MOZAMBIQUE

AGRICULTURAL SECTOR MEMORANDUM

VOLUME I: SUMMARY

April 30, 1997

Africa Region
Agriculture and Environment
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CURRENCY EQUIVALENTS
Currency Unit = Metical (Mt)
US$1.00 = Mt11,378.00 in February 1997

FISCAL YEAR
April 1 — March 31

WEIGHTS AND MEASURES
Metric System

ACRONYMS

| AGRICOM — Agricultural Marketing Enterprise | JVC — Joint Venture Company |
| DINAGECA — National Directorate for Geography and Cadastre | LOMACO — JVC formed by Government and Lonrho |
| DRC — Domestic Resource Cost Coefficient | MOA — Ministry of Agriculture (and Fisheries) |
| ENSO — El Niño-Southern Oscillation | MSU — Michigan State University |
| ESRP — Economic and Social Rehabilitation Program | Mt — Metical |
| EMIB — National Directorate for Lonrho | MT — metric ton |
| ENDESA — Geographv and Cadastre | NGO — Non-governmental agencies |
| INEMCA — National Directorate for Agriculture | PDP — Priority Districts Program |
| IDA — International Development Association | PTIP — Triennial Program of Public Investment |
| IFAD — International Fund for Agricultural Development | PULS — Small Unit for Intensive Production |
| INDER — Rural Development Institute | RIF — Rural Investment Fund |
| INIA — National Agricultural Research Institute | ROCS — Roads and Coastal Shipping project |
| ICM — Instituto de Cereais de Moçambique (Cereals Institute of Mozambique) | SIMA — System of Agricultural Market Information |
| | UNDP — United Nations Development Programme |

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ACKNOWLEDGEMENTS

An initial mission to Mozambique took place in November 1993, led by Mr. Jean-Paul Chausse (then AF6AE). Participants included: Ms. Paola Agostini (forestry), Mr. Amos Ben Mayor (extension and research), Ms. Christine de Voest (food aid and food security), Mr. Pierre Haas (farmers' associations), Mr. Peter G. Moll (comparative advantage and farm efficiency), Mr. Augusto Moreno (the institutional environment), Mr. Raymond Noronha (land management), Ms. Adelina Paiva (pricing and incentive policy), Mr. Gale Rozell (privatization and the private sector environment), Mr. Lloyd Strachan (input supply and marketing), Mr. Jorge Tembe (farming systems and sub-sector notes). The first draft was prepared by Mr. Jean-Paul Chausse; the report was completed by Mr. Peter G. Moll. Thanks are expressed to Messrs. Jean-Paul Chausse, Inácio Manecas and Luigi Marcuccio for their assistance and to Mr. James Coates for his guidance. The Peer Reviewers were Mr. Graeme Donovan and Mr. Gene Tidrick. The work was carried out under the supervision of Mr. Jean-Paul Chausse (then Chief of the AF1AE Division), and subsequently under Ms. Sushma Ganguly (Technical Manager for Agriculture and Environment, Eastern and Southern Africa). The Country Director is Ms. Phyllis Pomerantz.
A. Current status of Mozambican agriculture

1. Agricultural output in Mozambique is increasing. FAO estimates put the 1996 grain harvest at 1.4 million tons, the highest in two decades. Agricultural marketing increased by an estimated 18 percent between 1995 and 1996. The good rains of 1995/6 helped, but there were other factors as well: the return of exiles and the return of deslocados to their farms, the sustained peace, the improvement in the trunk and secondary roads, and the increase in the price of maize at the farm gate owing to the substantial involvement of small traders in marketing. Significant increases in cropped area have been reported in some parts.

2. Table 1 presents growth rates of marketed agricultural output for the period 1992-1996. Marked output fell by 11 percent in 1992, mostly on account of the extended drought, pulling down the rate of growth of GDP as well. When rains returned to normal in 1993, the sector grew by a substantial 21 percent; it grew by 5.0 percent in 1994, 6.9 percent in 1995, and 9.4 percent in 1996, according to the understated Government statistics. True production numbers are probably much higher.

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3. The share of agriculture in gross domestic product is approximately 37 percent. Agriculture is the basic means of support for roughly 69 percent of the population. Agriculture and renewable natural resource exports constitute about 76 percent of all exports. Shrimps and prawns constitute the single largest export item in Mozambique, accounting for over a third of total registered exports (Figure 1).

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1 From: World Bank (1996b).
2 For instance, in the Monapo district of the northern province of Nampula, the area sown by the average household increased by some 80 percent between 1992/3 and 1994/5. See footnote 58 for details. No aggregate data are yet available on areas sown and yields for the 1995/6 season.
3 See paragraph 49 for further detail.
4 See further detail and sources in the Appendix Tables.
4. As is shown in Figure 2, total registered exports of all sectors (agriculture and other) grew from $105 million in 1989 to $226 million in 1996, with an average growth rate of about 12 percent p.a. Export crops contribute some 33 percent of total exports. Cashew nuts constituted the largest export crop, with almost one half of the total up to 1992. The sub-sector declined dramatically in the subsequent two years, falling to just two percent of total exports in 1994, but rose to 19 percent of exports in 1996. Cotton is the second largest export crop, with an average value of exports close to 10 million dollars in 1989-1996. The third place belongs to sugar, with average annual exports valued at 13 million dollars in 1996. Copra and citrus are the other exported crops of any significance, while timber accounted for 8 million dollars in 1996, though this figure is likely to be significantly under-reported.

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5. On the policy side, Mozambique has made considerable progress towards the market orientation that the government has espoused since 1992. Although inflation rates fluctuated between 33 and 63 percent from 1990 to 1995, the effects of monetary tightening were felt in 1996, and the inflation rate dropped to 17 percent by the end of the year. Borrowers' interest rates were controlled until 1994, and they tended to follow the inflation rate, so that the real interest rate varied between -8 percent and 3 percent between 1990 and 1994. Real interest rates rose with the liberalization, and for small borrowers, owing to the greater risk involved, were sometimes over 100 percent in real terms. Real interest rates declined during 1996, and prime borrowers faced (nominal) interest rates of 25 percent.

6. The official exchange rate was heavily overvalued in the early 1990s, but the freeing of currency movements and successive devaluations resulted by the mid-1990s in a negligible official-unofficial rate differential. As is shown in Figure 2, there was a substantial real depreciation between 1990 and 1993, though with a slight appreciation again by 1996. Taking into account the recent improvements on the inflation front and the real depreciation of the exchange rate, the macroeconomic scene is set for further growth in the agriculture sector.

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Figure 2. Commodity exports, 1989-96

As far as product markets are concerned, the state-controlled system with fixed prices run by AGRICOM was dismantled, and AGRICOM was replaced by the ICM (Cereals Institute of Mozambique). While the ICM has a broad mandate of agricultural price stabilization, it has a very limited budget and is functioning as a regular wholesaler. The government sets minimum prices annually, often after the growing season has already started. Given the fact that inflation was high and unpredictable during the early 1990s, these prices rarely corresponded to the observed market prices, but the government lacks the funds to defend the floor prices.

There remain certain constraints in the input markets. There is a minimum wage but it is rarely enforced in the agricultural sector and it is infrequently adjusted, so that its effects on factor choices are negligible. Capital markets are problematic for many farmers on account of the high effective real interest rates they are required to pay. Furthermore, land cannot be used as collateral because the land law forbids the sale of land, and there is insecurity for many smallholders in the face of land titling activity by outside agencies, firms and farmers.

The government has divested itself of practically all of its state farms and agro-processing facilities, the most notable of which was the cashew processor Caju de Moçambique.

Import tariffs, according to the new regime of November 1, 1996, are low, between zero and 35 percent. Export tariffs are zero but for the case of raw cashew nuts where the tariff was reduced from 20 percent in the 1995/6 season to 14 percent in the 1996/7 season. There is a sales tax (imposto de circulação) of between 5 and 21 percent which impedes trade to the extent to which it is enforced. A more serious problem in the trading area, however, is the difficulty of entry into wholesaling and retailing, owing to the stringent legal requirements and to some misapplication of the rules by local officials.

Overall, taking into account the macroeconomic environment, the output and input markets and the marketing, trade and tax regimes, Mozambique has in recent years made substantial progress towards bringing about market-based growth. Its agricultural sector is well placed for expansion.

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7 Sources: see the Appendix Tables of Volume II (Main Report) of this Memorandum.
B. Major Findings of the Memorandum

12. This memorandum has reviewed Mozambique’s agricultural performance in some detail. Institutional and economic factors were analyzed in order to 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.

(a) Raising smallholder agricultural production is an effective way of addressing poverty

13. Poverty may be defined by reference to a poverty line, the level of which is necessarily arbitrary. A line frequently used in the African context is $1 equivalent per capita family income per day. The (unenforced) minimum wage in Mozambique is about $0.50/day; few rural employees receive wages higher than this. By the standard of $1/capita/day, the vast majority of Mozambicans, rural and urban, would be classified as "poor".

14. An alternative definition of poverty is the lack of a specified combination of services which our society has come to consider as basic necessities. This basket of services often includes access to clean water, access to primary education, access to medical care, and access to enough food calories for health and comfort (which in turn presumes a certain level of income). By any reasonable standard incorporating arbitrarily defined levels of the latter variables, the vast majority of Mozambicans are poor. Roughly three-quarters of the population lacks access to safe water. 842 percent of men and 77 percent of women (rural and urban) are illiterate. Chronic malnutrition affects 27 percent of children under the age of five. 9 About 60 percent of the population, rural and urban, lacks access to health services. 10 Infant mortality (146 per thousand live births) and under five mortality (282 per thousand live births) 11 are much higher than the sub-Saharan African averages of 99 and 172. Maternal mortality (1,100 per hundred thousand live births) 12 is one-third higher than the average for sub-Saharan Africa. Reflecting the lack of access — urban and rural — to medical care, the average life expectancy is 46 years. 13

15. The analysis has demonstrated that raising the farming output of smallholders is an effective way of reducing poverty. The argument is developed in three stages: smallholders constitute the vast majority of Mozambican society; smallholders are among the poorest people in the country; and raising smallholder production would reduce poverty directly, by raising incomes, and indirectly, by reducing the isolation of smallholder families.

