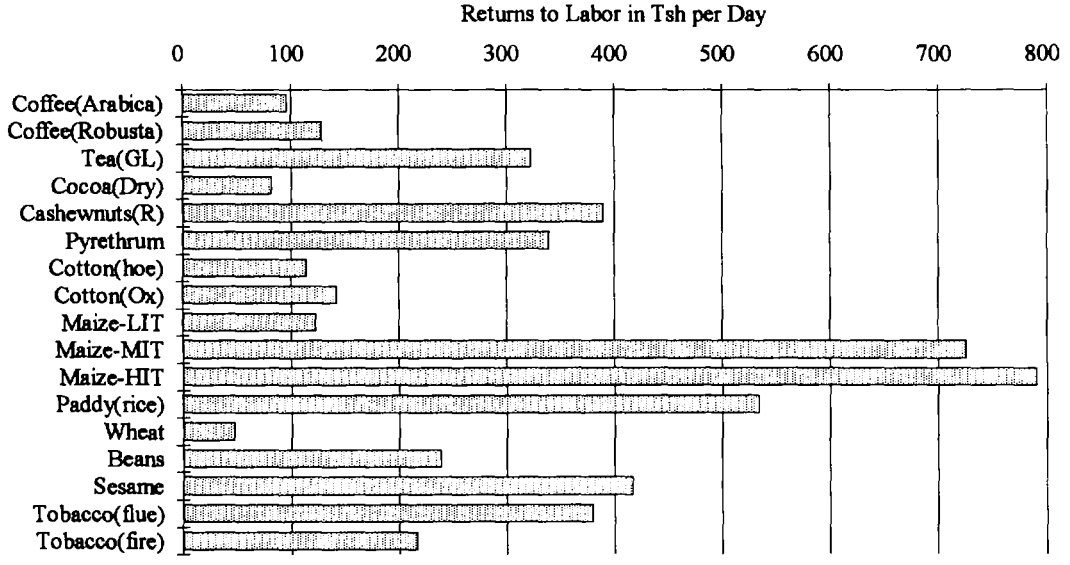
145 The chart represents gross crop value, less cash costs such as fertilizer, pesticides, manure, implements, less the amortization of the investment in establishment costs for perennial crops, less transportation and other marketing charges. Hired labor, normally 30 percent of the total labor input, is not included as a cost for purposes of this calculation. Estimates are necessarily indicative, and may not coincide with those from other sources in MOA/MDB.

Figure 4.4: Returns to Labor in Various Crops in Tsh per Day



For most crops, 20 to 50 percent of labor costs are in weeding and land preparation. Technology which reduces these requirements, or which enhances labor capacity to deal with these demands (e.g. animal-drawn cultivators), is likely to be attractive.

Supply Response in Agriculture

The gradual process of economic reform and liberalization of marketing mechanisms in agriculture during the 1980s has elicited a positive response from the smallholder farming community. A survey of the overall response of the agricultural sector to positive shifts in its terms of trade was undertaken by the IMF in the early 1980s. It showed that for over nine countries, in the long run, a shift in the real farmgate price index between 1963 and 1981 of 10 percent elicited an output increase of 2.1 percent.[146] For Tanzania the short-run and long-run elasticities of aggregate supply with respect to price were the same, estimated at about 0.15.[147]

Individual crops respond much more aggressively to changes in relative prices, because farmers are free to shift resources between crops, which is a much easier than shifting resources across sectors. Recent studies indicate that agricultural exports are very responsive to changes in real producer prices. Own price elasticities of supply for Tanzania's exports has been estimated at about 0.43 in the short run[148] and 0.64 in the intermediate term.

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146 Marian E. Bond, "Agricultural Responses to Prices in Sub-Saharan African Countries," IMF Staff Papers, Vol 30, Dec. 1983, 703-726.

147 A 10 percent increase in the real price index for agricultural produce will elicit a 1.5 percent increase in aggregate supply.

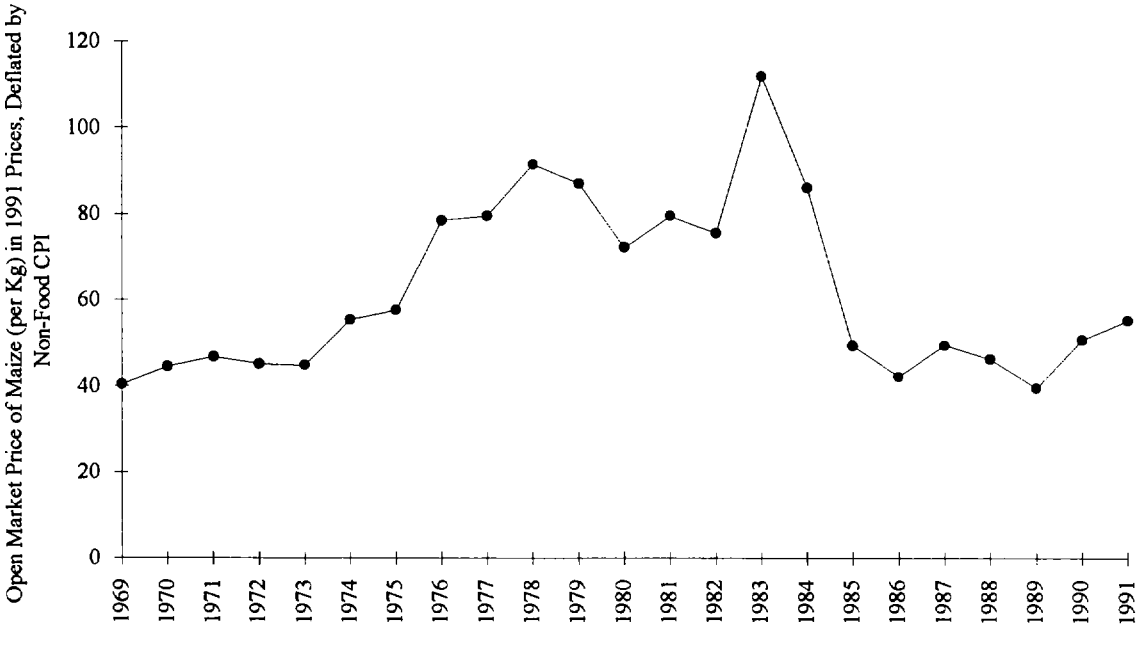
148 Both Jaeger, William K., op. cit., p.14 and Ramon Lopez, Ridwan Ali and Bjorn Larsen, "How Trade and Economic Policies Affect Agriculture," WPS 719, July 1991.

The Effects of the Economic Reform Program

Both consumers and producers have benefited from the sequence of reforms affecting the agricultural sector from 1984. The average annual agriculture GDP growth rate between 1986 and 1991 was 3.9 percent per annum, versus 3.5 percent between 1981 and 1985, and 2.2 percent between 1966 and 1980.[149] The main features of the reform program as they influenced agriculture include: (i) relaxation of Government controls on the marketing of food grains; (ii) continuous devaluation of the official exchange rate and permission to retain a portion of the funds generated from nontraditional agricultural exports; (iii) the gradual adjustment of farm level production incentives and removal of Government-set prices; and (iv) the increased availability of imports financed from donor support programs and from "own funds."

Marketing Liberalization - Marketing of crops, especially food crops, has been progressively liberalized since 1984. In 1987, weight limits and permit requirements for grain trade between regions were lifted, minor crop exports were liberalized[150] and domestic marketing of inputs was opened to the private sector. Marketing of sorghum, millet and other food crops was decontrolled at the Cooperative Union level beginning with the 1988/89 season. In 1989, cassava, beans, oilseeds and all grains except wheat were decontrolled at the primary society level. Wheat marketing was liberalized in 1990. Implementation of this set of reforms appears to have been thorough. The removal of restrictions on maize marketing, coupled with good weather and improved road networks, has led to a reduction in the real market price of maize, as the figure below indicates.

Figure 4.5: Open Market Maize Price, Averaged Across Urban Markets, Deflated by the Non Food CPI



Measures to liberalize traditional export crop marketing, however, were slow to get

149 Growth rates were obtained using least squares exponential trend lines fitted to the official agricultural GDP data in 1976 prices.

150 Following the dissolution in 1986 of the parastatal General Agricultural Products Exporters (GAPEX).

underway. Initially, in 1984, the marketing boards were replaced by the cooperative unions as monopoly buyers and processors of export crops. Marketing boards were charged with managing the auctions and representing union interests at the auctions (for a fee). Recently private entrants have gradually been allowed into the cashew market, where the export trade in raw nuts has flourished, and in 1992/93, permission was granted for three joint ventures (union-private sector-marketing board) and one fully owned private sector "greenfields" venture in cotton ginning. In the late 1980s, due to inefficiencies in the processing and marketing chain and delays in adjusting farmgate prices, the increased returns from the devaluations of the currency were not passed on to farmers. In the early 1990s however, in an effort to stimulate production, the Government set producer prices at levels which were unsustainable, causing widespread losses in the cotton and coffee unions. The variation in the ratio of the farmgate price to the export price of cotton and coffee is shown below.

In a commercially-run coffee sector, operating with market exchange rates, it is possible to pay producers 80 to 85 percent of the export price (equivalent) for their coffee. This has been the experience in Kenya. It can be seen below that there have been wild swings in the shares going to the farmers and cooperative unions involved in processing and export. Following the successive devaluations of the Tanzanian shilling from 1986 on, the distance between producer shares at official and parallel rate declines. Between 1986 and 1990, real exchange rates were depreciated 72 percent,[151] reducing the premium on the parallel market to about 50 percent (see Figure in Chapter I). However, the benefits from these devaluations did not reach the farmers. From 1986 through 1988 producers' shares actually decline, due to delays in adjusting producer prices. They remain at a low of around 45 percent before increasing gain in 1990 and 1991. In 1992 producers' shares increased again, putting the unions under severe financial pressure.

The devaluation of the currency increased the domestic returns to exports. However, the absence of adjustment in the structure of the export processing industries, which remained monopolies in the hands of the cooperative unions, combined with the maintenance of centrally-controlled producer pricing procedures, which did not adjust to the devaluation as one would have expected, meant that large shares of the increase in domestic returns was transferred out of the hands of the farmer, into the export processing monopolies. Only later were these flows reversed, when Government overcompensated the farmers by increasing farmgate prices beyond sustainable levels.

When the farmer share (at official exchange rates) swings above 80 percent, the cooperatives lose money. These losses are eventually borne by the banking system, and is one of the reasons for the large volume of bad loans held to date. Under the reform process Government eventually increased farmgate prices for export crops (with a lag, as noted previously). Government has gradually relinquished the right to set farmgate prices, without really reducing the monopsony power of the cooperative unions in the processing industries. Adjustment in the export processing industries will not be complete until the monopsony position of the cooperative unions or the marketing boards is completely withdrawn.

The movement in relative shares under parallel and official exchange rates also indicates the size of the implicit tax on the coffee sector. Successive devaluations of the official shilling under the reform program (since 1986) have significantly reduced this tax. Margins are so thin however, that the taxation of this sector (implicit and explicit) should be reduced to zero, if it is to survive in a very competitive world market.

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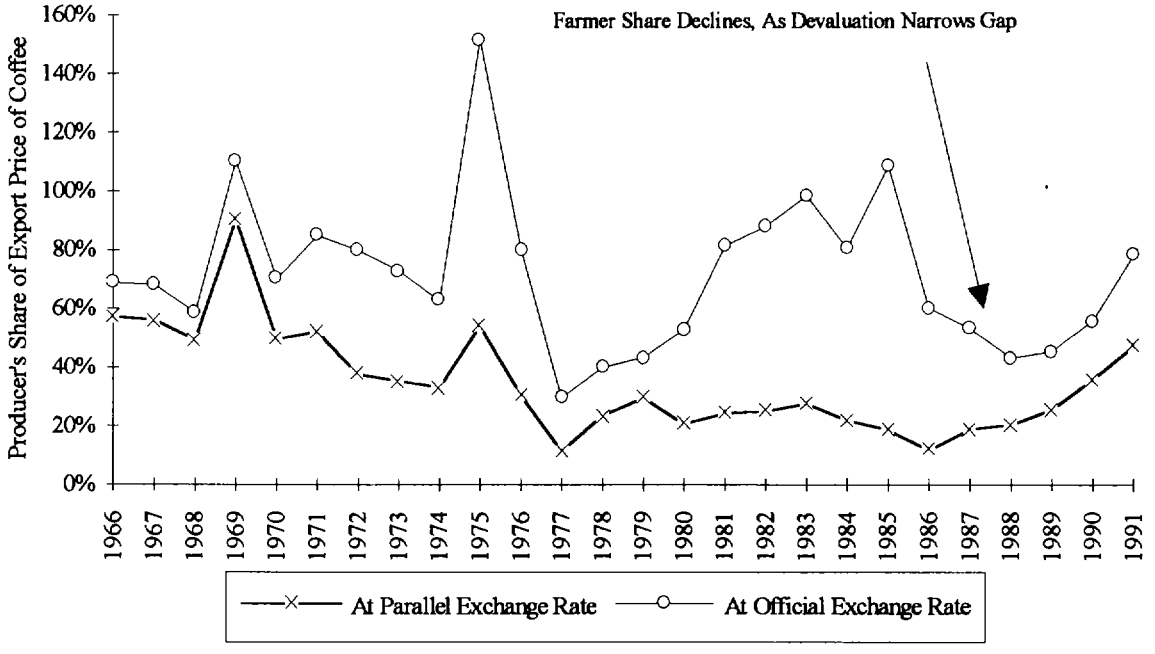
151 IMF calculations, as noted in Akiyama and Larson, op.cit., p.40.

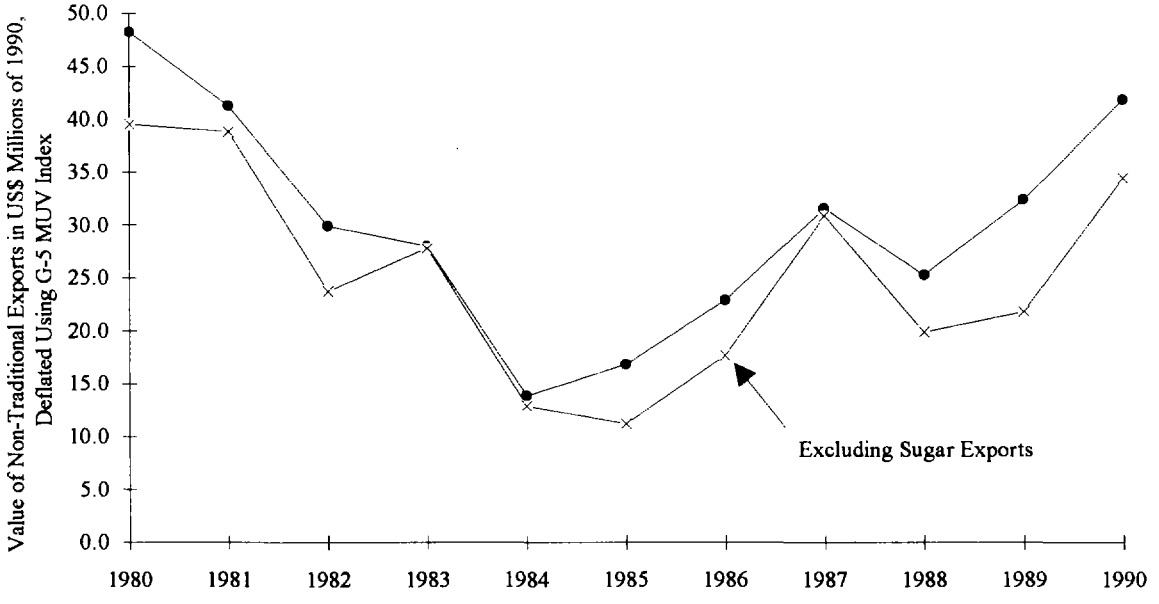
Figure 4.6: Farmer Share of Coffee Export Price, Under Official and Parallel Exchange Rates



The process of devaluation, upward adjustment in farmgate prices, eventual decontrol of prices, and relaxation of the cooperative union monopoly on purchase and processing has been followed, with variants, for the other export crops. Subsequent crop by crop analysis will clarify the process in each case. Only in the case of cashew nuts however, has the marketing (not the processing) of a traditional export crop been completely decontrolled. In all of the other **traditional** export crops the process of decontrol, and the reduction of monopoly processing positions, while more advanced in some industries than in others, is still to be effectively completed.

Another feature of reform in the exchange rate policy that had a significant effect on **nontraditional** agricultural exports was to allow exporters to "retain" 35 percent of the foreign exchange earned. This could be converted at the parallel rate, and significantly improved production incentives in the nontraditional export sector. The change in policy reversed the rapid decline in the value of nontraditional crop exports, and as of 1985 they have increased rapidly.

Figure 4.7: Exports of Non-Traditional Agricultural Produce in US$ Millions at 1990 Prices, Deflated Using the G-5 Manufacturing Unit Value Index



An important feature of the reform program initiated in 1984 has been to increase the availability of consumer goods, especially "incentive" goods, for rural dwellers.[152] Bevan and others have shown that for Tanzania, "...the supply responses are indeed a function of the severity of rationing, rather than merely movements in real producer prices."[153] Bevan's analysis shows that the increase in output lags one year behind the increase in consumer good availability. This effect is important in view of the foreign exchange shortages of the late 1970s and early 1980s, which caused a severe contraction in imports of "incentive" consumer goods.[154] The shortages were felt especially severely in rural areas, where transportation and marketing difficulties compounded the problem. Cash was so useless in rural areas that the peasant farmer response to an increase in the price of a cash crop was to limit production. Additional cash could not be spent on anything of interest. The supply of export crops per capita fell by about 35 percent between 1977 and 1985.[155] The increase in supplies of consumer goods which followed permission for "own funds imports" (no questions asked) in 1984, caused a surge in the production of cash crops and the marketing of food crops from 1985 through 1989, though crop product prices remained stagnant or declined.[156] This phenomenon will not repeat itself, however, farmers have returned to 'normal' behavior. They now appear to respond positively, increasing supply of cash crops when relative prices move in their favor (see analysis below).

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152 Bevan, D., Collier, P., and Gunning, J.W., "Peasants and Governments - An Economic Analysis", Clarendon Press, Oxford, 1989, pp 153-222, and World Bank, "Tanzania -Economic Report - Towards Sustainable Development in the 1990's", Report 9352-TA, June 11, 1991, pp 66-67.

153 Ibid. p.204.

154 "...sugar, cooking oil, soap and combined varieties of clothing..." Bevan et al. op.cit. p 198.

155 Sarris and van den Brink op cit. and van den Brinl, "A Review of Agricultural Statistics of Mainland Tanzania", op.cit p.6.

156 World Bank, Report 9352-TA, op.cit., p.67.

A further effect of trade reform and the increased availability of foreign exchange has been to increase the availability of fertilizer. Sold at a subsidized price 80 percent below cost, fertilizer consumption increased from 100,000 tons in 1984/85 to 140,000 tons in 1987/88. This will have increased food production, even with stagnant food prices, although the effect has not been quantified. The fertilizer supply system is constrained by the subsidization policy. In a bid to reduce the budget deficit, and reduce unsustainable distortions in agricultural production, the Government has undertaken to gradually reduce subsidies and increase prices (see section on fertilizer in Chapter III). Since maize growers in the Southern Highlands are relatively heavy users of fertilizer, elimination of fertilizer subsidies and panterritorial pricing may have a significant impact on the regional distribution of production.

In addition to the policy changes mentioned previously, agriculture has been affected by droughts in 1973-74 and 1982-83, the oil price shocks of 1973-74 and 1978-79, the break-up of the East African Community in 1977, and the war with Uganda in 1979. Since the first significant liberalization measures were taken in 1984, weather (insufficient or untimely rainfall and localized flooding) has also been a key determinant of food production. The localized failures of rains in 1989/90, 1990/91 and again in 1991/92 have led to production shortfalls.

Empirical Analysis[157]

To quantify the supply response of smallholders in Tanzania, a simple empirical model was constructed and estimated. The model consists of individual equations for food production and official purchases of export cash crops. Export cash crop are divided into annual and perennial crops including: (i) food crops (maize, sorghum, paddy, millet, cassava, beans); annual export crops (cotton, pyrethrum, tobacco) and perennials (coffee, cashew, tea).[158] For each of the three categories, Tornqvist price and quantity indices were created, using as weights value shares at official producer prices.[159] The quantity indices were divided by an index of rural population to produce indices of output per capita of rural population. This was done to account for the largely deterministic effect on output of growth in total rural households and labor supply. The effect is assumed to be fixed, given the wide availability of land and the relative lack of technical change in Tanzania since independence.[160] It is assumed that export crops compete with food crops for inelastically supplied farm labor. This is allowed for by including the price of competing food crops in the export crop equations. Similarly, the price of annual export crops is included in the food crop equation.

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157 Taken from Malcolm Mayfield, "The Effects of Policy Reforms on the Performance of Agriculture in Tanzania", background paper prepared for this report, February 10, 1992.

158 Data goes from 1966/67 to 1991/91 and is drawn from van den Brink "A Review of Agricultural Statistics of Mainland Tanzania", June 1992, Southern Africa Dpt., the MOA's Marketing Devopment Bureau and the Bureau of Statistics.

159 The Tornqvist index is a discrete approximation of a Divisia index. A Tornqvist price index for N goods may be expressed as

$$P^T_t = \prod_{i=1}^{N} (p_{it}/p_{i0})^{\frac{1}{2}(s_{it}+s_{i0})}$$

where p_{it} (s_{it}) and p_{i0} (s_{i0}) are prices (value shares) at time t and in the base period, respectively. An analogous equation is used for aggregating quantities.

160 The argument here is that a certain amount of a household's planned production is undertaken in order to meet household consumption requirements and that this amount is unresponsive to prices. On the slow rate of technical and structural change in Tanzania, see van den Brink (1992). Cultivation by hand hoe still predominates in smallholder agriculture and the use of other purchased inputs has not increased very significantly over the period.

The estimated model uses a Cobb-Douglas (logarithmic) functional form:

$$\ln Q_{it} = \beta_{i0} + \beta_{i1} \ln p_{i,t-1} + \beta_{i2} \ln p_{j,t-1} + \beta_{i3} z_{it} + \varepsilon_{it}, \qquad i = 1, 2, 3 \quad j \neq i$$

where Q_{it} is production of crop i in crop year t, and $p_{i,t-1}$ and $p_{j,t-1}$ are the official producer prices paid in the previous season for crop i and competing crops j, respectively. Lagged prices are used as reasonable proxies for the prices expected to prevail at harvest.[161] In the case of perennial crops, $p_{i,t-1}$ is a three year moving average price, lagged one year. The z_i terms represent other exogenous factors. In the food equation, z is a dummy variable for years reported (based on weather data) to have been poor weather years for food crops. For the two export crop equations, z is a dummy for the period since the reintroduction of the Cooperative Unions in 1984. This is the principle change in the marketing structure to effect the traditional export crops[162] since the mid-1970s, and we test the statement made by other observers that the cooperatives performed poorly relative to the marketing boards previously charged with procurement and export.

Two changes were made in the above model to account for suspected distortions in the data. First, as Van den Brink has argued, a substantial inflation in reported maize production appears to have occurred in the mid 1970s. Thus, in 1974/75, the official maize production figures rise by more than 600,000 metric tons, although 1974/75 was regarded as a poor weather year and production was reportedly disrupted by the villagization program. It is possible that political pressures led to over-reporting which was subsequently never revised downward. To account for this, we include a dummy for all years from 1974 on, and 1973 and 1974 were not included as poor climate years in the "drought" variable. Second, many studies report that significant amounts of export crops were marketed outside of the official marketing system. We assume that variations in the portion of output diverted through illegal channels are primarily a function of the relative difference between the official price and the border price, here defined as the world market price converted into TShs at the official exchange rate. Two variables are included to take this into account, one for annuals and one for perennial crops.

The results for this analysis are given below[163] for the period 1969-1991:

Table 4.3: Regression Results for Food and Export Production

Dependent	Explanatory Variable	Coefficient (Response elasticity)	T-Statistic
Food Production	Constant	-0.20	-3.57
	Food Price (lagged 1 yr)	+ 0.34	+ 2.62
	Annuals Export Price (lagged 1 yr)	-1.08	-6.98
	Adjustment factor from 1974 on.	+ 0.18	+ 2.54
	Drought	-0.14	-3.66

R^2 .946; Adj. R^2 .934; D-W 2.09; Q(11) 9.36

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161 Significant, variable inflation over the period covered implies that considerable uncertainty can exist as to the real, harvest period value of producer prices announced early in the crop year. Jaeger (op.cit) also argues that farmers base planting decisions on expectations, rather than any observed price.

162 Smallholder tea growers continued under the previous system, selling directly to the Tanzania Tea Authority (TTA).

163 The estimation technique was Seemingly Unrelated Regression (SUR). The SUR procedure generally results in more reliable estimates of the coefficients when the errors are not independent across equations. This is highly probable for our estimated model since weather and other variables not appearing in the model affect both food and export/cash crop production and marketing.

Dependent	Explanatory Variable	Coefficient (Response elasticity)	T-Statistic
Official Purchase of Annual Export Crops	Constant	0.48	4.18
	Annual Export Crop Price (lagged 1 yr)	1.24	7.56
	Food Price (lagged 1 yr)	-0.12	-0.70
	Border-Farmgate Price Ratio (Annuals)	0.06	0.64
	Entry of Cooperative Unions in 1985	-0.03	-0.49

R^2 .818; Adj. R^2 .778; D-W 2.10; Q(11) 6.56

Dependent	Explanatory Variable	Coefficient (Response elasticity)	T-Statistic
Official Purchase of Perennial Export Crops	Constant	0.36	4.17
	Perennial Export Crop Price (lagged 1 yr)	0.83	5.69
	Food Price (lagged 1 yr)	-0.08	-0.48
	Border-Farmgate Price Ratio (Perennials)	-0.21	-1.94
	Entry of Cooperative Unions in 1985	-0.29	-4.80

R^2 .864; Adj. R^2 .834; D-W 1.82; Q(11) 4.17

These statistical studies provide evidence to support the following observations:

In the **food** subsector:

- The supply response to own price change in the food sector is significant and quite substantial, with an elasticity of about 0.34. Given the large share of food production consumed on farm, the responsiveness to price changes is not expected to be very large.
- The relative price of annual exports (cotton, pyrethrum and tobacco) significantly affects the supply of food.
- Drought years tend to reduce food production by about 15 percent.
- There appears to have been an adjustment in the quantity of food produced[164] from 1974 on, which has increased the estimates of output by about 20 percent.

In the **export crops** subsector:

- For the delivery to Government of annual export crops (mainly cotton, but also pyrethrum and tobacco) the output response to own price change is positive, significant, although very high, at 1.24.
- For the delivery to Government of perennial export crops (coffee, cashews and tea), there appears to be a positive output response to changes in own farmgate price of about 0.55 in two years, or 0.83 in three.[165] This begins to approximate farm-level response to prices, as the substitution effect for delivery to official purchasers, versus clandestine exports is taken into account. The coefficient for the ratio between border prices and farmgate prices is significant. At 0.21 it indicates that a ten percent increase in the ratio of border to farmgate prices will cause an additional 2 percent of coffee output to be diverted from official purchasing entities. The effect of the entry of the cooperative unions into the

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164 Noted in van den Brink, op.cit.

165 See reference to Lopez, et. al. and Jaeger, op. cit.

market (or perhaps some parallel event which started in 1985) has caused a downward shift in deliveries to official purchasers of about 30 percent.

C. Technological Change

Once the avenues for increased growth noted above have been exhausted, continued expansion in agricultural output in Tanzania will have to come from technological change. The review of the sector provided above paints a picture of a peasant economy where labor availability is an important constraint to expansion. Labor augmenting inputs such as the ox-plough and fertilizer appear to be essential for raising rural income. The ADIS farm-level surveys confirm the priority given to inputs supply, and farmers' desire for Government intervention in this area.

There is significant potential for yield improvement in cereal cultivation in Tanzania. A comparison of Tanzania's average maize yields with countries of comparable potential having similar peasant-based production systems indicate potential for improvement:

Table 4.3 Comparison of Average Maize Yields With Other African Countries (Kg/ha)[166]

Tanzania	1,196
Ethiopia	1,556
Kenya	1,893
Lesotho	1,867
Zambia	1,660
Swaziland	1,917
Zimbabwe	2,066

Van den Brink has assessed the rate of technical change in peasant agriculture by comparing the results of the agricultural census of 1971/72, and the agricultural survey of 1986/87.[167] Fertilizer use had doubled over the 15 years between the census and the survey, from 7 to 14 percent of all farmers. As the figure below notes, the largest increase between 1971/72 and 1986/87 occurred among farmers with 2 to 4 ha. Use declined quite dramatically for farmers with 0 to 0.5 ha, possibly because of difficulties in access to markets for products or inputs. Rationed fertilizer supplies would naturally have gone to the more influential farmers. While levels of use are low (21 Kg/ha in 1991), the evidence of adoption and use of potentially profitable new technology, especially by the smallest farmers in the distribution, is encouraging.

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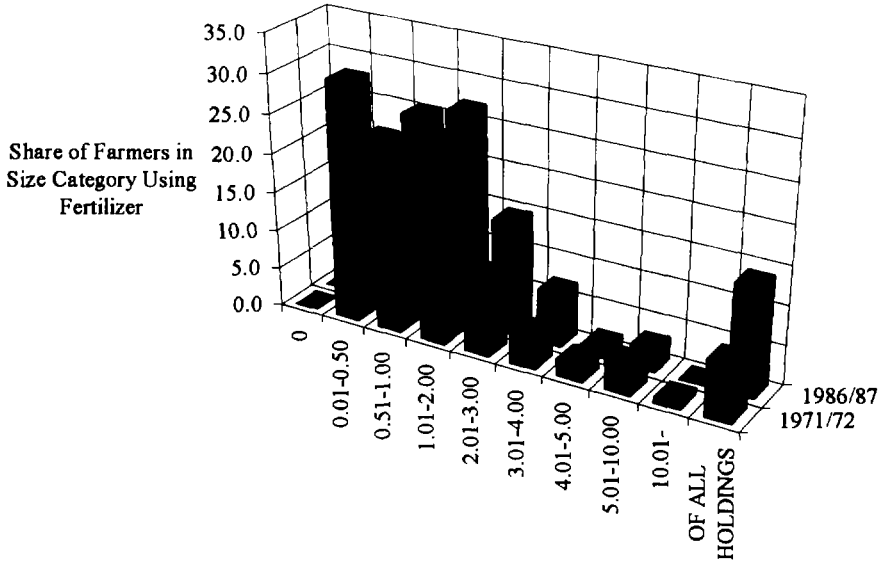
166 World Bank, "Eastern and Southern Africa Agricultural Research Review", April 22, 1987. p.22.

167 van den Brink, "A Review of Statistics ..." op cit. pp 24-26, and Sarris and van den Brink, "Economic Policy and Household Welfare ..." op. cit. pp 141 - 143.

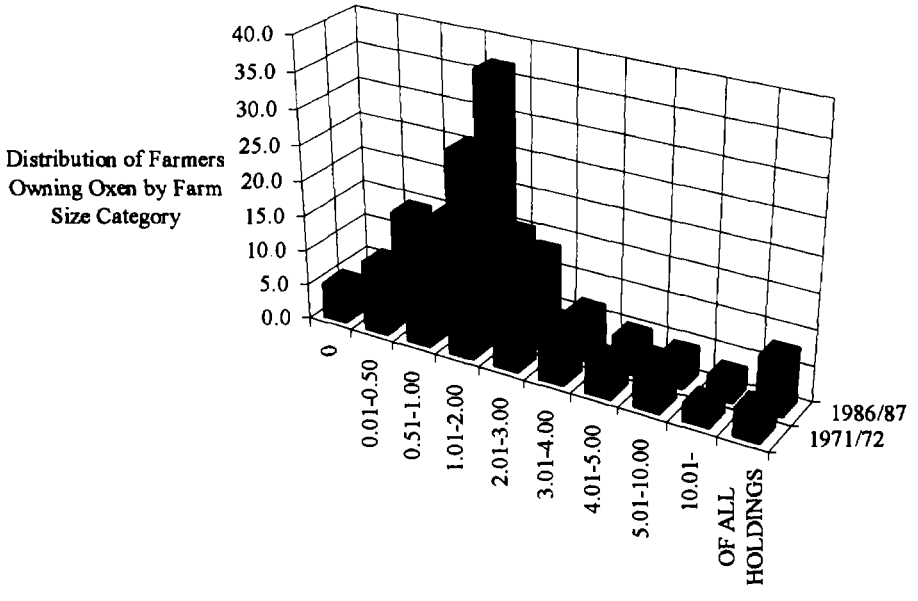
Figure 4.8: Change in Distribution of Those Farmers Using Fertilizer, By Farm Size Category



The use of improved seed, normally associated with fertilizer adoption, has been increasing rapidly. Whereas the 1971/72 census did not report on this input, the 1986/87 survey reported that about 27 percent of holdings used improved seed. The Cornell/ERB survey notes that hybrid seed, a subset of improved seed, was used by 22 percent of the holdings.

The ownership (and presumably the use) of oxen has also doubled in 15 years. The pattern is similar to fertilizer use, with adoption rates and the increased use rates, occurring in the medium-sized farms of between 1 and 2 ha. Ox ownership (closely paralleled by plough ownership) has increased overall from 4 to 7.8 percent of all holdings.

Figure 4.9: Change in Farmers Owning Oxen, By Farm Size Category, 1971/71 vs 1986/87



The use of tractors has declined since the early 1970s for smallholders. Tractors were promoted during the villagization period when efforts to induce communal, mechanized farming, were made to increase labor productivity. The difficulties and costs of operating tractors were too large for smallholders, and use rates dropped by a little over 60 percent, from 0.29 percent of all holdings, to 0.11 percent.

The adoption of innovation in Tanzania is encouraging. In spite of all the difficulties agriculture faced over the past 20 years, adoption of productivity enhancing technologies has increased rapidly between 1971/72 and 1986/87. Seventy four percent of the farmers who use fertilizer, cultivated less than 2 ha (Table 3.5). Adoption rates within farm size categories increase as the size of the farm increases. Thus, fertilizer use is greatest among the farmers with 2-4 ha where between 25 and 30 percent of the farming population in each size category use fertilizer. Adpotion is also high among farmers in the 5-10 ha category with 27 percent of the farming population in the size category using fertilizer. Clearly farm size and fertilizer use must correlate the access to a better resource base, and cash. For all farms up to 2.0 ha in size, 93 percent of all holdings and 51 percent of the total area in farms, adoption rates for fertilizer use were 12 percent. Clearly there is a long way to go, in bringing the benefits of intensification to the small farming community. However, it appears that the fertilizer subsidy, or some element of it, may be reaching the smallest of rural farms, identified with the poorest segment of Tanzania's population.

Use of the ox-plough, an expensive implement costing about Tsh 15,000 (50-60 days of manual labor at rural wages), appears to be accessible mainly to better-off farmers. Only 8 percent of all farmers owned an ox, although 13 percent claimed to use machinery other than a tractor. The potential for introducing labour saving mechanization at the small farmer level is great. Of all farmers owning oxen, 59 percent cultivated less than 2 ha, indicating no lack of interest from the smaller farmer. However, adoption by size category is highest for the larger farms. There are interesting breaks in adoption levels for oxen. Farmers with below 1 ha have ownership rates of 4-6 percent. Middle sized farmers, with between 1 and 4 ha have an adoption rate of between 12 and 14 percent. The adoption rate doubles again, to over 30 percent, for farms of more than 4 ha, suggesting some structural shift in prodution technology (and labour productivity) at these two farm sizes. Pesticides are also used quite widely, mostly among cash crop farmers in the cotton, coffee and cashew nut zones. About 12 percent of the farming population uses pesticides. The research establishment and inputs supply markets face a challenge. If new technologies are accessible and prove worthwhile, even the smallest farmers are prepared to adopt them, and one can expect rapid take-up rates.

D. Traditional Export Crops

The health of Tanzania's balance of payments depends largely on growth in the value of its agricultural exports. Traditional agricultural cash crop exports of about $180 million represented 46 percent of total exports in 1989-91, down in terms of both share and value from any previous period since 1969 (Figures in Chapter I). The situation for each traditional crop is reviewed below in light of recommendations for an agricultural development strategy.

Coffee

Coffee is produced in three main zones - the Northern Zone comprising Kilimanjaro & Arusha, the Southern Zone comprising Mbozi and Mbinga, and the Western Zone west of Lake Victoria. About 390,000 smallholdings produce about 95 percent of the total crop. Estates account for about 5 percent and employ about 10,000 people. Final processing and export preparation is carried out in four regional curing mills which together employ a further 2,000 people.

Table 4.4: Coffee Production in Tons of Clean Beans

Year	Kilimanjaro & Arusha	Mbozi & Mbinga	Estates	Total Mild	Hard Arabica	Robusta	Total Coffee
1979/80	18,445	8,528	3,503	30,476	374	14,194	45,044
1980/81	32,945	13,299	5,106	51,350	868	11,767	63,985
1981/82	23,521	11,977	4,485	39,983	639	10,352	50,974
1982/83	21,676	13,177	2,999	37,852	937	12,528	51,317
1983/84	17,427	14,099	4,032	35,558	763	11,284	47,605
1984/85	20,568	12,889	2,099	35,556	762	10,888	47,206
1985/86	22,126	16,596	2,657	41,379	596	11,704	53,679
1986/87	12,541	11,881	2,629	27,051	939	11,854	39,844
1987/88	13,540	20,006	2,134	35,680	622	10,799	47,101
1988/89	21,522	17,870	2,629	42,021	1,052	12,188	55,261
1989/90	16,250	14,998	2,565	33,813	673	16,125	50,611
1990/91	15,047	11,834	2,807	29,688	1,749	16,000	47,437
1991/92	17,580	14,600	2,440	34,620	3,470	16,925	55,015

The area under coffee appears to have doubled during the past 20 years from about 126,000 ha. in 1972 to the present 235,000 ha (equivalent). About 70 percent of all coffee is grown under a banana/coffee farming system; 235,200 ha. is a hectarage equivalent based on a tree count divided by a standard planting density of 1,330 trees per hectare. Robusta is confined mainly to the western side of Lake Victoria and accounts for about 30 percent of the area and output.

Table 4.5: Evolution of Coffee Production and Yields

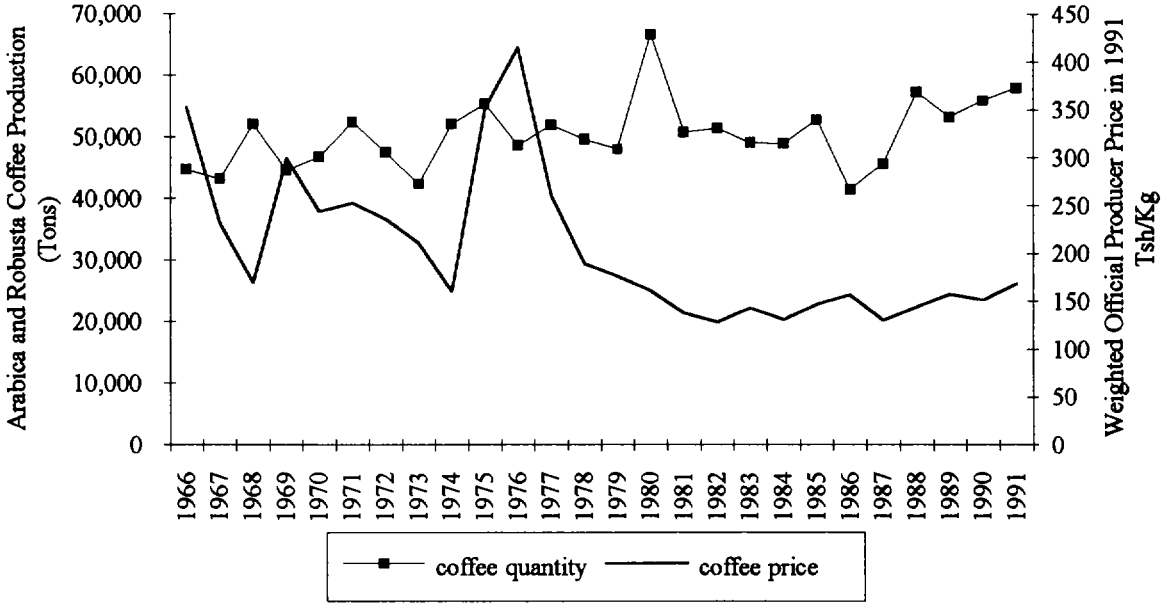
Year	Zone	Hectares	Production	Yield Kg/Ha
1972/73	Northern	63,000	18,900	300
	Southern	16,000	5,400	338
	Estates	12,200	11,200	918
	Western	35,000	12,000	343
Totals & average yields		126,200	47,500	376
1981/82	Northern	53,000	23,521	444
	Southern	22,000	11,977	544
	Estates	12,200	4,485	368
	Western	40,000	10,991	275
Totals & average yields		127,200	50,974	401
1991/92	Northern	90,000	17,580	195
	Southern	66,000	14,600	221
	Estates	12,200	2,440	200
	Western	67,000	20,395	304
Totals & average yields		235,200	55,015	234

The expansion of the coffee area took place during the 1970s and 1980s when prices were generally favorable. The majority of the expansion took place in the Southern Arabica zone (Mbozi and Mbinga), promoted by two EEC-supported projects. This area quadrupled from 16,000 ha. to 66,000 ha. over the 20 year period. For the same period the area under robusta in the Western region expanded from 35,000 ha. to 67,000 ha. In the northern traditional coffee areas of Moshi and Kilimanjaro the coffee area declined by about 11,000 hectares, mainly because of the decline in real prices, together with land scarcity, the process of subdivision and the pressure from competing (and more profitable) food crops.

The principal cultivators of arabica were developed in the 1950s and the 1960s and recommended for their superior yield and quality. However, both varieties are highly susceptible to coffee leaf rust and coffee berry disease. Coffee berry disease appeared first in 1975 and quickly spread to all the arabica growing areas of the country. An annual program of fungicide sprays has been used to contain the two diseases. At current market prices, the cost of a fungicide spray program for arabica coffee in Tanzania is about 25 percent of direct production costs. During the 1970s and 1980s a number of donors provided a supply of fungicides at subsidized prices. From 1992 farmers had to pay the market price for fungicides and the use of fungicides has declined considerably. The increased incidence of these diseases, and the lowered standards of husbandry for crop whose price has been declining in real terms, has a catastrophic fall in yields from an average of about 400 kg/ha clean coffee in 1981/82 to some 230 kg/ha clean coffee in 1991/92 .

As illustrated below, the real producer price for coffee has been low for a long time. Since the early 1980s it has been below the averages of the late 1960s and the 1970s, when much of the existing stands were planted. It is not surprising that standards of husbandry are poor and that yields are declining.

Figure 4.10: Production of Clean Coffee and Weighted Average Official Producer Price for Arabica and Robusta in 1991 Tsh (Deflated using NCPI)



The quality of the coffee has also declined, no doubt due to the lack of quality incentives, and the low overall returns to the crop. Arabica is wet processed, and robusta follows the traditional dry processing method. Initial processing of 90 percent of the arabica is done at home, where the coffee is pulped, fermented and dried. Hand washing is not uniform, and grade suffers. Final processing and export preparation is still monopolized by four large curing works in the main coffee zones as follows:

Table 4.6: Coffee Processing Capacity and Utilization

	Name and Location	Owner	Capacity (tons of clean coffee)	Capacity Utilization
Northern (Moshi)	TCCCo, Moshi	KNCU and TCGA	63,400	31.4 %
Southern	Mbozi	TCMB	20,000	50 %
Southern	Mbinga	TCMB	16,000	53 %
Western	BUKOP, Bukoba	Kagera & Karagwe Coop	17,600	99 %
Western	Tarime (Mara)	Tarime Coop.	1,000	89 %

In view of these disappointing trends in the subsector and the financial crisis in the cooperative unions (discussed in Chapter III), Government has taken significant measures to liberalize the marketing, processing, and pricing of coffee in recent years, with the support of an IDA (and donor) financed Agriculture Sector Adjustment Operation. These measures include:

- From the 1990/91 season on, the pooling system has been abolished. Under this system, TCMB kept the accounts for all cooperative unions, distributing sales revenues from the auctions down to the primary level, and arranging finance for the advance (first) payment to farmers. From 1990/91 TCMB has paid all the proceeds of the auctions to unions within three weeks. The unions became responsible for making payments to the primary cooperatives and then to farmers.

- From the 1990/91 season on, TCMB has become a marketing agent for cooperative unions with an agent fee of 1.6% of the auction sale. Preceding the 1990/91 season, TCMB deducted its marketing costs and paid the rest to the cooperative unions, then the unions deducted their costs and paid to farmers. This agency fee system simplifies the fee structure.

- From 1992/93 on, Government has ceased to announce the advance payment made by unions to farmers. It is up to each union to decide how much the advance and total payments should be. A review of the advance payments by Unions for the 1992/93 season shows large diversities. Previously, Government had, on occasion, set a farmgate price higher than what the market, and the unions, could bear, causing large losses.

- From March 1992 on chemical inputs have been allowed to be marketed by the private sector. Previously all chemical inputs were channeled exclusively from TCMB to Unions and then to farmers;

- In mid-1992 Government announced that traditional crop exporters could retain 10 percent of their earnings in foreign currency. This has since been raised to 100 percent for all crops except coffee.

Marketing and Processing Efficiency

There has been concern that the monopsonistic position of TCMB and the cooperative unions has led to wide margins at the marketing and processing level, with the farmer not receiving adequate returns for his or her efforts. A Coffee Industry Policy Bill, prepared for presentation to Parliament in 1993, legalizes the reforms of the industry which were designed to introduce competition and hence increase efficiency and farmer prices. The main elements of the proposed Bill would include:

- Restructuring of TCMB into the Tanzania Coffee Board and confining its functions to policies and regulations for the subsector. The current TCMB Export Division will become an independent body and the two curing companies in the Southern Highlands are expected to be divested and become independent companies. These changes would make TCMB more efficient, and remove potentially conflicting objectives.

- Liberalizing internal purchasing of coffee by allowing the private sector to participate. Presently, smallholders are required to deliver their parchment coffee to the primary cooperatives which are required to deliver to unions. Under the new system, farmers would have four options for the delivery: (a) directly to the auction after having the parchment cured; (b) sell to the curing companies, which, in turn will deliver to the auction; (c) sell it to private traders who in turn will sell it to curing companies or deliver it to the auction after having it cured; and (d) deliver it to the cooperative unions as in the past. Farmers would be free to use the Primary Cooperatives, or to operate independently. Introducing competition in internal marketing will promote efficiency.

- Liberalizing the ownership and management of curing companies, by permitting private sector ownership. This will introduce competition in the curing industry, improving efficiency and farm level gains.

- Allowing participants of the auction to decide which auctioneer will operate and manage the auction system. If professionals run the auction, it will be more responsive to the needs and requests of the participants, and not tied to TCMB.

In addition to legislative changes, certain mills, such as the BUKOP robusta plant, need to have their hulleries refurbished to operate efficiently and reliably. This will require financing. In analyzing the options for rehabilitation of the industry, Government and donors should identify sources of equity finance such as foreign or local investors to join with the unions in funding a rehabilitation of the basic infrastructure.

The Exchange Rate and the Interest Rate

The greater efficiency from the reforms mentioned above will increase real producer prices to some extent, but farm level returns from coffee are still very low when compared to the returns from food production. There are two variables in the marketing chain that affect real producer prices significantly: the exchange rate and interest rate.

Traditional export crops, including coffee, suffer when the official exchange rate is applied to export earnings. The possibility of retaining 10 percent of the auction revenue in foreign currency will do a little to improve the situation, but it is only a palliative measure. **It was noted in November 1992 that it was very important for the profitability of the sector that the market exchange rate, which is has been between 20 and 30 percent lower than the official rate for the past year, be applied to coffee export proceeds.** As the DRC calculations show, the coffee sector is economically viable only if the market rate of exchange is applied to export earnings. In July, 1993, the Government devalued the official exchange rate, putting it on a par with the market rate, and eliminating the implicit tax on exports. The Government is now committed to maintaining a unified rate.

An additional benefit from using market exchange rates for coffee exports is that the adjustment in the exchange rate will provide some compensation for the interest costs of holding coffee stocks between farmgate purchase and sale (four to six months sometimes). Interest rates paid will be closer to the dollarized rate, rather than the rate in Tanzanian shillings (29 percent per annum in early 1994) which takes local inflation into consideration. Interest costs can also be reduced by taking measures to shorten the time between the harvesting coffee and receiving revenues from the auctions. To reduce interest charges, the auction system should be thoroughly reviewed to identify ways to speed the process such as using smaller lots, more frequent auctions, and other measures.

TCMB and Cooperative Union Debt

The accumulated deficit of TCMB is estimated to be on the order of Tshs. 7 billion. These debts have accumulated since 1986/87 season and have been mainly for the purchase of chemical inputs delivered to the unions but not yet repaid. A good portion of the inputs were not requested by farmers and the unions are not likely to pay for them, nor associated interest charges. One half of the debts is owed to the banks and the other half to the Treasury. These debts would need to be settled before or at the time TCMB is to be restructured.

Cooperative Unions, especially those which handle coffee, have huge debts. As noted in Chapter III, all now insolvent. It has been argued previously that one of the major causes of these debts is the high advance payments to farmers announced by the Government. This occurred at a time of low world prices (during the 1991/92 season) causing severe losses. It is clear from examinations of the financial balances of KNCU and Arusha Cooperative Union (see below) that producer price should have been about one half of the actual advanced payment in 1991/92. The negative balances were paid by unions through their borrowings from the banks. Other unions' financial conditions are reported to be similar to that of KNCU and Arusha Cooperative Union.

Table 4.7: Price Breakdown for Coffee, Actual 1991/92 and Estimated 1992/93

PRICE AT AUCTION	1991/92 KNCU	1991/92 ACU	1992/93 KNCU	1992/93 ACU
(Sh/Kg Clean)	354	357	470[1/]	470[1/]
(Sh/Kg Parch)	284	286	376	376
TCMB Cost (1.6%)	4.5	4.1	6.0	6.0
Curing Cost	8.8	8.8	12.5	12.5
Union Charges				
Total(Incl. chemicals)	154.2	135.3	91.2	126.3
Total(Excl. chemicals)	90.3	65.4	91.2	76.3
Chemical Inputs	63.9	69.9	0.0	50.0
Financial Cost (Interest)	63.2	41.2	50.4	44.5
Administration Levy	6.6	4.1	6.8	3.0
Crop Transport	4.4	2.9	5.3	8.3
Society Levy	3.5	2.9	5.3	3.5
TISA Fund	0.4	3.0	3.5	3.0
Local Government Cess	2.2	2.0	2.3	2.0
Coffee Development Levy	3.4	3.0	4.0	1.5
Others	6.6	6.3	13.6	10.5
Price to Farmers (Total)				
Excluding Chemicals 2/				
(Sh/Kg Parch)	230	230	266	231
(% of Auction Price)	81.0	80.4	70.8	61.5
Including Chemicals 3/				
(Sh/Kg Parch)	294	300	266	281
(% of Auction Price)	103.5	104.9	70.8	74.8
Balance of Union				
(Sh/Kg Parch)	-113.5	-92.2	0.0	0.0
(% of Auction Price)	40.0	32.2	0.0	0.0

1/ Mission Estimate
2/ Farmers Price after deduction for chemicals
3/ Farmers Price before deduction for chemicals.

It is clear that the two most important costs by far are financial costs and chemical inputs. Financial costs are the interest costs unions had to bear for the advance payments and other costs. This item as a share of the advance payment was 27.5 percent at KNCU. Chemical input costs are high but the chemicals are to be used by farmers. In the1992/93 season, no chemical input purchases were made by some unions because of their financial difficulties.

Unless these debts are settled, the marketing system could be disrupted (to the detriment of farmers) when the new, more competitive system is introduced. The unions need to be able to compete under the new system. Unless their liabilities to the financial system are settled, or easier repayment terms negotiated, they will be unable to do so. In July of 1993 the Government took over Tsh. 35 billion of the debt owed by the cooperative unions to Government banks. This was debt caused by Government interference in commercial decisions. Cooperative unions now have some breathing room in which to gear up for competition with the private sector in agroprocessing.

Improving Research and Extension Effectiveness, and Reducing Costs of Production

Compared with several coffee producing countries in Latin America, Tanzania is a high-cost producer. Although its rural wages are low, its chemical input costs are high because of the prevalence of CBD, leaf rust, and insect damage. Chemical input costs are estimated to constitute about 30 percent of coffee production costs. This share will increase with real depreciation of

Tanzania's currency. The returns to the use of chemicals is also low, due to the lack of research on appropriate dosage, and the deterioration in the vigor of the trees.

Unless real producer prices are increased through the application of the market rate of exchange to coffee exports, the increasing prices of chemical inputs (as the chemical input trade is liberalized) will cause farmers to stop applying chemical inputs and reduce profitability even further. There is a possibility of production declining sharply especially in the short run, because of spreading diseases and insect damage. Bean quality will also be affected, again reducing unit prices and returns to coffee production.

In the long run, Tanzania needs to develop disease-resistant varieties and replace the old stands with such varieties. Several African and Latin American producing countries have developed such varieties and an increasing number of farmers' coffee trees have already been replanted. Some advances had been made to identify new, more disease-resistant cultivators from Tanzania. But the work has been paralyzed for a few years because of the disarray in the agricultural research system. The profitability of Tanzania's coffee subsector depends critically on research to identify and test these varieties. Once they are available a concerted effort will be needed to replant some of the aging stocks. Some of the trees in the Kilimanjaro region are over 50 years old.

Cotton

Cotton is a leading cash crop and export earner. Since the mid-1980s it has generated between $50 and 80 million a year in export earnings. In addition, about 30 percent of the crop of 50 to 70,000 tons of lint is sold to the domestic textile industry. Ninety percent of all cotton is grown in the Lake Zone. Mwanza, Shinyanga and Mara produce ninety percent of the cotton from the Lake Zone, followed by Tabora, Singida, Kagera and Kigoma Regions. The remaining 10 percent is grown in the Eastern Zone including Morogoro, Coast, Mbeya, Arusha, Kilimanjaro and Tabora Regions. In 1989/90 about 504,000 ha of cotton were planted. Yields of seed cotton average 0.5 tons per ha, which is very low by international standards. Cotton fits well into the livestock, millet farming system however, and has externalities which make up for inadequate financial returns. Farmers appear to be extremely responsive to changes in the real price of cotton. As the empirical analysis undertaken previously demonstrates (illustrated in the figure below), output responds dramatically to changes in farmgate price, **with a one year lag**.[168] Production increases in 1983/84 and 1984/85 may be attributed to the incentives provided by the increased availability of consumption goods as discussed previously.[169]

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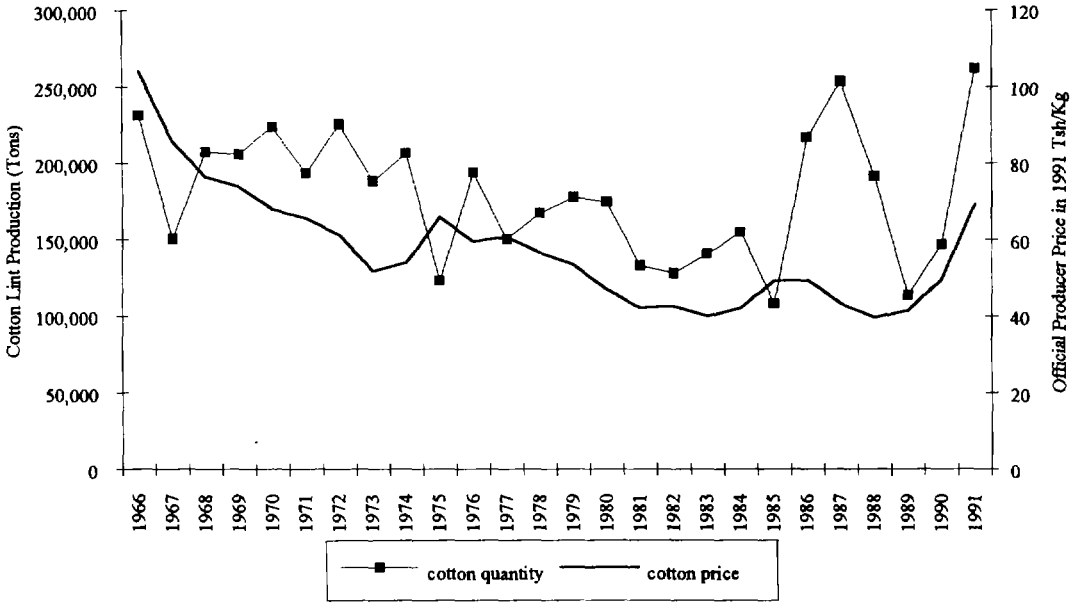
168 Different studies arrive at estimates for the elasticity of cotton supply with respect to price of between 0.65 and 2.00. Our estimate was about 1.3, i.e. a 10 percent increase in the real price elicits an increase of 13 percent in production.

169 The years in the figure refer to the first year in the season. Thus 1991 is actually 1991/92.

Figure 4.11: Seed Cotton Production and Official Producer Price in 1991 Tsh (Deflated Using the NCPI)



Since the Arusha Declaration, cotton processing and marketing has been in the hands of the cooperative unions. In 1976 the gins were taken over by the Cotton Authority. They were returned to newly constituted unions in 1984/85 in a very run-down condition, without compensation for the deterioration. The unions do not compete for seed cotton, but are fed by a network of primary cooperatives within a predetermined area of influence. The primary cooperatives serve as intermediaries to the farmer, buying and aggregating seed cotton, and distributing pesticides and payments. Until the 1992/93 season farmgate prices have been set by the Government. Pricing methods have been quite arbitrary. At times (such as in 1985/86 and 1986/87) they have been set at levels which exceeded the international price, eliciting an overwhelming supply response, while ensuring that the unions and the marketing board would run at a loss. Large debt burdens have been accumulated up by the unions and the marketing board as a result, causing problems for the banking system, and making borrowing for additional crop finance difficult. These problems have been noted previously in the section on cooperatives.

Table 4.8: Seed Cotton Production and Price 1981/82 to 1991/92

Year	Seed Cotton Production in '000 tons			Average Farmgate Price (Tsh per Kg of Seed Cotton)		
	Lake Zone	Eastern Zone	Total	Actual Price	Constant Prices (1987/80)	Percent of FOB Price
1981/82	124.0	9.1	133.1	3.62	18.16	83
1982/83	120.3	7.9	128.2	4.63	17.35	93
1983/84	130.6	10.1	140.6	5.92	18.28	85
1984/85	145.7	9.4	155.1	8.32	18.48	82
1985/86	96.2	12.0	108.2	12.88	22.29	165
1986/87	199.8	17.1	216.9	16.82	21.99	111
1987/88	237.5	16.2	253.7	19.45	19.45	51
1988/89	172.6	19.2	191.8	22.35	17.45	39
1989/90	102.0	10.5	112.5	28.00	18.22	40
1990/91	140.6	6.4	147.00	41.00	23.20	37
1991/2	248.1	14.5	262.6	70.00	31.77	55

Ginneries operate for about 39 months a year. While the theoretical ginning capacity is about 360,000 tons of seed cotton (674,000 bales of lint per season),[170] effective capacity is less than one third of this because of the physical deterioration of the machinery, and difficulties in servicing it. As the table below shows, in 1990/91 with a harvest of about 275,000 bales, unions were only able to gin 211,000 bales during the season. The remaining seed cotton was stored until the next season, causing it to deteriorate.

Table 4.9: Theoretical and Actual Ginning Capacity, 1990/91.

Region	Number of ginneries	Installed gins	Installed capacity	Capacity utilization 1990/91	
Western Zone				Bales	%
Mwanza	11	268	251,805	65,268	25.9%
Shinyanga	6	223	165,849	98,040	59.1%
Mara	3	96	53,690	17,343	32.3%
Tabora	1	50	17,901	10,866	60.7%
Kagera	1	40	25,000	7,127	28.5%
Singida	1	12	15,000	1,937	12.9%
Sub-Total	23	689	529,245	200,581	37.9%
Eastern Zone					
Morogoro	6	81	90,000		
Mbeya	1	10	15,000		
Tanga	2	20	10,000		
Coast	1	6	15,000		
Moshi	1	8	15,000		
Sub-Total	11	125	145,000	10,517	7.3%
Grand Total	34	814	674,245	211,098	31.3%
Production				276,199	
Unginned cotton				65,101	

Tanzania has traditionally commanded a premium on the world market of about 6 US cents per pound (about 10 percent of the world price) because its cotton is hand-picked. This premium has been threatened recently because of inaccurate grading at the primary society level and the illicit introduction of foreign matter into bales. Supervision and controls over grading and baling procedures will have to be tightened, and the quality sampling tests improved.

Domestic mills have been purchasing about 30 percent of output. Prices paid are more or less equivalent to the export prices received at auction. Domestic sales have declined recently because of financial problems in the industry. The problems facing the cotton industry parallel those in the coffee sector. Steps to address these problems will be similar.

Marketing and Processing Efficiency

As noted previously, the monopsonistic organization of the industry and the arbitrary nature of Government intervention in setting key prices provides no incentives for investing in plant and equipment and increasing operating efficiency. For farmer incentives to be improved, and the industry efficiency to increase, competition amongst ginneries should be permitted. Recognizing these problems, the Government has moved recently, with Bank assistance under the Agriculture Sector Adjustment Program, to diminish the marketing board's role in the processing and sale of the crop. Under the adjustment program, a large share of the cotton ginneries were to enter into joint ventures with the private sector and become private companies. To permit competition in the sector, Government should:

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170 One bale of lint cotton weighs approximately 180 kg.

- withdraw from setting farmgate prices for seed cotton, even "indicative" price announcements can be disruptive.

- revoke the legislation requiring farmers in a given region to sell to the primary in the region, and the primary to sell to the union. Ginning concerns should be permitted to compete with each other for seed cotton. This will raise farmgate prices, and improve quality. The Cooperative Act of 1991 seems to permit this, but is not completely clear.

- diversify ownership in the ginning industry, permitting the private sector to participate in joint ventures with existing unions or with full ownership of new plants, granting them equal access to seed cotton. Some such ventures have been recently approved by the Cotton Marketing Board. Legislation clarifying the rights and privileges of new entrants, local or foreign, would improve the investment climate.

- take measures to reduce the debt burden which hampers the industry at present. Some of these debts were incurred by complying with the Government-decreed farmgate pricing policy. These losses should be acknowledged and taken over by the Government.

- review tendering procedures to reduce delays, which can reach six months between harvest and sale and have an impact on financing charges.

- continue to reduce the role of the Cotton Marketing Board in the marketing and sale of cotton. Unions and other participants in the tenders should be allowed to choose their own agents. The board should not participate in the trade, financing, purchase or movement of the goods. They should be left to the seller and the buyer. Legislation is needed to codify the marketing board's role as a regulatory body, monitoring export volumes and prices, and promoting research and other industry development activities.

- consider assessing a small levy (maximum 0.5 percent of export revenue) to fund research into improved cotton varieties, and the development of more efficient husbandry techniques.

Market Exchange Rate and Interest Rates

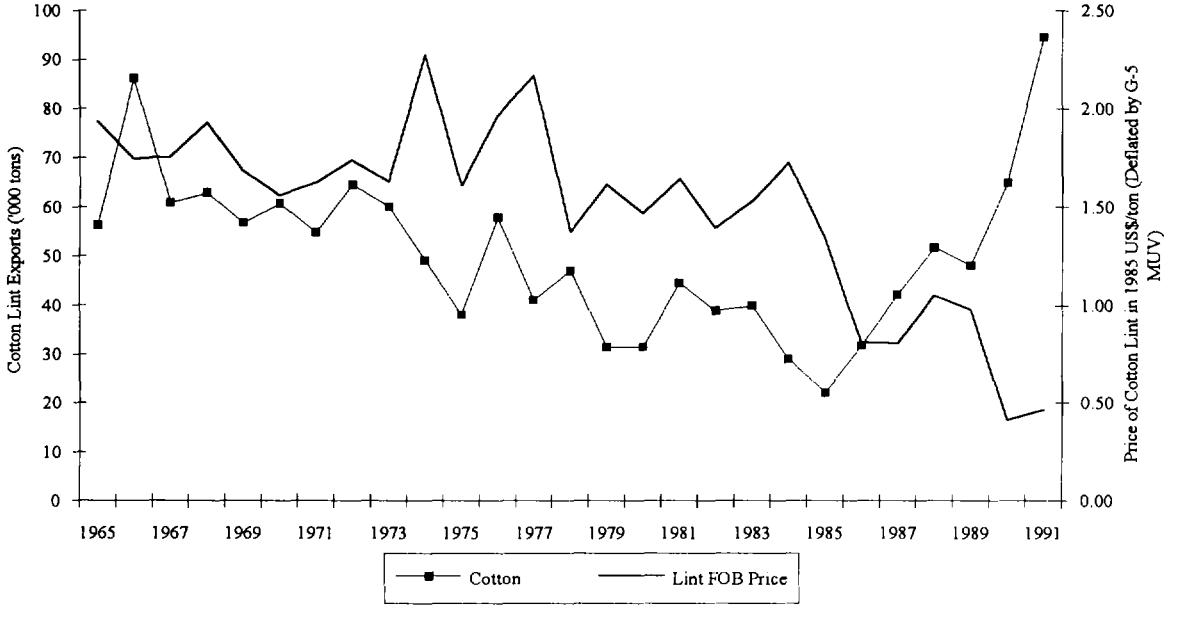
As with coffee, it is necessary to cut all implicit and explicit taxes on the sector if the profitability needed to finance rehabilitation and improve efficiency is to be generated. When the official exchange rate was 20 to 30 percent below the parallel rate, returns to the sector were low. They drop to negative when a farmgate price that is too high is decided on by Government, as the breakdown below indicates. Unification of parallel and market rates should begin to restore profitability.

Table 4.10 Cotton Processing Costs, as a Percentage of the Export Price at the Official Rate of Exchange in 1991/92[171]

	Present	Under Efficient Mgmt and Reasonable Farmgate Prices
Farmer's price	56%	52%
Primary buying cost	2.8%	2.3%
Union's cost	24.3%	14.1%
Loss and levy	1.2%	0%
Ginning cost	49.5%	19.7%
Export market cost	31.0%	11.0%
Total Domestic Cost of Export, as Share of Export Value Realized	164.8%	99.1%

Farmer returns have been a fairly uneven share of the international price, as the table above indicates. Actual exports have little to do with international prices (see figure below). As with coffee, international prices have dropped to very low levels in real terms. Country competitiveness should be enhanced as much as possible and the use of the market exchange rate is a very effective mechanism. While devaluation in this sector will also affect the costs of imported pesticides, the increase in returns will outweigh additional cost.

Figure 4.12: Cotton Lint Exports and Real Export Price (Deflated by the G-5 MUV)



Union Indebtedness and Financial Restructuring

The large cotton unions figure prominently in the problem portfolios of the commercial banks. As argued previously for the case of coffee, Government has some responsibility for this debt and should take steps to reduce it. The remainder is partly a consequence of inefficient management and waste. Given the need to improve the profitability of some of its strategic borrowers, the National Bank of Commerce is paying more attention to management practices and pricing decisions in the larger cotton unions. This

171 This and other data taken from the Marketing Development Bureau, "Review of Cotton", June 1992.

auditing and independent review function should be enhanced. The bank should appoint an independent, knowledgeable third party to supervise union management, with the right to intervene where necessary to improve efficiency and profitability. To improve industry flexibility, and possibly enhance union earnings, ginnery operation could be contracted out to independent operators for a flat fee. When demand for ginning services exceeds supply, which is the current situation, ginnery operators ought to be able to charge enough to more than cover operating, maintenance, and a portion of rehabilitation expenses.

Improving Research and Extension, and Improving Farm Level Profits

Tanzania has an advantage over others in the cotton market, most of whom have highly mechanized, capital-intensive production methods. The marginal costs to cotton production for the peasant farmer are low, probably lower than calculated in this report. Benefits are not only in cash. The crop is used to prepare land for a follow on millet rotation, and residues are used as a livestock feed supplement. It is still true that the quality of cotton has gradually deteriorated. Seed selected for certain agro-ecological areas has been mixed. Productivity is low (although so are inputs). Research into varieties that are more disease-resistant, with longer staple, or better yields, would enhance farmgate profitability and boost the country's competitive edge. The research establishment has been in disarray for a few years. A stable source of funding for cotton research, such as a small levy on the value of the lint sold in the tenders, for domestic as well as export sales, would greatly improve the research effort. Husbandry plays an important role in a crop such as cotton which is highly susceptible to pests and diseases and an effective extension service is vital. It would be in the farmer's interests to have an extension service funded in part from the proceeds of the crop, centered in the gins, or in the research stations or substations. The same levy could cover both research and extension.

Cashew Nuts[172]

Cashews are grown mainly in the Southeast (Mtwara, Lindi and Coast), as well as in Ruvuma, and Tanga regions. These are some of the poorest regions of the country, and revenue from cashew nuts sales are a vital part of farm family income. The cashew nut crop has four exportable cashew products: raw nuts, kernels, cashew nut shell liquid and cashew powder. The main export product has been raw cashew nuts for processing abroad (mainly in India), followed in importance by processed kernels. Cashew nut production peaked at 145,000 tons in 1973/74, some 30 percent of world production. Since then, production has declined to a low of 16,500 tons in 1986/87. This decline was due to the effects of villagization in the mid-1970s (distancing farmers from their perennial crops), the drop in farmgate prices, delays in farmer payments, the inefficiency of the monopolistic processing and marketing system, and the incidence of a fungal disease which attacks trees at flowering and reduces their fruit production. Also during the early 1970's, the State-owned Cashew Authority expanded cashew-nut processing capacity from 20,000 tons to some 57,000 tons in a first phase, with a second phase expansion taking capacity to some 83,000 tons per annum. This investment, financed by IDA, was an attempt to supplant the Indian factories which purchased most of Tanzania's raw nuts. The gradual declines in production during the mid and late 1970's coincided with completion of the factories. As a result this investment has never been fully utilized, and even in 1993 operated at 4 percent of capacity.

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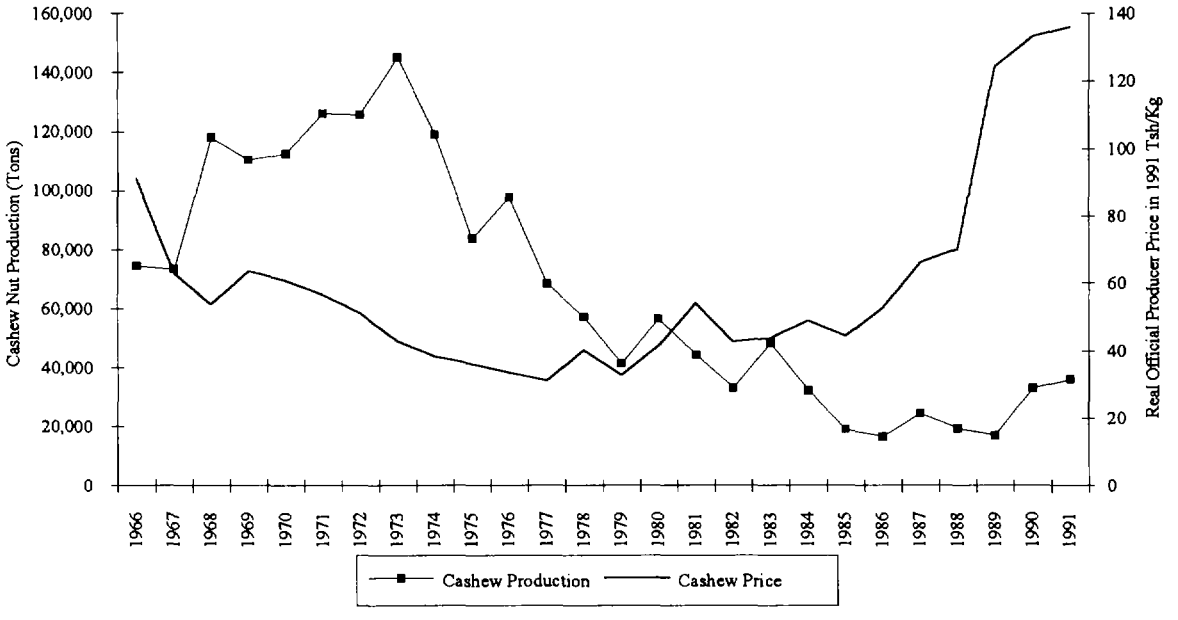
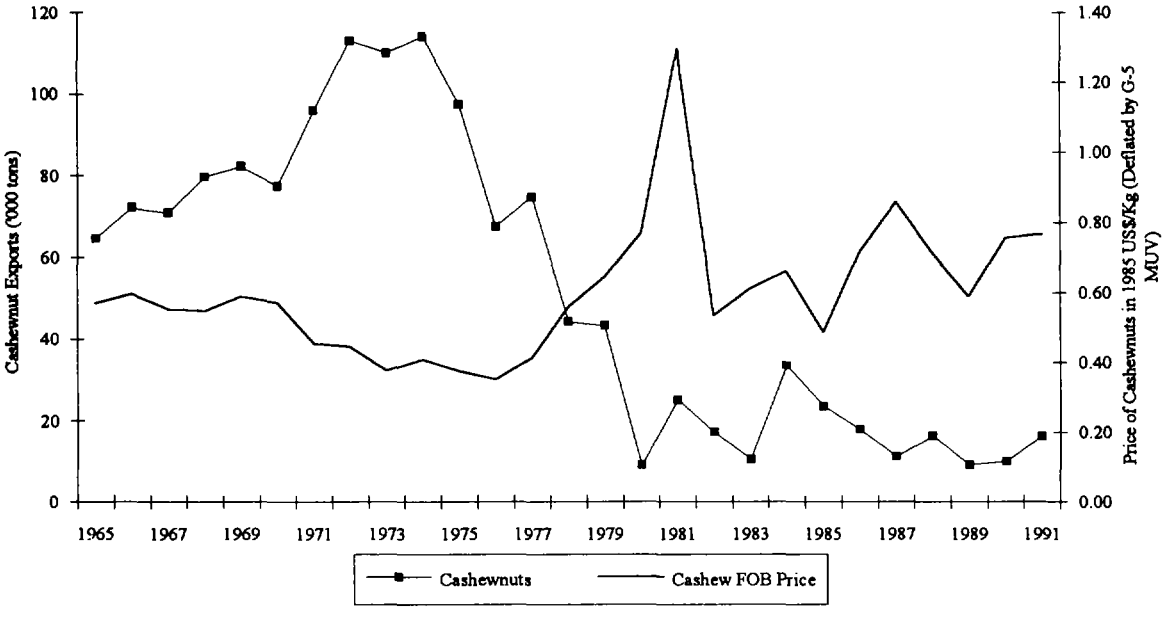
172 This section draws on the MDB Annual Review of Cashews, 1992, and Steven Jaffee's "Reversing Decline in Tanzania's Cashew Nut Industry: Market Liberalization and Private Sector Response", AGR, World Bank/ODA Study on Private Enterprise and the Processing and Marketing of Commercial Food Products in Sub Saharan Africa, Draft, September 1993.

Figure 4.13: Cashew Nut Production and Real Official Farmgate Price in 1991 Tsh Deflated using the NCPI



In recent years production has begun to recover, reaching 36,000 tons in 1991/92, and possibly 50,000 tons in 1992/94. The resurgence in production is in response to changes in the marketing system which have gradually permitted increased private sector participation in the purchase and export of raw cashew nuts. This has resulted in improved farmgate prices. The application of sulfur dust to control the fungus, and the investment of labor in improved husbandry are now worthwhile. Exports of cashew products (mainly raw nuts) are expanding rapidly. As can be seen in the figure above, although there was a breakthrough on producer price incentives starting in 1985, production did not respond until recently because of the collection and payment difficulties created by the cooperative unions and the monopolistic Tanzania Cashew Marketing Board (TCMB). Prior to 1991/1992, exports of raw nuts, kernels and by-products were the exclusive domain of TCMB. Sales were by contract negotiated with private buyers overseas. Because of the lack of transparency, the method drew considerable criticism for under-invoicing, inefficiency, and delays in payments to farmers. Starting in 1991/92 farmers were allowed to sell directly to traders as well as coops. Traders were allowed to export directly, without recourse to the marketing board. Farmgate terms of payment have improved, and production and exports of raw nuts have increased dramatically. Traders' share of the market has expanded rapidly, and reached 43 percent of the marketed crop in 1992/93. In spite of an increase in capacity in the late 1970's, Tanzanian cashew factories, under Government management, have not been able to compete within the international market, and exports of processed kernels remain small.

Figure 4.14: Exports and Price of Cashew nuts 1965 - 1991



Following the investment program of the 1970s, Tanzania's cashew nut industry has twelve factories. Except for the factories in Dar es Salaam which operate as an wholly-owned subsidiary, the other factories continue to be run as a department of the Cashew Marketing Board. Processing capacity and utilization for 1990/91 is given below. These factories are slated for divestiture under the Parastatal Sector Reform Program. Tanga, Iringa, Mbeya, and Morogoro region have no processing capacity, and are served by the Kibaha factory in Coast region.

Table 4.11: Cashew Nut Factory Capacity and Utilization Rates for 1990/91

Region	Operational Processing Capacity	Raw nut Production	Raw nut Processing	% Capacity Utilization	% Processing
MTWARA	41200	14352	1473	4%	10%
LINDI	17200	3242	0	0%	0%
DSM	21400	2830	1345	6%	48%
COAST	8600	5722	1345	16%	24%
RUVUMA	8600	1336	0	0%	0%
OTHERS	0	1843	0	0%	0%
TOTAL	97000	29325	4163	4%	14%

Strategy for Cashew Sector Reform. The elements for the reform of the cashew export sector are similar to those for the other export sectors. In the medium-term an effort should be made to increase local value added to exports by increasing kernel (rather than raw nut) exports. The objectives of the reform program would be to: (i) improve competition in the marketing and processing of the crop, from farm level through exports; (ii) increase industry returns by applying the market rate of exchange to exports; (iii) improving the effectiveness of the inputs supply, as well as research and extension for the sector.

Marketing and Processing Efficiency Trading margins will go down and farmgate prices should increase, if competition between traders, and between traders and cooperatives, is increased. To foster this competition it is essential that the uncertainty regarding future Government policy be removed. The

Cashew Marketing Act and other legislation regulating commercial activities in the sector should be revoked, and new laws passed to induce the entry of private enterprise while providing a minimal level of regulation on the monitoring of exports and quality standards. Trade and exports should be open to all enterprises meeting the minimum requirements. The regulation and promotion of the sector should be achieved through a joint Government and Industry-based Cashew Trading Board. These concerns were addressed under the Crop Board (Amendments) Bill of August, 1993.

The factories should be sold off to the private sector as soon as possible. If possible foreign capital should be attracted to finance their rehabilitation and refurbishment, so they may compete with foreign capacity, creating employment and increasing the value added of the exports.

Debt The debt overhang in this industry differs from that in cotton and coffee. Long-term loans were provided to the Cashew Marketing Board to fund the construction of the factories. IDA participated in this funding. It is recommended that the servicing of these loans be financed from general Government revenue. It is unwise to saddle the incipient expansion of the sector with the costs of previous unproductive investments. If and when the profitability of the processing industry is established, a levy on exports of cashew kernels could be assessed to contribute to the servicing of these debts.

Market Exchange Rate As with the other export industries, the implicit tax of 20 to 30 percent is affecting international competitiveness. Combining the introduction of the market exchange rate with the liberalization of trade (which is already well underway) will provide an injection of cash at all levels and strengthen the expansion. Given the increased competition in marketing, farmers should receive a sizable share of the local price increase that the application of the market exchange rate to exports would bring. This problem has been diminished as of July 1993, when the market rate of exchange was applied to cashew exports.

Research and Extension Effectiveness The profitability of the sector has increased substantially with the widespread introduction of sulfur dust into crop husbandry routines. Continuous research is needed to maintain productivity and respond to new disease challenges. The extension effort is also essential to promote improved practices. Measures to open the importation of agrochemicals, discussed previously, will enhance profitability. Government, with assistance from IDA and other donors, is financing a Cashew and Coconut Improvement Project, under which improvements in research and extension service effectiveness have been realized. The possibility of a small cess of under 0.5 percent of exports should be considered, once industry profitability has been consolidated, to provide a secure source of funding for cashew research.

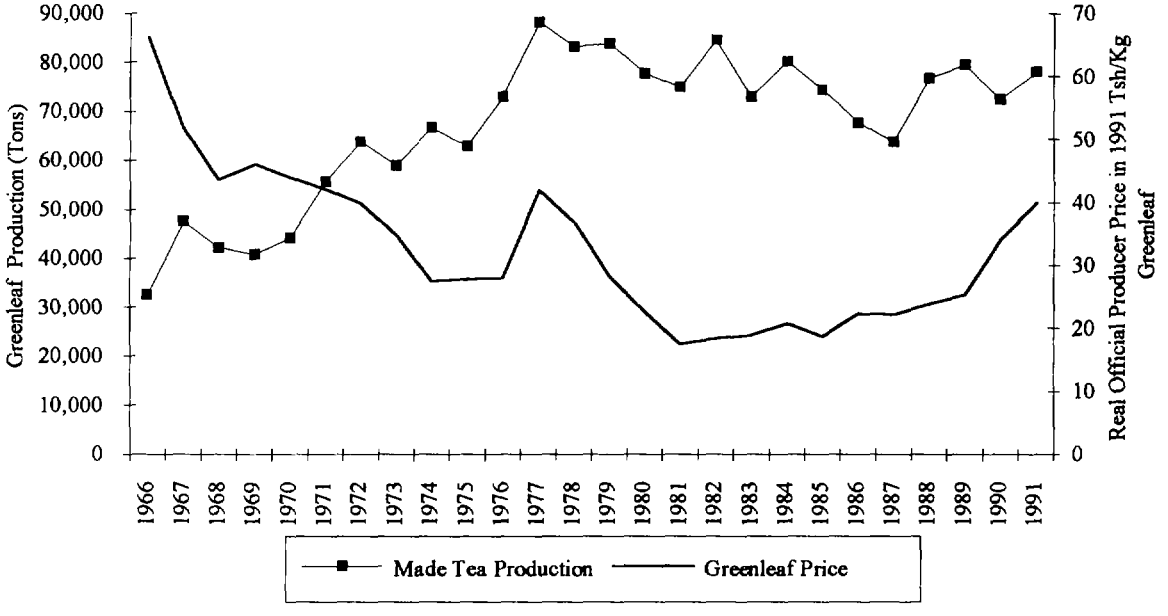
Infrastructure Much of the cashew trade takes place out of the port at Mtwara. Improvements in port facilities will reduce export costs, while permitting easier access to imported agrochemicals. The road network into the interior is poor. Improving the Songea connection to the coast will permit an expansion of the cashew growing areas into an underpopulated but high-potential zone.

Tea

Prior to Independence Tanzania had about 7,300 ha of estate tea and associated factories. Since then there has been a rapid expansion in the area under tea on smallholder farms, with green leaf processed in factories operated by the parastatal Tanzania Tea Authority. There is now about 8,800 ha of smallholder tea, 1,400 ha of tea grown on estates managed by the Tanzania Tea Authority, and 8,500 ha of tea under private estates. Production is concentrated in Usambara (in Tanga region) and Rungwe (in Mbeya region), each with about 30 percent of total production. The remaining 40 percent comes from Mufindi, Njombe and Kagera, in declining order of importance. Some 63 percent of the smallholders are concentrated in Mbeya and Iringa regions in the Southern Highlands.

Production has increased steadily through 1977/78. Since then, output has fluctuated between 14,000 and 17,000 tons of made tea per annum (see figure below). In 1987/88 Government decided to allow tea exporters to retain 10 percent of export earnings (at a time when the premium on the parallel market for foreign exchange was very high). Also in 1988/89, Government decreed a sharp real increase in the producer price for green leaf (applicable to the smallholders). Production increased to 19,200 tons and has remained at about this level since then.

Figure 4.15: Production of Greenleaf and Producer Prices in Tsh of 1991 (Deflated using the NCPI)[173]



Between 75 and 80 percent of tea production is exported. Tanzania's exports represented only 1.3 percent of the world export market (against Kenya's 15.1 percent). The country does not face an "adding up" problem (as discussed previously) and will not face a price penalty for expanded exports. Export prices for Tanzanian tea (1.35 $/Kg in 1990) are slightly below Kenya's, but above export prices for Malawi and Zimbabwe. Tea sold domestically is blended by Tanzania Tea Blenders Ltd. (a company with majority shareholding by Government). About 20 percent of this is then exported. The share of tea going to the local market appears to be declining rapidly. Volumes have halved since 1984/85 sales of 4,800 tons, while export prices at the official rate are below local prices. This may be because of the effect of the 10 percent retention on the effective export price, or to a softening in the domestic demand for tea.

Capacity utilization in the Tanzania Tea Authority factories is lower than in the private factories which average about 83 percent in 1991/92, versus 68 percent for the tea authority. Measures are needed to introduce private sector management into Government factories. These would reduce the authority's role to regulation and possibly set a minimum smallholder price for greenleaf to mitigate the monopsony rents garnered by the factories.

Strategy for Tea Sector Development. Much of the tea sector is in private hands and run fairly efficiently. The sector's development can be enhanced by measures designed to improve profitability, thus

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173 Note: 4.6 tons of Greenleaf tea equivalent to 1 ton of Made Tea, for Tanzania.

enhancing the incentives for increased investment in plant and equipment to improve factory efficiency and reduce margins. These measures should include:

- allowing valuation of tea exports at the market rate of foreign exchange;
- privatizing management, and maybe ownership of the factories operated by the Tanzania Tea Authority. Ownership of the factories could be vested in the smallholder farmers whose tea is processed;
- changing the Tanzania Tea Authority into a regulatory entity only, to monitor tea production and exports, promote research, establish quality standards and set minimum greenleaf prices at the smallholder level. Management of a small research levy of under 0.5 percent of the value of exports could also be considered.

Sisal

Between 1960 and 1970 sisal fiber production fluctuated between 200,000 and 230,000 tons. In that period Tanzania was the world's largest producer and exporter with 24 percent of world production. Since 1970's output of 202,000 tons, the industry has been in steady decline. Output hit a low of 30,000 tons in 1986, and has stabilized between 30,000 and 40,000 tons, about 7 percent of world production. The decline can be attributed to a series of factors which include: (i) the substitution of the cheaper and stronger nylon for sisal baler twine, causing total world consumption to decline; (ii) the nationalization of 52 estates (60 percent of the area planted in 1967 and 1973); (iii) the establishment of a monopoly on export marketing by the parastatal Tanzania Sisal Authority; (iv) the appreciation of the real exchange rate, reducing international competitiveness. With the decline in profitability, investment in replanting and estate maintenance declined. The devaluations instituted with the Economic Recovery Program in 1986, coupled with a 50 percent retention allowance on exports; the return of some of the estates to the private sector, the removal of forced marketing board intermediation on fiber and twine exports; and an IDA-funded line of credit for traditional crop rehabilitation managed through the Cooperative and Rural Development Bank; have all contributed to a gradual resurgence in the industry. Production in 1991 was about 36,000 tons.

Sisal production is concentrated in Tanga region, with some estates also located in Morogoro and Arusha. At peak production in the mid-1960s about 280,000 ha were under sisal. This has fallen to about 75,000 ha in 1991, of which 60 percent is under private sector ownership. The largest private estate, Bambini, produces 60 percent of private sector fiber output, about 36 percent of total production.

In spite of the many steps taken to re-establish Tanzania's position in the world sisal market, prospects remain poor. Spinning capacity (and hence demand for fiber) is being reduced in the industrialized world with the decline in the demand for baler twine. In addition, Brazil, the world's largest producer, is dumping low grade fiber on the world market at prices which the Tanzanian producers cannot match. The decline in spinning capacity in the industrialized world had been taken up by producing countries such as Tanzania. Exports of raw fiber have dropped to negligible amounts, as local producers channel production into twine and carpet mills.

The effective spinning capacity in the county is 71,000 tons of sisal yarn per year. Capacity utilization is about 30 percent, and varies widely across mills. The Bambini mill, owned and operated by the private sector, has a 1,000 ton per annum capacity and operates at 100 percent. The parastatal Tancord mill, the largest in the world with a total effective capacity of 45,000 tons per annum, operates at 9 percent of capacity. Production of sisal yarn was about 21,000 tons in 1991, and has been at about the same level since 1986. Whereas private spinning mills are running close to full capacity, the public sector

factories are underutilized. Measures to increase utilization of excess factory capacity should be investigated.

In addition to the twine, yarn, and ropes produced by the mills, the sector also produces carpets, bags, buffing cloth and sisal pulp. Production of carpets by the parastatal Tanzania Carpet Factory at Kilosa is erratic, declining from 60,000 square meters in 1986 to 28,000 square meters in 1991 because of weak demand. Bag production, also at parastatal factories, is between 2 and 2.5 million pieces a year. Sisal bags are not competitive with jute bags in price or in uses, as they are not suitable for wheat or rice, so even the domestic market is not assured. The one bright spot in the sisal market is the use of sisal fiber for production of high quality pulp. A pulp factory recently established in Moshi has been exporting about 1,000 tons of pulp a year, worth about $1,242 per ton. The market for this product is quite elastic, and investment in additional capacity by a Canadian investor is expected.

Sisal fiber prices collapsed dramatically in 1991, falling from $540/ton to $360 pr ton between January and December. This was because of the softening of demand, from the economic recession in Europe and the collapse of the market in Eastern Europe. Local producers shifted from direct exports of fiber to spinning the fiber into yarn. Gross margins vary by estate. The most efficient private estates are only marginally profitable, at current export values and costing output as yarn or twine. While some replanting is taking place under the CRDB export crop rehabilitation loan program, more attention is needed.

A Development Strategy for Sisal. The liberalization of the sisal market is more advanced than other traditional sectors. The profitability of the traditional sisal exports appear marginal at best. To continue to compete in a declining market, measures must be taken to enhance international competitiveness to generate foreign exchange and revenue for financing diversification into better markets. Such measures should include:

- application of the market exchange rate to all exports of sisal products;
- providing tariff-free imports of intermediate production goods (tractors, decorticators, spinning machinery);
- divestiture of all Government-owned mills and estates to private sector buyers, and continued use of the rehabilitation loan to help purchasers to reestablish productivity levels. Special attention should be paid to installing new mills capable of producing the finer yarns needed for buffing cloth;
- investment of funds for identifying new market opportunities for a strong, high-quality natural fiber, i.e. pulp production or buffing cloth. Initial investments should be based on well-established market niches. Limited Government support in the market investigation and product research to aid the transition to a higher-value product market would be appropriate.

Much of the land used for sisal production has an alternative use. Given the sunk investment in farm establishment, Tanzania ought to be able to compete effectively in price and quality in new, specialized markets for the fiber. Failing that, the best areas should be shifted into more productive use.

Sugar[174]

Commercial sugar production in Tanzania started in the early 1930s when a factory and estate were established by the privately-owned Tanganyika Planting Corporation in Kilimanjaro. A second factory was established in Kagera, also by private investors. Following Independence, factories and irrigated estates were established by private investors (including IFC) in Kilombero in Morogoro (on the Great Ruaha river), and at Mtibwa, also in Morogoro. With these investments, production expanded continuously during the 1960s from 52,000 tons in 1963/64 to a peak of 106,000 tons in 1973/74. From then on production has varied between 95,000 tons and 130,000 tons, depending on production constraints, with no clear growth trend. Following the Arusha Declaration, the sugar estates were gradually nationalized, (Kilombero in 1969, Kagera in 1970) Mtibwa in 1975, TPC in 1979)and are now all held by the Sugar Development Corporation.

With the rapid increases in production and income during the 1960s and early 1970s, sugar consumption climbed to a high of about 8.6 kg per capita between 1970 and 1975. Since then, stagnation in per capita incomes, production problems and shortages of foreign exchange for imports have caused consumption to decline down to 4.4 kg per capita, a level commensurate with the late 1950s. While this level of consumption is less than a quarter of that of Kenya, (20 kg per capita), incomes are also significantly lower, and sugar is highly income elastic. Income elasticity of demand is estimated at around 2. Sugar imports have never completely stopped, as the table below shows. Import duties have been about 30 percent until 1991, when they were reduced to 20 percent. Starting in the mid-1970s, Tanzania started to export sugar and molasses, in spite of domestic shortages, to generate foreign exchange. Tanzania is able to export 10,500 tons of sugar to the European Community under the Lome Convention, where it receives a price often double the world market price. Starting in 1986 with the Economic Recovery Program, the sugar sector was given the right to retain 100 percent of revenue earned from exports. These funds were used to supply the industry with badly needed spares and recurrent inputs.

Table 4.12: Sugar Supply and Consumption, 1956-60, 1986-90

	Production	Imports	Exports	Available	Population	Consumption per capita
1956-60	23.3	22.1	0.9	44.5	9,070	4.91
1961-65	49.1	13.9	1.6	61.4	10,583	5.80
1966-70	78.2	4.9	0.1	83.0	12,366	6.71
1971-75	98.4	31.2	4.2	125.4	14,520	8.64
1976-80	115.2	21.3	16.2	120.3	17,009	7.07
1981-85	113.4	10.1	11	112.5	19,608	5.74
1986-90	99	11	10.5	99.5	22,552	4.41

The expansion of the sugar industry was predicated on substituting for ever increasing imports. Evaluating production costs in "economic terms" against import parity prices, Tanzania has more or less broken even. Economic costs on average between 1981 and 1991 were $320 per ton.[175] Import parity prices over the same period averaged $335 in Dar es Salaam. While the benefits were only marginal, the international market is a residual, representing a small proportion of the sugar consumed in large producing countries behind high tariff walls, and international prices are quite erratic. Continuation of the present policy makes sense because it ensures supply at a predictable price that is not subject to the vagaries of international commodity markets.

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174 Material for this section is drawn from Netherlands Development Corporation, "Sector Aid and Structural Adjustment: the Case of Sugar in Tanzania", Operations Review Unit, December 1992.