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8 Multiple Indicator Cluster Survey, Table 8, p. 25.
9 In the sense of having a weight-for-age Z-score less than -2.0 (Multiple Indicator Cluster Survey (1996), quoted in Desai (1996), Table XV). No rural/urban breakdown is available. Data refer to 1995.
11 World Development Indicators, 1995, Table 27. No rural/urban breakdown is available. Data refer to 1993.
13 World Development Indicators, 1995, Table 1. No rural/urban breakdown is available. Data refer to 1993.
16. As of 1993, 69 percent of the Mozambican population lived in rural areas and small rural
villages. This figure has probably risen since to about 80 percent, as refugees and deslocados returned home. Of these rural people, about 90 percent have their livelihood in smallholder agriculture. About 72 percent of all Mozambicans are directly dependent upon smallholder agriculture.

17. Smallholders are among the poorest in Mozambican society. While many urban people, particularly the deslocados, are poor, the effects of deprivation, isolation and vulnerability in rural areas are generally worse. Rural people are vulnerable to climatic uncertainty, and while all occupations, urban and rural, are subject to uncertainty (of demand, employment, prices, etc.), rural people have less scope for risk-reducing diversification. The average rural household experiences “food insecurity” for 3.7 months in the year. As of 1994, 77 percent of smallholders had no off-farm income, and 71 percent had no marketable surplus. Rural people have less access to medical services. In urban areas, there were, as of 1992, 1.83 hospital beds per 1000 people in urban areas, and 0.48 in rural areas.

18. Raising smallholder agricultural production would reduce some aspects of poverty directly. Their incomes could be raised by increased yields, which in turn could be assured by improved agronomic research and dissemination. If smallholders faced higher output prices due to the reduction of export taxes or due to more efficient marketing (arising from better roads) their incomes would rise immediately; the stronger incentives would induce a supply response and incomes would rise further in subsequent years. Demand for primary education and elementary medical services would rise, and this in turn would tend to reduce the infant mortality rate and raise the life expectancy. With their basic food needs covered, smallholders would be

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14 World Development Indicators, 1995, Table 31. Data refer to 1993.
15 Desai (1996) reports that about 5 percent of rural households do not have “cultivated land” (2.5 percent in the North, 1.7 percent in the Central region, and 8.0 percent in the South) (p. 20). He also reports (Table XI), that 91.5 percent of rural households have some income from agriculture, fishing or livestock.
16 Multiple Indicator Cluster Survey, (1996), quoted in Desai (1996), Table XIV. “Food insecurity” is here a subjective judgment of the respondent.
17 Ministério da Agricultura e Pescas (1994), as quoted in Desai (1996), Table 6, p. 22.
18 Ministério da Agricultura e Pescas (1994), as quoted by Desai (1996), Appendix Table IX.
20 Ministério da Saúde (1994), p. 33, Table 3.2.5, p. 55. Hospital staff refer to the sum of doctors, nurses and technical staff.
21 Multiple Indicator Cluster Survey, Table 8, p. 25.
22 Multiple Indicator Cluster Survey (1996), quoted in Desai (1996), Table XVI.
better able to smooth their income inter-seasonally and inter-annually, resulting in less food insecurity.

19. The government’s infrastructural interventions in aid of agricultural production would also reduce poverty. Rehabilitating the feeder roads and installing culverts, for example, would lower transport costs and improve people’s access to medical services and education. Low-cost transport services would also result in an increase in rural demand for urban-produced commodities, resulting in improved incentives for increasing agricultural output. The government’s investments in primary education would facilitate technological transfer, which would raise agricultural output and incomes in the medium term. They would also increase the access of rural dwellers to nonfarm earning opportunities, and increase their returns from such work.25

20. Thus a strategy aimed at smallholders would simultaneously address the largest group of those in poverty and those of the poor whose situation is the most precarious. Fortunately an anti-poverty strategy aimed at smallholders is not hard to imagine; it arises naturally because smallholders are the most efficient farmers.

(b) Smallholders are the most efficient farmers

21. On efficiency grounds it is clear that it is in the smallholder sector that the country can find the highest return on its investments; this observation is supported by all measures of comparative advantage which have been obtained. Smallholders are efficient producers of food crops (maize, groundnuts, cassava, rice, sunflower, beans), cotton and cashew, with most domestic resource cost coefficients (DRCs)26 between 0.4 and 0.8, depending on the assumptions about the shadow wage and the output price.27 In cotton, at the favorable 1996 international price, the smallholder DRC is 0.3, while that of large-scale producers is 0.6. In maize, the smallholder DRC is 0.6–0.8, while the large-scale producer’s DRC is 1.1 or 1.2. Irrigated sunflower seed production is most efficiently performed by smallholders with a small amount of (hired) machinery. The DRC is an attractive 0.7. Medium- and large-scale farms have significantly higher DRCs of 0.9 and 1.1, due to the higher cost of their mechanized operations.

25 This was shown for Tanzania by Collier et al. (1990). A person with no education had a 5 percent chance of obtaining nonfarm employment; literacy raised the chance to 11 percent; lower primary to 17 percent, upper primary to 31 percent, and secondary schooling to 74 percent. This is at the margin, of course; at the aggregate level an increase in schooling would lower these probabilities but total nonfarm employment would expand in turn.

26 The domestic resource cost coefficient (DRC) measures the cost, in terms of local resources, of obtaining one dollar’s worth of foreign exchange, after excluding the effects of all policy distortions. A DRC of between zero and unity indicates that the project makes a net contribution to the economy. Given flexible markets, and no policy distortions, the project would be taken up by private agents driven by the profit motive. A DRC greater than unity indicates a project which is not worth its while in terms of its foreign exchange earnings.

27 Note that the DRCs were calculated with a shadow price of foreign exchange midway between the official and the parallel market rates.
22. These results are driven by the fact that wages in Mozambique are low, enabling the labor-intensive smallholder system to outcompete large-scale mechanized producers. On poverty and equity grounds it is equally clear that a smallholder focus provides the most effective way to promote growth while at the same time ensuring the participation and improvement of the people who most need it.

23. However, the analysis has also found that in many lines of production the large-scale sector, too, is profitable, although it generally does not have domestic resource cost coefficients as low as those of smallholders (see also §61). Therefore large-scale producers have their place in the economic framework, although there would be no rationale on efficiency or on distributional grounds for the government to direct special assistance to them.

24. Another reason for permitting the growth of a large-scale sector is that this is consistent with Mozambique’s factor endowment, as one of the most land-rich countries in sub-Saharan Africa. If left to itself, the market would naturally generate a wide array of farm sizes; some smallholders would grow, in time, to medium and large sizes; and there would be new large-scale entrants.

25. It is recommended that the state provide public infrastructure and a conducive policy environment, the latter entailing clear definition of property rights, macroeconomic stability, and low tariffs. Such a policy environment would simultaneously encourage the smallholder sector and the large-scale sector, and any mix in between.

(c) The private trading system is recovering

26. The private trading system was mostly destroyed by the war and discouraged by the government’s panterritorial pricing policies exercised through AGRICOM. This study has shown that, since peace was reestablished in 1992, and since the withdrawal of the government-run marketing monopolies, private trading links have reestablished themselves in most parts of the country. There are, moreover, strong long-distance links between the south of the country and the center, and between parts of the north, though not yet between the south and the north. In 1993, shocks to the maize price in Maputo were not discernible in Chimoio (Manica province), 1200 km away; by 1995, Maputo price shocks were felt in Chimoio within a period of three weeks. The differential between prices in Maputo and Chimoio fell from an average of about 150 Meticais in 1993 to about 50 Meticais in 1995. Hence it is likely that links will develop in due course between the north of the country and the south. Although the marketing margins are still high, they have been coming down and will continue to fall as the volume of trading increases.

28 This situation is not static. If the population growth rate of 3.3 percent p.a. falls, and if GDP growth rates are strong, and if (as is likely) there is a gradual process of rural-urban migration, wages will eventually be forced upwards, resulting in changes of technique (e.g. mechanization of milling and other processing, followed by mechanization of farming operations and an increase in the vehicles used at the farm level). But to judge by the experience of other African countries, e.g. Kenya, the increase in the rural wage may take decades to materialize; so that the relative efficiencies of smallholder and large-scale farming operations are not likely to change in the near future.


27. The implication of this finding is that it would not be optimal for the government to mount major funding programs for the re-establishment of traders. The best that such intervention could do would be to accelerate a process which is already under way. Small projects such as training in business operations for traders, or the construction of market arenas and group storage sheds by local communities would be more appropriate. But accelerated trader development could be achieved more advantageously by addressing directly the two main market failures which have constrained the development of the network hitherto: the inadequate road system and macroeconomic instability. The former raises the costs of trade and, particularly in the north, debars trade altogether with many villages. The latter results in high real interest rates which raise the cost of trade, as well as creating an atmosphere of uncertainty which deters traders from borrowing capital and banks from lending to them.