175 Ibid, p.13.

In financial terms, the sugar industry has not fared well. Production costs have averaged about $430 per ton of sugar between 1980 and 1991, with recurrent costs of $350 and depreciation of $80. Prices for sugar are set by Government, in consultation with Sudeco. During the 1980s, in an effort to contain the increase in consumer prices, Government kept the ex-factory price of sugar to about $390 per ton. Factories were unable to cover all their fixed costs as a result. Between 1982 and 1986, ex-factory prices were set below recurrent production costs, causing severe losses at the factory level. These losses have been borne by Sudeco and the banking system. Since 1987 sugar prices have been set above recurrent costs, enabling all the factories, except Kagera, to run profitably. In 1991/92 an ex-factory price of $450 a ton was approved, with production costs averaging $400 per ton. The foreign exchange requirements for production are quite high, at about $210 per ton of sugar. Increases in volume, and capacity utilization at the factories, would reduce this substantially.

The sugar industry has performed well below potential in the 1980s. Production has been below capacity in all factories, although there are important differences in performance, as can be seen in the table below.

Table 4.13: Current Status of Sugar Industry (Average for 1991 and 1992)

	Kilombero	TPC	Mtibwa	Kagera	Total
Cane Crushed ('000 t)	562	336	293	80	1,271
Yield (tons/ha)	75	60	58	45	
Sugar Content (%)	9.7	9.2	9.2	5.9	
Sugar Production ('000 t)	55	32	27	5	119
Capacity	75,000	60,000	35,000	60,000	230,000
Capacity Utilization (%)	73	52	78	8	52

The Kagera factory has been gradually declining. Conditions for cane production are well below optimum, and factory management has been poor. Work in the factory was disrupted by the war with Uganda in the late 1970s. Following a period of investment, when the area under sugar expanded to 4,800 ha, production reached a peak of 9,000 tons of sugar in 1983, and has been declining ever since. Factory capacity utilization never rose above 15 percent. It has received little donor support since the mid-1980s. Recently the factory and estate have been taken over by a private company who intend to refurbish it and revitalize production.

Kilombero estates, in operation since the early 1960s were expanded in the early 1970s with assistance from the Netherlands, Denmark and the World Bank. During the 1980s the operation had 8,000 ha, of which 2,000 were under outgrowers. Two thirds of the cane in the estate is under irrigation. Cane crushed has averaged about 475,000 tons per annum during the 1980s, rising to 574,000 tons in 1992. Outgrowers supplied 158,000 tons in 1980, and only 55,000 tons in 1989, due to the drastic decline in the cane (and sugar) prices. Since then, the increase in the cane price has seen a dramatic resurgence in outgrower supply, to 97,000 tons in 1992.

Mtibwa sugar estates were brought up to a factory capacity of about 2,000 tons cane per day, and about 4,800 ha of sugar estate by 1990--1,800 irrigated and the remainder rainfed. Outgrowers have never supplied more than 20 percent of total cane crushed. Obtaining sufficient seasonal labor for cane cutting has been a constraint. Cane crushed has fluctuated between 240,000 and 300,000 tons in the early 1980s. Financial and other difficulties caused a drop to 150,000 tons in 1985. The availability of foreign exchange and increases in sugar prices, among other factors, have caused cane crushed to return to the 300,000 ton level by 1992.

The Tanganyika Planting Company is in a dry area, and all its 5,800 ha of cane is irrigated. No outgrowers are used, as rainfed production is not possible. The factory operates 270 days per year, longer than the normal 180 day season, because of favorable climatic conditions.

The sugar industry did not perform well during the 1970s and 1980s, with sugar output well below factory capacity, in spite of strong local demand. The reasons for this include:

(i) **Pricing and taxation policy**: Prices for sugar as of the early 1970s were set by Government, in consultation with Sudeco, to keep the sugar price for consumers in Dar es Salaam low. Shortages developed, and sugar has had to be rationed, with more than a proportionate share (about 50 percent) going to Dar es Salaam. Prior to liberalization of domestic sugar marketing in 1992, consumer prices were well above the Government price in Dar es Salaam and rural areas. Ex-factory prices in the mid-1980s were too low, and did not permit recovery of production costs, causing widespread deterioration in facilities, and the less than optimum inputs used.

(ii) **Low Yields**. Estates did not produce sufficient cane to keep the factories operating at peak capacity. Outgrowers did not supply the balance, because low sugar prices kept cane purchase costs below competing returns from cash crops. On the estates, yields were well below potential because: (a) fertilizers were incorrectly selected and applied; (b) poor leveling and ploughing led to drainage problems; (c) irrigation systems were ineffective, due to poor management; (d) crop cycles were misjudged, resulting in gaps in replanting and production; (e) management was poor due to inadequate remuneration and a bureaucratic approach to farming.

(iii) **Shortages of foreign exchange**. These shortages forced the use of less than optimal levels of fertilizer, which had an effect on yields. Spares parts were less available, affecting the reliability of machinery. Cane transport machinery, where breakdowns and delays affect sugar extraction rates, has been especially important. Lack of spares also affected factory operations, causing losses in potential operating time of up to 45 percent in TPC and Mtibwa, and less in Kilombero.

The changes in sugar development policy that followed the initiation of the ERP have fostered a significant change in efficiency and capacity utilization. The increases in the official sugar price have made the sugar factories and estates profitable.[176] With the increase in cane prices, outgrower production has become profitable and a significant source of cane. The permission to retain all foreign exchange earnings from sugar and molasses exports, coupled with the increased availability of foreign exchange from donors and Government, has improved access to vital imported fertilizers, chemicals, machinery and spare parts. The removal of domestic marketing restrictions has equalized access to sugar across the country, albeit at a higher price.

A Development Strategy for Sugar. The current strategy of gradual divestiture of factory and estate operations is appropriate and should be continued. Sugar production is a potentially profit-making commercial enterprise, and will be run best by owners and operators interested in making the most efficient use of the land and capital resources. With the gradual restoration of market-determined prices for sugar and inputs, and the fairly straight forward access to foreign exchange and credit, the private sector should be able to make good use of the enterprises.

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176 See World Bank, Report P-6040-TA, "Public Sector Adjustment Credit", Green Cover, April 13, 1993, Annex VI.

Some degree of regulation will be necessary in the short and medium term as the industry is privatized and local production efficiency is restored. This will justify the maintenance of a small, joint private sector/Government sugar development authority which is capable of monitoring developments in the market, fostering research, and developing policy in support of the sector. In the short term, while the devaluation of the real exchange rate is making local sugar competitive with international prices, some degree of protection via import tariffs will be needed until local capacity utilization has increased, and unit costs have declined. A variable tariff policy may be needed to protect the industry from the violent swings in international prices. The contracting of sugar cane research is also done most effectively on an industry-wide basis. The analysis of the effects of taxes and other Government interventions on the sector is also best done on an industry basis.

Outgrowers are demonstrating that they can be a responsive and reliable source of cane supply for those factories in areas where rainfed production is possible. It is likely that Kilombero and Mtibwa will increase the use of outgrowers for cane growing, as it diminishes production problems. The availability of land guarantees that the factory cannot exert overwhelming monopsonistic power on smallholders. When the cane price drops, and the returns to foodcrops or other options are higher, smallholders will switch out of cane as they have in the past. There is the possibility, in complexes where smallholders are an important part of the system, that Government-owned operations could be turned over to a private company with joint ownership by outgrowers and a management firm. Such alternatives could be considered during the design of divestiture alternatives for the various sugar producing enterprises.

Food

Prior to 1986 the food marketing system of Tanzania was a single channel system; National Milling Corporation (NMC) was given a legal monopoly over requisition, processing and distribution of the eight major "scheduled"' food staples. Private traders officially were not allowed to engage in trade, nevertheless the share of the maize market estimated to have been handled by private traders was between two-thirds to three-quarters, and for the paddy market it stood at close to 90 percent during the early reform period.[177]

The pricing system adopted by the Government attempted to secure stable and remunerative producer prices while keeping consumer prices at an artificially low level. Prices were pan-territorial to avoid any price discrimination between urban and rural consumers, as well as between the Western, Northern and Southern producers. Consumer subsidies were considerable and the pricing system was not "anchored" to international prices, which disconnected domestic food grain prices from macro-economic variables such as exchange rates, interest rates and inflation.

These restrictive policies led at times to a failure of meeting consumer demands, as well as to repeated failures to purchase all the food crops offered for sale by producers. The subsidies placed a heavy burden on the Government's budget; NMC efficiency within the parastatal was very low. This aggravated public deficits and helped push food consumer prices up. Food production shifted to regions far from the main consumption centers. The banking system built up "bad debts" because of credit disbursements to various official participants within the food marketing and distribution chain who were not particularly creditworthy (primary coops, cooperative unions and, above all, the National Milling Corporation NMC).

In response to these problems, the Government began to gradually decontrol maize marketing by raising the limit on private grain movements to 500 kg, (from 30 kg in 1984). When this did not effectively

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177 Amani, H.K.R., van den Brink, R., and Maro, W.E., "Tolerating the Private Sector: Grain Trade in Tanzania After Adjustment", Cornell University Food and Nutrition Policy Program, November 1992, Working Paper 32.

address the problem an inter-ministerial committee was set up in 1986 to work out a new food distribution system for the country. The decontrol of food grain markets was accelerated with the following measures:

- 1986: Removal of explicit consumer subsidies on maize;
- 1987: Abolition of grain movement permits within the country;
- 1988: Deconfinement of cassava, sorghum and millet at the union level. The NMC was allowed to choose where to buy maize at the society or union level;
- 1989: Deconfinement of all grains at the primary society level. Exports of all grains except wheat and rice were allowed.[178]

By 1989 the single-channel marketing system was effectively abandoned, in favor of a "liberalized" food marketing system.[179] Some of the consequences of the liberalization of the grain trade are as follows:[180]

- a sustained increase in supply. This can be noted from Table below. The supply response clearly cannot be attributed only to the liberalization of marketing. Factors such as the increase in the availability of incentive consumer goods in rural areas, the reduction of transport costs, the increase in fertilizer availability and good weather all played a role. Nevertheless, mere supply has affirmed the potentially positive welfare effects of the economic liberalization policies;

- the average real maize price fell dramatically. The biggest drop was in 1984 (a year where supply problems coincided with a drought), and 1986. Over this period, the reform program was beginning to have an effect. Also, weather improved, increasing supplies and lowering prices. Between 1983-85 and 1986-88, real maize prices fell by 50 percent. Prices rose again by ten percent through 1989-91, due to the effect of a poor season in 1991.

- for maize, the main food crop, there has been a marked and sustained reduction in the price differentials between producing and consuming regions. The real price differential between the Southern Highlands (low price) and consuming regions such as Dar es Salaam, fell from Tsh 288 per unit of measure (in 1991 prices) to Tsh 135 per unit of measure (in 1991 prices) between 1983-85 and 1986-88. This reflects the more efficient intermediation by the private sector in the grain market and occurred in all regions except for the South Coast;

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178 The blanket ban of imports and exports was replaced by a system of licenses complemented by duties on wheat and rice imports.

179 For an in-depth discussion of the evolution of the grain marketing system in Tanzania see Gray, 1992; for a discussion of the emerging private trade see Gordon, 1989, Santorum and Tibaijuka, 1991 and, in particular the Marketing Development Bureau 1992; a brief overview of the outstanding issues for the food grain marketing system is provided in Banda, 1991.

180 This section draws from World Bank, Tanzania Agricultural Sector Adjustment Program, Gray, J. "Evolution of the Grain Marketing System in Tanzania", January 1992pp 17-22.

Table 4.14: Cereal Production Through the Reform Period (1980/81 - 1990/91)
(in '000 Metric Tons)

Year	Maize	(Paddy) Rice	Wheat	Millet-Sorghum	Total
1980/81	1839	200 130	90	705	2764
1981/82	1654	320 208	95	970	2927
1982/83	1651	350 228	58	793	2730
1983/84	1939	356 231	74	760	3004
1984/85	2093	427 278	83	1024	3478
1985/86	2210	549 357	72	943	3582
1986/87	2359	644 419	72	954	3804
1987/88	2339	615 400	76	682	3497
1988/89	3125	720 468	97	804	4494
1989/90	2445	740 481	106	568	3600
1990/91	2332	624 406	84	750	3571
		Index[181]			
		(Pre-reform)			
1980/81	82.8	37.0 118.9	72.4	76.3	76.3
1981/82	74.5	59.3 125.5	99.6	80.8	80.8
1982/83	74.3	64.8 76.7	81.4	75.4	75.4
1983/84	87.3	65.9 97.8	78.1	82.9	82.9
		(Post-reform)			
1987/88	105.3	113.9 100.4	70.0	96.6	96.6
1988/89	140.7	133.3 128.2	82.6	124.1	124.1
1989/90	110.1	137.0 140.1	58.3	99.4	99.4
1990/91	105.0	115.6 111.0	77.0	98.6	98.6

- there has been some reduction in seasonal price variations for maize, as private merchants intervene by storing during periods of low price and selling when the price goes up. However, seasonal price swings still remain substantial.[182] This has occurred in all regions except the South Coast;

- maize prices at harvest in the surplus regions in the Southern Highlands appear to have dropped somewhat, in real terms. The low prices of late 1990 have lifted because of the poorer harvests in 1991 and the buying activities by the Strategic Grain Reserve;

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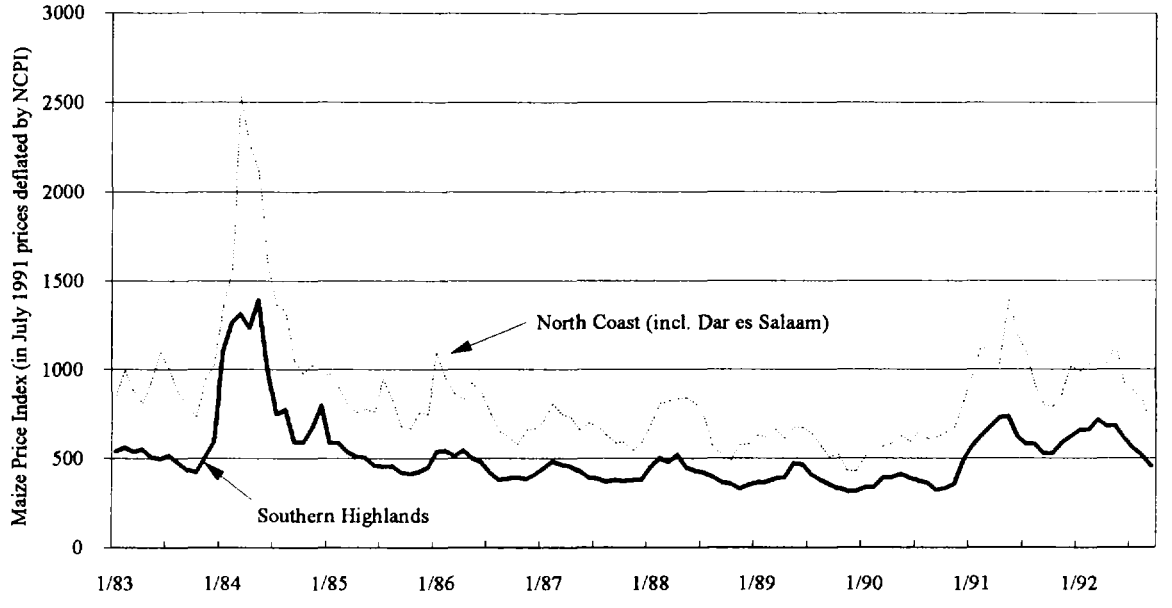
181 In calculating the index, the average annual production for the two year period 1984/85-1986/87 equals 100.

182 The seasonality index for maize was from 0.86 in August to 1.20 in February.

Figure 4.16: Maize Price Index for Southern Highlands and North Coast (which includes Dar es Salaam) in July 1991 prices deflated by the NCPI.



- maize deliveries to Dar es Salaam's Tandale wholesale market have tended to come more from Iringa and Dodoma than from the more distant regions in the Southern Highlands (Rukwa and Ruvuma);

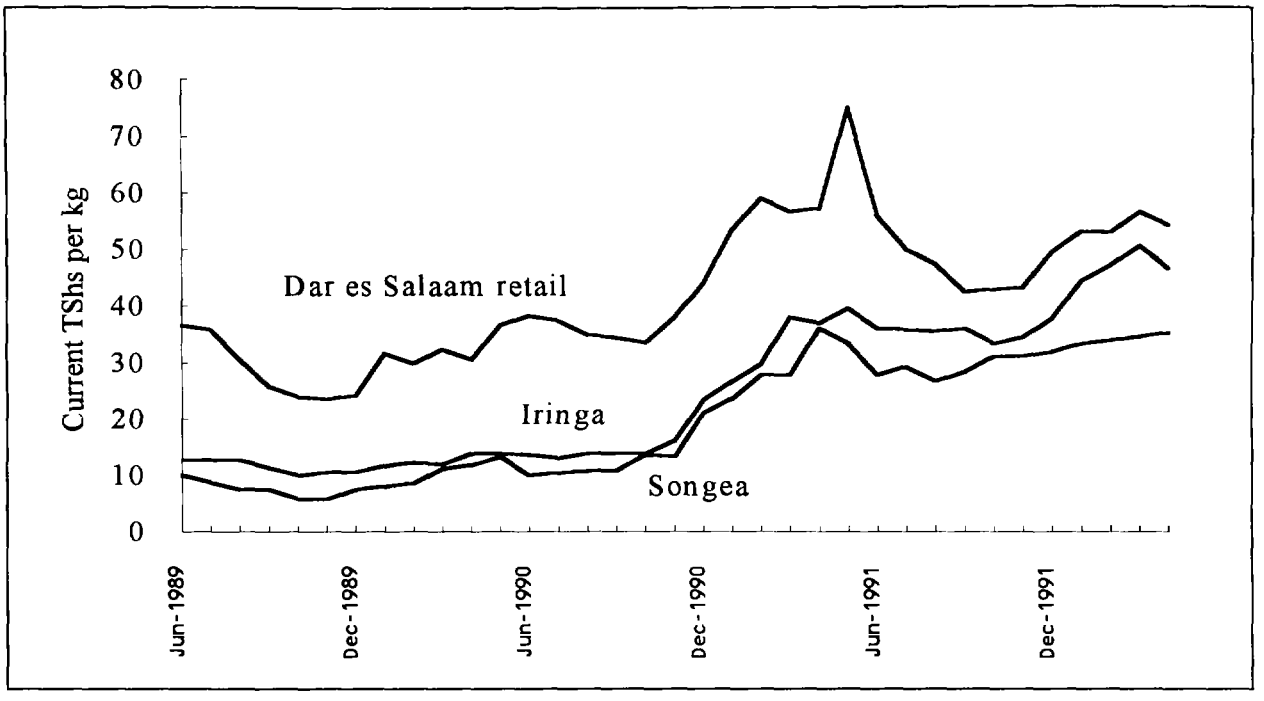
Table 4.15: Source of Maize at Tandale Market, DSM[183]

Source	Nov. 89 - June 90	July 90 - June 91	July 91 - Feb. 92
Dodoma	62%	23%	45%
Songea	14%	10%	6%
Iringa	18%	43%	32%
Mbeya	0%	18%	11%
Other	6%	6%	6%
Total	100%	100%	100%

- Some regions are not well-integrated into the market. A case in point is the South Coast, as noted above.

183 From the "Review of Maize, Rice and Wheat", MDB, 1992, Table 5.

Figure 4.15: Iringa and Songea Producer Prices and DSM Retail price of Maize



The decontrol of the foodgrain market saw the gradual emergence of private sector traders who effectively took over the $50 million dollar market for grain supply to urban areas with minimal funding from the formal financial system.[184] The evidence is that these private traders are small scale operators, often farmers themselves, who entered the market to take advantage of a commercially attractive opportunity, buying in surplus areas, often along the road between Iringa and Mbeya, and transporting the grain to Dar es Salaam. The volume per trader was small (500 to 5,000 bags per season) but there were enough traders to create a fairly competitive market in Dar es Salaam. As a result, the small trader markets at Tendale and Manzeze provided some 70 percent of Dar es Salaam's grain requirements by mid-1988. NMC's market share gradually diminished, as it could not match the margins of the small traders. With the decline of NMC's role in the food market, the cooperative societies, which acted as primary buyers, have also seen their role decline. (Although in certain rural areas the cooperatives aggregate produce for private sector traders.)

Some of the characteristics of the private trade which has emerged since deconfinement are listed below:

- *Limited specialization:* most traders were found to deal in one single crop and one single load at a time - only one out of six handled both maize and legumes.
- *Limited access to formal working capital:* only one out of ten traders reported obtaining credit from sources other than own or family finance.
- *Limited vertical integration:* only one out of fourteen maize traders used own production and a further two out of fourteen bought from other traders. It is also reported that very few traders own a vehicle for transport or have storage facilities.

184 This event, amongst others, indicates the presence of a fairly effective informal financial network, capable of providing fairly sizable amounts of finance, albeit in fairly atomized form.

In spite of these limitations, the private grain trading system now handles virtually all of the traded food grains within the country. However, these limitations could be addressed with the following measures.

Strengthening the private trade system, without inducing inefficiency, could be achieved by (i) clarifying the legal position of private domestic and external trade; (ii) enabling decentralized between-season storage in order to reduce seasonal price fluctuations; and (iii) improving available information to all participants of the private markets, including consumers and primary producers. Direct forms of support could include the supply of physical market facilities available on a lease basis, as well as the provision of credit for grain inventories, using joint and several liability to a group of traders, and the product as collateral.

The removal of legal uncertainties and impediments to the development of private trade in agricultural produce is very important. Some of the legal obstacles which still remain include:

- the Agricultural Products Act of 1962 which eliminated private grain traders in favor of the cooperative system;[185]

- the NMC Act No. 22 of 1984 which provides for the "continuance of the National Milling Corporation" and expands its powers to curb private trade. While this has been adjusted and modified by the Food Security Act of 1991, further changes are needed to remove uncertainties associated with private trade.

By late 1992 some five years of experience had been gained of the liberalized "multi-channel" food grain marketing in Tanzania had been gained. An inventory of "problems-yet-to-be-resolved" would include, at least, the following:

- first and foremost, persistent chronic as well as transitory, household food insecurity. This is found especially in rural areas, despite positive supply responses for food grains;

- second, the "barriers-to-growth" of the emerging private food grain trade. Limited between-season food grain storage by private traders is a major barrier;

- third, the formalization of regulations and rules governing private trade to establish scope for inventory-based trade financing;

- fourth, the efficient management of the Strategic Grain Reserve (SGR) with a focus on (i) localized food shortages and (ii) related within-season price spikes;

- fifth, the opening-up of external trade of food grain including maize, to capture potential gains for trade with countries in the region that face shortages.

Management of the Strategic Grain Reserve

The questions regarding management and regulatory framework of the SGR relate to:

- finding the least-cost way of executing the strategic procurement of sales and purchases according to food security objectives;

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185 Amani, van den Brink and Maro, "Tolerating the Private Sector: Grain Trade in Tanzania After Adjustment", Cornell Food and Nutrition Policy Program, November 1992, WP 32, p 7.

- determining the into-store purchase prices and the release trigger mechanism, including the appropriate sales prices;
- analyzing which market conditions warrant relief releases;
- deciding on the target size of its physical network;
- choosing when to start open market sales (or auctions) from the SGR stocks and whether to allow sales to any public and private trader or institution;
- clarifying and separating of the roles of SGR management and accounting at the zonal centers.

The proposals for improving the management of the SGR are as follows:

Purchase procedures. A tendering procedure for purchases should replace the current agency system. The tender documents would not specify an SGR offer price but simply request a specified quantity of grain of a prespecified and verifiable quality for a given date (e.g. September 1 of each year) at a specific location (the main zonal centers). The least-cost tenders would be accepted, subject to an aggregate quantity demanded. Inevitably the tendering procedure will need to be anchored in (i) the border prices for similar quality grain; (ii) the least-cost trade and transport charges to the specific location within a certain time constraint; and (iii) the SGR's opportunity cost as reflected by tender offer terms at other zonal centers. These tendering rules would create a level playing-field between farm groups, private traders and primary cooperatives and cooperative unions.

Release procedures and prices. The present practices of selling primarily through the Prime Ministers Office will need to be reviewed in favor of selling to any interested party - public or private, wholesaler or retailer. The current regulation stipulating a cost-plus determination of selling prices (100 percent above the into-store prices) will also need to be reviewed from the viewpoints of (i) ensuring internal efficiency;[186] (ii) its price-stabilizing impact; and (iii) its implications for maintaining adequate stock levels. A technical study of the release trigger mechanism, including the determination of the selling mechanism (preferably an auction in the affected area) for the purpose of price stabilization needs to be undertaken urgently. This study will produce recommendations to replace the current rule-of-thumb release price with a rule that refers to:

- the maximum permissible variance around the real average monthly market prices for maize, before Government response is triggered;
- the permissible trade margin between border and wholesale prices;
- the mechanisms for continuous update of the real average retail prices, using early warning information as well as domestic supply and import forecasts.

It seems imperative that every public and private agent or trader, wholesale or retail must be allowed to buy at the SGR auction (or release price). Sales to public institutions (e.g. schools, prisons, the army) should not be given preferential access. It must also be noted that the extent of political interference

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186 It is necessary to distinguish rotational sales from relief and price stabilizing sales. Rotational sales at the going market price will be necessary during a sequence of 'good' food production years, just prior to the new purchases. Relief sales and free or food-for-work distributions occur at specific food insecure zonal centers; this can be expected to occur regularly in chronic food deficit areas and occasionally in transitory food deficit areas. Price stabilizing sales occur only at specific locations and only at times when prices are exceptionally high.

in the SGR release and stock management at the district and regional levels tends to endanger efficient management of the SGR. Depoliticization of the decision making, reinforced by a flexible and unambiguous set of rules and regulations, must be allowed to take place.

Trade in Food

When considering external trade of food grains it is useful to make a distinction between the staples for which the country is, in normal production years, in an export regime (white maize), for which it is approximately self-sufficient (rice) and for which it is in import regime (wheat grain). The Table below presents the external trade volumes of the three main food staples: maize, rice and wheat. The table highlights the switch in the white maize market from an import regime in the early 1980s to an export regime in the late 1980s, reflecting the positive supply response during the liberalization of the food marketing. Rice imports continue during the post-liberalization period, though at a reduced pace. Considerable imports of wheat continue.

Table 4.16: Cereal Imports and Exports 1980-1990 ('000 metric tons)[187]

Year	Maize Imports	Exports	Rice Imports	Exports	Wheat Imports
1980	274.6	0.0	65.2	0.0	48.7
1981	234.6	0.0	70.3	0.0	83.1
1982	123.4	0.0	29.4	0.0	29.4
1983	194.3	0.0	57.1	0.0	46.3
1984	128.5	0.0	36.1	0.0	33.3
1985	6.1	0.0	32.9	0.0	21.8
1986	93.8	0.0	83.5	0.0	53.5
1987	0.0	90.8	52.3	0.0	33.7
1988	0.0	19.4	19.5	0.0	28.8
1989	0.0	30.3	0.0	0.0	30.0
1990	2.2	57.0	2.6	5.0	40.0

The principle reason for restricting exports of white maize from the Southern Highlands to the neighboring countries, or from the Northern border to Kenya, has been to avoid importing food for Dar es Salaam. The main arguments concern (i) the limited availability of foreign exchange to finance such imports; (ii) the thinness of the international white maize market; and (iii) the perception that food imports for the urban centers are a political failure.

The potential market for white maize from Tanzania is good, even in non-drought years. The official trade figures shown above do not capture the complete picture. Parallel export markets for grains exist to the neighboring countries, in particular Burundi, Rwanda, Southern Kenya, Malawi and Northern Zambia.[188] An early study by the Marketing Development Bureau in the pre-liberalization period estimates that between 40 to 100 thousand metric tons of maize, rice and beans may have been traded for consumer goods, such as clothes, soap and batteries, in neighboring countries. The improved availability of consumer goods in the post-liberalization period may have reduced the incentives for illegal exports, but

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187 Years refer to the marketing year. Sources include the National Milling Corporation (up to 1988/89) and Customs and Sales Tax Department.

188 Burundi and Rwanda reported a sharply declining per capita food production in the second half of the 1980's. Malawi and Uganda have faced years of positive as well as negative growth. Cereal imports stood at 5.5 percent of Burundi's total imports bill, 2.4 percent for Malawi and 1.0 percent for Rwanda. See *The Least Developed Countries 1991 report* (Statistical Annex, Tables 4 and 13), UNCTAD, Geneva and New York.

the chronic deficit countries such as Burundi are likely to continue to provide effective demand. It should also be noted that good and bad production years in Tanzania do not closely correlate with those in other SADCC countries. A study into the feasibility of triangular food aid between the SADCC countries calculated that production instability in Tanzania (over the period 1960 to 1980) was less than for its southern neighbors (excluding Southern Africa). Moreover, a negative correlation could be found with all other SADCC countries (except Lesotho). This observations corroborate the view that some considerable potential for intra-regional cereal trade exists.[189] Tanzania produces 20 percent of the SADCC country cereal harvest, second only to Zimbabwe's 25 percent.

Table 4.17: Correlation Coefficients Between Cereal Production in Tanzania and Other SADCC Countries, 1960-80

Country	Correlation Coefficient
Angola	-0.2381
Botswana	-0.2786
Lesotho	0.0448
Malawi	-0.1822
Mozambique	-0.2432
Zimbabwe	-0.1697
Swaziland	-0.2908
Zambia	-0.2908

The Southern Highlands has been effected by the liberalization of the trade in cereals. There has been a shift in the regions supplying maize to Dar es Salaam away from the Southern Highlands and into Dodoma, which is closer. The Southern Highlands is already losing market share, due to its transport cost disadvantage. Regional transport rates were between Tsh 35 and Tsh 45 per ton/km in 1991.[190] Using a subsidized rate of Tsh 28 per ton/km, a recent Government-FAO study concludes that 1,000 km distance from Dar es Salaam (worth about Tsh 30 per kg) the economic limit within which "surplus maize production for the Dar es Salaam market remains attractive" at reasonably high levels of input use and yield.[191] (The sustainable limit, without subsidies on transport or fertilizer, may in fact be less than 1,000 km, perhaps 750 km). Surplus production areas outside of this limit (such as Rukwa) would produce for other deficit regions, or export to neighboring countries. The export parity maize prices to Burundi or Malawi is likely to be 50 to 100 percent greater than the Dar es Salaam import parity price, depending on transport costs. The difference is a net foreign exchange gain to the country. It is estimated that the shift will need to be of the order of 100,000 tons. To the extent that production for Dar es Salaam shifts to the closer regions, and export markets take up the slack for the production from Southern Highlands, there would be a net foreign exchange gain of $20 to 25 million.

Thus, it is recommended that trade with neighboring countries be liberalized. In exceptional circumstances, such as the regional drought suffered in 1992, temporary export controls should be applied to shield the Tanzanian consumer from regional shortages. Such controls should be specified by commodity and duration, and should permit the export of a certain share of the national marketable surplus

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189 The production of cereal during 1960-1980 in Tanzania was the second largest in the SADCC countries after Zimbabwe. The aggregate instability for the SADCC region was less than the for each of the individual countries. Tanzania's instability was the lowest of any of the SADCC countries. See IFPRI , Research Report # 53, Koester, U., "Regional Cooperation to Improve Food Security in Southern and Eastern African Countries", Washington DC, 1986, p.45.

190 Economic Research Bureau, "Tanzanian Economic Trends", Vol. 4, Numbers 3 and 4, p.29.

191 URT/FAO, Comprehensive Food Security Programme, Dar es Salaam, October 1992, p.38.

(especially from far-off surplus regions such as the Rukwa and Ruvuma) to permit producers to participate in the favorable price regime.

Non-Traditional Agricultural Exports

Tanzania exports a wide variety of agricultural products other than the traditional coffee, cotton, tea, cashews and sisal discussed previously. These exports as a group are worth $40 to 50 million a year, equivalent to either coffee or cotton. They are growing much more rapidly than the traditional exports. By 1990 the value of these exports had almost returned to the level achieved in 1980, in real terms. A sense for the variety of non-traditional exports can be gained from the list of official exports in 1990. This should be interpreted as a minimum statement. Actual exports were probably higher if the unrecorded "second economy" trade is included. Exports of nontraditional crops are also fairly erratic. Apart from sugar exports, undertaken to supply the factories with foreign exchange for imports, and cereals, where the movement appears to be fairly steady, trade in the various items fluctuates dramatically year by year.

Table 4.18: Value of Non-Traditional Agricultural Exports, in 1990

	('000 TShs)	('000 US$)	% of Total
Pulses/Starches	3,707,434	19,007	45%
Cereals	1,483,579	7,606	18%
Sugar Products	1,444,759	7,407	18%
Oilseeds & Oil	695,158	3,564	9%
Cocoa Beans	551,627	2,828	7%
Spices	186,710	957	2%
Fruit/Vegs	40,154	206	0%
Cinchona Bark	37,100	190	0%
Nuts	4,617	24	0%
			100%
TOTAL	8,151,138	41,789	

The rapid increase in the value of exports between 1985 and 1990 is an indication of how fast growth in this sector can be. Production possibilities and trade potential in sugar and in the food markets (pulses, starches and cereals) have been discussed in the previous sections. Discussion here will focus on production constraints and market potential for high-value crops like flowers, fruit, vegetables, spices and oilseed.

Transport

A key determinant of export competitiveness in the high-value crop market is transport costs. Given the need for air-freight for flowers and such items, transport costs can account for 30 to 40 percent of the landed price.

Sea Freight There are modern ports at Dar es Salaam and Tanga, both with facilities for container and bulk grain handling, which provide good access to Gulf and European ports. A third port at Mtwara is in need of modernization. Sailing times to European ports are three to three and a half weeks and seven to ten days to the Gulf. With increased volumes the voyage to European ports could be reduced to two weeks, making Tanzania competitive with the fastest vessels from South Africa. Current freight rates for refrigerated containers from Dar es Salaam to Europe are $1,250 to $1,500 to Italy and $1,000 to

Dubai for 20 foot containers. However, there are limitations in the capacity to handle large quantities of refrigerated containters. Such facilities should be improved.

Air Freight With highly competitive handling charges and lower fuel bunkering costs than Nairobi, Tanzania has attracted an increasing number of flights to both Kilimanjaro and Dar es Salaam. Current air freight capacity from Kilimanjaro is estimated at around 60 tons per week. Air cargo rates for flowers and vegetables are $1.15 to 1.29 per kg for airlines from either Dar es Salaam or Kilimanjaro, with one exception where charges from Kilimanjaro have been raised to $3.0 per kg. There are already firm indications that without the introduction of air cargo charters there is going to be inadequate freight capacity from Kilimanjaro. Cargo on passenger flights is cheaper than charters. Thus, development of these high-value export markets depends on increasing the tourist and passenger traffic. Current Kilimanjaro freight rates compare extremely favorably with Kenya is $2.40/kg, Zimbabwe is $2.40/kg, Ecuador is $2.10/kg, Colombia is $2.20/kg and Zambia is $2.80/kg.

Physical Infrastructure. For cold storage to reduce product temperatures as soon as possible after harvest, cold stores must be farm-based and under the direct control of the exporter. There are many examples worldwide of the public sector investing in cold storage and refrigerated transport systems that are never fully utilized. Additional cold storage facilities may indeed be necessary at the airports or sea ports. There is no need for Government to invest in these production-based facilities. Rather, the private sector should be encouraged to establish its own infrastructure, and impediments to such investments should be removed.

Flowers and Foliage

The cut flower industry in Tanzania is still in its infancy. The two largest producers are both under five years old. These two companies have concentrated on low-cost field crop production (Ammi majus, Euphorbia marginata, Dill, Molucella, Amaranthus) and one is now diversifying into rose production. There are three other new entrants likely to enter production in 1992. These will all be based on field flowers and roses. The current production area of field flowers is estimated at 75 hectares and plastic greenhouse production at 12 hectares. Flower production is centered on the Arusha area.

Production standards of the established flower farms are comparable with leading world producers. Both farms have large cold stores and refrigerated trucks for transport of flowers to the airport. Technical expertise has in both instances been provided initially by the companies' Dutch marketing agents. Exports to the Netherlands show an increase from $20,000 in 1987 to $440,000 in 1991.

Total world imports of cut flowers amounted to $3,363 million in 1991, up from $2,219 million in 1987, an increase of more than 50% over the period. Total world imports of decorative foliage which includes ferns and a wide range of tropical species, has also shown significant growth, increasing from $260 million in 1987 to $461 million in 1992, an increase of 77 percent during the five year period. In most importing countries three species, roses, carnations and chrysanthemums, account for around half of total imports. The export market is dominated by Netherlands with 64 percent, and Colombia, with 12 percent. Kenya had 1.5 percent of the world market in 1991, with exports of $53 million in cut flowers.

It is likely that world rose supply will move into surplus. This is not only because of increased plantings worldwide, but also as a consequence of increasing yields from existing producers. Five years ago average export yields in Kenya were probably around 120 stems per square meter, they are now around 210 per square meter. The Netherlands has yields well in excess of 300 stems per square meter. Prices will fall unless the market continues to expand. With a recession in many European countries prices are already falling, particularly for short stemmed and low-quality roses. In response to over supply, Dutch producers have recently forced their Cooperative Auctions to place quotas on foreign rose imports. The

strategy of developing country flower producers has been to diversify into as many flower species as possible to offset the risk of price drops in a particular crop.

Tanzania has areas well suited for flower production, with good soils, adequate water supplies, and temperatures that range between 25-30 degrees centigrade during the day, and 15-18 degrees at night. These areas, around Arusha, are within easy access of the Kilimanjaro airport. The critical factor determining a flower farm's competitiveness is the combination of high yields and high quality. If quality is good, the product can support a temporary decline in price, or increases in air fares, which are likely as competition for restricted space increases.

Fruits and Vegetables

At present horticultural production is mainly for local consumption, involving small-scale farmers who market their produce locally. In general the quality of produce is variable and postharvest handling practices totally inadequate. Increased production from small farms is constrained by a lack of high quality planting materials, input supply problems and comparatively small local domestic markets.

It is estimated that fruit and vegetable exports in 1992 will be more than $10 million. The majority of these are of French beans from two very large exporters. Volumes of processed fruits are comparatively small. The two large French bean operations are sourced from either a combination of nucleus estate production with outgrowers or, in the case of the largest exporter, solely from small farmers. With the exception of a medium size pineapple unit all the existing fruit juice processing operations are small.

Tanzania has production possibilities similar to Kenya. With a similar or lower freight rate, it could potentially compete in the same markets. An analysis of Kenyan fresh fruit and vegetable exports show a wide range of crops. The major crops exported are French beans, 16,330 tons; chilies, 2,120 tons; avocados, 3,310 tons; mangoes, 2,612 tons; okra, 1,842 tons; kapella, 1,592 tons; courgettes, 52 tons; pineapples, 445 tons; strawberries, 650 tons; and passion fruit, 445 tons. Market opportunities exist for all these crops as well as a wide range of small volume lines, provided Tanzanian exporters are able to maintain continuity of supply and consistently high-quality produce.

There have been major developments in the European fresh produce market in the past 20 years. The most important of these has undoubtedly been the revolution in retailing. This has resulted in the large European supermarket groups gaining an increasing share of the fresh produce trade. Throughout Europe it is estimated at least 50 percent of all fresh produce, and an even greater share of imported produce, is now traded through these large retail groups. Although with the expansion of the EC a considerable proportion of fruits and vegetables do originate from within the community, the growing level of imports from outside the community, coupled with the worldwide expansion in the production of fruit and vegetables, has contributed to the current position of a full market. There is now oversupply of nearly every product at nearly every time of year. We have a buyers' market. In these circumstances it is critically important for new entrants such as Tanzania to develop very close links with companies who are already supplying the major supermarket buyers.

Inevitably the growth of the supermarket sector has led to a declining number of outlets (and buyers) of fresh fruit and vegetables in all countries , and of course an increase in the size and power of these remaining buyers. The greatest concentration of buying power has occurred in the United Kingdom There are now 5 companies controlling half of the UK fresh produce trade. The consequence of these developments has been to place enormous buying power in very few hands has a number of implications of changing market structure for Tanzania:

- Quality. Products have to meet precise size, shape, color, appearance and maturity specifications.

- Uniformity. All the produce within the carton must be of uniform size and quality and every carton must be identical.

- Cold Chain. To maintain consistent quality, temperature control is important throughout all stages of distribution from field through packhouse, airline to importers warehouse, and from importers warehouse to the supermarket distribution depot.

- Import Volumes. Small quantities per shipment may be imported, but increasingly the import trade is only interested in large volumes sufficient to meet the requirements of the large buyers.

- Continuity of Supply. The major buyers require produce delivered to precise supply programs. No market exists for suppliers who are unable to consistently meet precise time schedules.

- Packaging. The multiple buyers have very precise packaging requirements, both in terms of size and appearance. Whereas prepackaging was formerly undertaken almost exclusively by the importer there is a trend, because of increasing costs of packing, for prepackaging to be undertaken in the supplying country. These supplying country packhouses also have to meet the highly specific and stringent health and safety requirements of the importing buyers.

- Production Controls. The major buyers also require confirmation of the precise chemical spray programs used on the crop. Chemical residue testing is now standard practice by most of the supermarkets and multiples.

The effect of these requirements is that successful market entry is dependent upon the credibility of the supplier. This favors the large fully integrated producer who has full control over all stages of production. However, entrepreneurs in Moshi have demonstrated that small farmers can act as suppliers providing there is strict control over all stages of production and marketing.

Constraints to Growth

The sector is based on private initiative and investment. However, there are areas where intervention by Government can smooth the expansion path, and enhance profitability. Such areas include:

Banking System. The banking system can be made more responsive to the demands of the sector. The difficulty in obtaining working capital is frequently noted as a problem. Problems involving procurement and foreign exchange transactions also hinder efficiency. Entry of private sector competitors in the financial market should improve service.

Foreign Exchange Valuation: As with other agricultural exports, profitability would be greatly improved with the valuation of exports at the market rate of exchange. Equivalently, the provision of a 100 percent retention facility would permit investors to cover startup costs and make remittances to foreign suppliers, or owners. Such a step would greatly increase the attractiveness of the sector to foreign investors.

Air Freight Capacity: Steps to maintain competitive fueling and airport charges, coupled with the promotion of tourism, will continue to keep Tanzanian cargo rates competitive. Freight capacity has

become a problem, especially to the UK. Organizing producers into an association charged with coordinating effective supply and utilization of air freight capacity could reduce this problem. Measures could also be taken to improve cold storage and weighing facilities at the airports. Such an organization (TANHOPE) has been started, but has yet to take steps to address these constraints.

Lessons from the Kenyan Experience

A review[192] of the successful experience in Kenya of diversifying into high-value agricultural exports notes that:

- Trade diversification into horticultural markets is high risk. The failure rate for companies attempting to enter this business has been high. Products are perishable, buyers have rigid specifications, and competition is high. Firms that succeeded had extensive prior experience in horticulture production or marketing, and diversified across products, suppliers and buyers. In the processing industry, government infant industry support and links to multinational trading companies have been critical to success.

- The horticultural export trade developed successfully with very little help from official research and advisory agencies. The need for private sector research and development lengthened lead times. Foreign investors, with access to international expertise, have been able to shorten lead times to successful startup.

- Firms and farmers have experimented with a wide range of institutional arrangements. Such flexibility permitted an effective response to the changing requirements of producers and buyers.

- Kenya was well endowed with the support services and infrastructure necessary to compete successfully in European markets. Entrepreneurs in Kenya had ready access to a well-developed financial system, good roads and airport facilities, and a wealth of private management and technical expertise. Replication of these preconditions for success will not be easy for Tanzania.

Oilseeds

Edible oil production in Tanzania is dominated by cotton seed (60 percent of the market) and sunflower, although sesame, groundnuts, copra, soya beans and castor seeds are also used. The regions producing oil seeds coincide with the main cereal areas. Groundnuts are produced mainly in Mtwara and Ruvuma. About 70 percent of the sesame seed comes from Lindi. Over 80 percent of the castor oil is produced in Dodoma and Morogoro. More than 80 percent of soya bean production is from Mtwara and Morogoro. With the dissolution of GAPEX in 1986, the cooperatives were given sole responsibility for procurement of oil seeds. In 1989/90 the Government completed deconfinement of the marketing of oil seeds. Under the new arrangements private traders, oil mills, and cooperatives unions are free to purchase oil seeds directly from farmers.

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192 Jaffee, Steve, "Agricultural Trade Diversification in SADCC Countries: Prospects and Constraints", prepared for AF6AG, March 15, 1991.

Table 4.19 Oil Seed Production 1988/89 to 1989/90
('000 tons)

	1988/89	1989/90
Cottonseed	207.60	179.00
Sunflower	33.00	40.30
Sesame	17.23	17.31
Groundnuts	120.36	120.00
Soyabean	21.06	NA
Castor bean	NA	NA

Domestic demand for edible oils in Tanzania is estimated at 60,000 tons per annum. Half of this is supplied by the domestic producers, who operate well below capacity. The edible oil milling industry is being restructured under the IDA supported Industrial Restructuring and Trade Adjustment Credit. There are 42 mills with a total installed capacity of 424,000 tons per annum, although present available capacity is estimated at 200,000 tons per annum. Domestic oil millers have found it increasingly difficult to procure oil seeds at a price low enough to compete with imported refined oil. The farm price of oil seeds in areas near to Kenya is inflated by higher oil seed prices in Kenya. The Kenyan oil millers are protected by a higher tariff on refined oil imports (60 percent). In Tanzania, crude oil is subject to no duty and refined oil incurs a duty of 20 percent. Local millers are unable to compete within this margin, possibly because of their high fixed costs, a consequence of underutilized capacity. A review of firm level profitability, as well as the prices offered by the main exporters (Indonesia, Malaysia and the Philippines), will determine whether dumping is taking place, and whether countervailing duties are required.

Tanzania has traditionally exported significant volumes of sesame, soya beans and sunflower in addition to major exports of cotton seed. Tanzanian exports peaked at some 70,000 tons in 1980. Exports declined in the mid-1980s, and have still not returned to prior levels. The demand in world markets for specialized oils and seeds from sesame, sunflower, and groundnuts growing, some of it in response to the reduction of Sudan's production.

Strategy for Development of Nontraditional Agricultural Exports

The strategy for diversifying agricultural exports should be based on increasing the incentives for involvement of the Tanzanian private sector in association with foreign firms. The role of Government should be minimal, as has been the case in other countries that have successfully diversified. Efforts should be made to allow enterprises flexibility in financing, production and export, in order to enhance competitiveness with firms in other countries that produce for the same markets. Where there are failures in markets for inputs, air transport and finance, Government should encourage firms to develop their own solutions within an open, competitive environment. The following measures appear necessary to enhance the profitability and chances for success of ventures in this high-risk sector:

- Permit full retention of foreign exchange. Exporters need to be able to sell the foreign exchange earned from nontraditional exports at the market rate (or retain it all). This will provide flexibility in arranging finance (available in foreign exchange from offshore banks), attracting foreign investors, and making payments for foreign expenditure (inputs, machinery, marketing costs).

- Maintain low and competitive airline refueling and airport use charges. This will enhance the attractiveness of Tanzania as a refueling point for international carriers, increasing the availability of cargo space.

- Promote tourism. Increased passenger traffic will increase the availability of cargo space for use by exporters.

- Organize producers. The formation of a producers association will permit sharing of overheads on specialized infrastructure (cooling plants at airports for example), coordinate use of scarce resources (such as cargo space), and potentially pool resources for provision of common services such as research, extension, and quality verification.

- Disseminate information for investors on tax incentives, market prospects for different commodities, market contacts in importing countries, and other background data. Provide a facility to share the cost of feasibility studies for potentially viable enterprises.

- Promote Tanzania as a haven for foreign investment in enterprises to produce tropical products for the European market, taking advantage of its ACP tax free status, excellent productive potential, low freight charges and low cost labor.

Livestock

The livestock subsector in Tanzania generates over one-quarter of agricultural GDP. Of this, beef accounts for about 40 percent, milk for 30 percent and poultry and small stock for the remaining 30 percent. In addition, animal traction is important for cultivation and rural transport. Manure is used on crops or as fuel. Livestock play important social roles in many communities and, in particular, provide a relatively secure form of savings and investment. Cattle are the dominant species, with a national herd of over 13.9 million in 1989/90.[193] They account for some 75 percent of total livestock production. There are some 7.7 million sheep and goats, of which 70 percent are goats. and over 17 million poultry. Pig numbers are low (0.7 mln. approx.) and concentrated in a few regions.[194] Of the three and a half million farming households, it is estimated that 58 percent own poultry, 19 percent have small stock and 17 percent own cattle - only 7 percent keep pigs.[195] Some 80 percent of livestock owners are also crop farmers; the other 20 percent are pastoralists (but they own 40% of al cattle). Results from the Cornell/ERB survey[196] indicate that the ownership of livestock is considerably more skewed than expenditure. The Gini coefficient for livestock ownership amongst rural dwellers is 0.82; for expenditure in rural households it is 0.60, for land ownership in rural households it is 0.46. Clearly wealth is linked to livestock ownership.

Production is largely for the home market. The most important exports are live animals to the neighboring countries (largely unrecorded) and hides and skins. Until the mid-1970s, exports of corned beef to Europe were a profitable business. The only significant livestock product imported is skim milk powder and butter oil, largely as food aid, which accounts for some 15 percent of urban milk supplies. There is limited production of dairy products but virtually no meat processing. Average annual consumption levels of livestock products in 1988 are estimated at 10.0 kgs of meat (beef 7.9 kg, goat/sheep 1.2 kg, poultry 0.6 kg and pigmeat 0.3 kg) and 21 liters of milk, i.e. about half the levels in Kenya.[197] The

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193 Bureau of Statistics, "Agricultural Sample Survey of Tanzania Mainland 1989/90," June 1992, p.24.

194 Ibid., p.27.

195 Assuming that households with adult animals overlapped completely with those with younger animals. The larger number was taken in all cases.

196 World Bank, Cornell/ERB, "Poverty Profile", op. cit., Tables 4.10, 4.11, 4.12.

197 From "Livestock Development Programme 1989 -2000", Ministry of Agriculture and Livestock Development. The Marketing Development Bureau have estimated milk consumption at only 15 kgs per capita.

share of the household expenditure on food that goes into meat and fish rises from 17.5 percent in rural areas, to 22.3 percent in urban areas and 25.2 percent in Dar es Salaam.[198]

Cattle

The rangelands, largely exploited on a communal basis, provide over 90 percent of the feed resources for ruminant livestock. Nearly 50 percent of the cattle herd is on agropastoral systems in the humid plateau lands (Mwanza, Mara and Mbeya). About 40 percent are on pastoral systems in the semi-arid to sub-humid rangelands (Arusha, Dodoma, Shinyanga and Singida). A further five percent, including most of the 200,000 exotic and cross-bred dairy cattle, is found in the very humid Northern and Southern Highlands, and the remainder are in the humid lowlands around Tanga and Dar es Salaam.

The Tanzania Shorthorn Zebu breed accounts for nearly all the cattle in the country. The indigenous breed is typified by its small size (around 240 kgs mature live weight), low production coefficients (milk yield of 1-2 liters per day in addition to calf requirements), resistance to disease, and ability to survive under poor nutrition. High mortality rates (over 5 percent in adults and 25 percent or higher in calves) and low calving rates (40 - 50 percent) severely limit offtake and potential herd growth. The national offtake rate is estimated at around 10 percent. About 100,000-200,000 live animals are exported (usually illegally) to neighboring countries. The domestic supply of beef is estimated at 190,000 tons in 1991.

Meat prices are low by international standards. The average liveweight price on the Dar es Salaam market in October 1992 was Tshs 150/kg (i.e. US 40 cents approx.). As noted in the Livestock Development Programme: "Incidence of meat shortages in urban areas is a rare occurrence, and attests to the strength and ability of the private sector to fulfill its role ...." Private livestock traders buy, aggregate, transport, hold and resell livestock. The trade is highly competitive and marketing margins reflect the costs and risks involved.[199] Private and public sector slaughter houses and slabs serve the urban areas. Facilities are basic and hygiene standards are low. It is estimated that only about 40 percent of the meat consumed is inspected at any stage. There are three meat processing plants, owned by the parastatal Tanganyika Packers Limited, but none are operational.

Milk production was estimated at 525 million liters in 1991, of which the traditional herd provided almost 80 percent largely for home consumption. Marketed production came mainly from smallholders (65 million liters) and large-scale farms (50 million liters). An additional 22 million liters equivalent was reconstituted from imported materials. Lactation yields in the traditional sector are estimated at 140 kgs (in addition to calf requirements). Yields in the smallholder sector are of the order of 2,500 kgs, while in the large-scale (largely parastatal) sector the average is about 1,800 kgs. Some 60 percent of the improved dairy animals are found in the Northern Highlands. Other important smallholder production areas are the Southern Highlands, Kagera and Tanga. A peri-urban production system, using cross-bred animals, has developed around Dar es Salaam, producing up to 65,000 liters per day.[200] The existing improved dairy herd should be producing at least 25,000 female replacement animals per year. By comparison, the combined output of the government and parastatal heifer Breeding Units is around 2,500 per year. However, the quality of the farm-bred heifers is highly variable as mating is often to local bulls in the absence of an effective AI service or improved bulls.

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198 World Bank, Cornell/ERB "Poverty Profile", Table 4.14.

199 A Marketing Development Bureau report on its 1991 survey of "Northern Trek Routes and Terminal Markets" concluded that: "Trader operations appear to be relatively efficient; trader margins also appear to be reasonable, being roughly equivalent to the opportunity cost of capital".

200 World Food Program survey.

The price of fresh milk in urban areas is high, reflecting its relative scarcity. For example, in Dar es Salaam, fresh unpasteurised milk sells at up to Tshs 200/liter (over 50 US cents). Recombined milk is sold at Tshs 160 (40 US cents).[201] Prices are much lower in more remote areas; thus while farmers around the capital receive Tshs 100/l for collected milk, in Arusha and Tanga the comparable price is Tshs 70/l and in Musoma it falls to Tshs 30/l. The parastatal milk processing company, Tanzania Dairies Limited, has seven plants around the country, but two (Musoma and Utegi) are virtually closed and most of the others require rehabilitation. An additional five plants are owned by private businessmen or institutions, including a recently opened plant in Dar es Salaam. The fresh milk intake to Tanzania Dairies has fallen from over 14 million liters in 1978 to around 4 million liters in 1991 and the company is dependent on recombination for some 80 percent of its supplies. Average capacity utilization is still only 25 percent. Producers are increasingly selling untreated milk directly to consumers and are thus getting approximately twice as much for their product. The high returns from milk sales is reflected in a willingness to pay high prices for cross-bred heifers - up to Tshs 200,000 (over $500) per animal.

Sheep and Goats

The largest concentrations of small stock are to be found in the same areas which have high cattle numbers. Six regions (Arusha, Shinyanga, Mwanza, Singida, Dodoma and Kilimanjaro) account for two-thirds of the total. The populations consist almost entirely of local breeds. Although small ruminants provide only 12 percent of national meat supplies, they are significant contributors to local consumption in rural areas. Annual offtake rates are estimated at 25 percent for goats and 15 percent for sheep. Their small size, reproductive efficiency and relatively low cost make them attractive to smallholders with limited feed resources and capital. Goats are also more resistant to tsetse and are thus of particular importance in the south-east of the country , e.g. Lindi and Mtwara.

Poultry and Pigs

Most of the birds (over 70 percent) are in traditional scavenging flocks. Little reliable information is available on the growing commercial sector around the major urban areas. There are over 100 hatcheries (two-thirds of which are privately owned), with an effective setting capacity of around one million eggs per year. Prices of day old chicks are no longer controlled but the supply is inadequate and erratic because of breakdowns and lack of spare parts. It has been found that there is limited demand for layer chicks because producers must wait longer for their returns and the disease risk is high in the interim. A grandparent stock facility has been established with Belgian assistance but some of the larger private producers continue to import their own stock. The parastatal National Poultry Company operates hatcheries and farms and controls the grandparent stock facility. In common with many other parastatals it is facing financial and management problems. A private company (Inter-chick) has developed a combined hatchery and feed mill business in Dar es Salaam and has an impressive marketing network.

Competition is intense in the feeds market. This has effectively controlled prices, but it has led to reduced quality. The parastatal feeds company has practically ceased production because of a lack of working capital. Around three-quarters of the feed-milling capacity is in private hands. Imported pre-mixes, drugs, vaccines, etc., are now available on the open market, but the development of the private sector is undercut by Government sales at subsidized prices. There is some concern that the relatively uncontrolled import of live vaccines could introduce new diseases into the country. The

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201 A recent study on "Dairy Development in Sub-Saharan Africa" concluded that the import parity price would be 40-50 US cents per liter, of which the producer would typically receive half [Walshe et al, World Bank Technical Paper No. 135, 1991].

frequent breakdowns in electricity supply are a cause of major losses to the commercial poultry industry. As a result of the actual losses incurred or the perceived risk of loss, disease is a major constraint on the expansion of the commercial poultry sector, especially for smaller-scale producers.

Pigs are not of great significance in meat supplies. Over 90 percent of production comes from the traditional free range village system, which relies on scavenging and household residues. The largest concentrations are found in the Southern Highlands (Iringa, Mbeya, Ruvuma) and in the Northern Highlands (Arusha, Kilimanjaro). African Swine Fever is presumed to be endemic in the wild porcine species. Fatal epidemics are experienced in the domestic pig populations on a regular basis. Effective control would depend on compulsory and secure segregation of domestic pigs, but there is not yet any official policy or legislation to address the issue. There is a small number of commercial producers (private, parastatal and institutions) in and around the urban centers.

Hides and Skins

Hides and skins are important by-products giving rise to significant export earnings and providing raw material for domestic leather and footwear industries. Most cattle hides do reach the market, but only about 50 percent of goat and sheep skins are collected and traded, due to their lower value. The parastatal company, Tanzania Hides and Skins, had a monopoly of the trade until the mid-1980s, but it is now practically defunct. A small number of private companies now dominate the market. Official figures show export earnings of around $ 3 million in 1990, but there were also substantial illegal exports at that time. Hides and skins are classified as traditional exports and thus traders cannot benefit from the foreign exchange retention scheme. There are major quality problems with the raw material due to branding and poor preparation and storage. Prices paid are now related to quality, as well as size weight, which, providing an incentive to improve preparation and handling.

Government Services for Livestock

The share of the recurrent budget going to livestock over the past decade has been broadly commensurate with its relative importance, averaging about 20 percent of the total agriculture budget. However, funding has been inadequate to maintain the level of services. As a result physical structures have deteriorated, technical field services are effectively non-existent over large parts of the country, and staff morale has plummeted. At the same time, livestock's share of the development budget has been low and declining. The proportion of donor funding for agriculture which has gone to livestock has fallen to around four percent. The subsector has received a substantial share of local development funds, a consequence of the reinvestment of counterpart funds from dairy commodity aid. Only about three percent of lending by the Cooperative and Rural Development Bank has gone to livestock in the recent past, mostly in the form of microcredits.

Past Government investment in livestock was in the parastatal sector: beef ranches, dairy farms, poultry production, feed milling and milk processing. This has yielded little return, with poor management and technical performance and mounting financial difficulties in most of the enterprises. The diversion of a large share of funding to the parastatal sector has meant that core government services have been starved of funds. This trend should be reversed with the gradual divestiture of commercially viable activities to the private sector.

The restructuring of the research and extension services has been reviewed in Chapter III. It must be accepted that messages for livestock development really only exist for the intensive highland dairy systems. This is where the focus of efforts in the cattle-oriented research and extension services should be. Priorities for addressing the various disease and nutritional problems of the livestock sector are contained in the Research Masterplan.

Recommendation Following the liberalization and restructuring programs, Government will be left with a core of key functions, including monitoring, planning, regulating and promoting. Substantial investment will be required to rehabilitate and strengthen core services, many of which are currently dormant. There is a need to delineate more precisely just what these core functions might be in livestock, to prepare restructuring and staffing proposals and to identify related investment requirements. There is a considerable resource of skilled and experienced personnel, but they must be given the means and incentives to carry out their work. There is also a continuing need for investment in human resource development (with a strong emphasis on management) to meet current and future needs. Experience from such attempted restructuring exercises elsewhere (e.g. Kenya) has shown the need to address the strategic issues first before initiating a rehabilitation and investment program.

Market Potential

The growth in output of the livestock sector has been low in the recent past. For example, over the period 1976-1988, value added in the subsector increased by only 8 percent in real terms, compared to 36 percent for crops.[202] Because of the simultaneous existence of controlled and parallel prices, it is difficult to establish reliable price indices for livestock products, but it is clear that real prices have risen significantly. This explains livestock's increased share of agricultural GDP up from 16 percent in 1976 to 26 percent by 1988. In constant prices its share fell to 13 percent. Thus the decline in per capita consumption of livestock products must be seen in the context of: i) falling per capita incomes in real terms and ii) rising real prices, both of which act to choke off demand. Purchasing power is the main limitation to increased consumption. Growth in real incomes resulting from the effects of adjustment will eventually generate a strong demand for livestock products, most of which have high income elasticities of demand.

The export market opportunities for livestock and meat will be assessed in a study (funded by ODA) planned for 1993. Substantial live cattle movements to neighboring countries, especially Kenya, are expected to continue in response to effective demand. The completion of the exchange rate liberalization process and the harmonization of exchange rates, coupled with the wider availability of commodities on the domestic market, could convert this into a legal trade. Substantial investment would be needed to permit resumption of corned beef exports to the European market. Disease restrictions would appear to preclude any exports of fresh, chilled or frozen meat to this market in the near future. There may be opportunities available, however, in the less restrictive, high income markets of the Middle East.

Legislation

In the legislative arena the principal issue is that of land tenure. As noted in the report of the Presidential Commission of Inquiry into Land Matters, security of tenure (with related use obligations) is essential for villagers and pastoralists.[203] This will provide incentives for rational rangeland management and will encourage the required investment in improved pastures and water supplies. In particular, the pastoralists require:

- rights of access to both wet and dry season grazing (including related water supplies) and
- sufficient control over their land to encourage improved management and investment.

In other areas, including range management and disease control, some updating of legislation is required. The enforcement of existing public health legislation is also an issue.

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202 Derived from World Bank, "Tanzania Economic Report: Towards Sustainable Development in the 1990s," Volume II, Sub-Annex 5, Table 4.

203 Report of the Presidential Commission of Inquiry into Land Matters, Volume I, November 1992, p.148.

Fodder and Water Management

The estimated carrying capacity of the rangelands in Tanzania is 20 million animal units, while present stock numbers are equivalent to about 16 million. In gross terms there would appear to be adequate scope for expansion. However, a large part of the underutilized dry sub-humid zone is heavily infested with tsetse, while water resources are poorly developed. These areas cannot be exploited at present. At the same time, there is increasing pressure on the accessible range as more land is taken for agricultural production and livestock numbers continue to increase. The productivity of grazing animals is significantly reduced by poor nutrition in the dry season, but the low prices of meat do not justify significant levels of supplementation. The development of strategically located water resources, where available, offers the best hope of rangeland development. Development should take into consideration use of fodder resources, and grazing pressures, to prevent degradation. Any interventions in land and water management should be designed and implemented with the full participation of the pastoralists.

Cultivated pastures are mainly found in the highland areas and are associated with dairy production from exotic or crossbred animals. In general, there has been a serious imbalance between investment in cattle and in pasture on dairy programs.[204] Pasture seed production does not match demand and much is imported. Opportunities exist for the contract production of seed on parastatal or private farms. The feed industry is now largely in private hands and should be in a position to respond to local demands and opportunities. The absence of formal feed testing and labeling regulations means that livestock producers do not have automatic access to the nutritional information they require for proper livestock management and assessment of cost-effective feeding options.

Disease Control

The widespread prevalence of trypanosomiasis, tick-borne diseases and other ailments leads to substantial losses and control costs. Some diseases (e.g. foot-and-mouth) limit export options. The perceived risk also constrains upgrading to more productive (but usually more susceptible) stock and the adoption of more intensive production systems, for example, in the poultry industry. With the notable exception of rinderpest, official disease control activities are rather ineffective. Veterinary services are largely in the hands of Ministry staff, with private practice slowly developing in peri-urban areas and densely populated rural zones. Subsidized prices for drugs and elective vaccinations, combined with (theoretically) free clinical services, impose a substantial burden on the government budget and effectively undermine commercial practice. At the same time, the inadequacy of funding and declining levels of supervision, discipline and morale have resulted in the near collapse of the disease monitoring and reporting system.

As a priority, a new policy should be put in place for strategic and locally-managed control of ticks and tick-borne diseases. Responsibility for cattle dips was transferred to the Districts in 1986 but the Councils had neither the resources nor the will to resuscitate an already moribund service, with the result that few cattle outside the modern dairy or ranching sector are now dipped regularly and disease losses are high.[205] Some form of community or producer association control would appear to be the only sustainable basis for operating such communal facilities. Under the Netherlands-supported

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204 UNDP/FAO (1991), "Assistance to Smallholder Dairy Development: Project Findings and Recommendations," AG: DP/URT/86/013. Terminal report, FAO, Rome.

205 A survey in Kagera in 1991 found that the overall mortality rate in cattle was 11.5 per cent (calves 35% approx.) in areas where the dips were not working, compared to seven per cent overall (calves 23%) where dips were operating - offtake was correspondingly lower. [Annual Report of Kagera Livestock Development Programme, 1/7/1991 - 30/6/1992].

program in Kagera Region, user committees have been established to run council facilities. This example may provide useful lessons for the rest of the country. In relation to tsetse control, low cost technologies (e.g. traps and targets) have been developed which can be implemented at village level; the challenge now is to implement them on a participatory and self-sustaining basis.

Steps should be taken to institute a private veterinary service, where it is commercially viable. In a survey conducted by the Tanzanian Veterinary Association, 51 percent of veterinarians identified private practice as their first preferred option, but informed commentators do not see self-employed practitioners accounting for more than 10-15 percent of veterinarians in the near future.[206] In the lightly populated extensive production areas, conventional private practice is not likely to be a viable option. Possible alternatives would include allowing Government veterinarians to take on part-time commercial veterinary practice. Alternately, self-financing para-vets or, in the case of pastoralists, trained workers from the community, could be developed.

Breeding

It will be necessary to retain the central artificial insemination facility in the public sector until such time as the associations and or the private sector are sufficiently developed to take it over. However, charges should cover full costs, and it should operate on a commercial basis. In the meantime, further investment is urgently required in facilities and breeding stock. The national breeding program which is currently under preparation should consider the potential for the breeding and dissemination of improved bulls, for example. This might have a much greater long-term impact than the dissemination of heifers.

Inputs Supply

The inadequate supply of appropriate inputs has been a major constraint for livestock producers. Acaricides, drugs and vaccines are virtually the only cash inputs into the traditional sector. They account for between five and ten percent of the costs of commercial systems. There is some manufacture of antibiotics and anthelmintics by both parastatal and private companies, but most drug production in Tanzania consists of the reformulation and repackaging of imported products. A small vaccine unit in the Animal Diseases Research Institute produces limited quantities of commonly used bacterial vaccines. The bulk of veterinary drugs and vaccines are still imported by the government. The private sector accounted for 40 percent of the total in the past year. Drugs have been distributed largely through the Ministry's field staff. The policy of subsidized pricing, which applied until recently, inhibited the development of the private sector and stimulated substantial re-exports to neighboring countries.

A policy has now been adopted of encouraging commercial suppliers to take over drug and acaricide distribution. Government withdrawal from the market should be completed as soon as possible. Prices of many inputs must be expected to rise sharply as subsidies are eliminated and the full impact of the currency devaluation is felt. The initial producer response is likely to be negative as they have been accustomed to a level of subsidization. The veterinary authorities must retain responsibility for the supervision of the market, as required by legislation on animal diseases and pharmaceuticals. They must also retain responsibility for the mass vaccination campaigns against the major epidemic diseases (e.g. rinderpest). The cold chain set up to support these campaigns can be used for the distribution of elective vaccines also, thus justifying a continuing government involvement

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206 Gripper, J.N. & B.S. Sathe (1998), "Preparatory Assistance to Review the Animal Health Delivery System", FAO TCP/URT/6762.

in this area. An EC project is supporting the rehabilitation of the Central Veterinary Stores and the improvement of distribution and accounting systems.

Livestock Development Strategy

The priorities in the short to medium term are considered below under broad headings. Underlying all of these is the need to reorient government services so that they support and monitor (rather than attempt to control) the production and processing sectors. In fact, the livestock sub-sector is at the forefront in terms of public sector promotion of development from the outside, as most of the production and marketing is already carried out by private individuals.

Legislation A key legislative issue is the question of tenure rights to grazing lands, water points and dry season fodder by pastoral groups, while permitting flexibility of use patterns. Legislation requires updating in a number of areas, including range management and animal disease control. In other cases, legislation exists but is not enforced, e.g. public health.

Livestock Inputs As argued in the section on Inputs Supply market liberalisation should be continued, especially in relation to drugs and acaricides. Government will need to retain control over certain vaccines, as well as chemicals and reagents for its own diagnostic work; and will continue to have an important regulatory/monitoring role in relation to all dangerous drugs.

Parastatal Restructuring As noted in the section on parastatals in Chapter III, this question is being addressed centrally. The ranches and livestock breeding farms operated by parastatals or the Ministry of Agriculture can be operated at equal or improved efficiency by the private sector. The divestiture of such enterprises would be undertaken under procedures designed by the PPMB through the Agriculture Sector Management Project. The case of Tanzania Dairies is somewhat different as it controls large (underutilised) processing facilities - some of these plants may lend themselves to joint ventures, some others may simply have to be closed down. The market survey underway with ODA funding for exports of animal products should identify the potential for corned beef and other processed meat products, and permit an assessment of the commercial viability of a privatized Tanganyika Packers Limited.

Priority Surveys While the core research programme is being considered within NALRP, there are areas which require gathering of basic sectoral information. These include (i) the proposed tsetse distribution survey, (ii) range resource surveys, (iii) surveys in the rangelands to improve understanding of pastoral strategies of resource management, (iv) surveys of local consumption of livestock products, and (v) the study of export market opportunities, of which a first phase is now underway with ODA funding.

Government Planning and Regulatory Functions and Core Services Following the liberalisation process government will be left with a core of key functions, including monitoring, planning, regulation and promotion, as noted in Chapter III. Substantial investment will be required to rehabilitate and strengthen core services. There is a need to reorient and strengthen the planning and coordination functions in livestock. The core livestock support functions for livestock should be more closely identified, and the Ministry structure and staffing adjusted to provide these services. Such activities can be funded under the Agriculture Sector Management Project. The ASMP will also fund initial strengthening of these activities which shall remain in the public sector. Continued strengthening of the core functions in support of livestock development could be planned under subsequent investment projects. The switch to a more market-oriented system calls for different techniques in data collection and monitoring than does a centrally administered system. If Government is to be effective in this new environment it must be as well equipped. Linkages with other Ministries and sectors should be strengthened.

Specialized Small Farmer Institutions The Cooperative Act of 1991 permits the formation of single purpose livestock cooperatives. The establishment of such groups should be promoted, as cost-

effective service delivery mechanisms. New options for village level processing, especially for highly perishable commodities such as milk should be developed and their adoption by such farmer institutions encouraged.

Livestock Extension There is concern whether livestock is, or can be, adequately addressed within the National Extension Programme. Livestock production does not lend itself easily to standard seasonal recommendations to be dispersed through a generalist extension service. Under the National Extension Program, frontline extension workers are receiving an additional 5 months intensive training in livestock related technical messages. Effective recommendations to improve traditional livestock management techniques will have still to be formulated before livestock extension in traditional areas has much relevance. There is a need to develop cost-effective sustainable approaches to range management, tick borne disease and tsetse control in particular. Some of the elements for such a package exist and there is substantial experience to draw upon but there is a need to develop and test coherent packages. Means of adapting aspects of the unified Training and Visit methodology to better fit the requirements of livestock extension, in those areas where livestock production is of high priority, should be the object of continued study.

Credit As mentioned in the section on Rural Finance, Chapter III, a start has been made in developing innovative credit packages for small-scale producers but further development and dedicated funding is required. Group-based lending schemes have had considerable success elsewhere (e.g. Grameen Bank in Bangladesh and similar initiatives in Africa) in relation to dairying and poultry and this experience should be drawn upon.

Animal Traction The use of animals for cultivation and transport is already well established in some areas and expanding to others with government and donor support. Equipment manufacturers have not been sufficiently responsive to farmers' needs. This could be improved by more open competition, including imports from neighbouring countries. There is a particular need for promotion and development work on an animal drawn weeder, and scoops at the farmer level.

C. Summary

This chapter sets out to assess the markets, technology and production constraints for the major agricultural products where Tanzania might expect growth. It is shown that, while the prices for Tanzania's main exports are low, it does not have to fear that increased export volumes will affect international prices significantly. A review of regional markets indicates that this might be a fruitful source of expansion. An assessment of competitiveness shows yet again how the inefficiency in the country's agro-processing capacity restricts the abilility to add value to export crops. Cashews, for example, are exported raw due to the non-competitiveness of the local factories. Econometric analyses confirm the responsiveness of smallholders to relative price incentives across a variety of crops.

Following the sectoral assessments of markets, competitiveness and supply response, the chapter takes up the case of each of the major agricultural commodies produF 0 n Tanzania, and analyses constraints to production in detail. A historical vision is developed, and trends in production and price incentives are reviewed in order to assess the origin of current problems. For each crop, conditioned on access to, and growth in the relevant market, a set of recommendations are developed designed to restore competiveness and induce a supply response. In many cases there is a need to restructure agro-processing facilities, in the hands of cooperative unions or Government parastatals (cashews, pyrethrum, cotton, coffee, tobacco). Recommendations hinge on the need to allow private sector entry into these industries, on equal terms with existing participants. A key precondition to enabling a "level playing field" and fair competition is to restrict favoured access by insolvent agro-industrial borrowers to credit from

Government-owned banks. The pressure of new entrants will cause the restructuring of the agro-processing industries into more competitive, dynamic organizations. The decline in processing margins, and increased competition for raw materials will improve farmgate prices and production incentives, generating a supply response.

V. AN AGRICULTURAL DEVELOPMENT STRATEGY

A. Previous Sectoral Reviews

The Bank and the Government of Tanzania have worked together in the past to develop a vision for agricultural sector development. Prior statements of sectoral development strategy include: (i) the Economic Survey Mission of June 1959;[207] (ii) the sector study mission of October 1973;[208] (iii) the sector report prepared during 1982 and 1983;[209] and (iv) the review of the agricultural sector in the country economic memorandum prepared during 1989 and 1990.[210] The themes of the various reviews are similar; the prescriptions differ. In 1960 the concern was for a strategy aimed at "improvement" of productivity in peasant farming while simultaneously seeking the "transformation" of the structure of farming to larger, more productive, planned systems. Under the "improvement" approach the emphasis was on:

"A Increased concentration of effort on areas and crops in which the greatest increase of marketed production is to be expected, and improvement of planning techniques to ensure that public efforts are deployed in the most effective manner.

B. Reorganization of extension work on the basis of multipurpose extension workers, and adoption in some areas of a community development approach.

C. Reorganization of the administration of agricultural credit.

D. Measures to improve the market outlets for African crops and to increase cash incentives."[211]

The "transformation" strategy involved the "creation of farming systems based on more intensive and permanent use of the land by efficiently run, planned farms of economic size." It was affirmed that in areas already populated, "transformation would involve reorganization of land tenure and some redistribution of holdings," a process likely to be slow. Hence, the focus of the "transformation" program would be on "using selected, sparsely populated areas for planned settlement schemes and cattle ranches." The Government was to take on an omniscient role, entering into a production "partnership" with farmers, where it provided "capital works, productive services and an element of skilled management," and peasant farmers tilled the soil. Irrigation was considered a "transformation" activity of particular promise, although also requiring heavy public investment. Cattle ranching was another area where a public-private "partnership" was forseen. There was an overriding concern with soil degradation and loss of fertility. The justification for broad and direct Government intervention in production activities was the belief that "action is desirable in order both to avoid a check at some future date in the pace of development and to reduce as soon as possible the dependence on methods which destroy the fertility of the soil."[212]

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207 World Bank, "The Economic Development of Tanganyika", Johns Hopkins Press, Baltimore, 1961.

208 World Bank, "Tanzania - Agricultural and Rural Development Sector Study", Report 541a-TA in Three Volumes, December 10, 1974.

209 World Bank, "Tanzania - Agricultural Sector Report," Report No. 4052 TA, August 19, 1983.

210 World Bank, "Tanzania - Economic Report, Towards Sustainable Development in the 1990s", Report No. 9352-TA, June 11, 1991.

211 World Bank, "The Economic Development of Tanganyika", op.cit., p 101.

212 Ibid., p.7.

The 1961 report also picked up topics which would recurr in subsequent reviews: (i) a need for a land-use policy, backed up with studies on soil quality, rainfall, topography and other natural features to guide the expansion of cultivation into new areas; (ii) the need to change land tenure systems towards the use of individual titles; (iii) the need to reform agricultural credit operations, and (iv) the need to improve the availability of "incentive" consumer goods in rural areas. At the time the population totalled about 9 million, and the area cultivated was in the order of 7.5 million ha, allowing for fallowing requirements.

The 1973 review was concerned with the stagnation which appeared to have fallen on agriculture, slowing income growth and reducing food availability. Contrary to the previous report, in 1973 the Bank was concerned that Government intervention in agriculture had gone too far. Concerning the ujamaa villages, the report notes that this policy "has the advantages of facilitating grass root participation in the planning process and in the provision of farm supplies and social services, but empirical evidence indicates that the implementation of this policy has also had a disruptive effect on production....There are thus now clear indications that unless the overall development strategy is adjusted to correct these problems, improvements in rural incomes and standards of living are likely to be low."[213]

As previously, the need for more agroecological information to enable effective land-use planning and guide the expansion of cultivated area, is mentioned. The potential for yield improvement and intensification of agriculture is also pointed out, with implications for improving the research and extension establishment, and focussing on use of purchased inputs. Yield increases and area expansion are projected to yield real growth of the order of 6 percent per annum by 1992.

This report is the first to mention the constraints to growth posed by "serious defects of the supply and marketing systems and the ineffectiveness of the extension services." Recommendations were made to release the cooperatives from Government interference. In a recommendation designed to increase input use, and raise yields, the report "proposes that consideration be given to a seasonal input subsidy scheme, particularly for fertilizers, which might amount to as much as 75 percent of their cost. For the most part the cost of such a subsidy should be recovered through adjustments to commodity prices and taxes."[214] Fertilizer use at that time was about 66,000 tons per year.

The need to increase Government budgetary resources to support basic research and extension services for agriculture is also put forward. Two large new initiatives: a National Maize Project and a National Agricultural Development Project, were to provide a wide array of support services, inputs and finance through a series of geographically defined suboperations.

In 1983 the Bank's message was more urgent. The agriculture sector had started to decline rapidly for reasons attributed in part to domestic development policies associated with the disruptive effect of villagization, and the centralization of agricultural marketing and processing functions in parastatals. The second oil price shock and the war with Uganda also had negative effects on the agricultural economy, compounded by the decline in the world prices for sisal, coffee, tea and cotton. In response to these events the report identified the need for sweeping changes in domestic policy, and the investment of large sums in agricultural ventures. "The degree of deterioration in the policy and institutional environment is so extensive that a few minor measures are unlikely to make a significant difference to agriculture's declining trend. Major policy and institutional reform is necessary to increase the efficiency of use of the massive sums of resources now needed by the sector."[215]

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213 World Bank, Report 541a-TA, op.cit., p. xii.

214 Ibid., p.xiv.

215 World Bank, Report 4052-TA, op. cit., p.xii.

This report highlighted the effects that shortages of foreign exchange had on agricultural productivity and farmer incentives. Much attention was also given to the shortcomings of the parastatals that dominated agricultural marketing and processing of both food and agricultural exports in the command economy. The main recommendations are summarized below:

> "(a) priority to agriculture as reflected in substantial injections of financial and trained manpower resources for direct agricultural activities and for supporting sectors including transport and consumer goods;
>
> (b) improved incentives including substantial increases in real producer prices of food and export crops, liberal supply of inputs and consumer goods and a greater decision making role for farm families in terms of what crops they grow and where. A major adjustment in the exchange rate will be necessary to sustain an increase in real producer prices; and
>
> (c) institutional pluralism leading to liberalization of agricultural input and output markets. This should not only involve reform of the parastatals and introduction of cooperatives as proposed by the Government in the Structural Adjustment Program, but also official recognition of the legalized role of the private sector in marketing, distribution, processing and transportation would be necessary. This would again free the Government to perform many of the traditional governmental functions more effectively."[216]

Many of these recommendations were gradually incorporated into Government policy during the gradual institutional and economic reforms of the mid-1980s.

B. Government Policy Statements

In early 1983, simultaneously with the release of the Agriculture Sector Memorandum, the Government published a statement of development policy for agriculture which was designed to respond to the crisis facing the sector.[217] With the possible exception of the reference to socialism, the objectives for sectoral development given then are still valid today:

> "(a) To develop an egalitarian agricultural community, based on the policies of Socialism and Self Reliance;
>
> (b) To achieve national self sufficiency in food, and to raise the nutritional standards of all the people;
>
> (c) Through increased output, to contribute to the general raising of the living standards of all Tanzanians.
>
> (d) To earn foreign exchange for the nation, as well as to meet the needs of agriculture.
>
> (e) To provide raw materials for the nation's industrial sector.

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216 Ibid., p.xiii.

217 URT, "The Agricultural Policy of Tanzania", March 31, 1983.

(f) To develop an integrated agricultural sector, using methods of scientific husbandry and technology appropriate to the respective crops, size of operation and national resources."[218]

The concern with food self-sufficiency ranks high in the statement of the agricultural development strategy which follows. Much of this strategy statement could still stand. The intentions and direction are still valid today. What has changed are the mechanisms that the society will rely on to achieve these objectives. From the statement:

"(a) The output, variety and marketing of foodcrops must be increased so as to provide food which is adequate in quantity and quality for all Tanzania's people, and output must thereafter continue to grow at least as fast as population grows;

(b) A National Strategic Grain Reserve must be built up, and properly managed.

(c) The efficiency of production, marketing, and processing of agricultural commodities, must be greatly improved.

(d) Investment in the agricultural sector must be increased.

(e) The development programmes of all other sectors, (but especially those of industry, water, transport, natural resources, education and health), must be coordinated with the development of agriculture.

(f) The social and economic infrastructures in the rural areas must be strengthened and expanded.

(g) The different types of agricultural production must be coordinated and developed on the dual basis of maximum efficiency and the interests of the producers **as seen by them**."[219]

The intent of the statement of policy is to search for additional efficiency and responsiveness, **from within the state-run system**. The onus is very much on having the Government, be it at federal, regional or district level, resolve agricultural production and marketing problems. "...it is the Government's responsibility to help the villagers by providing guidance about appropriate methods of organization, and appropriate husbandry practices...it is the Government which is responsible for ensuring that the necessary equipment and facilities are available when required..."[220] The actual procedures to be used to attain the above objectives reveal a continued reliance on a monopolistic, state-controlled agricultural support system. Producer prices would be set by Government, albeit at higher real levels. Inputs would be supplied by parastatal monopolies. Parastatal farms and ranches would continue. Reform was contemplated for the marketing of agricultural produce. The reconstituted cooperative system was to be the intermediary between farmer and the monopoly boards and crop authorities for all food and export crops, with the exception of perishable goods like fruit and vegetables.

The policy statement recognized the problems facing the sector, and clearly outlined the outcomes to be achieved. However, implementation still relied heavily on the Government, operating in a controlled and monopolistic environment, to achieve these ends. While the situation gradually improved as a result of macroeconomic measures (like the sanctioning of "own fund imports" which contributed to an increase in

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218 Ibid., p.2.

219 Ibid., p. 2-3. Bold type inserted by authors.

220 Ibid., p.4.

the availability of "incentive" consumer goods in rural areas, and hence a sharp increase in agricultural production in the mid-1980s), development strategies in the agricultural sector were still not achieving the desired results.

C. Adjustment Programs

The Economic Recovery Program[221]

Many of the problems agriculture faced in the early 1980s were the sectoral reflection of macroeconomic distortions, coupled with policies where Government controlled all the key prices in the economy, and owned and operated all the key enterprises. The 1984/85 budget provided a new pragmatism and marked a shift toward market-based economic management. The exchange rate was devalued by a third, parastatal subsidies were cut, imports were liberalized, and some restrictions on agricultural marketing were eased. Encouraged by the positive effects of these policy changes, the Government then launched a more comprehensive reform.

The Economic Recovery Program was started in 1986. With strong support and increased foreign exchange allocations from the donor community, the Government engaged in a series of reforms: (i) adjustment of the official exchange rate from Tsh 17 to the US dollar in early 1986 to Tsh 193 in mid-February, 1990; (ii) establishment of the Open General Liscencing facility to improve the allocation of (donor provided) foreign exchange; (iii) the raising of interest rates in the state-run banking monopoly so that they were positive in real terms; (iv) the removal of price controls on almost all of the 400 consumer goods previously regulated; (v) the raising of producer prices for export crops in real terms; (vi) the continuation of liberalization of the food market; and (vii) establishing responsible targets for the fiscal deficit and monetary expansion. These measures were continued under the Economic and Social Action Programme, and additional emphasis was placed on (i) reform of trade policy, and the reduction of import tariffs; (ii) changes in the priorities within the public expenditure program; (iii) improvements in the management of state-owned enterprises, and the initiation of a restructuring and divestiture program; (iv) the restructuring of the banking system, laden with the bad debts of loss-making public enterprises and cooperatives; coupled with (v) measures to increase effectiveness in the provision of social services, to rehabilitate and expand the road and rail network, and to improve the efficiency of the major public utilities.

To complement the changes in macro-economic management and generate a much needed supply response, a sectoral adjustment program was formulated for agriculture.

Tanzania Agricultural Adjustment Program

The objectives of the agriculture adjustment program, which also received wide support from the Bank (Credit 2116-TA) and donors, were to liberalize the marketing and pricing of foodgrains; to initiate liberalization of the marketing and pricing structures of the major export crops; to remove the monopoly export powers of crop marketing boards; to restructure several agriculture sector parastatals; to improve the efficiency of the cotton tenders, the coffee auctions, the cotton ginneries and the cashew nut plants.; and to close down or restructure non-viable projects in the agricultural public investment program.

Most of the measures noted in the agricultural adjustment program were put in place. Agricultural output has grown at 3.9 percent per annum between 1986 and 1991. This is higher than the

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221 This section draws on World Bank, Report P-5200-TA, "An Agricultural Sector Adjustment Program", 1990.

trend of 0.7 percent per annum between 1976 and 1980, or the 2.1 percent per annum growth experienced between 1981 and 1983. Growth in 1984-1985 was an exceptional 6 percent per annum, explained by the one time effect of a resumption in access to "incentive" consumption goods in the rural areas. Exports reversed their decline, and between 1986 and 1991 experienced zero real growth in value. This is a significant accomplishment in the face of across the board price declines in the main export commodities.

D. Lessons from this Review

This report reviews agricultural performance since independence. Institutional and economic factors are analyzed in order to try and explain the successes and failures of past policy. Some key conclusions, which form the basis for subsequent recommendations on sectoral development policy, are set forth below.

Smallholder Supply Response

One of the main conclusions of this review is to reaffirm the notion that smallholder farmers respond vigorously to changes in the incentive environment. The economy can rely on smallholder farmers to respond to food shortages, and to foreign exchange earning opportunities, as long as the financial returns to these endeavors are attractive. Smallholders will also adopt new technology if such improvements increase returns to labor without undue increases in risk. The widespread adoption of fertilizer and hybrid seed and other productivity enhancing technology in the high potential agricultural areas provides evidence for this observation. Further evidence is provided by the farm level survey[222] undertaken as a precursor to this study, which indicates that farmers give high priority to improving timely access to productivity improving inputs such as fertilizer.

The implications of this conclusion are that the current structure of production can be relied on to respond effectively to the country's present needs. To produce the present mix of crops, a structure based on individual smallholders is the most efficient, flexible and responsive. The transformation in production technology and productivity necessary to achieve high rural incomes and growth will take place in the smallholder sector, given time and the correct incentives. Smallholders are rapidly entering the market economy, and are highly responsive to changes there. The rapid agriculture supply response to the increased availability of consumer goods in rural areas in 1984-1985 is a case in point. This system can rapidly become more productive using technologies which are already available.

Commercial farms will also be an important source of marketed agricultural production. However, their current contribution to total agricultural output is small, with the exception of certain key sectors such as sugar, wheat, barley and high value non-traditional agricultural exports. Over 75 percent of the area under large commercial farms is owned and operated by the Government. Measures taken to revitalize product and factor markets for smallholders will also give impetus to the larger farms. The divestiture of the large Government owned farms and the development of a land market will be necessary to foster the development of commercial agricultural production.

Expansion in Area Cultivated

This review indicates that the area now dedicated to cereal cultivation, using low levels of technology and long fallowing requirements, can theoretically be increased by two thirds without changing technology or affecting the sustainability of production. However, this estimate does not take into account

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222 Oxford University Food Studies Group and Sokoine University, "Agricultural Diversification and Intensification Study", 1992, Final Report.

access to markets and other constraints. To use the additional two million hectares of high potential agricultural land which is still underutilized and not in fallow or reserves, enormous investments would have to be made in new roads and social infrastructure, and there would have to be large movements within the rural population. In fact, the limits to sustainable horizontal growth have been reached in many regions. However, if levels of technology are increased and fertilizer, mulching, terracing and other intensification techniques are used, the effective output of the high potential land in the country can be doubled (see Table 2.5). Many of these techniques are already in use in the Northern Highlands.

A number of implications follow: (i) the scope for horizontal expansion is limited, and may have negative effects on the sustainability of cultivation in certain regions; (ii) the introduction of new and simple technology, especially to maintain and increase soil fertility, can greatly increase the population carrying capacity of the high potential land; (iii) migration to the underutilized soils of high potential should be indirectly encouraged through improvement and expansion of infrastructure and increased dissemination of information. Voluntary population flows should be guided and assisted to ensure cultivation of the best lands using the most appropriate techniques, and to avoid expansion into the poor, unsustainable soils.

Roads Make a Difference

Measures to improve smallholder access to the market economy, thus reducing the price of consumer goods and agricultural inputs and raising the price of agricultural output, will have a decisive effect on production. Roads are a key ingredient in this process. The correlation between rural road density and high income in rural areas, although not proof of cause and effect, has been pointed out in this review. Transportation costs are lowered. Access to market information is improved. Competition among traders in agricultural produce and suppliers of agricultural inputs is increased to the farmer's benefit. Access to off-farm employment is increased. All these effects increase farm family income, and farmers' responsiveness to market conditions. While the effect of road improvement is most visible, improving other infrastructure such as rural electrification and rural water supply systems can also have a decisive effect on agricultural intensification.

In addition to facilitating intensification, Government decisions on where to locate new roads is most important for determining the location and success of horizontal expansion in agriculture. Ministry of Works decision-making on where to construct new agricultural feeder roads, and which rural roads to rehabilitate, should be preceded by intensive review of the factors that determine agricultural potential: soil quality, rainfall and moisture availability, and distance from market, as well as a detailed assessment of the environmental consequences of agricultural development. District level information on agricultural potential is needed to determine road building (or rehabilitation) priorities.

Agro-ecological Information Base

The analysis in this report has suffered from an inadequate or unreliable information base. This shortcoming will continue to affect the quality of policymaking in the agricultural sector. In a more liberalized economy, Government interventions in the agricultural sector will be based on the exception; the state will only intervene where markets are not functioning correctly. To intervene effectively, policy makers have to be aware of failures or inadequacies in the marketing or supply systems, in environmental protection mechanisms as well as in the land and contract dispute settlement arrangements. More resources have to be allocated for obtaining more information on the quality and use of natural resources (soils, forests, lakes and ocean), on the levels of production, and on prices in the various markets affecting the agricultural producer.

Decline in International Commodity Prices

In the late 1970s the real value of Tanzania's exports was affected by the increase in the price of oil. Tanzania's import capacity was again squeezed when the real value of exports was sharply reduced from 1987 by the sudden and sustained declines in the real prices of coffee, cotton and tea exports. Although it appears that prices of these crops have bottomed out and can be expected to recover gradually in real terms over the next 10 years, they are unlikely to return to the levels of the 1970s.

The decline in the prices for coffee, cotton and tea has pushed industry returns in the producing countries down to or below marginal cost. These markets are experiencing an international "shakeout" where only the most efficient, high-quality producers will survive. Tanzania whose flexible smallholder production system has low marginal costs, and whose labor costs are low, is well placed to benefit from such competition. Smallholders will determine when to reduce expenditure on inputs and maintenance for perennial crops such as coffee and tea. Such crops can brought be back into production fairly rapidly when the price is right. Tea even profits from the rest.

However, the decline in prices within international commodity markets means that the rents available previously to Tanzania from its export crops have disappeared. These exports can no longer be taxed, through excise taxes or through the exchange rate as they have been since the 1970s, if international competitiveness is to be maintained. The luxury of inefficient processing industries can also no longer be afforded. Efficiency has to be promoted at all levels for exports to be commercially viable. Two points follow:

- At reasonably attainable input levels and yields, using existing prices, margins, and the official exchange rate (the "financial" analysis) certain key export crops (coffee, cotton, sisal and smallholder tea) are not commercially viable.

- When assessed using "economic" or scarcity prices, with taxes, tariffs and subsidies excluded, at the market rate of foreign exchange, all of Tanzania's current export crops are profitable.

The implications for Tanzania's export promotion policy are clear:

- Prices should be adjusted to scarcity or market values, with particular reference to the price of foreign exchange, if profitability and investment in the export industry is to be obtained.

- Research forms part of the country's competitive strategy in tight export markets. It is vitally important to increase farm productivity and reduce farm costs (especially for imported chemicals). The identification and promulgation of disease-resistant varieties of arabica coffee deserve special mention.

- Competition in export processing industries is needed to reduce margins and enhance international competitiveness.

E. Constraints to Agricultural Growth

Agricultural development in Tanzania faces tremendous challenges. Successful farmers have to overcome the problems of distance from markets for products and inputs; diseases affecting both livestock and crops, and the normal variations in rainfall and climate. In a semi-subsistence agricultural economy

such as Tanzania's, growth in food production will always continue at more or less the rate of growth in population. Provided new arable land is available, and there is political stability, the process of expansion whereby new rural families bring additional land into cultivation to provide themselves with their basic food needs, is continuous. For growth in agricultural production to surpass population growth, subsistence farmers need to be brought into a market economy where the availability of consumer goods provides incentives for cash generation and off-farm sales. The market also provides the ingredients for increasing the productivity of labor on the farm, as well as an outlet for marketable produce. Rates of agricultural growth will be greater than population growth to the extent that smallholder semi-subsistence farmers are brought successfully into the cash economy.