28. The study also found that there are still many restrictions on the establishment and functioning of trading businesses and that the best avenue for action for the government in the marketing area would be the clarification of the business and legal environment. The study has also pointed out that trade in agricultural goods would be better stimulated through government spending on road maintenance and the construction of culverts than through direct interventions. (d) Integration in regional grain markets will dominate long-distance internal (north-south) trade

29. Long-distance trade is expected to play an increasing role in the future, particularly if the government succeeds in improving the efficiency of operation of the ports. It has been shown that, under reasonable assumptions concerning improvements in the legal regime, the marketing system and the ports, Mozambican maize would find its way to South Africa in years when the latter country is in deficit. Prior to independence, trading links between the north and the south of Mozambique did exist. Today even bulky products such as cassava sometimes find their way by truck from the north to the south of the country. However, for the northern provinces (Cabo Delgado, the western parts of Nampula province, Tete) to produce cereals for Maputo is unlikely to be more than a marginal proposition; they would do better to export to Tanzania, Malawi and Zimbabwe. The volume of trade would be greatest with countries to the west, on account of the rail link from Nacala to Malawi. The north of Mozambique could also export to markets further afield, via the ports of Nacala and possibly Pemba, to, for instance, Sudan and Kenya

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31 Interest in mounting such projects has been rekindled by the prospect of closure of many rural branches of the Banco Comercial de Moçambique and the Banco Popular de Desenvolvimento in the process of privatization.

32 An additional practical problem is that loan recovery is difficult in the case of small and petty traders. The experiment with the Fundo de Comercialização in 1993 went awry because most loans were not recouped.

33 See the extended discussion in Coulter (1996), Appendix 4.

34 The calculations were done both under current price assumptions and under assumptions of realistic price reductions arising from improved shipping, improved port operation, and reduced marketing margins due to the secular increase in trade. The findings as reported in this paragraph reflect the calculations on the basis of assumptions of long-term price reductions.

35 Koester (1986) showed that maize production in northern Mozambique is negatively correlated with that in southern Tanzania and more or less independent of that of Malawi and Zimbabwe.
whose growing seasons do not coincide with those of Mozambique. Areas which are less distant, such as the Manica highlands, could produce maize and other products for the Maputo market.

30. In light of these findings about likely future trading patterns, is there any justification for a special import tariff on, say, cereals, in order to encourage north-south integration and promote self-sufficiency in cereals? This seems unlikely. The optimal amount of north-south integration is that which would arise in a context where there were no market failures. Currently there is at least one market failure: the inadequate state of the road system. The amount of north-south trade is consequently suboptimal. But the best way to address this problem is through improving the road system, which is already being done through the ROCS II program.

Using an import tariff would be a blunt instrument. While it would increase the quantity of north-south trade, it would impose unnecessary costs in so doing, by raising the cost of maize for consumers and encouraging the cultivation of maize in unsuitable parts of the south.

31. Concerning cereals self-sufficiency, these findings indicate that this objective would be expensive to attain. Due to the elongated north-south structure of the country, and the obvious opportunities for regional trade at both ends, self-sufficiency would require major departures from the patterns that the economy, unfettered, would “naturally” produce. The objective would probably require a substantially increased tariff, which would entail the costs mentioned above. Self-sufficiency is an unrealistic goal given Mozambique’s drought-prone agriculture; with a probability of one, the country would eventually be forced to import. In any case self-sufficiency would not guarantee household food security, to which we now turn.

(e) **Food security is attainable without continued government-directed food aid**

32. Price incentives and infrastructure are important for the growth of domestic food production, and in turn local food production is important for the attainment of food security. A controversial question, however, is that of direct food aid, through “commercial” food aid, as it has come to be called, and through “emergency” food distributions. Some think that direct food aid is an essential adjunct to market processes, in order to guarantee household food security and provide a response in times of crisis. This report, by contrast, has found that in recent years these direct food aid policies tended to undercut domestic production and hamper the development of a domestic marketing system, because commercial food aid used to be priced at less than import parity, and because emergency food aid leaked (and still leaks) into the market. The consignee price of commercial food aid (maize) stood at 80 percent of the market price in 1993, 30 percent in late 1994 and 50 percent in mid-1995. Since 1996 commercial food aid has been auctioned upon arrival, thereby reducing its effect on the price of cereals. The effect is still

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36 This argument was invoked during the course of discussions with the government in 1996 concerning the Third Economic Recovery Credit. It is sometimes stated in graphic terms: Why should the north of the country be exporting maize when the south is being forced to import and rely on food aid?

37 Up to 1994 there was another problem: the high cost of north-south sea transport, owing to the monopoly status of the government-owned shipping company. The sea transport market has since been opened and there is now an additional private sector competitor. Prices have correspondingly fallen.

38 See §103 and the main text (viz. Volume II of this Memorandum) for further detail.

39 From “Chegadas de ajuda alimentar comercial e de emergência e preços de milho, Maputo, Março 1990-Janeiro 1996”, by the Sistema de Informação dos Mercados Agrícolas (SIMA), in the Ministry of Agriculture.
negative, however, so that it would be better, from the point of view of local production, to phase it out altogether and leave imports up to private markets.

33. The extent of the disincentive for domestic production has been falling as the quantities of both commercial food aid and emergency food aid decreased markedly between 1993 and 1996. Commercial food aid peaked at 272,000 tons of maize in 1992/3, and fell to 54,000 tons in 1995/6; emergency food aid peaked at 389,000 tons of maize in 1992/3, falling to 40,000 tons in 1995/6. A straight-line projection would see no further aid by 1999. Since leakages of emergency food aid into the market are impossible to prevent, this aid should be phased out as soon as humanitarian considerations allow.

34. Long-run food security depends on adequate and stable national production; short-run food security depends on having a contingency plan in place to invoke in times of crisis. Given Mozambique’s natural potential for efficient food production, the main requirement for long-run food security is appropriate price incentives and infrastructure. At the national level, development of high potential areas together with the marketing system needed to link producers with consumers will provide the national capacity for satisfying food needs while the increased incomes resulting from the development of export and domestically-oriented agriculture will enable the country to weather the inevitable fluctuations that can be expected in national output. The government can play a role by facilitating research on drought-resistant crops and by training extension officers to exploit this information. At the household level, both increased incomes and improved crop storage technologies will be key elements of a strong food security strategy.

35. For short-run food security, since Mozambique is on the coast and has ready access to international markets, the country can draw on the international grain markets in the case of drastic shortfalls in supply. In order to prevent excessive price spikes, two actions could be taken:

(a) advance warning could be given about potentially bad harvests, using prediction based on the El Niño-Southern Oscillation phenomenon; and

(b) the efficiency of the ports and the domestic marketing system (wholesaling, retailing and transport logistics) could be improved, thereby reducing the import-export parity band from a potential $54 to $14 per ton of maize.

With better information and efficient port handling, traders would quickly import maize to satisfy local demand, and private markets would be sufficient to prevent price spikes. No government imports would be necessary. The problem of the income loss faced by drought-stricken farmers can be addressed by NGOs and the World Food Program, backed up by donors. Government initiatives in this area would not be cost-effective. NGOs will be more successful if provided with long lead climate forecasts.

(f) Local cashew processing can compete at world standards

36. In the past, local cashew processors were protected through a ban on the export of the raw nut, and the entire marketing chain was controlled by a set of minimum prices. Not surprisingly, the Mozambican farm gate price was one of the lowest in the world, falling to 31

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40 Data from Ministry of Agriculture/Michigan State University studies, in turn from Ministry of Commerce, Ministry of Agriculture, FAO, World Food Program, and donors.
percent of export parity in 1992/3 and 20 percent in 1993/4. Since 1994 the marketing chain has gradually been opened to competition. For the 1994/5 season, the export ban was replaced by a tax of 26 percent on the raw nut, falling to 20 percent in 1995/6 and 14 percent in 1996/7. The farm gate price started to improve. Between 1993/4 and 1996/7 the real farm gate price rose 25 percent, and the share of the farm gate price in the export price rose from 21 to 55 percent. Using an “infant industry” argument, some of the domestic processors have claimed that they need continued protection, and that they bought the processing plants on the assumption that protection would continue indefinitely.

37. This analysis has shown, on the basis of a variety of data sources, that it is possible for cashew processors to run profitable operations even at a zero rate of protection. This can be achieved in two ways: processors using capital-intensive technologies (e.g. the Oltramare technology) can operate profitably provided they are managed more cost-effectively; or processors can switch to more labor-intensive approaches which are competitive because labor costs are low. Indeed there are already several new entrants into the processing business which are using more labor-intensive approaches than the traditional ones.

38. As mentioned above, the farm gate prices of cashews have improved, in large part owing to the increased competition in cashew trading and the decrease in the export tax. In addition to the rise in petty trade, many new medium-scale traders have entered the business which used to be dominated by a small number of large-scale traders. In addition, several processors have themselves started to trade cashew in search of secure supplies and better quality nuts. The abolition of the export ban contributed to this change in the market landscape by forcing the processors to search harder for nuts of the requisite quality and in the desired amounts. The increased competition will encourage increased quality consciousness on the part of traders and farmers alike—an awareness which the old controlled system stifled—and this will lead in due course to the adoption throughout the market of a multilevel grading system for raw cashews. There is therefore a strong rationale to continue to reduce the export tariff.

C. Constraints on Agricultural Growth

39. The constraints on the growth of the agricultural sector of Mozambique are briefly summarized here. They refer mainly to the scarcity of water; landmines; the deficient property rights regime; the inadequate transport and communications infrastructure; low levels of skill and technology; asset poverty; the lack of “social capital” and the absence of rural financial markets; distortions in price incentives due to minimum prices and food aid; and the lack of capacity of the Government apparatus.

40. Scarcity of water. Mozambique faces extreme water stress. Annual rainfall in the provinces of Gaza and Inhambane is less than 600 mm, and droughts occur periodically. Irrigation is required to reach significant levels of sustainable production. The main rivers are running very low owing to use upstream by South Africa and Zimbabwe. There are abundant groundwater resources underlying most of Mozambique’s coastal plains, which would allow for

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41 Data from the Secretaria do Estado do Caju.