Improved literacy and extension of the infrastructure, particularly roads are preconditions to a successful extension of the market economy. Over the past twenty years the Government has made great strides in reducing widespread illiteracy in rural areas. Rural roads however have been allowed to deteriorate. The report's analysis of the factors which have constrained agricultural growth over the past twenty years emphasizes areas where Government policy or institutional inadequacy have hindered the successful, **voluntary**, integration of the smallholder farmer into the cash economy. These factors can be characterized in three ways: (i) the consequences of the experiment with centralized economic management from 1967 to 1982; (ii) a decline in the efficiency of public services; and (iii) the inadequate development of supporting markets.

The Government Dominated Economy

Following the Arusha Declaration in 1967 the state assumed direct control of large sectors of the economy in order to obtain egalitarian income distribution and generate a sustainable, self-sufficient growth path. In those areas where the agricultural economy was dependent on the market to signal shortages and surpluses, and to induce a response from support services such as food marketing, inputs supply, export processing, financial and transport services, the state dictated prices. Markets for agricultural produce and inputs were controlled by monopolistic parastatals. There was a strong drive toward industrialization based on import substitution, and large investments were made in state-owned manufacturing enterprises. During this period the provision of social services improved significantly, and Tanzania was foremost in Africa on such fronts as access to health care, availability of education, literacy improvements, infant survival and access to safe water.

The effects of these policies on agricultural growth were not very positive, as noted below:

- The control of all producer and consumer prices by the state prevented the signaling of shortages and the generation of a supply response. These signals had to be transmitted through the "second (or parallel) economy", outside the official system, adding to costs and uncertainty.

- Villagization and attempts to collectivize agriculture separated farmers from their perennial crops and known cropland, adding to costs and forcing the exploitation, often beyond sustainable levels, of the land close to the new settlements. Uncertainty related to possible relocation requirements and tenure insecurity reduced investment in land and conservation of soil fertility.

- The dissolution of the rural cooperative system and expropriation of its assets in the mid-1970s set back the development of a burgeoning rural institution capable of responding commercially to farmers needs in the remotest villages.

- The overvaluation of the exchange rate slowed agricultural exports, reduced international competitiveness, and caused severe shortages of foreign exchange.

- The barriers placed on the movement of labor, on the mobilization of savings by the financial system and on the allocation of capital all reduced the returns to investment in agriculture.

- The inefficiency, mismanagement, and over investment in the parastatal monopolies who were charged with the vital support markets for agriculture (processing, marketing and inputs supply), shifted resources out of the hands of farmers, consumers, and the state, which adversely affected farm level investment and caused losses in the banking system.

- The inefficiency and mismanagement in many of the cooperative unions, which were reestablished by fiat in 1985 without receiving compensation from the state for the depreciation of the machinery and other assets expropriated in 1976, has continued to plague the development of export crop industries, particularly the cotton industry.

These policies were not detrimental to agricultural development across the board. Panterritorial pricing (of maize in particular) and subsidized inputs clearly promoted maize production and agricultural development in the Southern Highlands. Regions such as far away as Rukwa and Ruvuma (over 1,000 km) supplied Dar es Salaam, albeit at great public cost.

Inefficiency of Traditional Public Services

During the period of direct Government involvement in production, the state took on more than it could handle. Funding for the traditional support services to agriculture declined. The ineffectiveness and disorganization of public research and extension services reduced the generation and dissemination of improved varieties and husbandry techniques. Without funding for maintenance rural roads deteriorated. The profitability of the railroads declined. The gradual decline in the quality of the road, rail and communications infrastructure raised transport and information costs at the expense of the farmer and the consumer.

Non-Development of Factor and Input Markets

The centralization of production decisions has left financial markets and land markets in a rudimentary state. The finance directed to parastatals and the cooperative system has proven irrecoverable. In an effort to prevent collapse of strategic export industries bad loans followed existing bad loans . Financial institutions in a market oriented system will be charged with taking responsibility for (and bearing potential losses from) their resource allocation decisions on. At present the banking network needs a period of reorientation and decentralization before it can become responsive to agricultural and rural needs.

Land markets operate outside the legal framework. Legislation related to the period of villagization in the mid- 1970s has caused confusion on exactly what tenure rights are, and how they should be transferred. The confusion has opened the door for the illicit manipulation of markets and caused much uncertainty, especially for investors in commercial agricultural undertakings.

The inputs supply markets have also been suppressed because parastatals, or the Ministry of Agriculture, were the exclusive dealers in the high volume products. They enjoyed preferential access to foreign exchange, import rights and subsidies which gave them a dominant position in the market (while also curtailing supply).

Labor markets are only recently emerging from underground as the laws against hiring rural labor are repealed, or not enforced. The movement of labor within Tanzania has been hampered by lack of information on wage differentials and difficulties with transportation and settlement in new areas.

F. An Agricultural Development Strategy

Tanzania's objectives in agricultural development were set forth by Government in its Agricultural Policy of 1983. The objectives are to: (i) provide sufficient food for a growing population, (ii) generate foreign exchange (agriculture is the prime source of exports for the country); (iii) supply domestic industries with raw materials, and (iv) raise rural income levels and alleviate poverty.

Prior to outlining proposals for short- and medium-term sectoral development strategies, the report describes the interaction between the agricultural sector and the rest of the economy, and provides an assessment of the changes likely to occur as agricultural growth takes place.

The Interaction between Agriculture and Other Sectors

The agricultural sector is inextricably intertwined with the rest of the economy. Measures to improve performance in agriculture have implications for the macro-economy, and for complementary activities. Proposals for action are not directed solely to the Ministry of Agriculture. They cut across the whole economy, affecting budgetary priorities, foreign exchange management, the priorities for improvement of social and economic infrastructure, and priorities for strengthening of social services. The key relationships between agricultural policies and development priorities in other sectors are noted below:

Foreign exchange. Agricultural exports will not be competitive, and investment will not be adequate unless agricultural exports are valued at the market rate of foreign exchange. In August 1993 the Government unified the official and the bureau exchange rates, eliminating this contradiction in development policies.

Budget for agricultural services. Continued growth in agriculture is contingent on adequate budgetary support for key public responsibilities, namely agricultural research and extension services, natural resource management, policy formulation, and environmental regulation and information collection.

Road and rail rehabilitation and expansion. Agricultural growth is dependent on the costs of transport, a key ingredient of farm level prices for both produce and inputs. Rehabilitation of the existing transport network and reduction of transport costs will provide a strong inducement for continued growth in agriculture. Successful horizontal expansion into new areas of good agricultural potential will be conditioned on where new roads and rail lines are built.

Social service improvement and expansion. Adoption of new levels of technology and improved husbandry techniques is a function of literacy and educational level in the farming population. Improvements in the effectiveness of the educational system will result in sustained growth in agriculture through productivity improvements. Successful expansion of agricultural production into new high potential areas will depend on the concomitant extension of reliable and effective social services (education and health in particular) into the new regions. AIDS, malaria, and other diseases will inevitably affect farm family output, and hence agricultural growth. The presence of an effective heath service is an essential ingredient of a successful growth strategy.

Dynamism in the industrial and service sector. Growth in labor productivity in agriculture will not provide the increase in incomes necessary to bring Tanzanians out of poverty. The returns to labor are

always higher in the service or manufacturing industries. In fact, the history of the development process indicates that even as labor productivity in agriculture increases, labor leaves agriculture to seek employment or supplement incomes with other commercial or processing activities. Without investment and growth in agriculture, off farm activities do not emerge. At this stage, growth in agriculture is necessary to generate the resources needed to foster off-farm investment. Stable supplies of food, foreign exchange and financial savings are necessary to support non-agricultural development. Policies for development in the non-farm sectors should emphasize support for activities which represent the first stages of off-farm diversification in a predominantly rural country. Small agroprocessing industries and services closely tied to agriculture in the villages and towns will be the first to prosper as the rural community seeks to diversify and increase incomes.

Environmental impact and natural resource management. Agriculture involves the management of natural resources in the production of commercial goods. It is crucial for the long term future of the country that Tanzania's natural resources (soils, water, forests, wildlife) be managed so that production of commercial products is sustainable, and negative externalities are kept to a minimum. The maintenance of current production levels should not require continuous exploitation of ever increasing quantities of Tanzania's natural resources. Nutrients extracted from the soils should be replaced, forests replanted, and water pollution reversed. A strategy for agricultural development should ensure that the incentives for prudent resource management and conservation are in place, along with the appropriate monitoring and regulatory framework. The current shift towards decentralized, market based production and marketing systems, and the increased financial incentives for production of food and cash crops, if allowed to develop without direction, will place increased stress on the country's eco-systems.

The agricultural strategy proposals set forth below assume that the Government is proceeding with its Financial Sector Adjustment program, its Parastatal Reform program and its Civil Service Reform program. The changes and improvements proposed within these programs, which all receive support from IDA and other donors,[223] are preconditions for the effective revitalization of the agricultural sector.

The Nature of Future Agricultural Growth

To maintain high rates of growth in agricultural output Tanzania will have to focus in the short run on export crops, where world markets can absorb the increased production without affecting prices. The production of raw material for domestic light industry (cotton, sisal, leather, fruits and vegetables) will also be important. Those crops and livestock products with high income elasticities of demand can expect to see their domestic markets expand. Food production can also be expected to grow, although perhaps not as rapidly as other sectors, in response to population growth, increases in per capita incomes and as improved technology becomes accessible to small farmers. The changes in the structure of production and growth in Tanzanian agriculture have started already. During the period 1986-91, with the return to normalcy in the supply of consumer goods and imported goods, and the gradual rehabilitation of the road and rail network, the market in food (cereals, starches and pulses) has stabilized, and following rapid increases in the middle of the decade, growth rates appear to have slowed. Growth in cereals production, 18 percent of agricultural GDP, dropped to 0.2 percent per annum in 1986-91, down from 4.3 percent per annum in 1981-85.[224] Production of starches, 21 percent of agricultural GDP, also slipped to 1.9 percent per annum in 1986-91, down from 3.6 percent in the previous period. The crops where growth increased in

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223 Financial Sector Adjustment Credit (Cr. 23081-TA of 1992); Financial and Legal Management Project (Cr 24130-TA of 1992); the Parastatal and Public Sector Reform Project (Cr 25070-TA of 1993) and the proposed Public Sector Adjustment Credit (later revised to form part of the proposed SAC).

224 Cereals production data may have been overstated in the early part of the decade, which would imply that the decline in output growth was not as dramatic as these figures suggest (see Sarris, A.H. and van den Brink, R., "Economic Policy and Household Welfare during Crisis and Adjustment in Tanzania", New York University Press, 1993, Ch 5).

1986-91 are those sold in the more elastic export markets (coffee, cotton, cashew, tea). Here growth rates are up to 2.4 percent per annum from -7.9 percent in 1981-85. Production of fruit and vegetables, pulses and oilseeds has also been significantly higher in the most recent policy period (1986-91). Crops and livestock products with high income elasticity of demand, (oilseeds, fruits and vegetables, beef, eggs, milk) can expect to have a good market as domestic demand is likely to grow with increases in income. In the medium term, as improvements in the technology for basic foodcrop production are generated and diffused, a rapid expansion can be expected which will lower real food prices and support development in other sectors.

Thus, the sources of growth in Tanzania's agriculture sector will come from two sets of factors:

- In the **short term,** an end to the command economy will remove the distortions in the exchange rate and other prices, the inefficiencies of monopolistic parastatals and cooperative unions, and the need to circumvent restrictive regulations. This should result in adjustment and growth in all sectors. The returns to adjustment in the cereals subsector have already been realized, and growth there will taper off. However, there should be a surge in exports, up to the ceilings determined by current capacity levels in the processing industries, as the breakup of monopolies increases efficiency in cotton ginning, coffee milling, cashew and pyrethrum processing, and as export marketing opens up to the private sector, providing new opportunities in traditional and non-traditional crops, .

- In the **medium term**, continued growth in agricultural output will depend on (i) the traditional expansion of food production for the domestic market as rural population growth causes an increase in the area under cultivation and livestock holdings, (ii) increases in food production for the domestic market as technological change causes productivity to increase and real prices to fall; (iii) increases in production of food, especially animal products and food crops other than starches and cereals, as higher per capita incomes cause effective demand to rise; (iii) increases in production of food for regional export markets, as new openings are found for maize, pulses, and oilseeds for example; (iv) increases in production of food or plantation crops for international export, as investment in the processing industries for crops such as coffee, cotton, cashews, and non-traditional high value items expands production capacity and reduces unit costs; and (v) increases in the production of export crops as technological advances reduce production costs at the farm level, for coffee, cashews and cotton in particular.

A matrix which outlines specific actions to be undertaken under the short- and medium-term strategies, and identifies progress on these areas since the Joint Agriculture Sector Review Mission of November 1992 is attached at the end of the Executive Summary.

Short-Term Strategy

Policies to induce growth in the agricultural sector by reversing price distortions and recuperating losses due to inefficient processing and marketing industries should focus on: (i) using the market rate of exchange for agricultural exports; (ii) revitalizing the export processing industries, and (iii) continuing to reduce Government participation and control in produce marketing and input supply mechanisms for the sector. Many of the actions needed to implement such policies are the concern of the Ministry of Finance, the Bank of Tanzania, the Planning Commission, as well as the Ministry of Agriculture and other agriculture-related ministries.

Foreign Exchange Valuation for Agricultural Exports

The profitability of export crop industries is dependent on the use of the market rate of exchange in the valuation of output. The inter-country competition in the markets for traditional goods and the decline in real prices has left little room for rent taking by anyone in the industry. For non-traditional agricultural exports, competition is also tough, and entry costs are high. Whatever profits can be taken in these industries should go to the producers and processors to finance rehabilitation and investment. In November 1992, the joint mission recommended that:

> As a matter of the highest priority, the market rate of exchange (or full retention of foreign exchange) should be applied to all agricultural exports, traditional and non-traditional.

Since the preparation of the report, the Government acted in August 1993 to unify the exchange rates. The official rate is now equivalent to the bureau rate, and export industries are now reimbursed the full domestic value of their export earnings.

Revitalization of Agricultural Export Industries

Increasing the returns from exports will not be translated to the farmgate level unless the efficiency of the export processing and marketing enterprises increases. Increased efficiency will raise returns at the farmer level, and thereby improve incentives for investment and productivity enhancement, and will provide additional retained earnings for reinvestment in export processing. Productivity improvements should be sought by encouraging competition in sectors that have remained monopolies under the cooperative system or under marketing boards. To these ends the Government should take the following actions:

- All relevant Acts governing the production, processing and marketing of export crops should be amended to: (i) allow competitive multichannel marketing from producer through exporter; (ii) permit and encourage competition at all levels of the marketing chain, including at the processing level (where investment in additional capacity by the private sector would be encouraged) and among export agents; (iii) separate the regulatory and commercial functions of marketing boards (the latter to be discontinued).

- Access to ginning, hulling or milling factories should be provided to all market participants on a competitive, fee-for-service basis, until such time as the industries have been restructured, and commercially viable ginneries, coffee factories, cashew factories and other processing plants have been taken over by independent, sustainable companies and joint ventures;

- Interested private sector investors should be encouraged, through the repeal of restrictive legislation or, if foreign, by granting the normal incentives available to foreign private investors, to establish new factories, mills, gins or meat-packing plants, in competition with existing installations, or to take over and operate processing plants where the current owners are interested in selling or leasing;

- Government should intervene in financial markets, pending the successful reform of the financial system, to ensure the continued availability of long term finance (in dollar terms at dollar rates if necessary) for well managed projects to rehabilitate existing plants or establish new export industries with good market potential.

Curtail Government Participation in Commercial Activities Related to Agriculture

The intervention of the state in the agricultural economy has driven a wedge between what farmers incomes could be, and what they are now. By imposing formation of rural villages; mandating the use of tractors and other inappropriate "improved" inputs; setting the prices at which farmer produce was procured at below market levels; monopolizing the purchase, processing and sale of food and export crops with inefficient parastatals (or quasi-parastatal cooperative unions); and controlling the price and distribution of agricultural inputs and consumer goods; the state has prevented farmers, traders and industrialists from reacting to the most profitable production opportunities and wasted resources through inefficient intermediaries. Government actions to reverse these interventions should include:

- Discontinuing the Government's practice of setting of farmgate prices and producer margins (even pronouncements on "indicative" levels) in export industries. Between the November 1992 joint mission, and the presentation of this report the Government has discontinued this practice;

- Withdrawing Government from the marketing of agricultural inputs, including fertilizer, agrochemicals and veterinary inputs. The presence of Government agencies in the market makes potential private sector entrants uncertain whether these agencies will seek competitive advantage behind regulations, or employ preferential access to privileged information or domestic or foreign resources. Following the joint mission in November 1992, the Government has announced its withdrawal from the fertilizer, agrochemicals and veterinary inputs markets;

- Eliminating the subsidy on fertilizer. The lack of sufficient budgetary resources to cover the cost of the subsidy is reducing fertilizer supplies and affecting deliveries. The increased availability of commercially supplied fertilizer should more than outweigh the declines in demand due to real price increases.

- Following an open trade policy which takes advantage of Tanzania's favored position for supplying food to neighbouring landlocked countries in Eastern and Southern Africa. This would support maize production in the Southern Highlands and help counteract the reduced profitability of maize production caused by the removal of the fertilizer subsidy.

Medium-Term Strategy

Over the next five to seven years, the Government should take steps to ensure that the process of innovation and expansion in the agriculture sector continues. The focus should be on confining Government involvement to the provision of key public goods (research, extension and market information), and intervening in the private sector economy where necessary to ensure that quality standards are set, conditions for a competitive commercial environment are maintained, incentives and controls are in place to ensure sustainable natural resource management, and negative environmental impact especially in water and soil use are prevented or minimized.

For Tanzania to meet the challenge of raising agricultural growth rates above population growth, its 3.5 million subsistence farm families must voluntarily enter the market economy. Experience has shown that smallholder farmers who are integrated into the market economy respond rapidly and efficiently to both positive and negative market incentives. Policies should focus on reducing the costs and uncertainty associated with producing for the market, and on making rural markets more responsive to small farmer needs. Efforts should be made to tailor supporting markets, infrastructure and research to the needs of the smallholder sector. At the same time, measures should be taken to ease the entry of private investors (foreign or local) into commercial agriculture.

The key elements of the medium-term strategy include measures to: (i) improve the Government's ability to understand and influence the market-determined incentive structure for agricultural production and processing, enhance competition in liberalized input and product markets, and at the same time, manage the country's natural resources to sustain productivity and minimize negative environmental consequences; (ii) improve the functioning of markets for the land, capital and labor elements of the agricultural production process, and (iii) induce technological change by improving the efficiency of markets that supply improved agricultural inputs, and by increasing the effectiveness of the Government's agricultural research and extension services.

Government Management of Sectoral Incentives

Government policy since the mid 1980s has advocated a gradual shift towards private sector ownership of commercial enterprises, and the use of market determined prices and incentives in the agricultural sector. To be successful this shift must occur within an institutional framework which ensures that the direction and nature of growth meets social objectives, markets are competitive, contracts are honored, key public goods are provided and the negative consequences of growth on the environment and on society are minimized. The institutional requirements for managing this type of economy are different from those needed to manage a command economy.

The Government should initiate a process of institutional change in the Ministry of Agriculture and related agencies to:

- Strengthen policy formulation and implementation capabilities in the Ministry of Agriculture;[225]

- Improve the collection and dissemination by the Ministry of Agriculture of information on prices and wages in key agricultural markets on a regular basis, while strengthening the Ministry's capability to estimate harvest volumes and provide early warning on potential food and raw materials shortages;

- Improve the Regional Government's understanding and commitment to the changes in agricultural development policy. The Central Government's capacity to monitor and intervene in regional level actions which affect incentives should be strengthened;

- Improve interagency collaboration in setting budgetary priorities and carrying out development activities. Collaboration between the Ministry of Agriculture, the Ministry of Land and Urban Development, the Ministry of Communications and Transport and the Ministry of Works on priorities for regional development should be institutionalized.

- Foster the creation of associations to represent private sector participants of industries and services that support agriculture.

Strengthening Markets for Factors of Production

In a market-based approach to agricultural development markets for the different resources used in the agricultural production process need to respond flexibly and efficiently to prices and potential returns. Measures needed to improve the responsiveness of the capital, labor and land markets to the needs of the agricultural sector are summarized below, as well as policy recommendations for farmer cooperatives and rural infrastructure.

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225 IDA is supporting this process through Credit No. 2537-TA for the "Agriculture Sector Management Project", Report 11769-TA of June 30, 1993, approved by the Board July 20, 1993.

In the financial sector, the banks' ability to respond to agricultural demands will depend on the success of the restructuring process now underway. National Bank of Commerce and Cooperative and Rural Development Bank already have an extensive branch network, and will continue to respond to the food and export marketing enterprises' requirements for crop finance, and for suppliers' needs for trade finance for inputs and consumer goods.

- Within the context of financial sector reform, and the use of commercial criteria for loan approval, NBC and CRDP should be staffed and trained to lend commercially for agriculture at wholesale and retail levels in competition with private sector financial institutions.

- Measures to reduce financial risk in lending to agriculture, such as innovative crop insurance schemes, should be encouraged.

- Measures to induce term lending or equity contributions for investment in agroprocessing facilities or export industries should be encouraged through possible venture capital investment funds, supplemented with lines of long term credit, where appropriate.

- The development of rural savings and credit associations based on farmers groups and other innovative approaches to rural enterprise finance should be encouraged.

Labor market adjustment will be enhanced by: (i) measures taken by the Ministry of Agriculture to improve the dissemination of price (including wage) information; (ii) the reduction of transport costs as road and rail infrastructure improves and vehicle traffic increases; (iii) the increases in literacy and education which will improve labor flexibility and adaptability to new tasks; and (iv) the commercialization of tenure arrangements to facilitate land acquisition and use by persons migrating from other parts of the country.

The land market and land tenure patterns are still in the process of evolution. To title all agricultural lands to individuals at this time would be undesirable and prohibitively expensive. In some areas shifting cultivation and/or transhumance may still be the most efficient land use practice. In these regions, alternative legal instruments, (recognizing rights to water and dry season grazing by pastoralists, for example) and their recognition by Government would be necessary. In areas of dense settlement and highly productive exploitation such as Kagera, Kilimanjaro and Mbeya, the right to land is held by the individual, and the legal instruments should just confirm this. What is essential is umbrella legislation that provides for the selection of alternative forms of "title", recognized and enforced by the national government, and with enough flexibility to allow for further changes as the economy develops. The Government is currently engaged in establishing the boundaries of the land over which each village exercises control. Once established, this land would be leased to the village, under current legislation. Leases to individuals would be emitted subsequently.

The village authorities should be allowed to control and manage land, not to create title. The traditional and/or the formal-legal system should create the "right to occupancy". The village authorities would merely confirm and verify this right. If the demand for land increases, and its alternative uses widen, processes of appropriation will result in individualized tenure. The village authorities should not be entitled to obstruct such transactions.

The system of rural cooperatives faced severe financial difficulties at the time of the November 1992 review mission. In July 1993, the Government announced it would take the responsibility for approximately 70 per cent of the Tsh 50 billion in overdue bank loans outstanding to certain, carefully selected "indispensable" unions, mainly in the cotton and coffee sectors. This provides compensation to the unions for the expropriation of the assets of the Cooperative Bank in 1967 and for the liquidation of the

cooperative unions in 1976. The debt forgiveness also provides redress for union losses caused by the Government decision to set farmgate procurement prices for cotton, coffee and other export crops well above commercially feasible levels. Cooperatives are the only commercial organizations with a network at the grass-root level. Their members are small scale farmers, responsible for most of the agricultural production, who have very little bargaining power in their commercial relations with suppliers and buyers. Primary societies bring economies of scale to buyers who do not have to deal separately with each individual farmer. Cooperatives can and should be given the opportunity to revitalize their activities so they may play a needed role in rural development. Institutions which can compete effectively with other private sector ventures, free from political interference and detrimental Government policies should be established. During the transition period, additional assistance to the cooperative sector should be provided where necessary, to ensure continuity in vital industries. However assistance should only be provided to those cooperatives with prospects for economic viability in a competitive, market based agricultural economy.

Policy recommendations include:

- The 1991 Cooperatives Act provides a reasonable framework for restructuring the rural cooperative system on an independent, voluntary, economically viable basis. The restructuring and consolidation of the primary societies into democratically-run, economically-viable rural institutions has already begun. This process should be continued throughout the hierarchy, with the members at each level determining the characteristics of the next highest group.

- The Cooperative Act of 1991, or to its rules and regulations, need certain modifications to: (i) state clearly that primary societies and their members are free to buy or sell produce on the open market, contingent on clearing their debts with other members of the movement; and (ii) clarify that the regulatory and control functions of the Registrar will diminish as the cooperative system develops its own internal review capacity.

- A Promotional Paper on Rural Cooperative Movement Rehabilitation should be prepared to state the objectives of the Cooperative Act of 1991 and describe the strategy to be followed by the Cooperative Department of MOA, the banking system and other entities to restructure, consolidate and democratize the rural cooperative system. This policy statement should also describe the process set out in Section 24 of the Cooperative Societies Rules, which stipulates that the Registrar shall gradually delegate his duties of promoting, advising, educating, and training to the cooperative movement, after the movement has fulfilled ten criteria designed to ensure it has the necessary technical and financial capacity.

- In the process of restructuring primary societies and unions, the Registrar should include measures to:

    * drastically cut union operating costs by reducing staffing and administrative expenses;

    * streamline operations by reducing the number of activities and concentrating on those directly relating to their main business;

    * introduce proper accounting, financial control and budgetary follow-up;

    * introduce genuine member control, which itself should result in increased financial accountability by management. Committees should also understand that the

unions are in the final analysis private business enterprises responsible to their members

- The Cooperative Department of the Ministry of Agriculture should be strengthened so that it can take the lead in the process of consolidation and democratization of the cooperative movement. To improve coordination and control during the three year transition period, it is recommended that the relevant regional and district level staff be transferred to the Department. Given the smaller number of societies envisioned after consolidation, and given the extreme financial difficulties faced by the Treasury, it is recommended that two-thirds of Department staff be relocated or retrenched, with promotional staff returning to the regional administrations. The savings in salaries and allowances would provide funds for the remaining 500 professionals, mainly auditors, to complete the restructuring exercise efficiently. Similar steps should be taken with the Cooperatives Audit Services Corporation.

- Following completion of the consolidation and restructuring exercise, the Department should be transformed into a much smaller Office of the Registrar, which would be in line with the 1991 Act.

Technology Generation and Natural Resource Management

Agricultural research underpins the development effort. Land and labor productivity in Tanzania are well below what they could be. If problems of rural poverty and food shortages are to be overcome, and if Tanzania is to be competitive in the markets for coffee, cotton, tea, cashews and the other traditional exports, agricultural productivity has to increase. These productivity increases have to be developed in Tanzania. While certain important technologies (such as hybrid maize) can be transferred wholesale into the country, most advances require the tedious adaptation of varieties, husbandry techniques, and agrochemical use to the local environment. A local research capacity is also needed to react to production problems arising from husbandry of a particular crop in a well defined micro-environment.

The economic returns to agricultural research are high. Not all these returns can be captured by a private research company. Thus agricultural research will always be under-funded if left only in the hands of the private sector. The fruits of good research are also easily transferred to smallholder farmers, and provide an inexpensive but powerful way to alleviate rural poverty. For example the enormous advantages of disease resistant varieties of arabica coffee can be transferred to smallholder producers for the price of a set of coffee seedlings.

Problems facing the research establishment are being addressed under a large donor (and IDA) funded project. The problems relating to organizational structure and the deterioration of physical infrastructure are well on their way to being resolved. The essential question still facing the agricultural research establishment is the funding of a "Scheme of Service" with salary levels high enough to provide incentives for full-time, quality research work. Current and projected Civil Service wages will not be sufficient. A special status is necessary for the agricultural research establishment, so measures may be taken in financial and personnel management which will permit the funding of a satisfactory "Scheme of Service".

The general agricultural extension service for smallholder farmers is necessary to disseminate improved technology and husbandry techniques generated by the research service to the farming population. It is also a necessary link between the farmers and the research establishment, helping to identify those problems worthy of research resources. The returns to agricultural extension are high, and

the return to the use of the Training and Visit method appears to be even higher. [226] To make best use of its extension network, Government would be well advised to:

- Consolidate the training and visit system, which uses a large number of staff and vehicles, in those areas of best potential and highest returns;

- Make decisive efforts to link extension more effectively to the research effort, so that agents can continue to assist farmers as they adopt more sophisticated technologies, or as they face second generation problems. This can be accomplished by ensuring that Research Extension Liaison Committees and officers are appointed for each region, that temporary swaps in personnel are instituted, and that research personnel are encouraged to participate in the training of extension agents and farmers.

- Increase the level of funding in real terms, to guarantee access to perdiems, vehicles and materials by the staff. Based on the financial allocations made by successful agricultural economies in Africa and comparisons of funding for agriculture in the developed work, a target of 1.5 percent of agricultural GDP appears an appropriate minimum funding level for agricultural research and extension.[227]

- Conduct a critical review of the commitment, technical capabilities and retraining potential of the existing village extension workers, retraining or replacing those who are unable to be effective in a unified crop and livestock extension system.

The successful introduction of improved technology relies heavily on the reliability of an agricultural inputs supply market. The use of fertilizers (chemical or organic), other agrochemicals, improved seeds, and the increased use of draft (or tractor) power will play a key role in improving smallholder productivity. The success of a private sector-based inputs supply market depends on the credibility of Government's withdrawal and on its even-handed treatment of parastatal and private sector competitors. Thus subsidies, foreign exchange, local finance, access to storage space, railway transport facilities and other services should be made available to both private and parastatal sector competitors on equal terms.

- A major source of competitive advantage in the imported agricultural inputs trade has been access to low-priced foreign exchange, or donations of goods, by Government agencies. The unification of the official and bureau rates of exchange in August 1993, and the revisions in the foreign exchange allocation mechanisms should minimize this distortion. Recently donors have been converting donations of fertilizers and other goods into foreign exchange contributions;

- Subsidies on fertilizer and pan-territorial pricing should be removed. These practices have contributed to shortages and rationing in the fertilizer market. The schedule negotiated for reducing fertilizer subsidies should be adhered to, with the subsidy disappearing in 1994/95. This report argues that Government interference in the fertilizer market is constraining supply by both parastatal and private sector suppliers. A policy of subsidy reduction, combined with a policy of open imports and the freedom to trade with

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226 Bindlish, V. and Evenson, R., "Evaluation of the Performance of T and V Extension in Kenya", Agriculture and Rural Development Series No. 7, March 1993, pp A13-1 to A13-3.

227 von Blarcom, B. Knudsen, O.; Nash, J.; "Reform of Public Expenditures for Agriculture", World Bank Discussion Paper, February 1993. p.6.

food-deficit countries in central Africa will maintain local markets and can lead to an expansion in output.

- Importation of agricultural inputs (fertilizers, pesticides, insecticides, tractors) should be permitted, at the market rate of exchange, free of duty. Local firms (both Government-owned and private) who want to enter the market should do so in open competition with imported inputs without the protection of high tariff barriers. Government's role should be restricted to reviewing fertilizer and agrochemical inputs to prevent the importation of substances which would be harmful to the environment and human beings, and to provide guidance in the use of those that are imported.

The management of the country's natural resources is weak. This is a key area for Government intervention, as only Government can act in the long term interests of the society, managing and conserving its natural resources, and minimizing damage to the environment. The country's natural resources, while very large, are threatened by factors linked to un-managed development. The main threat to the country's natural forests is uncontrolled clearing for charcoal, logging, tobacco curing, and cultivation of all crops. Select hardwood species are also being extracted without regard to fees or permits. Lake Victoria is threatened by pollution from the urban centers on its shores and from the runoff of fertilizers and agrochemicals. Coastal waters are threatened by the practice of dynamiting of coral reefs in search of fish. Wildlife management is threatened by the encroachment of reserved areas by cultivation. In certain regions erosion and shortened fallows are affecting the sustainability of cultivation. While the country's natural resources are not near complete depletion, they will be if the current trends are allowed to continue.

The ability to effectively manage increasingly scarce and inaccessible water resources is clearly an issue of high priority in Tanzania. This entails:

- strengthening the information base;
- rationalizing the mechanism by which water is allocated between competing uses;
- ensuring better coordination between institutions involved in the sector.

There are three reasons why the development of irrigation systems is an important aspect of the agricultural development strategy. First, the variability inherent in Tanzania's rainfed production systems creates problems of shortages of the main foodcrops in years of inadequate or poorly timed rainfall. Increasing irrigated food production will improve food security. Second, irrigation shemes if properly managed provide sustainable increases in small farmer productivity and income, addressing rural poverty alleviation and environmental management objectives. Finally, irrigated agriculture is the only way in which high value crops (vegetables, flowers) can be produced under the controlled conditions needed to meet market schedules in Europe and other demanding international markets, thus supporting the drive for diversified high value agricultural exports. The Ministry of Agriculture has been reviewing the Government's experience with irrigation projects, and has concluded that:[228]

- To be successful, "future development should be based on staged improvement and expansion of existing local technology, which allows the farmers to adapt at their own pace. Equal emphasis should be given to operational and extension support to farmers at existing schemes;"[229]

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228 Ibid. p 49.

229 Ibid. p 49.

- Projects undertaken to date have been too sophisticated, requiring expensive structures and massive capital injections. The funds for completing these projects have often not materialized, causing a massive waste of resources invested in un-used, half completed schemes;

- If a project is expensive to begin with (and recent projects in Tanzania have averaged $15,000 to $20,000 per ha),[230] returns will have to be very good, for the economic rate of return to be positive. The possibilities for marketing such high value crops, or for getting cropping rates above 100 percent, is limited to small, well managed private farms at present.

A ranking of potential projects has been developed, and a smallholder-focussed irrigation development program has been outlined. In order to carry out such a program, it is proposed that the key responsibilities for operational support and extension services would be provided at the Zonal level (bringing together contiguous regions). The Ministry of Agriculture would strengthen its capacity to coordinate irrigation activities and provide assistance at the design and construction stage. Projects would be carried out in Kilimanjaro, Morogoro, Tabora, Mbeya, Mwanza and Mtwara zones.

Strong steps are needed to strengthen the management of forests lands, the conservation of reserves, and the collection of fees and royalties for wood harvested. The ability of a weak and sparsely distributed forest service has recently been strengthened under a recent donor and IDA-funded Forest Resources Management Project, and a multi-donor Tanzania Forestry Action Plan (TFAP).

The lead role in defining national policy on environmental issues is now in the hands of the Ministry of Tourism, Natural Resources and the Environment. The process of reviewing environmental policy and defining conservation strategy is the focus of substantial assistance from donors including IDA.[231] The next step will be Government adoption of a National Environment Policy. This will provide the framework for updating and streamlining existing environmental legislation, and will establish the guidelines for natural resource management and environmental protection, to be followed by entities engaged in economic development. The National Conservation Strategy and the National Environmental Action Plan, also being formulated, will indicate how legislation will be applied in practical terms, defining reporting, monitoring and law enforcement responsibilities. The responsibility for coordinating implementation of national policy on environmental issues will be with the Ministry of Tourism, Natural Resources and the Environment. However, implementation of the conservation strategy is likely to be given to the National Environmental Management Council, a parastatal within the Ministry. Government regulatory and coordination powers are weak. Information on environmental phenomena and natural resource use is also poor. A first task will be to inventory natural resources, and document and evaluate in monetary terms the most important cases of incidence of degradation, pollution and over-exploitation. A first step in this direction will be the natural resource mapping exercise to be carried out by the Institute for Resource Assessment with funding from the IDA supported Forest Resources Management Project. Once the resource maps are available, the relevant legislation revised and the fines increased, Government's theoretical capacity to affect the use of natural resources and protect the environment will be greatly improved. If this is to be translated into changes on the ground, considerable resources should now be devoted to strengthening NEMC, the Forestry Department and other entities charged with monitoring and enforcement.

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230 Ibid. pp 8, 11.

231 See BTOs of November 17 1992 and May 28, 1993 of two World Bank Environment Missions, led by Mr. Narendra Sharma, assisting Government in the preparation of a National Environmental Action Plan.

G. Environmental Impact of Agricultural Growth

The environmental costs of agricultural growth can be categorized into those that: (i) contribute to irrecoverable soil degradation, (ii) contaminate ground or surface water, and (iii) cause encroachment into national parks, game, wildlife or forest reserves.

Soil Fertility Mining and Degradation.

Soil degradation has been defined as a process which results in the removal of the nutrient rich topsoil, and irrecoverably lowers fertility and water retention capacity. This occurs as a result of water or wind erosion, biological degradation (decrease in humus); physical degradation (increase in bulk density and decrease in permeability), alkalization or acidification. Irreversible soil degradation in an inhospitable climate leads to desertification.

Smallholder agricultural production of cereals and food crops in Tanzania has traditionally relied on a long fallow (five to seven years) to regenerate cultivated areas. As population densities in the settled areas of good potential have increased, the expansion in area cultivated has reduced fallow land. The period when cultivable land is under fallow declines, and the natural regeneration of soil fertility is reduced. Smallholders are aware of this pressure on their land, and normally take measures to stem the decline in fertility. The rapid increase in the use of chemical fertilizer over the past twenty years must be seen in part as an attempt to compensate for the reductions in fallow land, forced on farmers by increasing regional population densities. Improved mulching methods and the use of animal manure will also improve soil structure and fertility, permitting a sustainable reduction in fallowing periods. Also, Tanzania still has the luxury of large tracts of fertile land in regions of good rainfall which is still underutilized. As population density becomes too high in current areas of settlement, farmers will voluntarily move into the under-populated regions of good agricultural potential. The Government must address the task of guiding the flow of migrants to areas where agriculture can be sustainable and productive and supporting the development of permanent new settlements that are environmentally benign through land-use zoning and social and physical infrastructure priorities.

However, the increase in opportunistic cultivation of agro-ecological areas suited mainly to grazing of livestock by transhumant pastoralists is of concern Such lands are only marginally suitable for sustainable agriculture. In these regions, where rainfall is unreliable, averaging barely 500 or 600 mm per annum, removal and incineration of tree cover and cultivation in the ash using the residual fertility will permit two or three seasons of cropping. Farms are then abandoned. If soils are of poor quality and the availability of moisture is very restricted, regeneration of the forest cover will be very slow. High levels of wind and soil erosion may lead to irreversible loss of productivity and desertification.

- It is recommended that tenure arrangements be worked out in semi-arid and arid areas where agro-pastoral activities are encroaching, whereby pastoralists are given access rights to access dry season fodder and perennial water sources. Agro-pastoralist development should be limited to areas of better potential where a rotational system could be sustained. Agro-pastoralists should also be limited in the areas they are permitted to clear, and induced to move voluntarily to areas of higher agricultural productivity. The development of roads, schools and health posts should not support settlements established on the basis of production systems which are unsustainable.

Also of concern is the harvesting of the natural woodlands, disregarding watershed management, biodiversity considerations, livestock and agricultural uses and possible topsoil loss and desertification.

- Under natural resource management programs and environmental action plans measures should be put in place to (i) establish sustainable and recommended exploitation patterns by agro-ecological zone; (ii) place reserves in those areas where deforestation will affect watershed management, exacerbate erosion, or contribute to significant losses of biodiversity; (iii) serve as a guide to the planning of new physical and social infrastructure and (iv) guide the extension service in the formulation of recommendations oh husbandry for the farming community.

Contamination of Ground and Surface Water

The overuse of fertilizer or pernicious agrochemicals can contaminate ground and surface water. The ecosystems most vulnerable to agrochemicals and fertilizer are Lake Victoria and the Northern Zone. The southern part of Lake Victoria is adjacent to Tanzania's Western Cotton Growing Area. In addition to the possibility of wiping out beneficial species and of resistance developing amongst cotton pests, the potential risks to the Lake ecosystem are damage to fish populations (endosulphan is especially toxic to fish), and water hyacinth growth being stimulated by fertilizer run-off. The absence of aerial spraying, and the increased use of ultra-low volume (rather than knapsack) spraying, reduces the risk of pesticide drift and run-off. The effect of fertilizer on water hyacinth is associated much more with the Kenyan areas by the Lake where sugar is grown. Use of fertilizer in Tanzania's Western Cotton Growing Area is small. The potential ecosystem risks in the Northern Zone relate to copper fungicide insecticides run-off. These products are used on coffee around Mount Kilimanjaro and Mount Meru. Some farmers are reported to attribute the decline in maize yields in fields adjacent to coffee plots to spraying. Levels of copper in the soil have increased, and it is conceivable that this could, over many years, inhibit soil micro-organisms and so affect soil structure and fertility. However, there is said to be no evidence from Kenya to support this.

Tanzania has a registration system for agrochemicals, which is controlled by the Tropical Pesticides Research Institute (TPRI) at Arusha. Only five insecticides, three fungicides, two herbicides and one plant growth regulator have full registration. There are many products with provisional, restricted or experimental registration. The policy promoting the development of multi-channel distribution adds to the necessity of monitoring and providing training in the use of correct practices. TPRI has the mandate for these functions, and in 1993 is starting to provide training courses on the safe handling and use of pesticides.

- TPRI's agrochemical monitoring and registration program should be strengthened for the increased coverage and inspection requirements of a liberalized production, importation and distribution scheme. Efforts should be made to design and put in place Integrated Pest Management programs which make use of natural means of controlling infestation.

Encroachment on Reserves

Tanzania has set aside about 22 percent of its mainland surface area (94.3 million ha) as reserves. National Parks take up 4 percent of the country's surface area, Game Reserves 8 percent, and forest reserves another 10 percent. Some of the land in reserves has a high opportunity cost. It is estimated that about 15 percent of the land under reserves is suitable for cereal cultivation. Expansion of cultivated area is the main method used by smallholders to increase production. As agriculture expands, the pressure on reserve boundaries will naturally increase, especially where reserved areas are of good agricultural potential, or immediately contiguous to population centers.

- The policy on natural resource management should include measures to (i) establish buffer zones between population centers and the reserves; (ii) work with the communities contiguous to reserves, who see their livelihoods affected by the reservation policy, to

provide them with some of the benefits accruing to the society from the maintenance of these reserves, and to adjust local land-use systems to forego the need to use reserved areas. The use of tourism revenues for improving social and physical infrastructure in townships around national parks may be one approach; (iii) improve the monitoring of encroachment of reserve boundaries, and (iv) strengthen Government control of access to reserves and use of wood or other resources.

H. Poverty Alleviation

Poverty alleviation is one of the objectives of the proposed agricultural development strategy. The recent Poverty Profile for Tanzania indicates that the poor are overwhelmingly rural. Rural per capita expenditure levels (adult equivalent) are 63 percent of urban levels, and 44 percent of Dar es Salaam expenditure levels. Rural per capita expenditure is more inequitably distributed than urban expenditure. Per capita rural expenditure varies widely by region, reflecting level of development and agricultural potential. Poor smallholder farms are the backbone of Tanzania's agriculture. They are the most widespread adopters of new technology, and have the highest productivity in land and labor resources. Measures to promote agricultural development and export growth are completely congruent with steps to alleviate poverty. In fact, the reverse is also the case. Measures taken to improve living standards, especially health and educational levels, among the rural poor have an important effect on the adoption of innovation, labor productivity and agricultural output. Comprehensive, multisectoral poverty alleviation is good growth policy.

Features of the agricultural development strategy and their effect on poverty alleviation include:

- The recommended focus on smallholder farmers as the source of growth. The attention and resources used by parastatals and central Government in promoting capital intensive production through large agricultural enterprises should be shifted to the needs of smallholder farmers. This implies the redirection of research and extension, as well as priorities for road rehabilitation.

- The recommended liberalization of marketing and processing in the export crops to eventually improve farmgate returns. Initially, the devaluations of the late 1980s increased domestic returns to the coffee and cotton industries, without any of the increases being passed on to producers. This was due to Government's inaction on the adjustment of producer prices, and to the monopsony position of the cooperative unions who run the processing and export marketing facilities for these crops. The same situation holds for pyrethrum and tobacco, with the monopsony position held by a Government marketing board. Once the marketing and processing industry is opened to private entrants, greater competition for smallholder produce should increase real farmgate prices and provide quality premiums. With exports valued at market rates of exchange, industry returns will increase to the benefit of the smallholder producer.

- **The spatial dimensions of a growth strategy for cotton and cashews are congruent with the priorities for poverty alleviation**. The cotton industry is located in a depressed region: the Lake Victoria Basin. Per capita rural incomes in the cotton areas of Mara, Mwanza and Shinyanga are low. In Shinyanga the share of the population below the

national poverty line is 91 percent.[232] In Mwanza it is 58 percent and in Mara, 39 percent. Cotton production is grown exclusively by smallholders. Increasing returns to cotton will increase cash availability, employment and the demand for livestock products (another regional specialty) in the whole region.

- The cashew industry is also centered in a depressed area: the South Coast. Lindi, an important cashew producing region, has 91 percent of its population below the poverty line. Mtwara, another cashew producing region, has 57 percent of the population below the poverty line. Ruvuma, also a cashew producer, has 73 percent. These regions have already benefited from the resurgence in cashew sales, because of the freeing of the export trade. The dissemination of "sulphur dusting" technology has increased yields, improving farm-level returns.

- Agricultural research which focuses on smallholder production problems can dramatically increase farmgate profits and smallholder incomes. The results of such research can be incorporated in low to medium-cost inputs (hybrid maize seed, sulphur dust, fertilizer, pest control chemicals, improved seedlings), easily accessible to smallholders. Research into more effective animal-drawn implements is expected to further improve smallholder cultivation capacity and reduce transport costs;

- The use of strategically placed infrastructure, guided by land use studies and assessments of untapped agricultural potential, can direct the flow of rural migration to areas of high return. Such movements in population will benefit the individual and the country, if adequate infrastructure and technical support for sustainable development is provided.

- The maintenance of open borders for the export of maize, pulses and other foodstuffs to neighboring countries will be of most benefit to the regions of Kigoma, Rukwa, Mbeya, Ruvuma, which are far from the wealth-generating markets of Dar es Salaam, Morogoro, Tanga, Moshi and Arusha.

- Support for off-farm enterprise development by providing infrastructure, organizing groups and facilitating access to finance, will create employment opportunities for farm families throughout the year, and provide high-productivity employment for women.

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232 The results are drawn from the Poverty Profile of December 1993, prepared by the World Bank in collaboration with the Economic Research Bureau of the University of Dar es Salaam and the Food and Nutrition Policy Program of Cornell University. The Poverty Profile is based on a household survey, undertaken by the ERB and Cornell University using the National Master Sample frame, carried out in August-October 1991. The survey was not designed to provide data on a regional basis, and preliminary observations, such as that on Shinyanga, are subject to confirmation. An independent World Bank study, " Promoting Economic Opportunities for the Rural Poor During Economic Reform, the case of Tanzania", T. Addison, March 1994, page 11 indicates that in fact Shinyanga ranks as one of the better-off regions on other social indicators such as percentage of children stunted (relatively low), percentage of children undernourished (low), percentage of women at nutritional risk (low), and percentage of women with chronic energy deficiency (low).