42 The revenue implications of the reduction of the tariff are small, inasmuch as cashew exports accounted, in 1994, for only two percent of all exports. If the government wishes to increase its revenues, this would better be done by a low rate of tax on a wider base, for instance an increased import tariff on all goods, or a small tariff on all exports.
significant small-scale (village and farm level) irrigation development. Many irrigation works have been constructed, but only one-third of the commanded areas actually get any irrigation. The need for rehabilitation and modernization of (some of) the existing systems is paramount. Current analyses (SOGREAH 1993) recommend against considering any new irrigation works in the foreseeable future, in view of the backlog of existing systems that need to be rehabilitated. The development of sound water resource management strategies is crucial for poverty reduction, economic growth and food security.43

41. **Landmines.** During the war, both sides laid landmines44, often along road and access ways. The number of mines is not known accurately.45 Worst affected were Maputo, Zambézia and Tete provinces.46 Apart from the toll in human suffering, the effective supply of arable land has been reduced. In some cases, entire communities were deterred from returning to their traditional lands after the war. The UNDP/DHA Accelerated Demining Program has made significant progress in releasing this constraint on agricultural expansion. Among the areas which urgently need mine clearance still are the interior of Zambézia and the western part of Maputo province. At the present rate of mine clearance, practically all landmines which threaten human settlements and agricultural activities will have been removed in about five years in the South and about three years in the North.

42. **The deficient property rights regime.** With five hectares of land per inhabitant (or 2 inhabitants per square kilometer), Mozambique is one of the continent’s most land-abundant countries, once land quality is taken into account.47 Nevertheless land conflicts have been reported both in densely-populated areas such as the major river valleys, and in sparsely-populated areas such as the Matatüine district in Maputo province, and Monapo district in Nampula province.48 Smallholders, who have obtained rights in land through inheritance or through the customary tenure allocation system, have frequently been deprived of some of their land rights by outsiders who use legal instruments to obtain land titles, typically in the most productive areas.49 This insecurity of tenure of smallholders is mirrored by insecurity on the part of large-scale farming investors, tourist operators, and multinationals, whose legitimacy is frequently called into question and who fear reprisals by farmers or arbitrary cancellation of their titles. The lack of definition of the titling process is a constraint on smallholder production and on foreign investment alike. Furthermore, the Land Law No. 6 of 1979 prevents the sale of land, although buildings and land improvements may be sold. The absence of a legal land market, or a

43 The National Water Resources Development Project will assist the Government in the management and conservation of its water resources. It will include institutional development, capacity building, local and international river basin studies, and critical investment in bulk water storage.


45 Estimates have ranged as high as two million landmines.


47 See World Bank (1996c).


49 The problem is exacerbated by two factors: (a) given the inadequate infrastructure, the demand for land by large-scale farmers and tourist operators is focused on areas close to the main roads and cities; and (b) landmines, which reduce the demand for land in the affected areas and channels the demand towards the already conflict-ridden areas around the cities.
market in concessions, means that land per se cannot be mortgaged (though buildings can be). These restrictions are a constraint on investment.

43. Inadequate transport and communications infrastructure. The Roads and Coastal Shipping Projects I and II, which are supported by IDA and other donors, have concentrated mainly on primary and secondary roads. ROCS II, for instance, aims at major rehabilitation of 3,450 km of trunk roads, maintenance of 65,500 km of unpaved roads, emergency rehabilitation of 11,700 km of mainly unpaved roads, and labor-based building of 3,250 km of feeder roads (World Bank, 1994b, p. 10). The ROCS II also stresses the maintenance of the newly rehabilitated roads, which is appropriate, given the relatively low cost of maintenance compared with new building of roads. But further investments in rehabilitating tertiary and other feeder roads are required, and there is a need for culverts and farm to market tracks in rural areas. The lack of this infrastructure prevents consumer goods from reaching isolated rural populations, decreasing their incentives to produce surpluses for the market; and it raises the costs of transport which reduces farm gate prices, depressing the incentives of farmers further.

44. Low levels of skill and technology. Some 60 percent of the Mozambican population is illiterate, and in some rural areas male illiteracy is as high as 87 percent. The level of agricultural skills in the smallholder sector is correspondingly low. The technology is shifting cultivation with hand-hoes, with low levels of productivity. There is a need for massive investment in primary education in rural areas, which will show results in terms of productivity change and output. The research and extension systems also require major rehabilitation and upgrading.

45. Farmers' asset poverty. During the war the Mozambican cattle herd was virtually eliminated. Farmers in the south and the highlands, where cattle were raised, thereby lost their wealth base, their draft power and their cheapest means of saving and capital accumulation. This makes the supply response to the incentives given by the new-found political stability and the freer markets less strong than otherwise; and it will constrain the development of rural financial institutions and cooperatives in the future.

46. Lack of social capital and the absence of rural financial markets. The unfortunate history of cooperatives in Mozambique resulted in mistrust by farmers of efforts by the state to facilitate the creation of cooperatives. There are very few farmers' or peasants' organizations other than in the Zonas Verdes around Maputo. Such as there are have small membership bases, few resources and little access to organizational skills. As a result there are no farmers' organizations at present with the capacity to intervene in factor or input markets. This is a constraint in all lines of smallholder production, but especially in cotton, where the use of pesticides is essential for profitability. Furthermore, the ability of rural dwellers to accumulate savings and borrow resources is severely limited by the paucity of rural financial institutions.

47. Distortions in price incentives due to minimum prices and food aid. Mozambique has largely moved away from central control of the economic system. Several prices and some marketing channels have been liberalized; some of the remaining controlled prices are being moved closer to their import-parity levels. Significant distortions remain, however, so that many producers do not receive proper market signals. Eight agricultural products are subject to minimum prices. In early 1996, on account of the excellent harvests in the region, the government converted the minimum prices into non-binding "reference prices". The

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50 See Table 17 in Volume II (Main Report) of this Memorandum.
government has undertaken to abolish all minimum prices by July 1999.51 Another problem area is food aid: emergency food aid tends to leak into the market, and although commercial food aid is now auctioned upon arrival, it still has a depressing effect upon prices, discouraging domestic food production and the national integration of maize markets.

48. Lack of capacity of the governmental apparatus. The capacity of the government to carry out its essential functions is limited, in terms of physical facilities, budgetary resources and human resources. One of the factors contributing to the limited government efficiency is the overreaching policies of the past, which forced the government to spread itself thinly over almost every conceivable field of intervention. There is a need for a major restructuring of the Ministry of Agriculture, focusing its mission narrowly on the key functions. Another of the factors is the dearth of skilled personnel. In order to continue operating even at the current levels of efficiency, the government is drafting into the Ministry of Agriculture and sector parastatals college students still in their third or even second year; this solution does not contribute new skills to government and jeopardizes the formation of the future professionals. To overcome the lack of trained personnel, several donors have provided training programs, but, perversely, the dearth of skilled personnel in the Ministry of Agriculture has meant that a few staff are sent to these training opportunities and are seldom available in their bureaux.

D. A Vision of Mozambique’s Agricultural Development

49. The agricultural sector is recovering quickly, owing to the improvement in security conditions in rural areas, the return of the displaced populations to their traditional lands, the reduction of food aid and the liberalization of markets. Growth of agricultural GDP was 1.4 percent from 1980 to 199152; after a decline of 1 percent in 1992, owing to the drought, it grew by 19 percent in 1993, 5 percent in 199453 and 199554, and 6.2 percent in 199655. These estimates, based upon district reports, are probably understated. Data from the Early Warning Unit and other sources suggest much larger increases; for instance, cereals output increased 9 percent between 1994 and 1995, and 33 percent between 1995 and 1996.56 Marketed agricultural output from the smallholder sector increased by 18 percent between 1995 and 1996.57 During the 1995/96 season, cashew production nearly doubled to about 60,000 tons, the highest level since 1981. There are ample resources for substantial expansion in the cashew sector, using simple and known technologies, and there are no demand or market constraints but for the export

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51 The minimum price for cotton should also be eliminated. Although the existence of the statutory cotton monopolies (and, in their absence, the likely existence of natural monopolies) provides a theoretical justification for the government’s setting the cotton price, in practice the government’s efforts in price determination have had a minimal impact and it is unlikely that this means of intervention is worth the administrative effort. See Chapter 5 of the main text (viz. Volume II of this Memorandum) for the details.

52 World Development Indicators 1995, Table 2.


55 World Bank mission estimates.

56 Sources: information reported by Ministry of Agriculture/Michigan State University project, Working Paper 13, in turn from the Department of Food Security of the Ministry of Commerce, the FAO Production Yearbook, the World Food Programme database and the Early Warning Unit.

tariff on the raw product. The grain harvest, due to good rains, reached its post-war peak of 1.4 million tons during the 1995/6 season. Farmed areas per family have increased; for instance, in the district of Monapo, Nampula province, the farmed area per household increased from 2.1 ha in the 1992/3 season to 3.8 ha in the 1994/5 season. This was partly due to the return of displaced people, and partly to increases in the area farmed per adult, from 0.8 ha/adult in 1993 to 1.0 ha/adult in 1995.58

50. The benefits of the liberalization of pricing and marketing are being realized, particularly in the southern half of the country where the trading network has reestablished itself. A further cause of the recovery lies on the demand side. The quantities of food aid released on the market have fallen, the donors have shifted towards local purchases of maize rather than shipments from overseas, and commercial food aid is now being auctioned; all three factors raised the demand for local maize and drove cereal prices up.

51. These recovery-driven increases in output — given good rains — will continue for a time, possibly for another two years, as available labor and land resources are once again brought into use. Once output again attains the production possibility frontier, further growth will depend on additional horizontal expansion, on productivity improvements and on the expansion of demand.

**Horizontal expansion**

52. Horizontal expansion will arise naturally as smallholders and large-scale (“commercial”) producers exploit the agricultural frontier in the northern half of the country, and particularly in the provinces of Niassa, Cabo Delgado, Zambézia and Tete. Using a few simple assumptions, it is possible to arrive at a rough estimate of the amount of land available for expansion in the future.59 We assume that the average rural household retains in fallow four times the area of land it cultivates, so as to maintain yields without fertilizer inputs. Then we calculate, for each of the provinces, how much cultivable land is currently in use and under fallow. Cultivable land beyond this total, less the area in national parks, is likely to be claimed and put to use at some time in the future. The calculations show that there is no “extra” land available in the three southernmost provinces (Maputo, Gaza and Inhambane) or in Nampula province — that is, yields cannot be maintained by fallowing alone, and the transition to a settled agriculture has already commenced. But in the other provinces there is a total of at least 14 million hectares of good land60 which is not currently under cultivation or intended as fallow. Most of this uncultivated land is to be found in the northern provinces of Niassa, Cabo Delgado, Zambézia and Tete.

53. Even if there were no urban-rural migration, and even if the population growth rate of 3.3% were not to fall — both extreme assumptions — these 14 million hectares would be sufficient to absorb the increase in the rural population, on a shifting cultivation basis with no loss of fertility, for another 23 years. This process of horizontal expansion could be encouraged by the rehabilitation of the roads linking the major towns in the North, and would occur

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59 See Moll (1993), Table F2, p. 13.
60 That is, land subject to “no limitations” or “moderate limitations” according to the USDA classification system. See Moll (1993), p. 13.
61 *World Development Indicators 1995*, Table 25.
automatically without the government's adopting special settlement policies. Better roads in these parts would permit new farmers to settle, and enable sitting farmers to move from small plots to larger ones. In fact the growth process will be more like a patchwork quilt: some farmers will improve their productivity given their existing land, and others, particularly young farmers, will move to new land at the frontier. The process will not be smooth, and land shortages will develop in some areas, forcing farmers to gradually abandon shifting agriculture. This will be the case especially in the three southernmost provinces and in Nampula province.

54. A corollary of the above calculations is that land-saving technological improvements such as fertilizers are more likely to be adopted in the denser-populated areas of the South and Nampula. In the land-abundant North and Center, on the other hand, the introduction of fertilizers is likely to be less efficient, on the whole; in these areas certain types of pesticide and herbicide — which raise yields while reducing labor input per unit output — would have greater chances of adoption by farmers. It was shown, for instance, that cotton production by smallholders in Cabo Delgado is more efficiently done by clearing new land from time to time, than by using fertilizers to maintain fertility. 62

55. This horizontal expansion and exploitation of the agricultural frontier will compete with scenic and wildlife uses. Mozambique has enormous areas whose obvious vocation is for wildlife development. Some of these areas are already included in the national park system, but others remain where the resources available, owing to swampy conditions or to the lack of drinking water, lend themselves better to wildlife development than to cropping or livestock. This natural vocation is reinforced by geographical location. Mozambique is adjacent to one of the foremost national parks in the world (Kruger National, in the Republic of South Africa), as well as others in Zimbabwe (Gona-Rhe-Su), Swaziland, and Northern Natal. Besides its natural tourist attraction for the landlocked Gauteng population, Mozambique's location would allow for its integration into international tourist circuits. As a result, the economic benefits for the national economy of scenic and wildlife development is anticipated to be several times larger per unit of (the relevant) land than its alternative use as cropland or pasture. Benefits would include generation of foreign exchange, employment and fiscal revenue, as well as increased meat supplies for the neighboring populations. For these benefits to be realized, Government action will be needed to define property rights and put in place institutions to ensure sustainable management of these natural resources.

Productivity improvements

56. In the medium term, productivity improvements will be the main engine of growth, given appropriate public sector interventions. These improvements will arise in at least four areas: smallholder technology, large-scale farm technology, processing technology, and marketing.

57. Improving the technology and farm management skills of smallholder farmers is fundamental to increasing smallholder productivity. The key element of this improvement is the effective dissemination of new production options. An IDA-financed project with a large extension component initiated activities in 1992, in two provinces in the north (Agricultural

62 See Chapter 5 of Volume II (Main Report) of this Memorandum. Obviously the rule of thumb that land abundance militates against fertilizer adoption does not apply in every instance, since there are many other factors that go into determining efficiency and profitability.
Services Rehabilitation and Development Project). Despite the difficulties owing to the security situation in the early years of the project, a substantial contribution has been made to the improvement of productivity of small farmers.

58. Initially, smallholder output of annual food crops will be encouraged by simple labor productivity enhancements, such as seed spacing and conservation tillage, coupled with the reproduction of improved varieties of grain, legume and root crops. The research facilities have already produced some improved (open-pollinated) varieties, which have been shown to be more profitable for farmers than using local unimproved seeds. If the research effort is well funded and organized, it can be anticipated that there will be significant further improvements in productivity. These will likely arise from some combination of: drought-resistant seed varieties (particularly for the drier regions of the South), seed varieties offering better yields (particularly for parts such as Zambezia where rainfall is high and consistent), pest and disease control, and the transition from shifting to settled agriculture. The latter transition is likely to occur in the more heavily populated southernmost provinces and in Nampula, and will entail the introduction of appropriate chemical and organic fertilizers. Export crop productivity, in particular, can be enhanced by treading well-known paths. In the area of cashew, for instance, productivity will respond to improved husbandry and, in due course, to replanting with mildew-tolerant, high-yielding varieties and by increasing the availability of water. With the technology generation and transfer systems in place, the smallholders will start a (slow) process of capital accumulation which will allow them in the longer term to invest in land clearing, animal traction, on-farm storage facilities, and other capital goods.

59. In the past livestock contributed only 5 percent of the agricultural GDP. The gradual reemergence of the livestock herd will raise productivity per unit of labor, as cattle provide dung fertilizer and oxen provide more efficient traction. In the longer term, livestock accumulation is expected to play a major role in facilitating (and instrumenting) capital accumulation in the sector. This process will accelerate in time as the capacity of smallholders to save increases. This will occur initially in the tse-tse-free south and the highlands of Manica. It could be accelerated by judicious government interventions in restocking. Demand for livestock products is likely to be high (see para. 70) so that projects of this kind would earn high returns. As the population rises, a process of intensification will take over. Tree cover will recede, depriving the tse-tse of its habitat, and it will become possible to breed cattle in parts of the North as well. In this domain the government and the donor community could play an role, for instance in tse-tse control programs which have proved to be effective in East African countries. The downside of this mode of development is that the rural population will need alternative sources of energy as the tree cover recedes. There will also be increased soil erosion. This highlights the important role of the research and extension system in informing farmers about conservation approaches.

60. In the long run, the distinction between the family and commercial sectors will wither away as the increased market orientation of family farms gradually draws them into commercial production in addition to production for own-consumption. Fundamental to this process will be the development of both output and factor markets to allow smallholders adequate access to resources and inputs as well as the ability to sell their produce at market prices.

61. The large-scale ("commercial") farming sector is set to play a significant, though lesser, role in the evolution of Mozambican agriculture. Although smallholder farming has superior (lower) domestic resource cost coefficients, some lines of large-scale farming are also efficient,

on account of the low cost of land. The DRCs for large-scale farms are an estimated 0.6 for cotton (at the favorable 1995 prices), 0.2 for citrus, 0.8-1.1 for sunflower, and 0.7 for rice. Large-scale farmers are not efficient producers of maize, with a DRC of 1.1-1.2. However, when Mozambique's concessionary capital inflows decline in the future, the exchange rate will depreciate and all these DRCs will fall, and some large-scale farmers could profitably produce maize at international prices, although smallholder production will still be more efficient than large-scale production.

The large-scale sector is already providing services, such as processing (e.g. of cotton), transport and ploughing to smallholders; these interactions will intensify as smallholder output rises. The large-scale sector has expanded considerably in the past ten years through the process of privatization of the majority of the state and cooperative farms. The fact that these are now under private management will probably result in productivity improvements. The process will continue with the arrival of foreign capital and technology, and the capitalization of the existing farms. The large-scale sector is active in several irrigation schemes and could expand this activity to other irrigation schemes which are non-functional at present. High levels of investment will require a high level of tenure security. This points to the need for a conducive land regime, and clear enunciation of a private sector development policy.

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Improvements in the Productivity of Trading, Marketing and Processing

Alongside the growth of large-scale farms there will also be the development of trading firms, input supply firms, and processing firms. A major requirement will be the reform and development of the banking sector, including capacity to provide finance and to operate a payments and resource transfer system (currently in process).

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64. There is already in place a foreign investment policy.

65. The PUPI (Pequena Unidade de Produção Intensiva = Small Unit for Intensive Production) is another model. This is one of the methods used by LOMACO, a cotton joint venture company. A plot of 60 hectares or more of the company's estate land is split up into 1-ha lots, each of which is assigned to a smallholder. The company does the ploughing, fertilizing, and pesticide application using mechanical means, and the smallholder is responsible for weeding and harvesting. The smallholder's revenue is docked for his/her share of the input costs.

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65. The commercial sector is expected to be involved primarily in agricultural production. Some commercial sector operations, such as the cotton ginneries, will in addition be involved in the supply of inputs, technology and credit to other farms in the commercial sector and to the smallholder sector; and in the processing and marketing of some commodities (e.g., cotton, tea, sisal, copra), on their own account and on behalf of outgrowers.

66. Improvements in processing efficiency will be an important source of growth. In turn these improvements will be driven by privatization and the liberalization of markets. An example is the cashew processing industry. With its many new entrants following privatization there will be improvements in processing efficiency and these will be transmitted upstream through the trading system to the farmer, and could induce further increases in farm marketing.