VI. IMPLICATIONS FOR PUBLIC EXPENDITURE IN AGRICULTURE

Total Government expenditure on agriculture was 7.2 percent of all budgetary expenditure, and 2.7 percent of agriculture GDP, well below the ratios for 40 comparator developing countries. The implications of this report for the Government's role in agricultural development, and hence the requirements for budgetary funding for agriculture, have been described in the institutional development strategy in Chapter III, and are summarized below.

Government should withdraw from a series of activities which could be carried out commercially. The operation of such entities as heifer breeding farms, tractor hire services, seed multiplication services, should gradually be phased out. Government ownership and operation of livestock ranches, production farms, state farms, most of which operate at a loss, should also be phased out. Portions of the veterinary service, in areas of high value livestock operations (dairy, poultry, piggery) should be left to the private sector, with Government intervening in those areas where population density is lower, and profitability is less, to ensure coverage. Commercial activities such as the supply of inputs for agriculture or livestock development should be transferred to the private sector. The effect of this will be to reduce the drag on the Ministry of Agriculture budget of loss making enterprises, while enhancing service delivery to farmers.

At the same time, Government should be reaffirming its role in defining and monitoring policies which set the incentive framework for agricultural development. The Ministry of Agriculture's policy analysis and formulation capabilities should be strengthened, concomitantly with the ability to gather information on prices, production, crop yields and marketing chains, to support such policy analysis.

The Government should also be strengthening its capacity to deliver key "public goods" in support of agricultural development. These are services which, if left to the private sector, would be delivered at levels well below those necessary to induce rapid agricultural growth. The key activities here are agricultural research and agricultural extension. Low staff morale in these services makes it difficult for them to be effective. Salaries should be raised in real terms, and operating costs should be fully funded to make these services operational and responsive to farmers needs. Research and extension services are expensive. The high cost will force Government to assign strict priorities to the production problems to be addressed, and the geographic areas to be covered. Based on a review of practice in successful agricultural economies, and experience in the developed world, a country dependent on agricultural growth, such as Tanzania, should be able to set aside a minimum of 1.5 percent of agriculture GDP in budgetary funds to support agricultural research and extension. This would imply annual expenditures (from the recurrent and development budgets) on the order of US$ 25 million in support of agricultural research and extension. In 1990/91 total government expenditure on agricultural research and extension were about 0.88 percent of agriculture GDP, around US$ 13 million. Real expenditure on these services should almost double in real terms.

At the same time, Government should undertake a careful review of the projects in its development budget portfolio, and assess their contribution to agricultural development objectives in light of the priorities outlined in this report. There are 55 donor-funded projects in the Ministry of Agriculture's portfolio, with expenditure (from local and foreign funds) of about Tsh 6.8 billion in 1992/93. Each project should be assessed in light of its contribution to the Ministry of Agriculture's revised role in the promotion of agricultural development, and discussions should be undertaken with each donor agency to realign investment priorities with the revised Governmental objectives.

A. The Bank Portfolio

By 1992 the World Bank had funded 37 completed projects in Tanzania. These projects implied commitments of World Bank funding totalling US$ 720 million. Out of the total, 25 projects were targeted entirely on agricultural development, and 2 had partial funding for agriculture. Out of the total portfolio of 37 completed projects, 10 have been pronounced satisfactory by OED (27 percent). All of these 10 projects were in the agricultural sector. Out of the agricultural portfolio, the ratio of satisfactory projects was 37 percent.

This is far from satisfactory. A review of the reasons for unsatisfactory performance indicates that the negative effects of macro-economic policy, and other events beyond the control of project managers took their toll. Of all those projects that were unsatisfactory across all sectors, 63 percent had problems due to the effects of unsupportive macro-economic policy, and 19 percent because of changes in the market conditions on which the project was founded. Within agriculture projects (including those with agriculture components), about 59 percent of the unsatisfactory projects suffered severe problems from unsupportive macro-economic policy, and 24 percent had seen market conditions change against project interests.

Not all the failures were due to adverse macro-economic policy, or changes in market conditions however. Of all those projects that were unsatisfactory across all sectors, 41 percent had problems due to inappropriate design, at the appraisal stage. The ratio was a little higher, at 44 percent for unsatisfactory agriculture sector projects. Management problems were important in 33 percent of all unsatisfactory projects, rising to 53 percent for unsatisfactory projects in the agricultural sector.

The implications of the above assessment are to induce caution in planning future publicly financed investments in the agriculture sector. Those agriculture projects which were judged successful included three technical assistance projects, two projects in tea production, two in forestry, one in tobacco, one in coconut development, and the agricultural aspects of a multisectoral rehabilitation project in 1986. Projects in a host of other subsectors within agriculture (dairy, general livestock, cashewnuts, sugar, cotton, maize, fisheries, area development), have all proven unsatisfactory. Overestimating production capacity has been a recurrent failing, haunting investments in the cashew sector. Overestimating the capacity of regional government affected outcomes in the Kigoma, Tabora and Mwanza-Shinyanga rural development projects.

The lessons of past projects in the agricultural sector point to the need to have:

- clarity of focus and objectives;
- cautious estimation of market potential for the crops to be produced;
- safeguards to ensure that management will be efficient and aggressive;
- sufficient local funding to permit effective implementation;
- strong commitment to project objectives at all levels of Government.

B. Donor Funded Projects

Donor aid should be used in support of the sectoral objectives outlined in this report. The shift in the use of donor aid in the agricultural sector which occurred in the late 1980s has been beneficial. Since

the Economic Recovery Program was initiated, the donor community has shifted a large share of its resources into providing foreign exchange, available under the OGL procedure, against changes in agricultural development policy. The practice of providing fertilizer or machinery in kind has declined, as has the share of investment project funding. Change in agriculture sector policy has been gradual, but continuous. The gradual liberalization of the grain market has been followed by a gradual process of freeing up entry to the traditional export processing industries, the input supply market, and the foreign exchange market.

Donors should continue their two-pronged approach, mixing balance of payments support with investment projects. While the agenda for policy reform in the agricultural sector has gradually been met, there are still areas where attention is needed if the process of market liberalization is to be completed. Also there continues to be a strong need for foreign exchange, to support investment and growth in the sector. The provision of such funding, against policy reform or adjustment in the legislative and institutional framework needed for promoting sustainable agricultural growth continues to be useful. Following the policy-based lending program, "investment projects" focusing on particular institutions or subsectors, can follow through on the changes in the legislative and incentive framework obtained under adjustment programs, and ensure that the institutions and infrastructure are in place to obtain sustainable agricultural growth.

Policy Based Lending

There are still three areas where the markets for agricultural products, or inputs, are not completely liberalized, and a "framework" approach will be needed to obtain the necessary change. This approach can be pursued through the negotiations on the next PFP (1994-97) and in the preparation of the proposed multisectoral Structural Adjustment Credit. The issues include:

(a) **Completing the liberalization of the traditional export crop markets**. Government has passed Crop Marketing Boards (Amendments) Act in August of 1993, liberalizing agricultural export processing and marketing, which permits private sector access to the production, processing and marketing of coffee, cotton, cashews and tobacco. To enhance the introduction of competition into these sectors, the Government should ensure that the various crop Boards: (i) publish the licensing requirements at all levels of the export chain (crop purchase, processing, export marketing); (ii) restrict licensing criteria to simple indicators of business capability and seriousness of intent; and (iii) discontinue the commercial functions of the marketing boards.

(b) **Completing the restructuring of the cooperative sector**. The Government should ensure that: (i) the cooperative primary societies **and unions** in the cotton and coffee producing regions are re-constituted under the provisions of the Cooperative Act of 1991. Under this Act, only primary societies which are independent, voluntary, economically viable, with democratically elected leadership will be registered; (ii) that these reconstituted primary societies address, with extreme priority, the questions of rehabilitation and management of the cotton ginneries and coffee factories owned by their unions; and (iii) the Cooperatives Act of 1991 is adjusted to permit the formation of joint ventures between cooperatives and private sector companies.

(c) **Complete divestiture of parastatal crop processing facilities.** The factory for processing pyrethrum, and some of the factories for processing cashews continue to be owned and operated by parastatals at well below capacity. Government should take steps to: (i) encourage the private sector to invest in smaller, more appropriate installations in the sector, (ii) improve capacity utilization in existing factories by divesting itself of these

installations to private sector enterprises interested and capable of operating them more efficiently.

(d) **Improve management of the Strategic Grain Reserve**. Government's direct intervention in the grain trade is now limited to the activities of the Strategic Grain Reserve. In order to find the least cost way of executing the strategic purchases and sales necessary to meet food security objectives, Government undertook to formalize: (i) a tendering procedure for purchases to replace the current agency system, and create a level playing-field between farm groups, private traders and primary cooperatives and cooperative unions; (ii) a procedure for grain release and pricing. A study is needed to produce a rule on intervention that refers to: (a) the maximum permissible variance around the real average monthly market prices for maize; (b) the permissible trade margin between border and wholesale prices; (c) the mechanisms for continuous update of the real average retail prices. Once the need for intervention is established, Government intervention should use market-based mechanisms, such as the auction of food grains in the affected areas, to bring prices down.

(e) **Complete the liberalization of the market in agricultural inputs** (fertilizer, pesticides, veterinary drugs and chemicals, tools and implements). Private sector entry into this market has been hampered by direct subsidies and the presence of Government agencies. During 1994 the Government has eliminated the subsidy on fertilizer imports, and discontinued pan-territorial pricing and product allocation procedures. To complete the liberalization process, the Government should discontinue its operations in all agricultural chemicals and should put in place a mechanism to auction all donated inputs (fertilizers and other chemicals or implements) at port of entry, so as not to undercut the domestic trade in these goods. The effectiveness of pesticide regulation at all stages (pre-marketing tests, importation, formulation, retailing) should also be strengthened, as should the legislative framework underlying the fertilizer market. Regulatory reform would be supported under the Agriculture Sector Management Project (Cr 2537-TA).

Investment Lending

Within the framework defined by the above-mentioned adjustments, donors could profitably support Government actions with projects in the following subsectors, listed in a **tentative order of priority**:

1. **Agricultural research and extension services**, currently receiving funds from multi-donor projects, will need follow-on operations to strengthen and deepen the improvements in service delivery, later on in the decade.

2. A **water resource management** project, to strengthen the framework for management of surface and ground water resources, with a special focus on river basin management and development of smallholder irrigation, would have strong positive effects on poverty alleviation and environmental management;

3. A **wildlife, game reserves and national parks** project could focus on wildlife management and tourism. The project could focus on strengthening national park management capacity and revenue generation, improving park facilities, setting up participatory mechanisms, community development efforts and buffer zones to ensure that surrounding communities benefit from the success of the parks;

4. **Rural financial market** development will assist in increasing income generation, and productivity improvement in rural areas. A project supporting the introduction of savings based rural finance programs, focussing on the creation of rural banks, strengthining the payment mechanisms, fostering savings and credit unions and non-government community development organizations, can provide the basis for an eventual rural financial network. Bank of Tanzania prudential supervision capacity would also have to be expanded;

5. Monitoring and regulation of a private sector **fishing industry** (including Lake Victoria, coastal fisheries and the protection of the coral reefs).

Outside of the agricultural sector, there are a series of investment projects by both donors and Government, which will support the agricultural growth strategy developed in this report. These are listed in this report in order of priority:

- The continued restructuring of the **financial sector**, fostering the entry of new banks and enabling them to respond to private sector financial needs as quickly as possible.

- The continued rehabilitation of the **rural roads network**, and the opening up of strategic new feeder roads will play a definitive role in fostering agricultural development. The rehabilitation and efficient operation of the railroad network and ports facilities will also contribute to export competitiveness and making producing regions in the interior of the country more competitive.

- The rehabilitation and improvement of the **communications infrastructure** will smooth trade opportunities, especially in the area of high value exports.

- Establishing a **minimalist regulatory environment** for private sector activities, that fosters competition, and keeps farmer shares of industry returns as high as possible. Government intervention in monopsony markets (such as the sale of green leaf or cane sugar to processing factories by smallholders) may be necessary to safeguard farmer shares.

- Strengthening the legal system, and the **enforcement of contracts**.

Short-Term Agenda On Agriculture Sector Policy

Ranking of Key Recommendations, and Highlighting of Actions Taken by Government Since Joint Mission of November 1992.

Rank	Subsector	November 1992 Joint Mission Recommendation	Government Action Since November 1992
1	Export Competitiveness and Comparative Advantage Non Traditional Exports	Allow agricultural exporters to exchange export earnings at the market exchange rate. .	This has been addressed by the unification of official and market exchange rates in August 1993.
2	Reform of Marketing Channels for Traditional Agricultural Exports Coffee	Amend all relevant Acts governing production, processing and marketing of export crops to: (i) allow competitive multichannel marketing from producer through export; (ii) permit and encourage competition at all levels of the markeing chain, including at the processing level, and among "export agents"; (iii) separate regulatory and commercial functions of marketing boards.	Passage of the Crop Boards (Amendments) Bill in August 1993 removes barriers to private sector entry and competition in the marketing of export crops. Regulations still under review. Boards still retain commercial functions.
3	Credit	Banks to manage restructuring or liquidation of large cooperative union debtors. This has been addressed by forgiveness of Tsh 30 billion of cooperative union debt..	In July 1993 Government took over Tsh 30 billion in debts owed to the banks by the Cooperative Unions. This was estimated to be the debt incurred by the unions from following Governments edicts on crop pricing and marketing.
4	Marketing of Foodgrains	Amend the Acts restricting private commerce in foodgrains.	No action taken. De facto, private sector activities are not affected.
5	Agricultural Inputs	Identify and put in place conditions needed to have international inputs companies import and distribute on their own account.	Two private sector firms have imported small quantities of fertilizer in 1993. Subsidy discontinued as of FY 94/95 Budget.
6	Institutional Reform	A functional review of the Ministry of Agriculture be undertaken to design a program to enhance policy formulation, strengthen agriculture information systems, and streamline operations.	A "first round" functional review of the Ministry was undertaken in preparing for the appraisal of the IDA financed Agriculture Sector Management project. This project, appraised in March 1993 and signed in July 1993 will assist the Ministry to divest itself of commercial activities, and strengthen policy formulation and information management.
7	Land Tenure	Urgently develop "umbrella" legislation based on recommendations from the Presidential Commission on Land Tenure accepted by the Government.	The report of the Presidential Commission of Inquiry into Land Matters (the Shivji Commission) was completed in November 1992, and made public in November 1993. Government is drafting a Cabinet Paper on Land Tenure Policy to address land issues.
8	Cooperatives	Implement "spirit" of 1991 Cooperative Act, stopping political interference. Coops should be dissolved and reconstituted democratically.	Restructuring has been completed, with some 1,860 primary societies formed out of the 4,900 active societies registered. However, the reconstitution of the management and assets of the Cooperative Unions, especially in the cotton sector, is still delayed.
9	Livestock	Collect baseline livestock planning information: i.e. tetse infestation, rangelands use, consumption levels of animal products	Little action to date.
10	Agricultural Data and Monitoring Systems	Increase funding (salaries, allowances, operating funds, vehicles) for agricultural information gathering and dissemination systems (i.e. crop surveys, price collection)	Funding included in the IDA supported Agriculture Sector Management Project for improving data collection, management, and for undertaking the Agricultural Census.
11	Seeds Industry	Define National Seed Policy governing such things as patent protection, germplasm access, imports, quarantine, exports.	Draft National Seed Policy reviewed in November mission.. Little action taken.

Source: Bank Mission

Medium-Term Agenda On Agriculture Sector Policy

Ranking of Key Recommendations, and Highlighting of Actions Taken by Government Since Joint Mission of November 1992.

Rank	Subsector	November 1992 Joint Mission Recommendation	Government Action Since November 1992
1	Reform of Marketing Channels for Traditional Agricultural Exports Inputs Supply Seeds Industry	Cease Government support to parastatals marketing fertilizer, agricultural inputs, traditional crops and seeds.	Parastatals marketing fertilizer and other inputs, crops and seeds are are scheduled for eventual joint venture or sale. Little action taken to date. Subsidies for fertilizer imports discontinued as of the 1994/95 Budget. Panterritorial pricing discontinued.
2	Export Competitiveness and Comparative Advantage	Remove administrative controls on importation and marketing of inputs and agricultural produce.	Fertilizer imports opened to private trade. Importation of other agricultural inputs recently liberalized.
3	Marketing of Foodgrains	Liberalize external trade in foodgrains.	No action to date.
4	Land Tenure	Identify and put in place measures to formalize individual tenure.	Demarcation of village boundaries underway. No action on village vs individual tenure policy.
5	Institutional Reform Livestock	Veterinary services, veterinary drug distribution, heifer farms and other directly productive activities in MOA be privatized.	Will be addressed under the Agriculture Sector Management Proejct. No action so far.
6	Cooperatives	Reduce "Cooperative Development Department" of MOA to monitoring and training functions.	Staff reductions to follow the restructuring of the cooperative system under the 1991 Act, still underway.
7	Credit	NBC and CRDP restructured, and staffed to lend commercially for agriculture.	To be addressed under the Financial Sector Adjustment Credit. Issues studied on Financial Sector Review. No action so far.
8	Coffee	Put in place a replacement program for Arabica with new disease resistant varieties, using private sector and vegetative propagation techniques.	Research system gradually being refurbished under donor project. Coffee research still to be rehabilitated.
9	Agricultural Data and Monitoring Systems	Expand funding and coverage of radio broadcasts of price information.	To be addressed under Agriculture Sector Management Project. No action so far.
10	Non Traditional Agricultural Exports	Support creation of sources of long term investment funding.	Private Sector Development Project looking into such an instrument. No action so far.

Source: Bank Mission

Statistical Annex

Contents

TANZANIA
AGRICULTURAL AND TOTAL GDP AT FACTOR COST

Fiscal Year	NCPI	GDP at Factor Cost:		Real Gross Domestic Product		Agricultural Share in GDP % of Total
		Agriculture (Current TShs, millions)	Total	Agriculture (constant 1977 TSh, millions)	Total	
1977	100	11,131	25,698	11,131	25,698	43.3
1978	107	12,506	28,582	11,688	26,712	43.8
1979	120	14,728	32,317	12,273	26,931	45.6
1980	157	16,636	37,454	10,596	23,856	44.4
1981	197	20,338	43,906	10,324	22,287	46.3
1982	254	26,449	52,546	10,413	20,687	50.3
1983	323	32,737	62,608	10,135	19,383	52.3
1984	439	41,295	78,143	9,407	17,800	52.8
1985	585	61,231	108,083	10,467	18,476	56.7
1986	775	84,153	140,866	10,858	18,176	59.7
1987	1007	117,982	200,377	11,716	19,898	58.9
1988	1322	178,760	285,152	13,522	21,570	62.7
1989	1663	207,059	335,505	12,451	20,175	61.7
1990	1991	233,804	400,719	11,743	20,127	58.3
1991	2429	358,693	573,536	14,767	23,612	62.5

Sources: Bank of Tanzania; World Bank.

EXCHANGE RATES AND TERMS OF TRADE

Year	Real Effective Exchange Rat	Unofficial Exchange Rate	Official Exchange Rate	Terms of Trade Index
	1985=100	TShs/US$	TShs/US$	1985=100
1979	42.70	12.0	8.2	
1980	48.22	21.0	8.2	
1981	63.39	27.6	8.3	92
1982	75.03	32.6	9.3	95
1983	83.79	39.6	11.1	79
1984	86.18	55.9	15.3	91
1985	100.00	100.8	17.5	100
1986	69.21	165.0	32.2	78
1987	34.05	180.0	64.3	72
1988	26.64	210.0	99.3	70
1989	23.31	254.2	143.4	70
1990	17.89	304.3	195.1	61
1991	19.13	371.3	224.4	59
1992	16.31			

Source: World Bank and Bank of Tanzania. 1990 and 1991 unofficial exchange rates estimated by applying the rate of growth in NCPI.

TANZANIA
GDP ESTIMATES AND COMPARISONS, 1954-66
(million TShs)

Year	1954	1955	1956	1957	1958	1959	1960	1961	1962	1963	1964	1965	1966
Total GDP at f.c.	2,504	2,604	3,048	3,248	3,342	3,542	3,701	3,870	4,189	4,547	5,594	5,671	6,514
of which Agriculture: 1/	...	...	...	...	...	...	2,256	2,281	2,485	2,787	2,839	2,630	2,953
% of Total:	...	...	...	...	...	...	61%	59%	59%	61%	51%	46%	45%
Real Agricultural GDP (current prices deflated by NCPI)	...	...	...	...	...	...	...	...	...	...	...	...	45,219
Total GDP at f.c. (through 1975) 2/	2,504	2,604	3,048	3,248	3,342	3,542	3,701	3,870	4,189	4,547	5,594	5,671	6,514
of which Agriculture	...	...	...	...	...	...	2,256	2,281	2,485	2,787	2,839	2,630	2,953
% of Total:	...	...	...	...	...	...	61%	59%	59%	61%	51%	46%	45%
GDP at f.c. Deflated by National CPI, 1985=1	...	...	...	...	...	...	...	...	...	...	...	...	99,747
GDP at f.c. Deflated by Low Inc. Index, 1985=1	56,090	58,330	68,275	69,957	66,840	76,289	74,020	77,400	83,780	97,935	116,024	105,859	121,595
GDP at f.c. Deflated by Deflator base 1985 = 1	...	...	...	...	...	...	...	...	...	...	55,698	57,078	64,748
GDP, 1976 Prices	...	...	...	...	...	...	...	...	...	...	12,511	12,821	14,544
Agriculture GDP in 1976 prices	...	...	...	...	...	...	...	...	...	...	6,295	6,180	7,085
Manufacturing GDP in 1976 Prices	...	...	...	...	...	...	...	...	...	...	1,040	1,177	1,386
Agriculture as Share of Total (1976 Prices)	...	...	...	...	...	...	...	...	...	...	50%	48%	49%
Rural Productivity													
Ag. GDP in 1976 prices per rural inhabitant	...	...	...	...	...	...	...	...	...	...	...	...	651
Ag. GDP at c.p. defl. by NCPI per rural inhabitant	...	...	...	...	...	...	...	...	...	...	...	...	4,153
Overall Productivity (GDP/cap)(Defl. NCPI)	...	...	...	...	...	...	...	...	...	...	...	...	8,602
Overall Productivity (GDP/cap)(Defl. LI CPI))	7,021	7,073	8,020	7,960	7,375	8,162	7,679	7,786	8,172	9,263	10,641	9,414	10,486
Overall Productivity (GDP/cap)(GDP Deflator, 1985=1)	...	...	...	...	...	...	...	...	...	...	...	5,076	5,584
Overall Productivity (GDP/cap)(1976 Prices)	...	...	...	...	...	...	...	...	...	...	1,147	1,140	1,254
Population	7,989	8,247	8,513	8,788	9,063	9,347	9,639	9,941	10,252	10,572	10,903	11,244	11,596
Rural Population	7,785	8,010	8,242	8,481	8,719	8,965	9,217	9,476	9,743	10,017	10,299	10,589	10,887

1/ From 1966-1975, agriculture GDP is derived using the ratio to GDP from 1977 CEM

2/ From "Selected Statistical Series 1951-1988)" (GDP at current prices), 1977 CEM (Agriculture at current prices 1966-75) and 1966 Statistical Abstract (Agriculture at current prices 1960-65)

Sources: Selected Statistical Series 1951-1988, Bureau of Statistices, January 1991, p.45,46;

World Bank, Report No. 1616-TA, Tanzania Basic Economic Report, December 1977, Vol I, p. 143, and
Economic Survey of 1991, The Planning Commission, June 1992, p.78.

TANZANIA
GDP ESTIMATES AND COMPARISONS, 1967-79
(million TShs)

Year	1967	1968	1969	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979
Total GDP at f.c.	6,735	7,182	7,460	8,215	8,857	10,032	11,490	14,010	16,988	21,652	25,698	28,582	32,317
of which Agriculture: 1/	2,869	2,992	3,081	3,381	3,497	3,979	4,523	5,528	7,123	9,046	11,131	12,506	14,728
% of Total:	43%	42%	41%	41%	39%	40%	39%	39%	42%	42%	43%	44%	46%
Crops & Livestock										7,903	9,737	11,159	13,427
Real Agricultural GDP (current prices deflated by NCPI)	43,007	43,039	43,876	46,672	46,409	48,622	50,137	51,192	52,378	62,216	68,507	68,666	71,597
Total GDP at f.c. (through 1975) 2/	6,735	7,182	7,460	8,215	8,845	10,130	11,531	13,836	16,534				
of which Agriculture	2,869	2,992	3,081	3,381	3,492	4,018	4,539	5,459	6,933				
% of Total:	43%	42%	41%	41%	39%	40%	39%	39%	42%				
GDP at f.c. Deflated by National CPI, 1985=1	100,960	103,311	106,237	113,402	117,551	122,583	127,369	129,748	124,913	148,918	158,160	156,933	157,102
GDP at f.c. Deflated by Low Inc. Index, 1985=1	121,665	125,685	130,550	139,406	141,712	147,840	153,200	142,647	118,916	122,476	124,059	118,562	128,351
GDP at f.c. Deflated by Deflator base 1985 = 1	67,424	70,959	72,570	75,437	78,095	83,090	85,329	86,416	90,850	96,392	96,780	98,841	101,721
GDP, 1976 Prices	15,145	15,939	16,301	16,945	17,542	18,664	19,167	19,411	20,407	21,652	21,739	22,202	22,849
Agriculture GDP in 1976 prices	7,089	7,349	7,392	7,692	7,598	8,220	8,299	7,956	8,630	9,046	9,150	8,998	9,066
Manufacturing GDP in 1976 Prices	1,542	1,655	1,814	1,890	2,070	2,244	2,344	2,376	2,384	2,811	2,641	2,730	2,821
Agriculture as Share of Total (1976 Prices)	47%	46%	45%	45%	43%	44%	43%	41%	42%	42%	42%	41%	40%
Rural Productivity													
Ag. GDP in 1976 prices per rural inhabitant	633	641	629	638	615	649	639	598	633	647	639	613	603
Ag. GDP at c.p. defl. by NCPI per rural inhabitant	3,842	3,751	3,731	3,872	3,756	3,839	3,863	3,848	3,841	4,451	4,782	4,676	4,762
Overall Productivity (GDP/cap)(Defl. NCPI)	8,442	8,365	8,330	8,610	8,643	8,727	8,781	8,662	8,075	9,322	9,587	9,212	8,967
Overall Productivity (GDP/cap)(Defl. LI CPI))	10,173	10,177	10,236	10,585	10,419	10,526	10,562	9,523	7,687	7,667	7,520	6,960	7,326
Overall Productivity (GDP/cap)(GDP Deflator, 1985=1)	5,638	5,746	5,690	5,728	5,742	5,916	5,883	5,769	5,873	6,034	5,867	5,802	5,806
Overall Productivity (GDP/cap)(1976 Prices)	1,266	1,291	1,278	1,287	1,290	1,329	1,321	1,296	1,319	1,355	1,318	1,303	1,304
Population	11,959	12,350	12,754	13,171	13,601	14,046	14,505	14,979	15,469	15,974	16,497	17,036	17,519
Rural Population	11,194	11,473	11,760	12,054	12,355	12,664	12,980	13,305	13,637	13,978	14,327	14,685	15,035

1/ From 1966-1975, agriculture GDP is derived using the ratio to GDP from 1977 CEM
2/ From "Selected Statistical Series 1951-1988)" (GDP at current prices), 1977 CEM (Agriculture at current prices 1966-75) and 1966 Statistical Abstract (Agriculture at current prices 1960-65)
Sources: Selected Statistical Series 1951-1988, Bureau of Statistics, January 1991, p.45,46;
World Bank, Report No. 1616-TA, Tanzania Basic Economic Report, December 1977, Vol I, p. 143; and
Economic Survey of 1991, The Planning Commission, June 1992, p.78.

TANZANIA
GDP ESTIMATES AND COMPARISONS, 1980-91
(million TShs)

Year	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992
Total GDP at f.c.	37,454	43,906	52,546	62,608	78,143	108,083	140,866	200,377	285,152	336,048	410,930	580,720	698,024
of which Agriculture: 1/	16,636	20,338	26,449	32,737	41,295	61,231	84,153	117,982	178,760	207,059	233,804	356,435	428,441
% of Total:	44%	46%	50%	52%	53%	57%	60%	59%	63%	62%	57%	61%	61%
Crops & Livestock	15060	18705	24760	29754	37481	54079	75291	109831	168195	193,809	218,671	339,835	410,235
Real Agricultural GDP (current prices deflated by NCPI)	62,138	60,456	60,971	59,395	55,032	61,231	63,538	68,548	79,169	72,867	68,739	85,683	84,371
GDP at f.c. Deflated by National CPI, 1985=1	139,897	130,514	121,131	113,591	104,137	108,083	106,358	116,419	126,288	118,259	120,814	139,599	137,458
GDP at f.c. Deflated by Low Inc. Index, 1985=1	127,117	113,830	111,885	107,878	114,555	108,083	100,108	112,436	123,595	111,419	103,611	107,399	
GDP at f.c. Deflated by Deflator base 1985 = 1	104,259	103,734	104,348	101,868	105,314	108,083	111,609	117,285	122,249	127,137	133,205	138,383	143,364
GDP, 1976 Prices	23,419	23,301	23,439	22,882	23,656	24,278	25,070	26,345	27,460	28,558	29,921	31,084	32,203
Agriculture GDP in 1976 prices	9,418	9,511	9,639	9,914	10,312	10,931	11,557	12,066	12,606	13,183	14,055	14,618	15,263
Manufacturing GDP in 1976 Prices	2,683	2,382	2,304	2,103	2,159	2,075	1,991	2,081	2,228	2,399	2,338	2,619	2,668
Agriculture as Share of Total (1976 Prices)	40%	41%	41%	43%	44%	45%	46%	46%	46%	46%	47%	47%	47%
Rural Productivity													
Ag. GDP in 1976 prices per rural inhabitant	612	603	597	600	610	631	652	665	678	693	721	733	747
Ag. GDP at c.p. defl. by NCPI per rural inhabitant	4,036	3,836	3,778	3,595	3,253	3,535	3,583	3,775	4,259	3,828	3,527	4,294	4,130
Overall Productivity (GDP/cap)(Defl. NCPI)	7,765	7,044	6,358	5,798	5,168	5,216	4,991	5,313	5,604	5,103	5,070	5,696	5,454
Overall Productivity (GDP/cap)(Defl. LI CPI))	7,056	6,144	5,872	5,506	5,685	5,216	4,698	5,131	5,485	4,808	4,348	4,382	
Overall Productivity (GDP/cap)(GDP Deflator, 1985=1)	5,787	5,599	5,477	5,199	5,227	5,216	5,238	5,352	5,425	5,486	5,590	5,647	5,689
Overall Productivity (GDP/cap)(1976 Prices)	1,300	1,258	1,230	1,168	1,174	1,172	1,177	1,202	1,219	1,232	1,256	1,268	1,278
Population	18,016	18,527	19,053	19,593	20,149	20,720	21,308	21,912	22,534	23,173	23,830	24,506	24,506
Rural Population	15,394	15,762	16,138	16,523	16,917	17,321	17,734	18,157	18,591	19,034	19,488	19,953	20,430

1/ From 1966-1975, agriculture GDP is derived using the ratio to GDP from 1977 CEM
2/ From "Selected Statistical Series 1951-1988)" (GDP at current prices), 1977 CEM (Agriculture at current prices 1966-75) and 1966 Statistical Abstract (Agriculture at current prices 1960-65)
Sources: Selected Statistical Series 1951-1988, Bureau of Statistices, January 1991, p.45,46;
World Bank, Report No. 1616-TA, Tanzania Basic Economic Report, December 1977, Vol I, p. 143; and
Economic Survey of 1991, The Planning Commission, June 1992, p.78.

TANZANIA
GROSS FIXED CAPITAL FORMATION

(Tsh million in current prices)

		1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991
Agriculture:	Public	29	48	12	99	26	937	24	108	170	620	787	1026
	Private	669	629	834	873	1444	1260	1883	1810	2498	2372	5790	7067
	Total Ag.	698	677	846	972	1470	2197	1907	1918	2668	2992	6577	8093
Manufacturing:	Public	826	292	1029	924	908	1804	2037	4832	2797	17141	16287	18183
	Private	1129	1669	1993	800	1676	2485	3058	13591	24911	18978	46319	56531
	Total Mnfg.	1955	1961	3022	1724	2584	4289	5095	18423	27708	36119	62606	74714
Transport:	Public	263	533	1185	251	258	345	683	2186	3969	25375	26074	30605
	Private	1650	1394	977	1636	2596	3831	7034	22819	33380	23722	57918	70664
	Total Transport	1913	1927	2162	1887	2854	4176	7717	25005	37349	49097	83992	101269
Total:	Total Public	3839	4244	5848	3888	4986	7885	14212	19692	26831	69715	72636	85718
	Total Private	4791	4388	4977	3864	6987	8987	14467	45383	70470	59307	145768	176660
	TOTAL	8630	8632	10825	7752	11973	16872	28679	65075	97301	129022	218404	262378

(constant 1976 TShs, millions)

Agriculture:	Public	18	25	5	36	8	210	4	14	16	52	58	55
	Private	418	334	372	319	437	283	335	238	241	201	424	376
	Total Ag.	436	359	377	355	445	493	339	252	257	253	482	430
Manufacturing:	Public	516	155	459	338	275	405	363	635	269	1450	1194	966
	Private	706	886	889	292	507	558	544	1787	2399	1605	3395	3005
	Total Mnfg.	1222	1041	1348	630	782	963	907	2422	2668	3055	4588	3971
Transport:	Public	164	283	529	92	78	77	122	287	382	2146	1911	1627
	Private	1032	740	436	598	786	861	1252	3000	3214	2006	4245	3756
	Total Transport	1196	1023	964	690	864	938	1373	3288	3597	4152	6156	5383
Total:	Total Public	2400	2252	2609	1421	1509	1771	2529	2589	2584	5896	5323	4556
	Total Private	2996	2329	2220	1412	2115	2019	2575	5967	6786	5016	10683	9390
	TOTAL	5396	4581	4829	2833	3625	3790	5104	8556	9370	10912	16006	13946
Agric. GDP (mkt prices)		16,636	20,338	26,449	32,737	41,295	61,231	84,153	117,982	178,760	207,059	233,804	358,693
Total GDP (market prices)		42,118	49,102	58,226	70,509	88,892	120,621	159,648	226,950	331,217	406,542	494,999	690,421
Total GDP (1976 prices)		26,335	49,102	58,226	70,509	88,892	120,621	159,648	226,950	331,217	406,542	494,999	690,421

Source: URT, National Accounts of Tanzania 1976-1991.

TANZANIA
CONSUMER PRICE INDICES

Year	1956	1957	1958	1959	1960	1961	1962	1963	1964	1965	1966	1967	1968	1969	1970	1971	1972	1973
National CPI											38.2	39.0	40.7	41.1	42.4	44.1	47.9	52.8
NCPI, for 1985=1											0.07	0.07	0.07	0.07	0.07	0.08	0.08	0.09
Annual Inflation of NCPI												2%	4%	1%	3%	4%	9%	10%
GDP Deflator to 1976 Prices									0.45	0.44	0.45	0.44	0.45	0.46	0.48	0.50	0.54	0.60
GDP Deflator to 1985 Prices									0.100	0.099	0.101	0.100	0.101	0.103	0.109	0.113	0.121	0.135
Retail Price Index (annual avg.) for Goods and Services Consumed by Min. Wage Earners (LI Price Inde	25	26	28	26	28	28	28	26	27	30	30	31	32	32	33	35	38	42
Annual Change in LI Price Index	0%	4%	8%	-7%	8%	0%	0%	-7%	4%	11%	0%	3%	3%	0%	3%	6%	9%	11%
LI Retail Price Index, 1985 = 1	0.045	0.046	0.050	0.046	0.050	0.050	0.050	0.046	0.048	0.054	0.054	0.055	0.057	0.057	0.059	0.063	0.068	0.075
Retail Price Index for Goods and Services Consumed by Min. Wage Earners in Dar es Salaam in Dec	25	26	28	26	28	28	28	26	27	30	31	31	32	33	34	35	39	45
Annual Inflation of Minimum Wage Index	0%	4%	8%	-7%	8%	0%	0%	-7%	4%	11%	3%	0%	3%	3%	3%	3%	11%	15%

Year	1974	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992
NCPI	63.2	79.6	85.1	95.1	106.6	120.4	156.7	196.9	253.9	322.6	439.2	585.3	775.2	1007	1322	1663	1991	2435	2972.2
NCPI, for 1985=1	0.11	0.14	0.15	0.16	0.18	0.21	0.27	0.34	0.43	0.55	0.75	1.00	1.32	1.72	2.26	2.84	3.40	4.16	5.078
Annual Inflation of NCPI	20%	26%	7%	12%	12%	13%	30%	26%	29%	27%	36%	33%	32%	30%	31%	26%	20%	22%	22%
GDP Deflator to 1976 Prices	0.72	0.83	1.00	1.18	1.29	1.41	1.60	1.88	2.24	2.74	3.30	4.45	5.62	7.61	10.38	11.82	13.64	18.81	21.68
GDP Deflator to 1985 Prices	0.162	0.187	0.225	0.266	0.289	0.318	0.359	0.423	0.504	0.615	0.742	1.000	1.262	1.708	2.333	2.656	3.065	4.226	4.869
Retail Price Index (annual avg.) for Goods and Services Consumed by Minimum Wage Earners (LI Price	55	80	99	116	135	141	165	216	263	325	382	560	788	998	1292	1689	2221	3028	
Annual Change in LI Price Index	31%	45%	24%	17%	16%	4%	17%	31%	22%	24%	18%	47%	41%	27%	29%	31%	31%	36%	
LI Retail Price Index, 1985 = 1	0.098	0.143	0.177	0.207	0.241	0.252	0.295	0.386	0.470	0.580	0.682	1.000	1.407	1.782	2.307	3.016	3.966	5.407	
Retail Price Index for Goods and Services Consumed by Min. Wage Earners in Dar es Salaam in Dec	68	91	104	123	137	147	193	235	320	362	467	693	880	1108	1483	1826			
Annual Inflation of Minimum Wage Index	51%	34%	14%	18%	11%	7%	31%	22%	36%	13%	29%	48%	27%	26%	34%	23%	*	*	

Source: URT Bureau of Statistics.

TANZANIA
INTEREST RATE STRUCTURE

	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991
Deposit Rates												
Savings	5.0%	6.0%	7.5%	7.5%	7.5%	10.0%	10.0%	21.5%	21.5%	26.0%	26.0%	26.0%
90 days	3.5%	3.5%	3.5%	3.5%	3.5%	5.0%	5.0%	14.5%	14.5%	16.0%	16.0%	16.0%
5 yrs	7.0%	8.5%	10.3%	11.0%	11.0%	14.0%	14.0%	27.0%	27.0%	29.0%	29.0%	29.0%
Lending Rate												
Short term	12.0%	12.5%	12.5%	9.5%	9.5%	16.0%	16.0%	29.0%	29.0%	31.0%	31.0%	31.0%
Medium term	11.0%	12.0%	13.5%	13.5%	13.5%	16.0%	16.0%	29.0%	29.0%	31.0%	31.0%	31.0%
Inflation (NCPI)	156.7	196.9	253.9	322.6	439.2	585.3	775.2	1007.4	1321.58	1663.2	1990.8	2434.8
Annual Inflation Rate	30.1%	25.7%	28.9%	27.1%	36.1%	33.3%	32.4%	30.0%	31.2%	25.8%	19.7%	22.3%
Monthly Inflation	2.2%	1.9%	2.1%	2.0%	2.6%	2.4%	2.4%	2.2%	2.3%	1.9%	1.5%	1.7%
Monthly Lending (Short Term)	0.9%	1.0%	1.0%	0.8%	0.8%	1.2%	1.2%	2.1%	2.1%	2.3%	2.3%	2.3%
Monthly Decapitalization Rate	-1.3%	-0.9%	-1.2%	-1.3%	-1.8%	-1.2%	-1.1%	-0.1%	-0.1%	0.3%	0.8%	0.6%
Real Interest Rate (Short Term)	-14.2%	-10.7%	-13.0%	-14.1%	-20.0%	-13.2%	-12.7%	-0.7%	-1.7%	4.2%	9.6%	7.2%

Source: Bank of Tanzania and URT publications.

TANZANIA
COMMERCIAL BANK CREDIT USE BY SECTOR

(Current Tsh millions, end period)	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991
Agriculture Production	445	482	418	308	653	643	1,362	4,039	6,020	6,612	13,225	13,911
Marketing Agriculture Produce	4,672	5,429	5,872	6,706	7,580	9,789	5,150	35,221	37,324	48,361	49,220	70,187
Export Agriculture Produce	101	361	510	564	590	447	221	301	618	744	2,085	1,897
Trade (other than capital goods)	642	802	1,049	1,160	1,649	3,973	9,376	6,595	10,952	15,911	32,307	22,634
TOTAL	7,400	8,551	9,579	10,643	12,955	17,529	30,151	55,072	73,530	106,667	114,130	158,080
(millions, constant 1976 TShs, end period)												
Agriculture Production	278	256	186	112	198	144	242	531	580	559	969	739
Marketing Agriculture Produce	2,921	2,881	2,619	2,451	2,295	2,199	916	4,631	3,594	4,090	3,607	3,731
Export Agriculture Produce	63	191	228	206	179	100	39	40	59	63	153	101
Subtotal Agriculture	3,263	3,328	3,033	2,769	2,671	2,443	1,198	5,201	4,234	4,712	4,729	4,571
Trade (other than capital goods)	401	426	468	424	499	892	1,669	867	1,055	1,346	2,368	1,203
TOTAL	4,627	4,538	4,273	3,890	3,922	3,937	5,366	7,241	7,081	9,022	8,364	8,402
GDP Deflator to 1976	1.599	1.884	2.242	2.736	3.303	4.452	5.619	7.606	10.384	11.824	13.645	18.814
(Shares)												
Agriculture Production	6.0%	5.6%	4.4%	2.9%	5.0%	3.7%	4.5%	7.3%	8.2%	6.2%	11.6%	8.8%
Marketing Agriculture Produce	63.1%	63.5%	61.3%	63.0%	58.5%	55.8%	17.1%	64.0%	50.8%	45.3%	43.1%	44.4%
Export Agriculture Produce	1.4%	4.2%	5.3%	5.3%	4.6%	2.5%	0.7%	0.5%	0.8%	0.7%	1.8%	1.2%
Agriculture Credit	70.5%	73.3%	71.0%	71.2%	68.1%	62.1%	22.3%	71.8%	59.8%	52.2%	56.5%	54.4%
Trade (other than capital goods)	8.7%	9.4%	11.0%	10.9%	12.7%	22.7%	31.1%	12.0%	14.9%	14.9%	28.3%	14.3%
TOTAL	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%

Source: Bank of Tanzania and URT publications.

TANZANIA
GOVERNMENT SPENDING ON AGRICULTURE, 1973-91

(millions, current Tsh) Year Ending	1973	1974	1975	1976	1977	1978	1979	1980	1981
Total, Recurrent	2,332	2,665	4,122	3,933	5,015	5,599	7,228	7,419	9,532
Total, Development	956	1,642	2,225	2,253	3,244	3,331	4,741	5,184	4,759
Agriculture				544					705
Natural Resources				446					176
Total Government Spending	3,288	4,307	6,347	6,186	8,259	8,930	11,969	12,603	14,291
GDP (Tsh millions)	11,490	14,010	16,988	21,652	25,698	28,582	32,317	37,454	43,906
Govt. Spending, Share of GDP	29%	31%	37%	29%	32%	31%	37%	34%	33%
Exchange Rate Tsh per US $	7.021	7.135	7.367	8.377	8.289	7.712	8.217	8.197	8.284
GDP (US$ millions)	1,637	1,964	2,306	2,585	3,100	3,706	3,933	4,569	5,300
(millions, current Tsh)									
Agriculture, Forestry and Fishing	322	524	945	845	922	882	935	1,320	1,262
Total, Recurrent and Development	3,182	4,427	6,186	5,968	7,947	9,983	13,009	14,413	14,694
Agriculture GDP (Tsh millions)	4,523	5,528	7,123	9,046	11,131	12,506	14,728	16,636	20,338
Spending on Ag. and Nat'l Resources:									
as Share of GDP	2.8%	3.7%	5.6%	3.9%	3.6%	3.1%	2.9%	3.5%	2.9%
as Share of Agriculture GDP	7.1%	9.5%	13.3%	9.3%	8.3%	7.1%	6.3%	7.9%	6.2%
(millions, constant 1976 Tsh)									
Agriculture, Forestry and Fishing	538	725	1,135	845	780	685	661	825	670
Total Recurrent and Development	5,308	6,134	7,431	5,968	6,722	7,755	9,198	9,012	7,798
Agriculture, Forestry and Fishing									
% of Total Recurrent & Develop.	10%	12%	15%	14%	12%	9%	7%	9%	9%
GDP Deflator to 1976	0.60	0.72	0.83	1.00	1.18	1.29	1.41	1.60	1.88

Source: URT Planning Commission.

TANZANIA
GOVERNMENT SPENDING ON AGRICULTURE, 1982-91

(millions, current Tsh) Year Ending	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991
Total, Recurrent	13,039	14,054	15,273	21,371	26,381	42,794	58,697	87,313	108,167	164,526
Total, Development	5,185	4,404	5,736	5,391	6,023	8,859	10,891	17,855	17,828	46,999
Agriculture	618	574	879	968	984	2,367	2,478	4,773	1,634	5,020
Natural Resources	225	112	183	180	272	659	819	982	1,317	941
Total Government Spending	18,224	18,458	21,009	26,762	32,404	51,652	69,588	105,168	125,995	211,525
GDP (Tsh millions)	52,546	62,608	78,143	108,083	140,866	200,377	285,152	335,505	400,719	573,536
Govt. Spending, Share of GDP	35%	29%	27%	25%	23%	26%	24%	31%	31%	37%
Exchange Rate Tsh per US $	9.283	11.143	15.292	17.472	32.698	64.26	99.292	143.377	195.06	219.16
GDP (US$ millions)	5,660	5,619	5,110	6,186	4,308	3,118	2,872	2,340	2,054	2,617
(millions, current Tsh)										
Agriculture: Development						1,845	2,054	3,306	2,999	7,028
Recurrent						1,353	1,827	2,731	4,103	4,852
Agriculture, Forestry and Fishing	1,282	1,233	1,580	1,639	1,951	3,198	3,880	6,037	7,102	11,880
Total, Recurrent and Development	18,427	19,289	21,461	26,345	33,245	49,722	73,298	111,221	140,910	207,000
Agriculture GDP (Tsh millions)	26,449	32,737	41,295	61,231	84,153	117,982	178,760	207,059	233,804	358,693
Spending on Ag. and Nat'l Resources:										
as Share of GDP	2.4%	2.0%	2.0%	1.5%	1.4%	1.6%	1.4%	1.8%	1.8%	2.1%
as Share of Agriculture GDP	4.8%	3.8%	3.8%	2.7%	2.3%	2.7%	2.2%	2.9%	3.0%	3.3%
(millions, constant 1976 Tsh)										
Agriculture: Development						243	198	280	220	374
Recurrent						178	176	231	301	258
Total	572	451	478	368	347	420	374	511	520	631
Agriculture: % Development						58%	53%	55%	42%	59%
% Recurrent						42%	47%	45%	58%	41%
Total Recurrent and Development	8,220	7,050	6,497	5,918	5,917	6,537	7,059	9,407	10,327	11,002
Agriculture, Forestry and Fishing										
% of Total Recurrent & Develop.	7%	6%	7%	6%	6%	6%	5%	5%	5%	6%
GDP Deflator to 1976	2.24	2.74	3.30	4.45	5.62	7.61	10.38	11.82	13.64	18.81
Spending on Parastatals										
Total (millions, current Tsh)	540	439	548	637	609	1,317	1,383	2,437	764	2,071
Agriculture	450	373	462	557	473	1,006	1,058	2,392	607	2,046
Natural Resources	90	66	86	80	135	311	325	45	157	25
Total (millions, constant 1976 Tsh	241	160	166	143	108	173	133	206	56	110
Agriculture	201	136	140	125	84	132	102	202	44	109
Natural Resources	40	24	26	18	24	41	31	4	12	1
% of Ministry Budget for Dev.										
Agriculture	72.9%	64.9%	52.5%	57.5%	48.1%	42.5%	42.7%	39.9%	37.1%	40.8%
Natural Resources	39.9%	59.4%	46.9%	44.7%	49.8%	47.2%	39.7%	25.8%	11.9%	2.7%

Source: URT Planning Commission.