67. Another source of productivity improvement is the trading system. Although the southern half of the country is now effectively covered by trade links, the margins of traders are still high, often in excess of 100 percent, owing to the small size of the majority of trading operations and to the thinness of the market. In time, the volume of trade will increase, the markets for transport and trade will become denser, and the margins will fall, so that farm gate prices rise, other things being equal. Public policy has a role here in providing infrastructure, particularly roads and telecommunications, so as to reduce the costs and risks of transport and facilitate entry into the business.

68. Inflows of foreign capital, particularly from South Africa, are already contributing to increases of efficiency and technology transfer in processing and trade. This process will doubtless continue, as witness the investment by South African firms in other countries such as Botswana. Foreign capital is also expected to play a leading role in developing wildlife reserves and ranches, private parks, and other tourism facilities, as well as some infrastructure on a build-and-operate; or build-operate-and-transfer basis. An explicit and conducive regime for foreign capital investments in Mozambique is required as well as reform and clarification of the land tenure law.

Expansion of demand

69. Long-term growth in the demand for food is determined essentially by population growth, income growth and the income elasticity of demand. If future population growth is 3.3 percent, per capita private consumption rises at 2.2 percent, and the income elasticity of food demand is 0.7, then food demand in Mozambique is set to rise by about 3.9 percent per annum. In fact, agricultural GDP has grown by over 6 percent per annum, on average, since the peace accords in 1992, though some of this is due to the catch-up after years of war, dislocation and unfavorable policies.

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67 World Development Indicators 1995, Table 25.
69 This is on the assumption of a constant food price.
70. The demand for livestock products will probably rise more quickly than the demand for most food products, since its income elasticity, as calculated in other less developed countries, is well above 1.⁷¹

71. Mozambique’s share of world commodity exports is low in all cases, so that demand will not be a constraint on expansion. In the case of processed cashews, Mozambique’s share is about 4 percent⁷². World demand for cashews is growing at about 7 percent per annum⁷³ so that prospects for Mozambican exports are excellent.

E. Government Policy Statements


“(a) food security;
(b) sustainable economic growth;
(c) reduction of unemployment rates; and
(d) reduction of poverty levels.”

73. From these overall economic objectives stemmed the government’s objectives for agricultural development (loc. cit.):

“The transformation of subsistence agriculture into an agriculture increasingly integrated into the functions of production, distribution and processing, such as to lead to:
— the development of a self-sufficient family sector which contributes a surplus to the market;
— the development of an efficient commercial sector which participates in rural development.”

74. In order to attain these agricultural objectives, four fundamental principles were to be followed (República de Moçambique, 1995, p. 12):

“(i) Sustainable use of natural resources ... based on the education and involvement of the rural population in the management and sustainable use of natural resources ...

“(ii) The expansion of the capacity of production and agricultural productivity, based on the development of the family sector and the promotion of private and public investment. The development of agriculture and the achievement of food self-sufficiency depends fundamentally on the full involvement of the rural population in the search for local solutions which can result in an increase in production capacity and productivity and above all, the creation of self-employment.

⁷¹ von Braun et al. (1991), p. 66. See also the elasticities for milk of 1.0 in Pakistan, and those for beef of 2.8 and more in Nigeria in the 1960s, Tsakok (1990), p. 255f.
“(iii) Balanced institutional development, including the development of human resources, as well as training and incentives. In this context, the Agricultural Policy promotes the rehabilitation and development of agricultural schools ... and training centers for farmers which can increase self-employment and the establishment of centers for the demonstration of good agricultural practices in the rural context.

“(iv) The recognition of the fundamental role of women in agricultural activity and in particular in integrated rural development. Women exercise a fundamental role in education and extension, and as a direct agent in development. It is in this context that the Agricultural Policy prioritizes the participation of women in programs of professional training, rural extension and specific projects in the activities of production and marketing.”

75. The objectives and the four principles are strongly supported by the analysis contained in this document. At several points, however, the Government’s statement fails to give an indication of the principle used for distinguishing between government actions and the actions of the private sector. Actions are recommended without specifying who will accomplish them. The well-known concepts of externalities and of public goods are not used to make these distinctions.

76. The government document strongly emphasizes extension, which is named as “the principal operational instrument of the Agricultural Policy” (p. 28). This is a strongly positive element in the document because extension services are a public good and have been shown in other contexts to have a high rate of return. Even here, however, the issue of a mixed public and private role in the provision of the service is not mentioned.

77. In what follows, the government’s own statements of objectives will be used as a point of departure for developing an agricultural strategy, and an attempt will be made to use standard economic concepts in order to more clearly discern the specific role of government in an agricultural development strategy. These standard concepts include externalities, nonexcludability, market failure and public goods.74

F. An Agricultural Development Strategy for Government

78. In the light of the major findings of this Memorandum, it appears that a sound agricultural development strategy for the government would have three characteristics. (a) It would be based on the expansion and deepening of rural factor and input markets, bringing underutilized land and labor into production, facilitating the mobilization of new capital, introducing new technology into the agricultural sector, and raising productivity. It would not be based on the expansion of government controls or spending. (b) The process would be led by smallholders as opposed to large-scale farmers or multinationals. (c) It would be driven by an appropriate regulatory framework, market-based incentive signals and infrastructure investments.

79. This overall perspective will be dealt with in more detail below. We start with the basic principles of government intervention in the economic process, before proceeding to discuss four areas of intervention in turn: the incentive framework, rural infrastructure, public services and regulation.

74 See paragraph 84 for further explanation of these concepts.
(a) **Principles of Government intervention**

80. It is essential to try to identify a few principles for Government intervention in order to help with the task of prioritization. There are literally hundreds of things that any government could do, but the available finance and high-level skills cannot cover more than a tiny fraction of these. A judicious choice needs to be made from the long list of proposed actions in the Government's "Agricultural Policy and Strategy for Implementation" (1995). Many ways could be found to sift through the multitude of possible proposals. One way is to select actions, policies or projects on the basis of their *rate of return*. Another is to try to identify the most important *constraints* on economic activity, and to see whether government intervention can alleviate these. A third approach — and the one favored here, for reasons given below — is to have the government intervene only, or primarily, in areas in which there is an obvious *market failure* which is susceptible of correction. In fact, these three approaches would arrive at similar rankings of the importance of different policies and projects, because any market failure is simultaneously a constraint on the activity of private actors, and lifting such constraints is likely to be a high-return intervention. Whereas having the government invest in activities in which the private sector unaided would itself engage, and where there are no obvious constraints or market failures, is likely to produce low returns because the government would merely be "crowding out" the private sector.

81. The principle followed here for distinguishing between the roles of government and of the private sector is that the government should intervene only in areas in which there is an obvious market failure. Market failures can arise from a number of different sources: positive or negative external effects of an economic agent upon other agents (e.g. air pollution, agronomic research, livestock disease); the inability to exclude individuals from the benefits conferred by a good or service (e.g. military defense, landmine removal, extension advice); the inability of agents to charge fees for goods or services (e.g. city roads); natural monopolies (e.g. the electricity grid); asymmetries of information (e.g. potentially dangerous agro-chemicals — see §115). One of the most notable market failures in poor societies is the inability of the state to enforce loan contracts; this compels banks to require collateral, which poor people cannot provide.

82. In all of these cases, the market left to itself would generate suboptimal outcomes, for instance underinvestment in research and infrastructure, a lack of extension advice, insufficient landmine removal, a dearth of good quality roads, an excess of livestock disease, or an inordinate amount of injury from agro-chemicals. Poor people typically underinvest in education, because even if their enhanced earnings after the investment would pay for the tuition, they are unable to present the collateral in order to get loans. In these cases, there is a rationale for some kind of government intervention. Depending on the specific case, this intervention might take the form of legislative enforcement, incentives, taxes, government provision or government operation.

83. Since the government's resources are limited, these are best concentrated in domains where the government has a comparative advantage, and these are generally to be found in appropriate interventions in clearly-defined instances of market failure. In markets which are competitive or at least contestable, the private sector is usually a more efficient provider of goods and services. In less developed economies, where the government's resources are limited and where high-level human capital is in short supply, it is usually counterproductive to have government involved in the production and marketing of private goods. Apart from its low efficiency in so doing, this also has the undesirable effect of diluting the high-level human capital available for the central "governing" work of government. There is no reason, however,
why the private sector could not, under contract to Government, be brought in to produce public goods.

84. One way of summarizing these ideas is to say that the government should be active in the area of broadly defined "public goods". These are physical and institutional goods which are necessary for a well functioning economy but which the private sector does not typically produce in optimal amounts owing to one or other market failure.

85. From the large palette of actions which need to be taken, four stand out as priorities on account of their strategic importance for the sector and because they lay the groundwork for further developments in the future. Two are outside the agricultural sector and two are within it. The first is to ensure that the rate of inflation continues to fall. Rural financial markets will not develop without this step and foreign investment will be discouraged if the macroeconomic instability of 1990-5 returns. The second is to continue the projects for improving the road system, and to extend these further in the direction of feeder roads, culverts in rural areas, and farm to market tracks. This will pave the way for improvements in the efficiency of trading and transport, and in due course enable larger increases in supply. The third is to continue to reduce the tax on exports of raw cashew nuts. With lower taxes, supply will rise faster and there will be favorable effects in terms of rural demand for consumer goods. The fourth priority is to improve the land legislation, regulations and administration so as to guarantee security of tenure to smallholders and large-scale farmers. Without this improvement, investment could be held back and land conflicts may increase.

86. The timing of these actions is crucial, otherwise the value of many costly investments could be lost. Macroeconomic stability is an ongoing priority; and the legislative and regulatory changes required for security of tenure of smallholders and large-scale farmers could be effected within two years. With respect to the tax on the export of raw cashews, a study currently underway may provide insights on the optimal timing for cashew tax reform. Rehabilitation of the road system is under way, but the program needs to be extended in respect of feeder roads, culverts and market tracks; these improvements should logically accompany or precede the revamping of the agricultural extension service, so that the increased output can be marketed efficiently.

(b) The incentive framework

87. The first order of business for government in the effort to achieve agricultural expansion is to create an enabling environment in which the private sector — that is, smallholders, large-scale farmers, traders, processors and bankers — will face market-determined economic incentives, so that the market acts as the main engine of growth. Attention should be paid to macroeconomic and fiscal policy; internal and external trade; the development of markets; export crops; food aid; special incentives and subsidies; direct government involvement in production; and land tenure.

88. Macroeconomic policy: In the area of macroeconomic policy, it is essential that the progress attained in reducing inflation during 1996 be maintained. Without this, farmers will not have access to financial markets. While this is a matter of concern for all farming sectors, it is of especial importance for the "emergent" farmer group, viz. the ex-peasant farmer who has titled land, some machinery and a few non-family employees; the effective real interest rates this
group faced during 1995 were over 100 percent. It is also essential that the government’s present commitment to a market-determined exchange rate be maintained. On the fiscal side, the sales tax (“circulation tax”) should be abolished in rural areas because it has a cascading effect which raises the costs of and reduces the amount of trade. For the sake of the financing of local institutions, it could be replaced by a properly enforced land tax. The government plans to replace the imposto de circulação with a value added tax in 1999.

89. External and internal trade: To minimize market distortions for a given revenue take, the tariff regime should be simple (with as few variations in rates as possible) and non-discretionary. The government has already made great strides with trade liberalization. As part of the Third Economic Recovery Credit (1996), the number of bands for customs duties were reduced from 12 to 5, with essential goods such as medicines paying no duty, and consumption items paying 35 percent, with other categories in between. The scope for discretion on the part of customs officials was also greatly reduced.

90. With respect to internal trade, there are still a number of bureaucratic obstacles to registration for wholesalers and retailers in agricultural factor and product markets, and in consumer markets. Some of these barriers to entry are due to the law itself (e.g. the requirements for bank accounts of a certain size, and police clearance) and can readily be altered. Others are due to misinterpretation of the law by minor officials (e.g. the requirement for the sexta classe), and would need public restatement of the rules as well as prosecution of officials who exceed them. It is likely that women will be among the chief beneficiaries of this legal clarification, since in Mozambique there is already a phenomenon of “market women” who deal particularly in food crop marketing.

91. Development of markets: The best way to ensure efficient incentives for agricultural production is for the government to abstain from its traditional interventions in pricing and marketing. Efforts at pan-territorial pricing, whether by AGRICOM or its successor, ICM (Cereals Institute of Mozambique), have virtually always had counterproductive effects upon smallholders. Presently the ICM, due to lack of funding, is incapable of carrying out its mandate

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75 This is because small businesses borrowing from the banks have to pay their interest in full in advance.
76 The Government proposed, during the negotiations of the Third Economic Recovery Credit, to apply a seasonal tariff to five agricultural products (maize, rice, beans, groundnuts and sugar). The intention, presumably, was to have a high tariff during the harvest season and a low tariff in the “hungry” season. This would cut off imports and protect producers during the harvest season and help consumers during the “hungry” season. There are several objections to this arrangement. (i) The repeated changes in the tariff, and the dates selected for so doing, would become the object of speculation and would provide scope for patronage. (ii) This rough attempt at price stabilization would rob farmers and wholesalers of the incentives for inter-seasonal storage. The market would itself develop a certain degree of price stabilization — particularly if the government helps with on-farm storage technologies through the research and extension system — and the government is unlikely, through blunt tariff instruments, to be able to improve on private market outcomes. (iii) High tariffs are harmful to welfare as a whole because there are “deadweight losses” involved in the process of redistributing from consumers to producers. (iv) There is no obvious reason why the producers “need” a high tariff. If the problem is dumping, then this would best be addressed using the methods of the World Trade Organization, which would require an objective definition of “dumping” and would issue in a ban on imports from the relevant country. If the problem is long-term, permanent protection in neighboring countries, then no tariff is called for because it would not improve on the free trade outcome — the tariff would merely redistribute from consumers to producers and entail unnecessary deadweight costs. See also the discussion on tariffs in Chapter 4 of the main text (Volume II of this Memorandum).
of price support and is acting as a wholesaler. Its operating efficiency as a wholesaler would likely improve if it were privatized, as the organization would then have a profit motive. Accordingly its warehouse network of 120,000 tons could be privatized without delay. The government is already considering restructuring it.

92. A prerequisite for the development of domestic markets and the growth of domestic production to satisfy domestic demand is the re-establishment of a system of domestic trade which provides the physical and economic linkages between rural producers and urban consumers. As pointed out earlier, a new network has gradually extended itself over the southern half of the country. As demand continues to rise in the future, and provided the road system is rehabilitated, the network will spread over the northern half of the country within the next three years. To achieve this, it will be sufficient for the government to reduce the registration requirements of traders; no special government interventions in the form of special loans for traders would be necessary.

93. The development and the dissemination of improved farm level crop storage technologies, and the privatization of large, urban storage facilities, will be important as the government withdrawal from pan-territorial pricing causes greater price fluctuations at the farm gate. Improved on-farm storage will enable smallholders to both cope with, and take advantage of, these fluctuations in ways that will not only benefit them, but will reduce the need to develop off-farm storage capacity.

94. Export crops: Two sectors deserve special mention with respect to production and market incentives: cashew and cotton. Concerning cashew, the main challenge is to reduce further the export tax on the raw product. Studies have shown that it is possible for the processors to improve their efficiency so that they can compete on the world market without protection. There is vigorous competition for the raw cashew market among petty traders, large-scale traders and processors in rural areas of Nampula and Gaza, and there is already evidence that the export tariff reduction has had an impact on prices at the farm gate. The tariff reduction will benefit women disproportionately, since it is they who do most of the work in collecting cashew nuts.

95. Concerning cotton, there do not yet exist rural cooperative institutions which can provide credit to cotton smallholders. Unlike food crops, for which purchased inputs are not an absolute requirement, the profits from cotton are low without pesticides. The smallholders do not yet have the savings necessary for these purchases. Currently their only source of credit is the ginneries, several of which are joint-venture companies. The ginneries feel that they cannot enforce repayment of their loans unless they have the sole right to purchase cotton in their areas of operation. The government’s task in this domain is to encourage the development of cooperative and other forms of credit with a view to the ultimate scrapping of the cotton monopsonies. If the efforts to promote rural financial markets are appropriately focused, they could be of especial assistance to rural women.

96. Food aid: Another aspect of the incentive framework concerns the effects of food aid. The humanitarian need for food aid in the early 1990s was inescapable — it prevented mass starvation and the death of probably millions. It has since become an obstacle to the development of a market-oriented smallholder sector. The leakage of emergency food aid into the market, and the importation of commercial food aid (albeit auctioned at arrival) tend to undercut both production for the market by smallholders, and the development of rural-urban market links. While a certain amount of food aid is still necessary at present, given the gap
between national need and production, phasing it out in the near future is a prerequisite for development of existing national potential.

97. As Mozambique reduces its reliance on external sources of food, the government is working on the definition of a new food security policy. In the light of the discussion in this Memorandum, it appears that the policy ought to define the criteria for short term food security interventions at the national, provincial, district, and household levels, at times of a shortfall in supply. It should specify the relative roles of the Government, donors, NGOs and other actors in the field.

98. Special incentives and subsidies: From the set of principles outlined above there follow far-reaching conclusions about other sorts of government interventions such as subsidies. If private entrepreneurs, responding to market signals, are capable of operating and growing within this enabling environment, there is no need to provide them with subsidies except in two cases: when there is a clearly defined market failure which needs correction (and if alternative remedies such as taxes or prohibitions are judged unsuitable) or when there are distributional grounds (e.g. to ward off starvation, to alleviate the effects of poverty, to help women to obtain economic independence).

99. In the case of smallholders there may be distributional grounds in specific cases for subsidies. For instance, a rural investment fund (RIF) could be introduced, along the Zambian model, providing matching grants for local communities to build infrastructure. In view of the expected expansion of demand for livestock and dairy products, and the current inability of smallholders to borrow, the government could consider some form of restocking arrangement focused on building up smallholder herds. This might occur, for instance, in the context of a dairy program organized by a private sector processing company. Subsidies of this kind should be limited in time and have precise objectives. The prime task of the government with respect to the smallholder sector is to compensate for certain market failures which affect the smallholder sector especially seriously, and in particular the lack of smallholder-focused research and the lack of information and extension assistance.

100. Direct government production: Government involvement in agricultural production has decreased as nearly all the state farms have been sold. The few remaining state farms should be divested through sale, management contract, management employee buyout or other arrangements. Farms required for research or biodiversity conservation should be retained in public ownership, with proper arrangements made for their operation and management. The government has all but terminated its involvement in commodity processing and marketing, with the sale of the state cashew processor, among other properties.

101. There remain the joint venture companies such as the cotton producers/ginneries, in which the state has a 50 percent share. There is no market failure which demands the state’s involvement in ginning. The involvement of Government in the firms’ decision-making adds an inessential layer of bureaucracy and may induce managerial slack to the extent that the firms are protected from the risk of failure. Consequently it would be better not to contemplate any new joint ventures. Divestiture of the government’s share in the existing joint ventures should be discussed in tandem with the phasing-out of the monopsony arrangements in cotton (see §§ 95, 133).