TANZANIA
MERCHANDISE EXPORTS

(Index of Volume, 1987 = 100)

	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991
Coffee	140.4	113.3	105.0	113.7	91.1	104.2	100.0	84.8	102.6	118.3	118.9
Cotton	105.5	92.2	94.4	68.7	52.5	75.2	100.0	91.1	145.4	94.7	93.0
Tea	110.0	85.1	118.3	79.1	83.0	68.0	100.0	87.7	74.1	96.9	119.7
Cashew Nuts	224.7	153.9	93.9	299.3	211.0	159.2	100.0	130.4	121.5	80.4	98.3
Merchandise Exports	133.3	109.6	99.2	104.9	85.9	94.5	100.0	100.1	117.2	117.3	114.5

(Value in Current Prices, million $US)

Coffee	165.1	133.5	130.1	153.6	118.5	184.7	109.8	90	125.5	80.6	87.1
Cotton	78.1	56.3	61.8	49.5	29.6	30.4	42.3	52.9	84.2	61	64.9
Tea	21.7	18.6	21.8	23.5	17	13.6	18.1	16.4	15.3	22.7	24.6
Cashew Nuts	34.5	9.9	6.5	21.9	11.5	15	12.8	15.1	12.1	6.7	10
Other Agriculture	70.1	58.6	34.8	28.8	30.6	31.2	30.6	37.0	36.1	36.7	64.2
Subtotal Agriculture	369.5	276.9	255.0	277.3	207.2	274.9	213.6	211.4	273.2	207.7	250.8
Manufactures	59.5	32.7	44.2	33.1	32.8	39.1	63	64.8	87	101.8	88.7
Other Exports	108.2	178.6	96.7	73.1	97.0	2.6	60.1	61.8	62.3	79.8	54.1
Merchandise Exports	537.2	488.2	395.9	383.5	337	316.6	336.6	338	422.5	389.3	393.6
Merchandise Imports	1191.7	1128.5	956.7	855.7	945.9	1024.6	1100	1180	1354.6	1346	1381.3
Merchandise Export Price	119.7	132.3	118.5	108.6	116.5	99.6	100	100.3	107.1	98.6	102.1
Merchandise Import Price	93.9	100.4	107.5	85.7	83.6	91.3	100	102.6	110.5	116	125.3
Merchandise Terms of Trade	127.5	131.7	110.3	126.8	139.3	109	100	97.8	96.9	85	81.5

Cont'd.

TANZANIA
MERCHANDISE EXPORTS

					(Volume '000 t)						
Coffee	67.9	54.8	50.8	55.0	44.0	50.4	48.3	41.0	49.6	57.2	57.5
Cotton	44.5	38.9	39.8	29.0	22.1	31.7	42.2	38.4	61.3	39.9	39.2
Tea	15.4	11.9	16.6	11.1	11.6	9.5	14.0	12.3	10.4	13.6	16.8
Cashew Nuts	25.1	17.2	10.5	33.5	23.6	17.8	11.2	14.6	13.6	9.0	11.0
					(Unit Values in Current US Dollars)						
Coffee	2.43	2.44	2.56	2.79	2.69	3.67	2.27	2.20	2.53	1.41	1.52
Cotton	1.76	1.45	1.55	1.71	1.34	0.96	1.00	1.38	1.37	1.53	1.66
Tea	1.41	1.56	1.31	2.12	1.46	1.43	1.29	1.33	1.47	1.67	1.46
Cashew Nuts	1.37	0.57	0.62	0.65	0.49	0.84	1.14	1.03	0.89	0.74	0.91
					(Unit Values in 1985 US Dollars/Kilo: Deflated by MUV, 1985 = 100)						
Coffee	2.31	2.35	2.53	2.82	2.69	3.11	1.75	1.58	1.83	0.97	1.02
Cotton	1.67	1.40	1.53	1.72	1.34	0.81	0.77	0.99	1.00	1.05	1.11
Tea	1.33	1.50	1.30	2.13	1.46	1.21	1.00	0.96	1.07	1.15	0.98
Cashew Nuts	1.30	0.55	0.61	0.66	0.49	0.71	0.88	0.74	0.65	0.51	0.61
Other Agriculture											
US $ '000	17,870	15,250	10,263	9,308	11,088	13,292	12,722	16,782	20,027	26,193	
					(Value in millions of 1985 US Dollars, deflated by the G-5 MUV)						
Coffee	156.7	128.7	128.4	154.8	118.5	156.6	84.8	64.8	91.0	55.3	58.5
Cotton	74.1	54.3	61.0	49.9	29.6	25.8	32.7	38.1	61.0	41.8	43.6
Tea	20.6	17.9	21.5	23.7	17.0	11.5	14.0	11.8	11.1	15.6	16.5
Cashew Nuts	32.8	9.5	6.4	22.1	11.5	12.7	9.9	10.9	8.8	4.6	6.7
Other Agriculture	66.5	56.5	34.3	29.1	30.6	26.5	23.6	26.6	26.2	25.1	43.1
Subtotal Agriculture	350.7	266.9	251.6	279.6	207.2	233.1	164.9	152.2	198.0	142.5	168.5
Manufactures	56.5	31.5	43.6	33.4	32.8	33.2	48.6	46.6	63.1	69.8	59.6
Other Exports	102.8	172.2	95.4	73.7	97.0	2.2	46.4	44.5	45.1	54.8	36.4
Merchandise Exports	510.0	470.7	390.6	386.6	337.0	268.5	259.9	243.3	306.2	267.1	264.4
Merchandise Imports	1,131.3	1,088.1	943.9	862.6	945.9	868.9	849.4	849.3	981.8	923.4	928.0

Sources: Customs and Excise Annual Trade Reports (Bank of Tanzania); Tanzania Economic Trends
(Economic Research Bureau, U. of Dar es Salaam); International Financial Statistics Yearbook (IMF); World Bank

TANZANIA

TRADITIONAL AGRICULTURAL EXPORTS

	1965	1966	1967	1968	1969	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979
Volume in '000 metric tons															
Coffee	28.2	50.6	44.4	49.2	49.5	44.8	35.5	54.7	60.3	41	54.4	58.1	46.8	50.9	42.4
Cotton	56.2	86.2	60.8	62.9	56.7	60.7	54.8	64.5	60	49.1	38	57.8	41	47	31.4
Sisal	213.6	198.9	204.4	189.1	171.9	217.2	160.8	153.1	113.4	93.4	101.6	92.2	68.4	81.1	79
Tobacco	3.3	3.4	4.9	5.2	5	7.7	6.6	7.1	7.2	12.1	8.6	15.8	11.7	11	7
Tea	4.3	6.3	6.1	6.7	7.6	6.9	8.3	9.2	9.5	9.6	10.4	12	12	15	15
Cashewnuts	64.6	72.2	70.9	79.7	82.2	77.4	95.9	112.9	109.9	114	97.3	67.5	74.8	44.2	43.3
Value in Current Tsh millions															
Coffee	172	301	237	265	257	312	227	383	495	375	483	1,288	1,957	1,303	1,213
Cotton	244	350	251	283	235	247	245	336	333	473	297	636	541	420	399
Sisal	286	235	201	159	160	179	134	145	222	463	302	242	229	211	472
Tobacco	23	23	39	40	39	60	60	65	68	134	118	262	211	222	149
Tea	30	45	43	45	48	42	49	54	54	69	81	134	178	168	164
Cashewnuts (raw)	83	100	92	102	119	115	120	150	141	196	177	133	188	161	219
All Merchandise Exports	1,421	1,851	1,746	1,700	1,717	1,756	1,871	2,259	2,553	2,848	2,747	4,108	4,464	3,671	4,484
Official Exch. Rate, TSh/$US	7.14	7.14	7.14	7.14	7.14	7.14	7.14	7.14	7.02	7.14	7.37	8.38	8.29	7.71	8.22
Value in Current US$ million															
Traditional Agriculture	117.2	147.6	120.9	125.1	120.0	133.7	116.8	158.6	187.0	239.7	197.9	321.7	398.5	322.3	318.2
Coffee	24.1	42.1	33.2	37.1	36.0	43.7	31.8	53.6	70.5	52.6	65.6	153.8	236.1	169.0	147.6
Cotton	34.2	49.0	35.2	39.6	32.9	34.6	34.3	47.1	47.4	66.2	40.3	75.9	65.2	54.5	48.5
Sisal	40.0	32.9	28.1	22.2	22.4	25.0	18.7	20.3	31.6	64.9	41.0	28.9	27.7	27.4	57.4
Tobacco	3.2	3.3	5.5	5.6	5.4	8.3	8.4	9.1	9.6	18.7	16.0	31.3	25.5	28.7	18.1
Tea	4.2	6.3	6.0	6.3	6.8	5.9	6.8	7.5	7.7	9.7	11.0	16.0	21.5	21.8	19.9
Cashewnuts (raw)	11.5	14.0	12.9	14.2	16.6	16.1	16.7	21.0	20.1	27.5	24.0	15.8	22.6	20.9	26.6
Other Agriculture															
All Merchandise Exports	199	259	244	238	240	246	262	316	364	399	373	490	539	476	546
Merchandise Imports	167	219	213	230	218	284	345	360	438	660	670	556	647	993	961

Sources: Customs and Excise Annual Trade Reports (Bank of Tanzania); Tanzania Economic Trends (Economic Research Bureau, U. of Dar es Salaam); International Financial Statistics Yearbook (IMF); World Bank.

TANZANIA

TRADITIONAL AGRICULTURAL EXPORTS

	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992
Volume in '000 metric tons													
Coffee	43.54	67.88	54.76	50.7	54.96	44	50.38	48.34	38.67	49.92	87.1	73	53.4
Cotton	31.47	44.48	38.86	39.84	28.94	22.1	31.69	42.15	51.7	48.04	64.9	94.6	63.6
Sisal	48.87	57.5	50.68	26.8	21.5	15.49	15.06	13.76	11.19	8.6	3.2	3.4	4.1
Tobacco	8.51	10.95	10.06	5.38	4.62	7.74	7.1	8.23	9.78	7.72	11.6	22.3	11.4
Tea	13.26	15.44	11.95	16.6	11.1	11.65	9.54	14.02	11.19	10.93	24.6	23.9	19.2
Cashewnuts	9.06	25.15	17.22	10.5	33.49	23.61	17.81	11.19	16.25	9.1	10	16.2	32.9
Value in Current Tsh millions													
Coffee	1,175	1,301	1,153	1,452	2,349	2,070	6,038	7,030	9,602	15,490	25,728	20,384	20,482
Cotton	397	638	520	687	757	517	994	2,822	7,473	9,305	20,988	29,806	25,782
Sisal	250	269	225	146	161	103	170	378	483	612	332	351	536
Tobacco	102	145	177	128	137	238	415	767	1,524	1,723	4,330	10,673	7,085
Tea	181	168	173	243	359	297	445	1,135	1,592	2,317	7,003	6,991	6,758
Cashewnuts (raw)	60	284	89	72	335	201	490	799	1,594	1,060	1,756	3,112	7,502
All Merchandise Exports	4,776	5,078	3,833	4,220	5,952	4,990	11,392	22,285	38,376	59,516	79,545	78,986	130,125
Official Exch. Rate, TSh/$US	8.20	8.28	9.28	11.14	15.29	17.47	32.70	64.26	99.29	143.38	195.06	219.16	297.71
Value in Current US$ million													
Traditional Agriculture	264.2	338.6	251.8	244.9	268.0	196.1	261.6	201.2	224.3	212.8	308.3	325.4	228.9
Coffee	143.4	157.09	124.24	130.29	153.59	118.5	184.67	109.4	96.7	108.0	131.9	93.0	68.8
Cotton	48.43	77.03	56.06	61.69	49.52	29.6	30.4	43.92	75.26	64.9	107.6	136.0	86.6
Sisal	30.53	32.47	24.28	13.1	10.54	5.9	5.2	5.88	4.86	4.3	1.7	1.6	1.8
Tobacco	12.49	17.45	19.05	11.52	8.99	13.6	12.7	11.94	15.35	12.0	22.2	48.7	23.8
Tea	22.07	20.24	18.61	21.79	23.47	17	13.61	17.67	16.03	16.2	35.9	31.9	22.7
Cashewnuts (raw)	7.32	34.34	9.54	6.5	21.92	11.5	15	12.43	16.05	7.4	9.0	14.2	25.2
Other Agriculture		79.9	49.5	33.3	29.3	25.9	34.3	31.5	42.3	35.5	38.4	58.7	55.0
All Merchandise Exports	583	613	413	379	389	286	348	347	387	415.1	407.8	360.4	437.1
Merchandise Imports	1089	1061	952	708	760	869	913	1001	1033	1,070.1	1,186.3	1,169.9	1,584.8

TANZANIA
TRADITIONAL AGRICULTURAL EXPORT UNIT VALUES

	1965	1966	1967	1968	1969	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979
Current US$ per kg															
Coffee	0.853	0.833	0.747	0.754	0.727	0.975	0.895	0.980	1.170	1.282	1.205	2.647	5.045	3.320	3.481
Cotton	0.608	0.568	0.579	0.630	0.579	0.570	0.625	0.730	0.791	1.349	1.060	1.312	1.590	1.160	1.545
Sisal	0.187	0.165	0.138	0.117	0.130	0.115	0.116	0.132	0.278	0.695	0.404	0.313	0.404	0.338	0.727
Tobacco	0.959	0.964	1.120	1.082	1.084	1.082	1.279	1.278	1.339	1.547	1.856	1.979	2.177	2.611	2.585
Tea	0.983	1.002	0.991	0.938	0.890	0.856	0.825	0.819	0.813	1.009	1.060	1.337	1.788	1.455	1.327
Cashewnuts (raw)	0.179	0.194	0.182	0.178	0.203	0.208	0.175	0.186	0.183	0.241	0.247	0.235	0.303	0.472	0.615
Constant 1985 US$ per kg (deflated by MUV Index)															
Coffee	2.71	2.56	2.27	2.31	2.11	2.67	2.32	2.33	2.41	2.16	1.83	3.96	6.88	3.93	3.64
Cotton	1.93	1.74	1.76	1.93	1.68	1.56	1.62	1.74	1.63	2.28	1.61	1.96	2.17	1.37	1.62
Sisal	0.59	0.51	0.42	0.36	0.38	0.32	0.30	0.32	0.57	1.17	0.61	0.47	0.55	0.40	0.76
Tobacco	3.05	2.96	3.40	3.32	3.15	2.96	3.32	3.04	2.75	2.61	2.82	2.96	2.97	3.09	2.70
Tea	3.12	3.08	3.01	2.87	2.59	2.34	2.14	1.95	1.67	1.70	1.61	2.00	2.44	1.72	1.39
Cashews	0.57	0.60	0.55	0.55	0.59	0.57	0.45	0.44	0.38	0.41	0.37	0.35	0.41	0.56	0.64
MUV G-5 Index (1985 = 100)	31.5	32.6	33.0	32.6	34.4	36.6	38.5	42.0	48.6	59.3	65.9	66.8	73.4	84.5	95.7

Sources: Customs and Excise Annual Trade Reports (Bank of Tanzania); Tanzania Economic Trends (Economic Research Bureau, U. of Dar es Salaam); International Financial Statistics Yearbook (IMF); World Bank.

TANZANIA
TRADITIONAL AGRICULTURAL EXPORT UNIT VALUES

	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992
Current US$ per kg													
Coffee	3.293	2.314	2.269	2.570	2.795	2.693	3.666	2.263	2.501	2.164	1.514	1.274	1.288
Cotton	1.539	1.732	1.443	1.548	1.711	1.339	0.959	1.042	1.456	1.351	1.658	1.438	1.362
Sisal	0.625	0.565	0.479	0.489	0.490	0.381	0.345	0.427	0.434	0.497	0.531	0.471	0.439
Tobacco	1.468	1.594	1.894	2.141	1.946	1.757	1.789	1.451	1.570	1.557	1.914	2.184	2.088
Tea	1.664	1.311	1.557	1.313	2.114	1.459	1.427	1.260	1.433	1.478	1.459	1.335	1.182
Cashewnuts (raw)	0.808	1.365	0.554	0.619	0.655	0.487	0.842	1.111	0.988	0.812	0.900	0.877	0.766
Constant 1985 US$ per kg (defl													
Coffee	3.14	2.20	2.19	2.54	2.82	2.69	3.11	1.75	1.80	1.57	1.04	0.85	0.83
Cotton	1.47	1.64	1.39	1.53	1.72	1.34	0.81	0.80	1.05	0.98	1.14	0.96	0.88
Sisal	0.60	0.54	0.46	0.48	0.49	0.38	0.29	0.33	0.31	0.36	0.35	0.34	0.32
Tobacco	1.40	1.51	1.83	2.11	1.96	1.76	1.52	1.12	1.13	1.13	1.31	1.47	1.34
Tea	1.59	1.24	1.50	1.30	2.13	1.46	1.21	0.97	1.03	1.07	1.00	0.90	0.76
Cashews	0.77	1.30	0.53	0.61	0.66	0.49	0.71	0.86	0.71	0.59	0.62	0.59	0.49
MUV G-5 Index (1985 = 100)	104.9	105.3	103.7	101.4	99.2	100.0	117.9	129.5	138.9	137.97	145.77	149.02	155.45

TANZANIA
REAL VALUE OF MERCHANDISE EXPORTS

	1965	1966	1967	1968	1969	1970	1971	1972	1973	1974	1975	1976	1977	1978
Value in million 1985 $US, deflated by G-5 MUV														
Traditional Agriculture	372.3	452.9	366.9	383.2	348.9	365.7	303.1	377.7	384.5	404.4	300.2	481.5	543.1	381.6
Coffee	76.4	129.3	100.7	113.7	104.6	119.5	82.5	127.7	145.0	88.7	99.5	230.2	321.8	200.1
Cotton	108.6	150.4	106.8	121.3	95.5	94.7	88.9	112.1	97.5	111.8	61.1	113.6	88.9	64.5
Sisal	127.0	100.9	85.3	68.1	65.0	68.5	48.6	48.3	64.9	109.6	62.2	43.2	37.7	32.4
Tobacco	10.1	10.1	16.7	17.2	15.7	22.8	21.9	21.6	19.8	31.6	24.2	46.8	34.7	34.0
Tea	13.4	19.4	18.3	19.3	19.7	16.2	17.8	17.9	15.9	16.3	16.7	24.0	29.2	25.8
Cashewnuts (raw)	36.7	43.0	39.2	43.6	48.4	44.1	43.4	50.1	41.3	46.4	36.4	23.7	30.9	24.7
Other Agriculture														
All Merchandise Exports	632.3	795.6	741.5	729.2	698.8	672.6	679.8	752.9	747.5	673.5	565.8	734.0	733.8	563.6
Merchandise Imports 1/	531.9	672.5	644.7	704.4	634.0	775.4	895.9	856.7	900.0	1114.2	1016.6	831.6	881.3	1175.1

	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992
Value in million 1985 $US, deflated by G-5 MUV														
Traditional Agriculture	332.6	251.8	321.5	242.8	241.6	270.2	196.1	221.8	155.4	161.4	154.2	211.5	218.4	147.25
Coffee	154.3	136.7	149.1	119.8	128.5	154.8	118.5	156.6	84.5	69.6	78.3	90.5	62.4	44.3
Cotton	50.7	46.2	73.1	54.1	60.9	49.9	29.6	25.8	33.9	54.2	47.0	73.8	91.3	55.7
Sisal	60.1	29.1	30.8	23.4	12.9	10.6	5.9	4.4	4.5	3.5	3.1	1.2	1.1	1.2
Tobacco	18.9	11.9	16.6	18.4	11.4	9.1	13.6	10.8	9.2	11.0	8.7	15.2	32.7	15.3
Tea	20.8	21.0	19.2	17.9	21.5	23.7	17.0	11.5	13.6	11.5	11.7	24.6	21.4	14.6
Cashewnuts (raw)	27.8	7.0	32.6	9.2	6.4	22.1	11.5	12.7	9.6	11.6	5.4	6.2	9.5	16.2
Other Agriculture			75.9	47.8	32.8	29.5	25.9	29.1	24.3	30.4	25.7	26.3	39.4	30.0
All Merchandise Exports	570.5	555.4	582.0	398.1	373.6	392.3	285.6	295.5	267.8	278.2	300.9	279.8	241.8	281.2
Merchandise Imports 1/	1004.3	1038.1	1007.5	917.9	698.9	766.4	869.2	774.5	772.6	743.5	775.6	813.8	785.0	1019.5

Sources: Customs and Excise Annual Trade Reports (Bank of Tanzania); Tanzania Economic Trends
(Economic Research Bureau, U. of Dar es Salaam); International Financial Statistics Yearbook (IMF); World Bank.

TANZANIA
COMPOSITION OF EXPORTS

	1969-71	1974-76	1979-81	1984-86	1989-91
Current $US (millions)					
Traditional Agriculture	123.5	253.1	307.0	241.9	190.4
Coffee	37.1	90.6	149.4	152.3	89.4
Cotton	33.9	60.8	58.0	36.5	56.6
Sisal	22.0	45.0	40.1	7.2	5.7
Tobacco	7.4	22.0	16.0	11.8	9.4
Tea	6.5	12.3	20.7	18.0	17.0
Cashewnuts (raw)	16.5	22.5	22.8	16.1	12.3
Other Exports	125.9	167.8	273.5	99.2	224.7
All Merchandise Exports	249.4	420.8	580.5	341.1	415.1
Constant 1985 $US, deflated by G-5 MUV (millions)					
Traditional Agriculture	339	395	302	229	132
Coffee	102	139	147	143	62
Cotton	93	95	57	35	39
Sisal	61	72	40	7	4
Tobacco	20	34	16	11	7
Tea	18	19	20	17	12
Cashewnuts (raw)	45	36	22	15	8
Other Exports	345	262	267	95	156
All Merchandise Exports	684	658	569	324	288
Percent of Total					
Coffee	0.15	0.21	0.26	0.44	0.22
Cotton	0.14	0.15	0.10	0.11	0.14
Sisal	0.09	0.11	0.07	0.02	0.01
Tobacco	0.03	0.05	0.03	0.03	0.02
Tea	0.03	0.03	0.04	0.05	0.04
Cashewnuts (raw)	0.07	0.05	0.04	0.05	0.03
Traditional Agriculture	0.50	0.60	0.53	0.71	0.46
Other Exports	0.50	0.40	0.47	0.29	0.54
All Merchandise Exports	100%	100%	100%	100%	100%

Sources: Customs and Excise Annual Trade Reports (Bank of Tanzania); Tanzania Economic Trends (Economic Research Bureau, U. of Dar es Salaam); International Financial Statistics.

TANZANIA
MERCHANDISE IMPORTS

(Value, million $US)

	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992
Capital Goods	506.5	569.2	485.2	326.0	346.5	434.2	494.0	613.9	415.0	648.8	506.3	715.8	894.8
Transport Equipment	131.5	136.5	82.8	64.3	87.7	108.4	123.7	185.8	80.4	192.0	104.0	278.4	438.7
Building and Construction	93.7	93.7	96.6	79.7	88.0	95.1	108.7	130.9	183.6	149.8	188.8	116.6	154.6
Machinery	281.2	338.9	305.9	182.1	170.8	230.7	261.6	297.2	151.0	307.0	213.5	320.8	301.5
Intermediate Goods	449.5	381.0	420.8	340.6	362.4	389.2	326.0	346.7	462.3	411.8	561.8	357.3	386
Oil	290.2	259.6	270.0	225.6	210.6	223.4	145.0	169.5	276.0	161.1	158.2	196.9	197.7
Fertilizers	13.5	6.3	5.9	3.9	9.6	8.8	11.0	6.4	3.9	15.5	5.0	26.0	36.8
Industrial Raw Materials	145.9	115.1	145.0	111.1	142.1	157.0	170.0	170.8	182.4	235.2	398.6	134.4	151.5
Consumer Goods	248.2	188.6	191.9	138.0	154.6	162.2	210.0	192.0	272.5	227.3	97.9	315.3	441.5
Textile	37.7	23.6	32.1	19.0	19.8	34.3	42.0	31.4	44.9	93.6	10.5	20.6	
Food	148.8	103.7	108.6	74.2	91.1	78.0	95.0	76.0	105.4	44.7	19.3	1.1	54.5
Other	61.7	61.4	51.3	44.8	43.7	49.9	73.0	84.6	122.2	89.0	68.1	293.6	387
Unclassified	1.8	0.8	1.9	1.5	0.6	2.1	2.3	0.4	0.1	10.7	1.0	2.5	76.5
TOTAL	1,204.1	1,138.8	1,098.0	804.6	863.4	985.7	1,030.0	1,152.6	1,149.8	1,287.9	1,165.9	1,388.3	1798.9

Source: Tanzania Economic Trends (Economic Research Bureau, U. of Dar es Salaam.

TANZANIA
MERCHANDISE IMPORTS

(Real Value, million $US, deflated by the G-5 MUV, 1985 = 100)

	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991
Capital Goods	482.7	540.3	467.8	321.6	349.3	434.2	418.9	474.0	298.7	470.2	347.3	480.9
Transport Equipment	125.4	129.6	79.8	63.4	88.4	108.4	104.9	143.5	57.9	139.2	71.3	187.0
Building and Construction	89.3	89.0	93.1	78.6	88.7	95.1	92.2	101.1	132.1	108.6	129.5	78.3
Machinery	268.1	321.8	294.9	179.7	172.2	230.7	221.9	229.5	108.7	222.5	146.4	215.5
Intermediate Goods	428.5	361.7	405.8	336.0	365.3	389.2	276.4	267.7	332.7	298.5	385.4	240.0
Oil	276.6	246.5	260.3	222.6	212.3	223.4	122.9	130.9	198.7	116.8	108.5	132.3
Fertilizers	12.8	6.0	5.7	3.8	9.7	8.8	9.3	4.9	2.8	11.2	3.4	17.4
Industrial Raw Materials	139.0	109.2	139.8	109.6	143.2	157.0	144.2	131.9	131.3	170.5	273.4	90.3
Consumer Goods	236.5	179.1	185.1	136.2	155.8	162.2	178.1	148.3	196.1	164.7	67.1	211.8
Textile	36.0	22.4	30.9	18.7	19.9	34.3	35.6	24.2	32.3	67.8	7.2	13.8
Food	141.8	98.4	104.7	73.2	91.8	78.0	80.6	58.7	75.9	32.4	13.2	0.7
Other	58.8	58.3	49.4	44.2	44.0	49.9	61.9	65.3	88.0	64.5	46.7	197.2
Unclassified	1.7	0.7	1.8	1.5	0.6	2.1	2.0	0.3	0.1	7.8	0.7	1.7
TOTAL	1,148	1,081	1,059	794	870	986	873	890	828	933	800	933
MUV G-5 Index	104.9	105.3	103.7	101.4	99.2	100.0	117.9	129.5	138.9	138.0	145.8	148.8
Capital Goods	42%	50%	44%	41%	40%	44%	48%	53%	36%	50%	43%	52%
Transport Equipment	11%	12%	8%	8%	10%	11%	12%	16%	7%	15%	9%	20%
Building and Construction	8%	8%	9%	10%	10%	10%	11%	11%	16%	12%	16%	8%
Machinery	23%	30%	28%	23%	20%	23%	25%	26%	13%	24%	18%	23%
Intermediate Goods	37%	33%	38%	42%	42%	39%	32%	30%	40%	32%	48%	26%
Oil	24%	23%	25%	28%	24%	23%	14%	15%	24%	13%	14%	14%
Fertilizers	1%	1%	1%	0%	1%	1%	1%	1%	0%	1%	0%	2%
Industrial Raw Materials	12%	10%	13%	14%	16%	16%	17%	15%	16%	18%	34%	10%
Consumer Goods	21%	17%	17%	17%	18%	16%	20%	17%	24%	18%	8%	23%
Textile	3%	2%	3%	2%	2%	3%	4%	3%	4%	7%	1%	1%
Food	12%	9%	10%	9%	11%	8%	9%	7%	9%	3%	2%	0%
Other	5%	5%	5%	6%	5%	5%	7%	7%	11%	7%	6%	21%
Unclassified	0%	0%	0%	0%	0%	0%	0%	0%	0%	1%	0%	0%
TOTAL	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%

Source: Tanzania Economic Trends (Economic Research Bureau, U. of Dar es Salaam).

TANZANIA
NON-TRADITIONAL AGRICULTURAL EXPORTS

year	Total Value All Non-Trad. Exp. Crops			Total Excluding Sugar and Molasses		
	Nominal Tsh '000	'000 Current $US Nominal Official Exchange Rate	Mill. 1990 $US Prices Deflated y G-5 MUV Index	Nominal Tsh '000	'000 Current $US Nominal Official Exchange Rate	Mill. 1990 $US Prices Deflated by G-5 MUV Index
1980	284,694	34,731	48.3	233,230	28,453	39.5
1981	246,829	29,796	41.2	232,151	28,024	38.8
1982	197,670	21,294	29.9	156,610	16,871	23.7
1983	216,847	19,460	28.0	215,222	19,315	27.8
1984	143,950	9,413	13.8	133,880	8,755	12.9
1985	201,636	11,541	16.8	134,448	7,695	11.2
1986	596,089	18,513	22.9	460,078	14,289	17.7
1987	1,801,152	28,029	31.6	1,760,376	27,395	30.8
1988	2,391,320	24,084	25.3	1,880,470	18,939	19.9
1989	4,389,859	30,618	32.3	2,956,429	20,620	21.8
1990	8,151,138	41,789	41.8	6,706,379	34,382	34.4

year	Nominal Value of Selected Non-Traditional Export Crops, '000 TShs									
	Nuts	Fruit/Vegs	Spices	Cocoa Beans	Cinchona Bark	Pulses/Starches	Sugar Products	Oilseeds & Oil	Cereals	TOTAL
1980	200	132	21,953	20,542	986	135,723	51,464	43,049	10,645	284,694
1981	909	121	16,188	17,668	1,822	165,195	14,678	29,018	1,230	246,829
1982	0	243	18,627	12,176	1,095	107,277	41,060	17,188	4	197,670
1983	205	4,964	8,759	8,846	7,700	43,804	1,625	43,204	97,740	216,847
1984	338	1,493	32,722	41,919	1,590	35,915	10,070	19,896	7	143,950
1985	331	1,745	10,071	50,357	0	56,287	67,754	14,208	883	201,636
1986	167	88,751	25,391	76,625	5,527	253,987	136,038	9,522	81	596,089
1987	83	21,932	91,228	245,173	15,232	969,625	40,776	53,319	363,784	1,801,152
1988	543	19,502	25,931	303,352	16,311	1,036,026	510,850	345,916	132,889	2,391,320
1989	1,068	12,882	64,249	406,768	28,784	1,239,303	1,433,430	595,066	608,309	4,389,859
1990	4,617	40,154	186,710	551,627	37,100	3,707,434	1,444,759	695,158	1,483,579	8,151,138

Source: Customs and Sales Tax Department data cited in "A Study on Exports of Non-Traditional Agricultural Commodities 1980-1991", MDB, 1992.

TANZANIA
POPULATION BY REGION

	Population ('000)			Intercensal Growth Rate	
	1967	1978	1988	1967-78	1978-88
Arusha	610	926	1,352	3.9	3.9
Coast	428	517	638	1.7	2.1
Dar es Salaam	356	843	1,361	8.2	4.9
Dodoma	709	972	1,238	2.9	2.4
Iringa	690	925	1,209	2.7	2.7
Kagera	659	1,010	1,326	4.0	2.8
Kigoma	473	649	855	2.9	2.8
Kilimanjaro	653	902	1,109	3.0	2.1
Lindi	420	528	647	2.1	2.1
Mara	544	724	971	2.6	3.0
Mbeya	754	1,080	1,476	3.3	3.2
Morogoro	683	939	1,223	2.9	2.7
Mtwara	621	772	889	2.0	1.4
Mwanza	1,056	1,443	1,878	2.9	2.7
Rukwa	276	452	695	4.6	4.4
Ruvuma	395	562	783	3.3	3.4
Shinyanga	899	1,324	1,773	3.6	3.0
Singida	458	614	792	2.7	2.6
Tabora	502	818	1,036	4.5	2.4
Tanga	771	1,038	1,284	2.7	2.1
TOTAL	11,959	17,036	22,534	3.3	2.8
Rural Population	11,194	14,689	18,580	2.5	2.4
Urban Population	764	2,348	3,954	10.7	5.3

Source: Census Bureau.

TANZANIA

POPULATION, HOUSEHOLDS AND LAND USE BY REGION, 1988

		Small Farmers				Large Farmers (1987/88)		All Farmers	
	Rural Population 1988	Farming 1/ 3/ Population 1988	Farming Households 1988	Area 2/ Cultivated Per HH	Total Area Cultivated 1988	4/ Temporary Crops (ha)	Permanent Crops (ha)	Annual Crops (ha)	All Crops (ha)
Arusha	1,078,213	1,221,239	221,112	0.83	183,671	46,351	13,556	230,022	254,084
Coast	471,386	589,463	117,849	0.95	112,203	54,761	4,561	166,964	153,047
Dar es Salaam	126,096	224,174	51,878	0.50	25,939	190	130	26,129	35,964
Dodoma	1,072,213	1,140,410	224,199	1.15	257,637	40,370		298,007	221,695
Iringa	1,030,489	1,126,566	231,059	0.63	144,773	7,297	11,190	152,070	197,611
Kagera	1,105,775	1,249,555	254,229	0.52	131,761	4,098	297	135,859	203,074
Kigoma	681,805	759,417	129,865	1.03	133,857	683	464	134,540	121,894
Kilimanjaro	845,428	964,343	175,622	0.59	104,231	4,347	1,431	108,578	159,108
Lindi	523,563	586,695	124,397	1.00	124,269	14,543	3,936	138,812	111,764
Mara	837,130	889,750	129,080	0.87	112,705	15,896	4	128,601	157,370
Mbeya	1,072,547	1,279,576	250,253	0.68	169,238	6,041	2,390	175,279	211,884
Morogoro	865,437	1,017,040	185,894	0.60	111,107	16,156	12,676	127,263	190,541
Mtwara	677,971	802,805	179,591	0.80	143,673	1,000	228	144,673	128,874
Mwanza	1,337,854	1,617,151	246,737	0.73	179,063	1,112	1	180,175	258,240
Rukwa	588,763	601,753	111,334	1.25	139,167	221		139,388	95,900
Ruvuma	658,417	704,137	130,303	1.63	212,207	1,958	271	214,165	114,187
Shinyanga	1,478,734	1,685,553	257,364	1.55	398,352	1,242		399,594	269,245
Singida	677,974	733,656	137,148	0.81	111,112	568		111,680	117,219
Tabora	838,940	906,022	155,177	0.92	142,258	32	2	142,290	144,091
Tanga	979,536	1,096,567	210,276	0.70	146,262	1,285	51,162	147,547	226,801
Total	16,948,271	19,195,869	3,523,366		3,083,486	218,151	102,299	3,301,637	3,372,593

1/ Share of Urban Mixed Population = 75.%; 2/ From the Agricultural Census, 1971/72; 3/ Population and Household Data from 1988 Population Census

4/ From the AGSASU 1987/88

Sources: Bureau of Statistics and MOA, various surveys.

TANZANIA
DISTRIBUTION OF LAND OWNERSHIP

Small Farms Planted Area	No. of Holdings	Planted Area	Average Planted Area	Cumulative Share of Holdings	Cumulative Share of Area	Total HH Members	Average Household Size
No Land	26	0		1%	0%	135	5.19
0.01-0.20	1,215	110	0.09	35%	4%	4,146	3.41
0.21-0.40	696	171	0.25	55%	9%	2,919	4.19
0.41-0.60	392	190	0.48	66%	15%	2,092	5.34
0.61-0.80	194	134	0.69	72%	20%	1,597	8.23
0.81-1.00	163	142	0.87	77%	24%	864	5.30
1.00-1.50	382	466	1.22	87%	40%	3,175	8.31
1.51-2.00	195	328	1.68	93%	51%	1,614	8.28
2.01-5.00	202	549	2.72	99%	69%	2,257	11.17
5.01 +	45	961	21.36	100%	100%	389	8.64
Total	3,510	3,051	0.87			19,188	5.47

Large Farms Region	Private Area	Total Area	% Private	Share of Private Area Cropped	Share of Government Area Cropped	Private Cropped Area	Total Cropped Area	Private as Share of Total Area Cropped
Dodoma		43,290			1%		240	1%
Arusha	57,231	110,400	52%	60%	81%	34,323	77,135	70%
Kilimanjaro	1,141	11,378	10%	94%	56%	1,069	6,843	60%
Tanga	123,119	306,539	40%	52%	46%	64,097	148,986	49%
Morogoro	18,720	262,692	7%	86%	24%	16,146	75,852	29%
Coast	27,263	105,333	26%	93%	6%	25,263	30,018	28%
Dar es Salaam	500	984	51%					
Lindi	8,981	28,442	32%	71%	6%	6,398	7,635	27%
Mtwara	1,136	34,136	3%	100%		1,136	1,136	3%
Ruvuma	3,784	25,640	15%	17%	28%	640	6,840	27%
Iringa	33,564	74,071	45%	23%	16%	7,561	13,859	19%
Mbeya	2,528	69,739	4%	100%	17%	2,528	13,872	20%
Singida	1,017	1,017	100%	94%		957	957	94%
Tabora		230			100%		230	100%
Rukwa		100,648						
Kigoma		71,575			3%		2,400	3%
Shinyanga	2,376	2,616	91%	26%	100%	610	850	32%
Kagera	408	34,309	1%	100%	26%	408	9,161	27%
Mwanza	6,321	7,435	85%	54%	100%	3,428	4,542	61%
Mara	2,209	32,972	7%	0%	13%		4,000	12%
Total	290,298	1,323,446	22%	57%	23%	164,564	404,556	31%

Source: Agriculture Sample Survey, 1989/90.

TANZANIA
COMPARISON OF FARMS BY FARM SIZE 1971/72 - 1986/87

LAND HOLDINGS

	% of Total Holdings		Area per household	
Farm Size (ha)	1971-72	1986-87	1971-72	1986-87
0.00	1.2	1.0	0.0	0.0
0.01-0.50	31.8	38.5	0.28	0.29
0.51-1.00	26.3	23.9	0.72	0.73
1.01-2.00	24.0	22.0	1.40	1.43
2.01-3.00	8.7	8.2	2.38	2.46
3.01-4.00	3.6	3.4	3.48	3.36
4.01-5.00	1.8	1.1	4.48	4.49
5.01-10.00	2.1	1.5	6.95	6.49
10.01+	0.5	0.3	14.82	13.75
TOTAL	100.0	100.0	1.24	1.11

CULTIVATED AREA (hectares per holding)

	All Crops Minus Cash Crops	Masika Season	Vuli Season	Total
Farm Size (ha)	1971/72		1986/88	
0.00				
0.01-0.50	0.21	0.25	0.14	0.39
0.51-1.00	0.54	0.58	0.22	0.80
1.01-2.00	1.04	1.11	0.19	1.30
2.01-3.00	1.63	1.76	0.28	2.03
3.01-4.00	2.22	2.40	0.22	2.62
4.01-5.00	2.80	2.95	0.34	3.29
5.01-10.00	4.03	3.89	0.27	4.16
10.01+	2.40	4.75	0.58	5.33
AVERAGE	0.87	0.82	0.19	1.00

ALLOCATION OF LAND HOLDINGS (hectares per holding)

	Total Land Holdings		Planted to Permanent Crops (pure)		(mixture)		Tot. Permanent (pure + mixture)	
Farm Size (ha)	1971/72	1986/87	1971/72	1986/87	1971/72	1986/87	1971/72	1986/87
0.00								
0.01-0.50	0.27	0.23	0.01	0.02	0.03	0.04	0.04	0.06
0.51-1.00	0.70	0.57	0.03	0.08	0.06	0.06	0.09	0.14
1.01-2.00	1.35	1.12	0.08	0.14	0.08	0.08	0.15	0.21
2.01-3.00	2.27	1.78	0.18	0.23	0.08	0.13	0.26	0.36
3.01-4.00	3.17	2.35	0.30	0.22	0.10	0.16	0.40	0.38
4.01-5.00	4.19	3.12	0.36	0.37	0.19	0.10	0.55	0.46
5.01-10.00	6.04	3.98	0.47	0.47	0.22	0.60	0.69	1.07
10.01+	3.79	5.00	0.15	0.67	0.09	0.75	0.24	1.42
AVERAGE	1.20	0.82	0.08	0.10	0.06	0.08	0.14	0.18

Sources: Agricultural Census of Tanzania 1971-72; Agricultural Sample Survey of Tanzania Mainland 1986/87.

TANZANIA
COMPARISON OF LABOR & INPUTS BY FARM SIZE 1971/72 - 1986/87

LABOR

	On-farm Workers (per household)		Off-farm Workers (per household)		On-farm Workers (per hectare)		Area per worker (hectares)	
Farm Size (ha)	1971/72	1986/87	1971/72	1986/87	1971/72	1986/87	1971/72	1986/87
0.00	2.29	2.14	0.05	1.00	N.A.	N.A.	N.A.	N.A.
0.01-0.50	1.97	2.07	0.11	0.12	7.14	7.25	0.14	0.14
0.51-1.00	2.24	2.27	0.10	0.12	3.09	3.11	0.32	0.32
1.01-2.00	2.49	2.59	0.08	0.04	1.78	1.82	0.56	0.55
2.01-3.00	2.72	3.07	0.09	0.06	1.14	1.25	0.88	0.80
3.01-4.00	2.78	3.39	0.10	0.11	0.80	1.01	1.25	0.99
4.01-5.00	2.81	3.85	0.15	0.02	0.63	0.86	1.60	1.16
5.01-10.00	2.94	3.76	0.10	0.13	0.42	0.58	2.36	1.72
10.01+	3.37	6.25	0.07	0.08	0.23	0.45	4.39	2.20
AVERAGE	2.30	2.42	0.10	0.10	1.85	2.18	0.54	0.46

CHEMICAL FERTILIZER, OXEN % PLOUGHS (% of households reporting use)

	Chemical Fertilizer		Oxen		Ploughs	
Farm Size (ha)	1971/72	1986/87	1971/72	1986/87	1971/72	1986/87
0.00	0.0	0.0	5.2	0.4	3.8	0.0
0.01-0.50	30.5	21.3	9.9	14.4	11.5	14.7
0.51-1.00	22.8	25.5	15.6	15.8	16.5	14.0
1.01-2.00	25.6	27.1	28.6	37.0	27.2	34.6
2.01-3.00	10.1	14.6	18.8	13.4	18.2	14.7
3.01-4.00	4.2	6.9	8.1	6.7	8.6	6.8
4.01-5.00	2.3	1.6	4.8	4.9	5.6	5.1
5.01-10.00	3.7	3.0	6.5	4.2	6.2	5.5
10.01+	0.8	0.0	2.6	3.2	2.4	2.7
% of Total	7.3	14.0	4.0	7.8	5.3	8.1

Sources: Agricultural Census of Tanzania 1971-72; Agricultural Sample Survey of Tanzania Mainland 1986/87.

TANZANIA
ALLOCATION OF LAND BY FARM SIZE AND USE

	1987/88 Land Under Small Farms		1987/88 Land Under Large Farms		1987/88 Land Under Farms	
	('000 ha)	%	('000 ha)	%	('000 ha)	%
Temporary Crops	2,515	55%	218	16%	2,733	46%
Permanent Crops	340	7%	102	8%	442	7%
Mixed Temp. and Perm. Crops	227	5%	0	0%	227	4%
Total Cropped Area	3,082	67%	320		3,402	
Fallow (up to 5yr)	552	12%	159	12%	711	12%
Pastures	120	3%	399	30%	519	9%
Forest	450	10%	147	11%	597	10%
Other	387	8%	298	23%	685	12%
TOTAL	4,591	100%	1,323	100%	5,914	100%

Source: Agriculture Statistics 1989, Bureau of Statistics; Survey of Large Scale Farming Report, Tanzania Mainland, 1987/8.

TANZANIA
AGRICULTURAL PRODUCTION
('000 metric tons)

	maize	paddy	wheat	sorghum	millet	cassava	Irish potato	sweet potato	cooking bananas	beans	lentils & pulses	ardam.	cashew	cocoa	coffee	cotton
1976	1,449	346	69	330	130	1,182	84	293	452	249	84	4.3	82	0.7	54	123
1977	1,664	314	64	260	220	1,348	86	302	464	185	89	4.0	98	0.8	49	194
1978	1,465	387	55	521	319	1,252	89	312	477	197	93	3.5	68	0.9	53	150
1979	1,720	262	70	451	335	1,411	91	321	491	218	97	4.5	57	1.0	49	168
1980	1,726	291	87	500	380	1,207	94	330	505	310	102	6.4	41	1.0	48	178
1981	1,839	200	90	525	350	1,456	97	339	519	272	106	4.6	57	1.0	67	175
1982	1,654	320	95	554	373	1,658	99	349	534	297	110	3.3	44	1.2	55	133
1983	1,651	350	58	475	320	1,967	102	358	589	282	115	3.2	33	1.4	54	128
1984	1,939	356	74	455	305	1,894	105	367	565	540	119	4.2	48	1.4	49	141
1985	2,067	427	83	615	410	1,923	107	376	581	441	123	1.3	32	1.2	49	155
1986	2,200	547	72	650	380	2,052	110	387	597	321	127	2.1	19	1.6	53	108
1987	2,359	644	72	663	291	1,709	110	364	597	425	150	3.0	17	2.0	42	217
1988	2,339	615	66	420	280	1,736	137	482	579	385	173	3.0	24	2.0	46	254
1989	3,126	718	97	503	300	1,948	141	495	562	503	178	2.6	19	2.2	57	192
1990	2,445	740	106	390	180	1,724	133	475	523	388	181	3.1	17	2.3	53	114
1991	2,332	624	84	503	200	1,566	137	492	601	425	190	3.1	33	2.4	56	147

	pyreth.	sisal	sugar cane	tea	tobacco	shelled groundnut	sesame	sunfl.	soya beans	copra	castor bean	coconut	tomato	fruits	barley others	other starches	other veg's
1976	3.9	119	1,241	63	14	197	51	37	1.7	1.3	2.2	48	4.9	109	107	375	230
1977	3.3	105	1,260	73	19	203	66	32	4.8	1.2	1.9	50	5.4	112	110	385	236
1978	2.5	91	1,280	88	18	209	57	38	3.4	1.0	2.2	50	5.9	115	113	394	242
1979	1.6	81	1,299	83	17	214	57	64	5.9	0.9	1.8	51	6.4	117	115	404	248
1980	1.6	86	1,318	84	17	221	38	102	4.7	0.8	1.3	51	6.9	120	118	413	254
1981	2.0	74	1,337	78	17	227	65	57	6.0	0.7	0.6	53	7.3	123	121	423	260
1982	1.9	61	1,253	75	16	233	36	50	1.1	0.5	0.6	55	7.8	123	124	433	266
1983	1.6	46	1,188	85	14	257	37	50	2.5	0.4	0.3	56	8.3	123	127	443	272
1984	1.4	38	1,361	73	11	247	54	24	1.7	0.3	0.2	51	8.8	118	130	454	279
1985	1.6	32	1,253	81	13	289	27	41	3.3	0.1	0.2	56	9.1	140	133	465	285
1986	1.4	30	1,107	71	13	261	25	56	4.7	0.1	0.2	56	10.0	145	136	476	292
1987	1.2	33	1,063	65	17	245	43	89	7.0	0.1	0.2	57	10.1	145	139	487	299
1988	1.4	33	1,219	64	13	252	46	87	8.7	0.1	0.2	60	13.3	181	143	499	306
1989	1.3	33	1,280	71	12	333	48	81	9.0	0.1	0.2	63	13.7	186	146	511	313
1990	1.6	32	1,709	72	11	349	56	77	9.3	0.1	0.2	65	13.9	171	149	523	321
1991	1.7	35	1,184	83	12	349	63	73	9.6	0.1	0.2	67	13.9	194	153	535	329

Sources: Government of Tanzania Publications and mission estimates.

TANZANIA
AGRICULTURAL PRODUCER PRICES
(official or estimated decontrolled prices, TShs per kg)

year	maize	paddy	wheat	sorg.	millet	cassava	Irish potato	sweet potato	cooking bananas	beans	lentils & pulses	card.	cashew (wt.avg.)	cocoa	coffee (wt. avg.	cotton (wt. avg.)
1976	0.80	1.00	1.00	0.75	0.80	0.40	3.20	2.64	1.00	1.00	1.36	12.0	1.0	4.0	10.1	1.9
1977	0.80	1.00	1.20	0.95	0.89	0.50	3.20	2.64	1.30	2.00	2.71	15.0	1.1	4.0	13.3	1.9
1978	0.85	1.20	1.25	1.00	2.00	0.60	3.40	2.81	1.55	3.50	4.74	25.0	1.1	5.6	9.3	2.2
1979	0.85	1.20	1.25	1.00	2.00	0.65	3.40	2.81	1.80	3.50	4.74	45.0	1.6	8.0	7.7	2.3
1980	1.00	1.50	1.35	1.00	2.00	0.65	4.00	3.30	2.00	3.50	4.74	45.0	1.7	10.0	9.3	2.8
1981	1.00	1.75	1.65	1.00	1.50	0.65	4.00	3.30	2.25	3.50	4.74	45.0	2.8	11.0	10.7	3.1
1982	1.50	2.30	2.20	1.00	1.50	0.70	5.30	3.60	3.50	3.50	4.74	45.0	4.6	11.0	11.8	3.6
1983	1.75	3.00	2.50	1.60	1.50	0.90	5.40	3.60	3.50	3.50	4.74	45.0	4.6	12.0	13.9	4.6
1984	2.20	4.00	3.00	2.00	2.00	1.20	5.50	3.80	3.50	5.00	6.78	63.0	6.5	16.8	21.1	5.9
1985	4.00	6.00	4.50	3.00	3.00	2.00	6.00	4.00	4.00	8.00	10.84	80.0	9.7	23.5	25.8	8.3
1986	5.25	8.00	6.00	4.00	4.00	3.00	7.00	5.00	4.65	12.00	16.27	96.0	11.6	28.2	38.4	12.9
1987	6.30	9.60	7.20	4.80	4.80	3.60	11.83	5.82	8.18	14.40	21.58	155.0	17.9	45.1	53.4	16.8
1988	8.20	14.40	9.00	6.00	6.00	4.50	15.45	7.78	11.10	21.60	32.18	185.0	29.5	63.0	58.0	19.4
1989	9.00	17.30	10.35	6.20	6.60	4.95	19.98	10.06	14.11	24.85	33.94	240.0	39.4	81.9	80.7	22.2
1990	11.00	19.00	13.00	6.20	7.25	5.45	26.97	13.66	20.85	27.30	43.70	301.9	82.6	90.0	106.0	27.8
1991	13.00	26.00	32.00	8.00	8.00	6.00	30.64	19.08	27.46	35.00	44.90	361.5	108.2	98.0	124.1	40.7

year	pyreth.	sisal	sugarcane	tea	tobacco (wt.avg.)	grounduts	sesame	sunflower	soya	copra	castor bean	coconut	tomato	fruits	other cereals	other starches	other veg's
1976	4.0	4.3	0.06	0.8	7.1	2.00	2.00	1.00	2.00	1.25	0.75	1.7	2.7	1.9	0.8	1.0	3.0
1977	4.0	3.9	0.06	0.9	7.2	2.50	2.50	1.10	2.25	1.45	0.75	1.8	3.0	2.0	0.9	1.3	3.4
1978	4.0	4.3	0.07	1.5	7.9	4.00	3.00	1.50	2.25	1.83	1.00	2.0	3.3	2.2	0.9	1.6	3.7
1979	4.0	3.7	0.07	1.5	8.0	4.00	3.30	1.50	2.25	1.93	1.00	2.1	3.7	2.4	0.9	1.8	4.1
1980	6.0	5.9	0.08	1.5	8.4	4.00	3.50	1.50	2.25	2.00	1.00	2.4	4.2	2.8	1.0	2.0	4.6
1981	7.5	6.3	0.11	1.5	9.0	4.20	4.00	1.60	2.25	2.50	1.20	3.1	5.0	3.4	1.0	2.3	5.5
1982	10.0	5.3	0.14	1.5	10.5	4.38	4.50	1.80	3.00	3.00	1.70	3.9	6.5	5.4	1.3	3.5	7.3
1983	10.0	5.5	0.17	2.0	16.7	5.80	5.70	2.60	3.00	4.20	1.70	6.6	8.1	5.9	1.7	3.5	9.0
1984	14.0	6.4	0.24	2.8	15.7	8.00	7.00	3.50	4.50	6.00	2.00	10.0	10.7	6.1	2.1	3.5	12.0
1985	19.6	8.9	0.32	4.1	23.4	12.80	10.50	5.25	6.75	9.00	3.04	11.5	13.0	6.5	3.5	4.0	14.5
1986	23.5	16.1	0.36	4.9	37.4	17.90	14.70	7.40	9.40	12.60	4.26	12.0	13.4	6.7	4.6	4.7	16.0
1987	32.8	19.5	0.46	7.6	47.6	21.50	17.65	8.90	11.30	15.10	5.11	13.5	16.9	8.1	5.6	8.2	25.3
1988	39.4	38.8	0.60	9.9	59.7	26.90	22.10	11.15	14.15	18.90	6.40	15.0	20.5	9.4	7.1	11.1	30.7
1989	53.2	64.6	0.75	13.4	72.4	29.60	24.30	12.25	17.00	20.80	7.17	22.8	25.4	12.8	7.6	14.1	37.9
1990	66.5	94.0	0.92	17.0	87.3	35.44	29.09	14.67	20.35	24.90	8.58	23.4	31.1	14.5	8.6	20.8	46.5
1991	133.0	89.6	2.85	28.0	109.7	43.34	35.58	17.94	24.89	30.46	10.50	26.0	38.0	17.0	10.5	27.5	56.8

Sources: Government of Tanzania Publications and mission estimates.

TANZANIA
CROPS VALUE ADDED, FIXED 1990 PRICES
(millions 1990 TShs)

	maize	paddy	wheat	sorg.	millet	cassava	Irish potato	sweet potato	cooking bananas	beans	lentils, pulses	card.	cashew	cocoa	coffee	cotton
1976	12,544	5,851	762	1,739	801	6,120	2,028	3,602	8,480	5,982	3,243	1,242	6,330	60	4,595	1,779
1977	14,405	5,310	707	1,370	1,356	6,979	2,092	3,716	8,709	4,444	3,410	1,156	7,497	68	4,129	2,808
1978	12,683	6,544	608	2,746	1,966	6,482	2,157	3,830	8,954	4,733	3,577	1,007	5,253	77	4,502	2,178
1979	14,890	4,430	774	2,377	2,064	7,305	2,221	3,944	9,218	5,237	3,745	1,294	4,388	86	4,180	2,424
1980	14,942	4,921	961	2,635	2,342	6,249	2,285	4,058	9,481	7,447	3,912	1,833	3,178	86	4,061	2,572
1981	15,920	3,382	995	2,767	2,157	7,538	2,349	4,172	9,745	6,535	4,079	1,328	4,345	86	5,660	2,532
1982	14,319	5,411	1,050	2,920	2,299	8,584	2,413	4,286	10,025	7,135	4,247	936	3,405	103	4,663	1,925
1983	14,293	5,919	641	2,503	1,972	10,184	2,478	4,400	11,044	6,775	4,414	921	2,532	120	4,536	1,852
1984	16,786	6,020	818	2,398	1,880	9,806	2,542	4,514	10,605	12,973	4,582	1,216	3,710	120	4,163	2,036
1985	17,894	7,221	917	3,241	2,527	9,956	2,606	4,628	10,897	10,595	4,749	365	2,466	103	4,154	2,245
1986	19,045	9,250	796	3,426	2,342	10,624	2,679	4,759	11,205	7,712	4,882	605	1,460	137	4,477	1,566
1987	20,422	10,890	796	3,494	1,793	8,848	2,680	4,472	11,205	10,210	5,764	852	1,267	171	3,519	3,139
1988	20,249	10,400	729	2,213	1,726	8,988	3,335	5,922	10,869	9,249	6,645	860	1,874	171	3,875	3,671
1989	27,062	12,141	1,072	2,651	1,849	10,086	3,428	6,088	10,543	12,084	6,831	746	1,483	188	4,858	2,774
1990	21,166	12,513	1,171	2,055	1,109	8,926	3,222	5,844	9,805	9,321	6,968	875	1,306	197	4,511	1,643
1991	20,186	10,552	928	2,651	1,233	8,110	3,335	6,049	11,277	10,210	7,307	875	2,535	204	4,739	2,127
Value Added to Gross Value Ratios:																
	0.787	0.890	0.850	0.850	0.850	0.950	0.900	0.900	0.900	0.880	0.880	0.950	0.930	0.950	0.800	0.520

	pyreth.	sisal	sugar-cane	tea	tobacco	shelled groundnut	sesame	sunfl.	soya beans	copra	castor bean	coconut	tomato	fruits	barley & others	other starches	other veg's
1976	249	9,516	971	932	566	6,292	1,342	482	32	29	17	796	115	1,183	784	6,651	8,033
1977	211	8,390	986	1,082	762	6,469	1,717	419	89	26	15	823	126	1,213	804	6,817	8,234
1978	161	7,279	1,001	1,307	729	6,652	1,506	501	61	23	17	823	137	1,243	824	6,988	8,440
1979	101	6,504	1,016	1,233	677	6,840	1,498	845	108	20	14	836	149	1,273	844	7,154	8,640
1980	103	6,872	1,031	1,242	690	7,033	984	1,352	86	18	10	850	160	1,303	864	7,324	8,846
1981	126	5,897	1,046	1,152	670	7,232	1,715	755	111	15	4	877	171	1,334	884	7,498	9,056
1982	120	4,842	980	1,110	641	7,436	954	659	20	12	5	904	182	1,335	905	7,676	9,271
1983	101	3,691	929	1,253	541	8,205	963	664	45	9	2	917	193	1,334	927	7,859	9,492
1984	91	3,060	1,065	1,082	438	7,874	1,417	311	31	6	2	836	204	1,283	949	8,046	9,718
1985	100	2,581	980	1,195	533	9,213	719	540	60	3	2	918	212	1,522	971	8,237	9,949
1986	85	2,413	866	1,060	501	8,313	654	735	86	3	2	918	233	1,577	995	8,433	10,185
1987	78	2,653	831	959	657	7,813	1,134	1,181	128	3	1	942	235	1,577	1,018	8,633	10,427
1988	89	2,661	953	943	513	8,031	1,193	1,146	159	3	1	989	310	1,962	1,042	8,839	10,675
1989	83	2,661	1,001	1,054	462	10,635	1,260	1,065	165	3	1	1,034	319	2,017	1,067	9,049	10,929
1990	100	2,581	1,336	1,075	442	11,135	1,479	1,023	170	2	1	1,077	325	1,855	1,093	9,264	11,189
1991	106	2,797	926	1,234	470	11,135	1,641	970	176	2	1	1,106	325	2,106	1,118	9,484	11,455
Value Added to Gross Value Ratios:																	
	0.950	0.850	0.850	0.872	0.456	0.900	0.900	0.900	0.900	0.900	0.900	0.706	0.750	0.750	0.850	0.850	0.750

Sources: Government of Tanzania Publications and mission estimates.

TANZANIA
LIVESTOCK ESTIMATES

A. Quantity

year	cattle	goats	sheep	pigs	milk
		(000's units)			liters x 10
1976	9047	4910	2779	137	258
1977	9288	5080	2822	141	270
1978	9535	5256	2866	146	277
1979	9789	5438	2911	150	282
1980	10050	5626	2956	155	284
1981	10317	5821	3002	160	290
1982	10592	6022	3049	165	321
1983	10873	6230	3096	185	318
1984	11163	6446	3145	175	323
1985	11460	6669	3194	275	334
1986	11765	6899	3243	276	340
1987	12078	7138	3294	277	346
1988	12399	7385	3345	278	351
1989	12729	7640	3397	279	357
1990	13068	7905	3450	280	347
1991	13416	8178	3504	275	354

Source: FAO and mission estimates.

B. Prices and Gross Value.

year	cattle	goats	sheep	pigs	milk	Gross Value
		(TShs/animal)			(per litre)	of Livestock
1976	949	226	226	181	2.0	2,106
1977	1055	251	251	201	2.0	2,354
1978	1129	269	269	215	2.6	2,712
1979	1266	301	301	241	2.6	3,029
1980	1656	394	394	315	2.6	3,825
1981	2078	495	495	396	3.0	4,848
1982	2679	638	638	510	3.2	6,294
1983	3407	811	811	649	5.2	8,540
1984	4630	1102	1102	882	6.0	11,548
1985	6170	1469	1469	1175	8.0	15,890
1986	8174	1946	1946	1557	11.0	21,717
1987	10621	2529	2529	2023	15.0	29,180
1988	13944	3320	3320	2656	40.0	46,408
1989	17540	4176	4176	3341	50.0	59,657
1990	21000	5000	5000	4000	60.0	72,243
1991	25683	6115	6115	4892	73.4	90,537

Source: Government of Tanzania publications and mission estimates.

TANZANIA
FERTILIZER DISTRIBUTION
('000 mt)

year	Iringa	Mbeya	Rukwa	Ruvuma	Southern Highlands	Tabora	Arusha	Moro-goro	Total	S. Highlands % of Tot.
1981/82	18.6	17.3	4.5	16.9	57.3	5.6	5.7	4.4	94.9	60.3
1982/83	20.2	17.1	2.7	16.1	56.1	7.0	1.0	3.5	81.2	69.1
1983/84	22.9	21.2	3.9	13.2	61.2	8.9	3.0	2.7	88.5	69.2
1984/85	25.4	22.3	4.1	17.2	69.0	11.0	2.9	2.8	99.5	69.4
1985/86	25.2	27.2	4.4	22.7	79.5	13.2	2.6	2.9	118.1	67.3
1986/87	34.3	18.1	11.1	21.3	84.8	15.5	2.2	2.1	123.4	68.7
1987/88	39.6	29.3	8.9	19.3	97.1	15.6	3.5	3.2	139.3	69.7
1988/89	33.9	23.1	4.3	17.3	78.6	14.6	3.5	3.0	126.3	62.3
1989/90	39.5	22.5	5.4	15.6	82.9	13.1	4.2	4.2	123.9	66.9
1990/91	42.6	26.4	5.3	24.0	98.4	14.2	5.0	4.0	136.7	71.9
1991/92	40.8	28.5	6.3	21.2	96.7	17.8	3.6	5.1	146.2	66.1

Source: Bureau of Statistics and Tanzania Fertilizer Corporation.

OFFICIAL FERTILIZER AND MAIZE PRICES
(Ex TFC Regional Centers)

	urea	as	can	tsp	urea	as	can	tsp	maize: official price
	TShs/50kg bag				TShs/kg nutrient				TShs per kg
1980/81	142	86	101	96	6.2	8.1	7.7	4.2	1.00
1981/82	156	94	111	106	6.8	9.0	8.5	4.6	1.50
1982/83	156	94	111	106	6.8	9.0	8.5	4.6	1.75
1983/84	156	94	111	106	6.8	9.0	8.5	4.6	2.20
1984/85	348	234	273	322	15.1	22.3	21.0	14.0	4.00
1985/86	348	234	273	322	15.1	22.3	21.0	14.0	5.25
1986/87	382	332	303	449	16.6	31.6	23.3	19.5	6.30
1987/88	497	432	394	471	21.6	41.1	30.3	20.5	8.20
1988/89	497	432	394	584	21.6	41.1	30.3	25.4	9.00
1989/90	497	432	394	584	21.6	41.1	30.3	25.4	11.00
1990/91	..	..	..	..	..	..	..	..	13.00
1991/92	1,695	1,480	1,355	1,995	73.7	141.0	104.2	86.7	30.00
1992/93	3,220	1,950	2,585	3,350	140.0	185.7	198.8	145.7	
% nutrient:	0.46	0.21	0.26	0.46					

Sources: Marketing Development Bureau, URT; Tanzania Fertilizer Corporation.

TANZANIA
MAIZE PURCHASES BY GOVERNMENT AGENCIES
('000 metric tons)

Year 1/	Iringa	Mbeya	Rukwa	Ruvuma	Southern Highlands	Arusha	Dodoma	Total	S. Highlands % of Total
1972/73	8.2	0.1	0.0	0.5	8.8	17.3	54.1	106.5	8.3
1973/74	11.2	1.4	0.0	0.1	12.7	7.0	34.5	73.6	17.3
1974/75	4.2	0.7	1.0	4.3	10.2	2.9	0.0	24.9	41.0
1975/76	10.5	2.2	3.0	12.7	28.4	10.1	6.0	91.1	31.2
1976/77	14.7	6.6	12.0	10.2	43.5	11.8	11.9	124.0	35.1
1977/78	20.9	9.8	9.9	16.1	56.7	60.3	19.3	213.3	26.6
1978/79	26.9	7.2	5.1	25.7	64.9	69.9	37.1	222.3	29.2
1979/80	26.3	6.4	15.9	17.8	66.4	47.4	27.1	161.2	41.2
1980/81	21.8	5.4	17.8	14.0	59.0	17.4	23.7	104.6	56.4
1981/82	33.1	7.1	16.0	21.1	77.3	3.2	4.4	89.4	86.5
1982/83	26.1	9.5	17.6	22.8	76.0	1.2	1.5	86.0	88.4
1983/84	25.1	7.7	10.1	12.9	55.8	6.3	5.3	71.0	78.6
1984/85	26.2	11.7	13.3	22.7	73.9	6.6	7.6	93.3	79.2
1985/86	38.0	16.0	29.3	29.1	112.4	36.1	12.0	178.5	63.0
1986/87	36.4	11.8	28.2	22.3	98.7	46.4	7.1	172.6	57.2
1987/88 2/	61.7	14.2	17.9	16.4	110.2	70.5	25.7	236.7	46.6
1988/89	28.9	0.8	5.2	7.9	42.8	26.4	24.6	105.8	40.5
1989/90	40.9	2.0	7.2	10.4	60.5	40.6	34.6	149.2	40.5
1990/91	15.7	4.7	6.0	0.3	26.7	6.5	0.0	33.9	78.8
1991/92 3/	17.1	7.7	25.5	20.8	71.1	5.1	1.7	84.9	83.7

1/ Marketing year is June-May.
2/ Cooperatives begin purchasing maize from farmers, joined by private traders.
3/ Strategic Grain Reserve purchases through National Milling Corp. and Unions

Source: Marketing Development Bureau, URT.

TANZANIA
MAIZE PRODUCER PRICES AND DAR ES SALAAM RETAIL MAIZE PRICE
(selected regions, current TShs per kg)

Town Region	Njombe Iringa	Iringa Iringa	Mafinga Iringa	Mbeya Mbeya	Songea Ruvuma	Mbinga Ruvuma	Tunduru Ruvuma	S. High- lands Avg.	Iringa Avg.	uvuma Avg.	DSM Retail	NCPI 7/91=1
6/89	14.7		12.8	16.9	10.0	7.8	11.7	12.4	13.4	9.8	36.6	0.61
7/89	14.4	12.8	12.5	17.2	8.8	7.8	11.7	12.2	13.2	9.4	35.8	
8/89	8.9	12.8	12.8	16.1	7.5	7.8	11.7	11.1	11.5	9.0	30.7	
9/89	10.6	11.4	11.7	12.8	7.5	7.8	11.7	10.5	11.2	9.0	25.7	0.65
10/89	12.8	10.0	10.3	12.9	5.8	7.8	11.7	10.2	11.0	8.4	23.9	
11/89	9.6	10.6	10.6	12.8	5.8	6.6	15.0	10.1	10.2	9.1	23.5	
12/89	9.2	10.6	11.4	12.2	7.5	7.8	13.9	10.4	10.4	9.7	24.2	0.69
1/90	9.6	11.7	11.9	14.0	8.1	6.1	12.8	10.6	11.1	9.0	31.6	
2/90	10.0	12.2	12.2	14.2	8.6	8.3	12.8	11.2	11.5	9.9	29.9	
3/90	12.5	11.9	11.7	15.6	11.1	8.9	15.0	12.4	12.0	11.7	32.3	0.73
4/90	12.2	13.9	12.8	16.3	11.8	9.4		12.8	13.0	11.5	30.5	
5/90	12.2	13.9	13.9	16.7	13.3	9.4	11.7	13.0	13.4	11.5	36.7	
6/90	12.2	13.6	13.2	15.7	10.0	11.1	13.3	12.7	13.0	11.5	38.3	0.73
7/90	14.2	13.1	12.5	14.4		12.5	11.7	12.7	13.2	11.5	37.5	
8/90		13.9	11.7	12.2	10.8	12.2	11.7	12.7	14.1	11.6	34.9	
9/90		13.9	10.6		10.8	10.0		12.1	13.3	10.4	34.4	0.77
10/90	14.1	13.9	11.5	12.2	13.6	12.8		13.0	13.2	13.2	33.5	
11/90	12.8	16.1	11.7	12.5	13.3	13.9		13.4	13.5	13.6	38.0	
12/90	17.2	23.3	19.2	16.0	21.1	16.4		18.9	19.9	18.8	44.0	0.82
1/91	25.3	26.7	28.3	21.1	23.6	22.5		24.6	26.8	23.1	53.5	
2/91	32.2	29.7	32.2		27.8	28.3		29.7	31.4	28.1	59.1	
3/91	36.1	38.1	34.4	34.7	27.8	31.1		33.7	36.2	29.4	56.7	0.93
4/91		36.9	34.7		36.1	34.7	23.3	33.7	35.9	31.4	57.2	
5/91	39.7	39.6	36.1		33.3	27.8		32.9	38.5	27.3	75.1	
6/91	43.3	36.1	38.6		27.8	25.0	18.3	31.5	39.4	23.7	56.1	0.98
7/91	44.4	35.8	41.1		29.2	25.0	17.9	32.3	40.5	24.0	50.0	
8/91	30.6	35.6	36.7		26.7	26.7		29.6	34.3	24.9	47.6	
9/91	28.9	36.1	34.4	27.8	28.3	27.8	25.0	29.8	33.1	27.0	42.6	1.04
10/91	28.9	33.3	33.3	30.6	31.1	29.2	30.0	30.9	31.9	30.1	43.0	
11/91	28.9	34.4	33.3	33.9	31.1			32.3	32.2	31.1	43.4	
12/91	34.2	37.8	35.0	32.5	31.9			34.3	35.6	31.9	49.5	1.11
1/92	40.0	44.4	46.1	38.3	33.3			40.4	43.5	33.3	53.2	
2/92	41.4	47.2	46.7	36.7	33.9			41.2	45.1	33.9	52.9	
3/92	43.1	50.6	51.1	38.9				43.6	48.2	34.6	56.6	1.18
4/92	43.3	46.7	57.5	36.1	35.3			43.8	49.2	35.3	54.2	

Source: Marketing Development Bureau, URT. Producer prices are collected from traders in the indicated towns.

TANZANIA
REAL RETAIL MAIZE PRICES
(regional averages in TShs/debe, deflated by non-food CPI, 7/91=1)

	Northern Zone	Northern Coast	Lake Victoria	Western Zone	Central Zone	Southern Highlands	Southern Coast	Overall Average	Non-food CPI
1/83	608	853	1046		712	543	734	719	266
2/83	699	993	1045		695	563	706	1302	276
3/83	526	876	873		589	539	745	695	285
4/83	657	812	815	940	726	553	769	722	282
5/83	706	930	755	740	655	508		691	280
6/83	758	1099	719	692	583	499		698	277
7/83	820	1007	817	634	576	517	748	698	282
8/83	906	870	916	617	570	478	829	732	288
9/83	847	788	1143	906	699	436		789	294
10/83	658	735	1075	1026	810	423	889	789	312
11/83	716	945	1199	899	984	510	892	896	330
12/83	786	1024	1331	815	1028	596	822	954	349
1/84	1186	1357	1616	1225	1470	1105		1341	350
2/84	1580	1568	2063		1833	1268		1738	351
3/84	1776	2533	1460	1443	2312	1313		1799	353
4/84	2043	2269	1177	1318	1605	1234	901	1524	362
5/84	2205	2120	1123	947	1080	1394		1412	372
6/84	1964	1593	1177	1036	1058	1012	980	1261	382
7/84	1705	1365	1200	937	944	751	1210	1163	390
8/84	1536	1333	1422	1093	793	777	892	1180	399
9/84	1233	1050	1473	1041	808	592	874	1059	408
10/84	1202	978	1501	1404	834	593	906	1042	424
11/84	1044	1025	1811		864	673	830	1098	440
12/84	992	943	1912	1389	976	797	967	1259	457
1/85	1115	981	1822	1402	1056	587		1157	482
2/85	1051	902	1735		1053	590	992	1095	507
3/85	945	801	1314	848	964	538	763	920	533
4/85	814	761	1015	782	700	513	672	775	538
5/85	786	779	859	671	668	504	784	728	543
6/85	768	760	895	504	502	463	660	680	548
7/85	776	949	821	814	644	454	868	729	564
8/85	674	827	716	647	522	458	401	611	579
9/85	642	677	837	660	524	424	754	614	596
10/85	568	667	741	758	521	412	463	574	604
11/85	613	755	843	868	529	425	676	725	612
12/85	510	750	972	1006	629	451	561	750	621
1/86	561	1095	951	833	728	536	1016	877	627
2/86	632	955	775	989	710	546	938	839	633
3/86	600	864	683	950	713	515	877	784	639
4/86	595	833	633	686	740	545	936	720	656
5/86	649	928	541	491	564	501	589	655	673
6/86	625	868	522	445	486	481	589	620	690
7/86	672	753	498	419	458	420		508	709
8/86	619	653	470	418	441	380	552	538	727
9/86	555	620	562	427	481	387	632	559	746

Continued.

TANZANIA
REAL RETAIL MAIZE PRICES (continued)
(regional averages in TShs/debe, deflated by non-food CPI, 7/91=1)

	Northern Zone	Northern Coast	Lake Victoria	Western Zone	Central Zone	Southern Highlands	Southern Coast	Overall Average	Non-food CPI
10/86	537	578	598	479	491	392	656	562	771
11/86	592	661	546	462	542	383	520	570	797
12/86	450	668	550	534	519	408	763	580	823
1/87	487	715	664	547	554	445	746	630	832
2/87	564	808	594	635	565	485	828	663	841
3/87	486	749	601	650	565	466	768	632	850
4/87	478	732	521	493	557	455	733	585	869
5/87	540	661	469	357	478	429	710	537	889
6/87	523	698	443	382	441	395	662	533	909
7/87	581	682	432	351	396	388	644	516	929
8/87	543	633	529	401	405	368	630	524	950
9/87	562	589	584	508	413	381	760	538	970
10/87	499	591	626	517	393	372	547	542	981
11/87	449	546	662	489	503	379	534	553	992
12/87	469	587	662	725	500	381	597	583	1003
1/88	464	689	749	809	587	451	674	665	1031
2/88	550	810	741	852	643	501	789	728	1059
3/88	601	822	712	848	692	479	782	717	1088
4/88	669	837	657	478	571	522	600	647	1127
5/88	657	840	610	329	525	447	637	616	1166
6/88	828	808	636	416	485	431	776	646	1206
7/88	706	728	603	394	516	418	800	604	1197
8/88	493	547	613	384	405	393	655	534	1189
9/88	468	531	624	397	391	364	614	519	1180
10/88	434	491	672	448	401	358	591	517	1201
11/88	473	578	673	533	455	328	605	538	1222
12/88	477	581	696	536	491	349	686	553	1245
1/89	471	632	822	708	540	365	730	622	1269
2/89	478	620	797	546	529	370	724	610	1293
3/89	491	664	794	731	541	386	719	621	1317
4/89	412	613	741	535	624	394	740	599	1317
5/89	458	675	613	711	418	473	536	560	1317
6/89	503	673	634	475	330	465	419	562	1317
7/89	491	641	642	412	359	407	390	528	1419
8/89	467	574	570	347	349	378	378	474	1521
9/89	437	510	584	470	379	359	453	478	1626
10/89	418	522	569	560	355	333	462	475	1659
11/89	404	433	558	621	379	318	435	464	1691
12/89	402	429	640	663	447	313	568	501	1725
1/90	409	513	617	628	443	337	550	509	1784
2/90	495	527	592	680	443	342	581	512	1843
3/90	516	571	611	815	530	390	569	552	1905
4/90	539	585	610	806	479	395	571	560	1918
5/90	457	628	560	509	471	413	579	531	1931
6/90	489	596	517	445	416	392	472	497	1945

Continued.

TANZANIA
REAL RETAIL MAIZE PRICES (continued)
(regional averages in TShs/debe, deflated by non-food CPI, 7/91=1)

	Northern Zone	Northern Coast	Lake Victoria	Western Zone	Central Zone	Southern Highlands	Southern Coast	Overall Average	Non-food CPI
7/90	485	651	510	472	400	376	498	496	2024
8/90	480	611	626	537	443	361	501	514	2103
9/90	456	620	622	609	570	322	760	552	2185
10/90	521	645	697	622	551	335	684	588	2222
11/90	526	675	797	737	608	356	726	657	2259
12/90	757	823	1003	1118	686	491	978	830	2297
1/91	744	962	1143	942	799	570	1115	914	2316
2/91	954	1137	1067	983	972	626	1136	985	2336
3/91	931	1077	988	1122	978	679	1444	995	2356
4/91	1027	1032	774	672	775	728	1276	865	2430
5/91	1083	1393	671	461	762	737	751	829	2472
6/91	1075	1195	659	547	569	625	442	740	2514
7/91	1247	1106	621	482	668	581	421	713	2556
8/91	1053	922	718	447	631	582	474	720	2598
9/91	734	799	775	411	615	527	584	656	2640
10/91	768	793	872	638	676	530	615	696	2681
11/91	816	866	829	764	714	589	681	758	2723
12/91	847	1018	798	693	842	625	837	824	2765
1/92	1020	992	796	583	871	660	943	831	2807
2/92	1038	1027	832	672	858	664	966	862	2849
3/92	1025	1055	927	608	863	716	964	890	2891
4/92	1091	1030	803	554	888	682	878	835	2933
5/92	1106	1138	918	557	818	681	655	885	2974
6/92	1121	927	932	507	711	613	560	805	3016
7/92	976	883	905	504	621	560	559	768	3058
8/92	741	824	843	577	703	518	646	714	3100
9/92	715	693	1146	602	712	459	748	777	3142

Source: Marketing Development Bureau, URT.

TANZANIA
ECONOMIC ANALYSIS OF SMALLHOLDER CASH CROPS
(November 1992 values)

Crops	Yield	Producer price	Value of output	Variable cost	Gross margin	Family labour	Return per man-day	Rank
	Kg/ha	shs/Kg	Shs/Ha	Shs/Ha	Shs/Ha	Mday/Ha	Shs/Mday	no.
A. Perennials								
Coffee(A)	750	155	116250	79337	36913	382	97	15
Coffee(R)	1500	50	75000	43600	31400	243	129	12
Tea(GL)	5000	40	200000	61050	138950	430	323	8
Cocoa(Dry)	400	100	40000	25278	14723	178	83	16
Cashewnuts(R)	1100	100	110000	59200	50800	130	391	5
Pyrethrum	612	230	140760	4895	135865	400	340	7
B. Annuals								
cotton (hoe)	750	60	45000	18058	26942	235	115	14
cotton (ox)	1125	60	67500	43330	24170	169	143	11
Maize-LIT	750	35	26250	4917	21333	173	123	13
Maize-MIT	4500	35	157500	40673	116828	161	726	2
Maize-HIT	5000	35	175000	49231	125770	159	791	1
Paddy (rice)	3750	42	157500	74652	82849	155	535	3
Wheat	450	50	22500	16638	5863	123	48	17
Beans	1250	60	75000	48912	26089	109	239	9
Simsim	500	100	50000	12458	37543	90	417	4
Tobacco (flue)	1500	295	442500	185372	257128	676	380	6
Tobacco (fire)	875	200	175000	82104	92896	427	218	10

Note: Hired labour assumed to be 30% of total labour employed.
Source: Mission estimates.

TANZANIA
COFFEE PRODUCTION TRENDS 1980-1992
(tons)

Year	Mild Arabica			Total Mild	Hard Arabica	Robusta	Total Coffee
	Kilimanjaro & Arusha	Mbozi & Mbinga	Estates				
1979/80	18,445	8,528	3,503	30,476	374	14,194	45,044
1980/81	32,945	13,299	5,106	51,350	868	11,767	63,985
1981/82	23,521	11,977	4,485	39,983	639	10,352	50,974
1982/83	21,676	13,177	2,999	37,852	937	12,528	51,317
1983/84	17,427	14,099	4,032	35,558	763	11,284	47,605
1984/85	20,568	12,889	2,099	35,556	762	10,888	47,206
1985/86	22,126	16,596	2,657	41,379	596	11,704	53,679
1986/87	12,541	11,881	2,629	27,051	939	11,854	39,844
1987/88	13,540	20,006	2,134	35,680	622	10,799	47,101
1988/89	21,522	17,870	2,629	42,021	1,052	12,188	55,261
1989/90	16,250	14,998	2,565	33,813	673	16,125	50,611
1990/91	15,047	11,834	2,807	29,688	1,749	16,000	47,437
1991/92	17,580	14,600	2,440	34,620	3,470	16,925	55,015

Source: MDB, Dar es Salaam.
TCMB statistics.

COFFEE AREA, DISTRIBUTION AND YIELDS, 1973-1992

Year	Zone	Hectares	Production tons	Yield Kg/Ha
1972/73	Northern	63,000	18,900	300
	Southern	16,000	5,400	338
	Estates	12,200	11,200	918
	Western	35,000	12,000	343
	Total	126,200	47,500	376
1981/82	Northern	53,000	23,521	444
	Southern	22,000	11,977	544
	Estates	12,200	4,485	368
	Western	40,000	10,991	275
	Total	28,683	1,230	43
1991/92	Northern	90,000	17,580	195
	Southern	66,000	14,600	221
	Estates	12,200	2,440	200
	Western	67,000	20,395	304
	Total	235,200	55,015	234

Source: MDB, Dar es Salaam.

TANZANIA
SMALLHOLDER COFFEE BUDGETS
(1992 Financial Prices)

	Arabica (pure stand)			Robusta (coffee/banana)		
	Mbozi	Ruvuma & Mbinga		Kilimanjaro & Arusha		Kagera
	Family Labor	Family Labor	Family & Hired Labor	Family Labor	Family & Hired Labor	Family Labor
Very Low Yield - 200 Kg/Ha (clean coffee)						
Returns to Labor (TShs/man day)	53	53	26	120	111	74
Production Costs - TShs/Kg clean coffee	184	184	205	184	205	124
Producer Price - TSh/Kg	150	150	150	194	150	66
Low Yield - 350 Kg/Ha (clean coffee)						
Returns to Labor (TShs/man day)	51	51	16	158	146	84
Production Costs - TShs/Kg clean coffee	161	161	182	161	182	83
Producer Price - TSh/Kg	150	150	150	194	150	66
Medium Yield - 600 Kg/Ha (clean coffee)						
Returns to Labor (TShs/man day)	59	59	23	163	148	97
Production Costs - TShs/Kg clean coffee	143	143	163	143	163	54
Producer Price - TSh/Kg	150	150	150	194	150	66
High Yield - 900 Kg/Ha (clean coffee)						
Returns to Labor (TShs/man day)	142	142	213	316	329	88
Production Costs - TShs/Kg clean coffee	101	101	86	65	86	52
Producer Price - TSh/Kg	150	150	150	194	150	66

Mission Estimates.

TANZANIA
COFFEE: 1991/92 CURRENT AND POTENTIAL PRODUCTION AND RETURNS

	Area	Yield	Production	Price	Revenue
				US$/ton	US$ million
1991/92 yields and production					
Arabica	168,000	206	34,605	1,500	52
Robusta	67,000	304	20,395	750	15
Total	235,000		55,000		67
Area, potential yields and production (existing coffee)					
Arabica	168,000	375	63,000	1,800	113
Robusta	67,000	350	23,450	800	19
Total	235,000	368	86,450		132
Area, potential yields and production (new varieties)					
Arabica	168,000	500	84,000	1,800	151
Robusta	67,000	550	36,850	800	29
Total	235,000	514	120,850		181

Source: Mission Estimates.

TANZANIA
COFFEE AUCTION PRICES, INTERMEDIARIES COSTS & PRODUCER PRICES
(selected coffee co-op unions for 1991-93)
(TShs/Kg of parchment coffee)

	KNCU	Mbozi	Mbinga	Kyela	ACU	KCU	Average
1991/92							
Auction price	367	367	367	367	367	223	343
TCMB marketing charges	83	NA	73	12	70	30	45
Price paid to Union	284	NA	294	355	297	193	237
Curing charges	13	NA	22	18	13	9	13
Co-op Union charges	36	NA	113	104	51	80	64
Price to Co-op society	235	NA	159	233	233	104	161
Co-op society charges	5	NA	4	3	3	4	3
Price paid to producer	230	230	155	230	230	100	196
Producer price as % of the auction price	62.7%	62.7%	42.2%	62.7%	62.7%	44.8%	56.3%
1992/93							
Auction price	390	390	390	390	390	210	360
TCMB marketing charges	106	NA	166	185	93	28	96
Price paid to Union	284	193	224	205	297	182	231
Curing charges	13	18	22	22	13	9	16
Co-op Union charges	111	NA	79	79	160	103	89
Price to Co-op society	160	123	123	104	124	70	117
Co-op society charges	5	NA	3	4	4	4	3
Price paid to producer	155	120	120	100	120	66	114
Producer price as % of the auction price	39.7%	30.8%	30.8%	25.6%	30.8%	31.4%	31.5%

Source: TCMB statistics 1990 - 1992, Co-operative Union Statistics 1990-92 and mission estimates.

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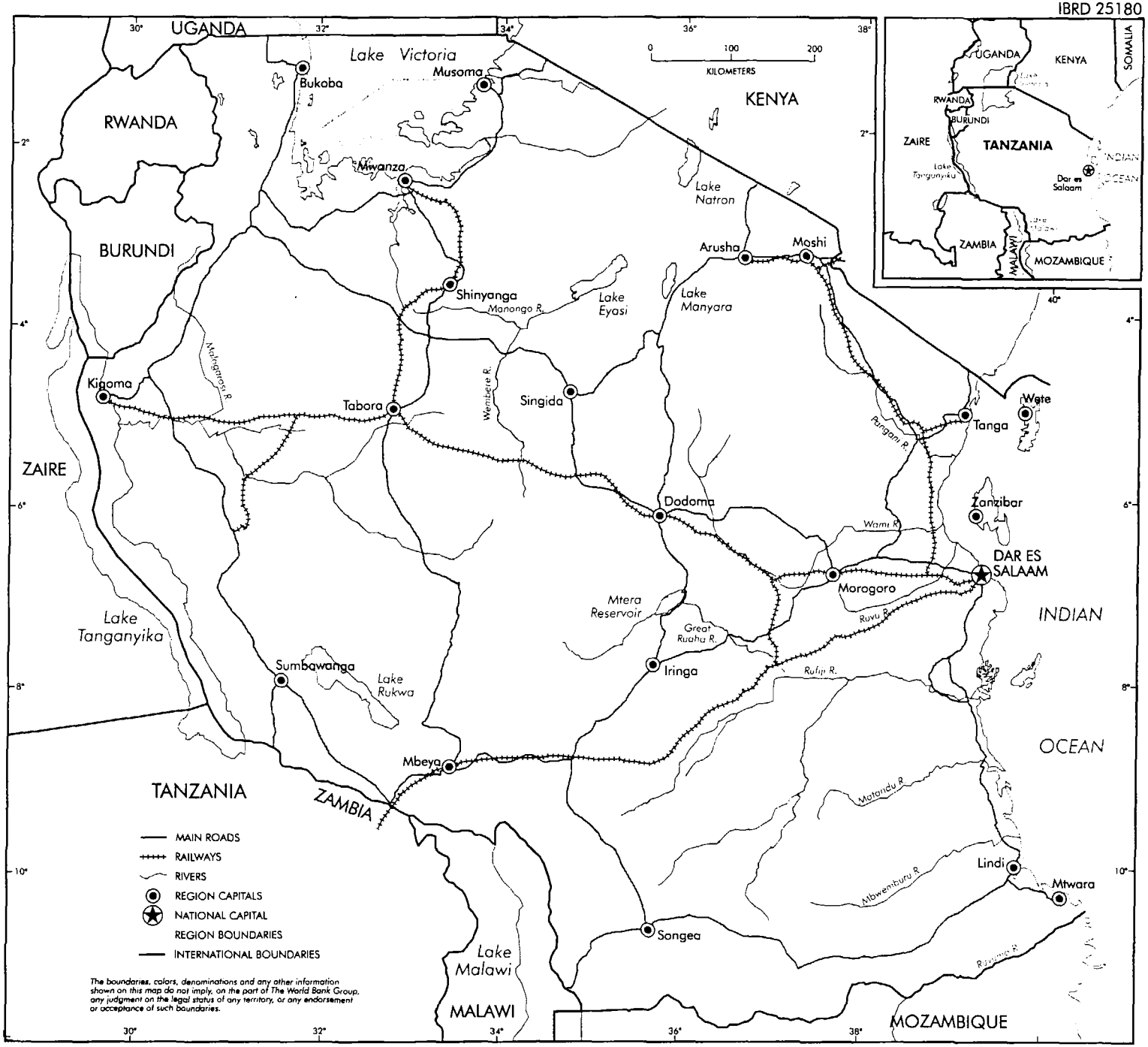

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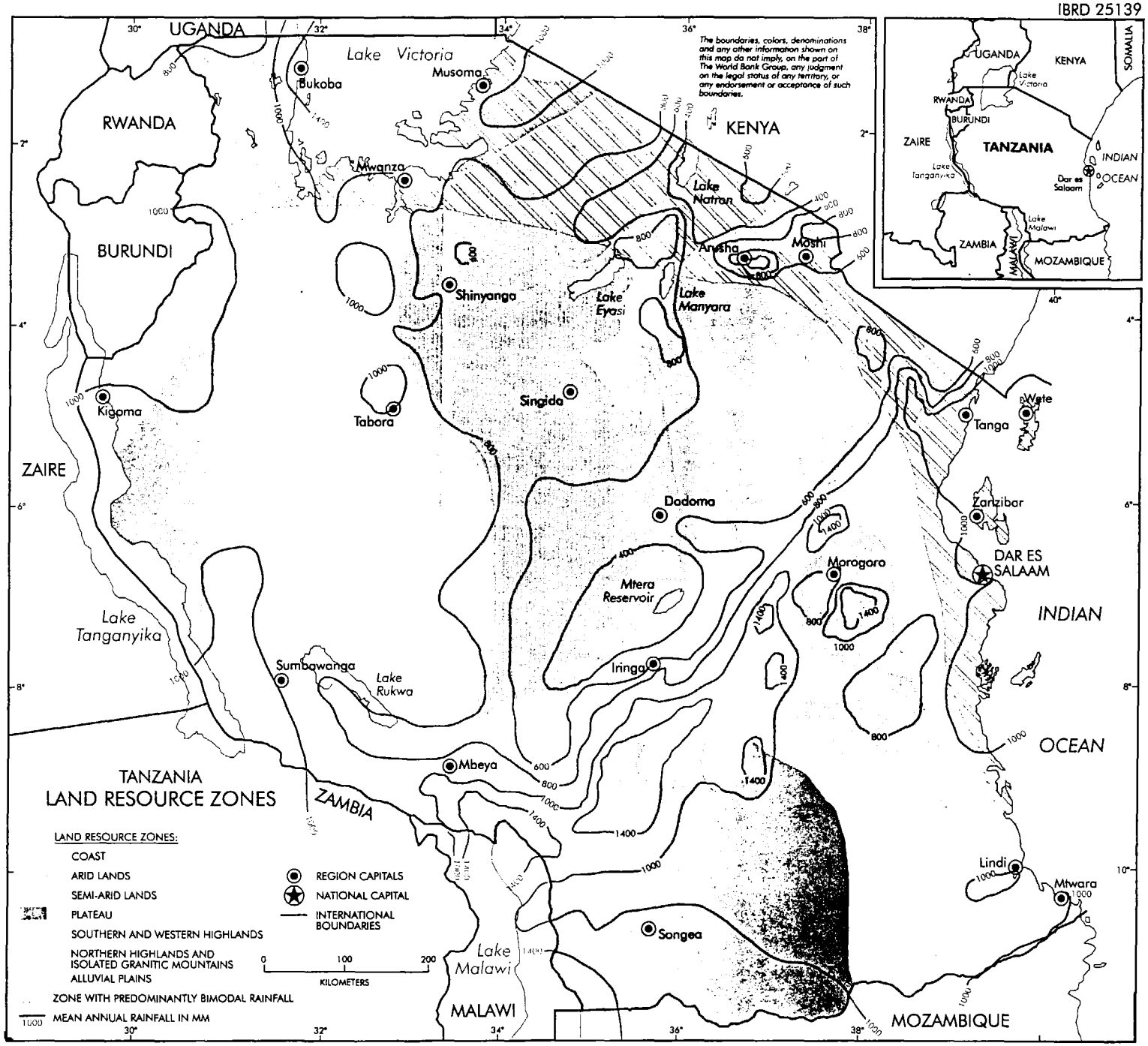

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