77 Often multinational firms favor the joint venture concept because it provides them with security against arbitrary government actions. But then it would be optimal for the government to improve its economic policy-making so as to avoid interference and haphazard rule-setting.
102. **Land tenure**: The Land Law No. 6 of 1979 appears to be incompatible with security of tenure for smallholders and for the large-scale sector. The law also prevents the functioning of a land market and inhibits the use of mortgages. The government has undertaken to revise the land law and, in 1995, appointed an Inter-Ministerial Land Commission with a full-time secretariat to undertake the task of drafting a new law and regulations. The draft legislation of September 1996 makes certain improvements in the smallholder sector without providing sufficient guarantees of security, and it is not clear whether it would permit the functioning of a market in government-awarded concessions, so as to enable land mortgages. What is needed still is a mechanism to prevent outside land developers (farmers, tourist operators, etc.) from moving smallholders off land which the latter have acquired by customary tenure. One approach, suggested by the government's National Land Policy document of September 1995, is to require that outside developers negotiate with the occupants of the land, permitting the latter the right of veto; and to back this up with permission for the occupants to receive legal compensation, either in cash or in kind, from the would-be investor. In order to guarantee tenure security to small and large farmers, it will be necessary to introduce legislative changes, to adjust the accompanying regulations, and improve the implementation capacity of the government institutions dealing with land.

(c) **Rural transport and communication infrastructure**

103. In Mozambique the needs for rural infrastructure are enormous, and as has been stressed in this Memorandum, roads are a primary driving force in the process of agricultural expansion. Research in other countries indicates elasticities of agricultural output with respect to road investments of as high as 20 percent, and the returns to rehabilitation and maintenance of existing road systems are higher still. To prepare for a take-off in marketing it is essential to continue with the rehabilitation of the existing feeder roads, as the Second Roads and Coastal Shipping Project is doing, and to build more culverts and farm to market tracks. In order to link up the northern and southern halves of the country the major trunk roads — currently in fairly good repair — will need constant maintenance.

104. One way of addressing the problem of infrastructure is through a rural investment fund (RIF) of the kind that was started in Zambia in 1996. Local communities would apply to the fund for matching grants for specific purposes, typically farm to market tracks, culverts or other items of social infrastructure. The justification for the subsidy is that these items of infrastructure would not ordinarily be undertaken by private agents. It may be more efficient to permit decision-making at the community rather than the ministerial or provincial level, as local communities would be best equipped to evaluate the benefits arising from competing infrastructural investments. For instance, some communities might prefer dams over tracks or culverts, and this possibility should be allowed for in the design of the rural investment fund.

105. One of the main contributions of the strategy of agriculture to the roads program will be to direct the investment program to those areas where agricultural development is most sustainable and appropriate. Research in other countries shows that farmers are highly responsive to land quality, that is, roads built in areas of high land quality (in terms of soil chemical composition, rainfall, inclination, etc.) attract farm settlement. On the other hand, roads built in areas with poor quality land are likely to have low economic/agricultural returns,
while causing habitat fragmentation, threatening the viability of some populations.\footnote{Chomitz and Gray (1996) investigate the relationships between soil quality, deforestation, market access, tenure status, and road building in the case of Belize. They point out that in some parts of Belize, road building would be a “lose-lose” proposition, causing habitat fragmentation and providing low economic returns.} It was pointed out that Nampula is infrastructurally under-served, given its agricultural output, compared with the other provinces\footnote{Part of the reason Nampula has fewer roads per cultivated hectares is that certain key trunk roads linking it to Zambézia province have not yet been rehabilitated. But even when these roads are rehabilitated, Nampula will still be under-served compared to the other provinces, in the sense of having a higher ratio of cultivated area (and output) to road length.}; so that one of the priorities, within the existing road rehabilitation program, ought to be to concentrate rehabilitation and maintenance works on rural areas in that province. Associated with the road investment program, there should be a process of zoning in order to ensure the protection of parks, forest and wildlife areas.

106. Part of the process of improving the country’s infrastructure is the demining program. This Memorandum has stressed that the remaining landmines will pose enormous costs in human suffering and are an important constraint on agricultural growth (§41). It is essential that the UNDP/DHA Accelerated Demining Program continue and complete its work.

107. Coastal shipping has been privatized and there is now more vigorous competition in this area. Communications and particularly the telephone system need to be extended to rural areas.

\textit{(d) Public services: research and extension}

108. Certain agriculture-related services are not provided in sufficient volume by private agents responding to private incentives. Research — at least for certain goods produced by smallholders — is a case in point. Private agents will not, for instance, do sufficient research on smallholder maize, because they will not be able to charge fees to the many users of their findings. On the other hand, hybrid maize varieties are routinely produced by major multinational firms and the market functions because the cultivars themselves are sold every season and cannot be reproduced. Similarly, private producers of agricultural hardware have an incentive to do research and produce better tools and machines, because their inventions are embodied in the objects that they sell; and they frequently provide technical advice to farmers as a means of marketing their goods. In these domains there is no need for government involvement other than for a regulatory function (see below). In sum, the government ought to play a major role in providing certain kinds of smallholder-oriented research. This does not imply that the government necessarily has to execute these projects. Some of them can be done in conjunction with the national university; others could be contracted out to private agents. Areas essential for government intervention include composite (or open-pollinated) grain crops, vegetatively propagated root crops, cassava, yams, potatoes, pulses (e.g. cowpeas), agronomic practices and national resource conservation.

109. In order to effect long run technological change in the smallholder sector, an effective national research and extension system is essential. The system should be capable of doing adaptive research and variety testing on cultivars brought in from abroad. The current status of both the research and the extension systems is weak, as are the linkages between them. Experience of other countries in Africa and elsewhere demonstrates that the returns to investments in these areas are high, both in the short run (by “borrowing” and “verifying”
technology) and in the long run (through applied research). Accordingly, research and extension merit attention, so that the basis for achieving these gains can be established.

110. Concerning research, the Government’s strategy is outlined in the “Política Agrária e Estratégia de Implementação”. Strengthening of the national university is a prerequisite to adequately staffing the national agricultural research institutes. Training and retention of faculty and students are the most important factors here, as the current low levels of pay and training result in a high attrition rate. It is important, however, not to force development of the university system at the expense of the primary and secondary levels, since these levels provide the “raw material” for the university and provide target populations in rural areas and elsewhere with the education necessary to make full use of research and extension messages directed to them.

111. Strengthening the national research institutes, INIA in particular, is key, and the Government’s strategy is appropriately focused on applied research in important staple crops. Screening and selection of existing varieties for local adaptation is a good tactic when coupled with on-farm trials and a good linkage with the extension system. Short season varieties of maize to reduce susceptibility to drought are important as are varieties with good storage characteristics and disease resistance. Similarly, there are strong reasons for emphasis on agronomic practices and soil and water conservation.

112. Development of the extension system to assist the smallholder sector will be important, as will the use of this system to provide feedback from the farm level to the research system. Strengthening these two-way linkages will be critical to maximizing the return to investment in the extension system. The government ought also to play a role in the provision of veterinary services in rangeland areas of difficult access, and the production or reproduction of basic genetic materials. The extension role could also encompass information about new technologies incorporating the use of fertilizers, focused upon the relative land-scarce areas in the South and in Nampula. This should be done as a complement and supplement to the actions of NGOs and the private sector, and not as a single, exclusive provider. Other challenges include ensuring adequate financing and adequate trained personnel.

(e) Regulation

113. The classic role of government is to regulate the “rules of the game” and to seek ways of internalizing important positive and negative externalities. In the context of Mozambican agriculture, these areas of regulation include technology transfer, the use of dangerous chemicals, natural resource management, and zoning.

114. Technology development and transfer: The rules and procedures for importing new technologies need to be defined, particularly when the technologies are embodied in seeds or animals. This will raise, in turn, the issue of patents and royalties for trademarked genetic materials. Development of the national research and extension system will be important areas for government involvement.

115. The use of dangerous chemicals: The rules for the use of chemicals dangerous to workers and/or harmful to the environment need to be defined. The reason is that workers often lack information about the chemicals (e.g. pesticides) that they are required to handle. In the Philippines, for instance, it has been shown that the benefits of agro-chemicals were outweighed
by the adverse health effects on the workers who handled them. It is the asymmetry of information that justifies some measure of state intervention. With respect to environmental harm, there may be external effects, for instance chemical wastes which are passed downstream after rains. The good done by regulation can, however, be more than undone by activist policies such as subsidies which encourage inefficient over-use of, for instance, pesticides.

116. **Natural resource management:** For the conservation of the country's natural resource base, the role of Government is unique. Even though the private sector, under clear rules and effective enforcement, can play a major role in this area, the lead, definition, and control must remain in public hands. Government should be the formulator and enforcer of policy, and the coordinator of foreign/donor aid and investments, but not necessarily the owner, developer, and/or manager of national parks and game reserves. Normally the policies for private sector intervention in this sector will be the same as for the rest of the economy.

117. If the aim of exploiting scenic and wildlife resources is to be achieved, it will be necessary to develop methodologies for involving local populations in joint management of multi-use lands, so that wildlife (centered in the lands that lend themselves for their growth) and crops and livestock (which will normally surround the reserved lands) merge harmoniously. By giving the local populations a stake and a role in wildlife development, such a strategy not only contributes to making wildlife development sustainable but also generates benefits for the local population (similar to the CAMPFIRE approach successfully tested and introduced in Zimbabwe.)

(f) **Public services: health, education, water**

118. Effective public services in health, education and water supply are essential for rural development. Health services are needed for their own sake as well as for the improvements in labor productivity that they can bring. It has been stressed in this Memorandum that the technological change that will undergird future agricultural productivity growth is crucially dependent on the expansion of primary schooling education.

119. Access to clean water directly improves the quality of life of rural dwellers, but it also improves their health status, which raises their productivity. To this end, the National Water Resources Development Program, partly funded by IDA, has a rural water and sanitation component which aims to develop sustainable, demand-driven water supply management systems in rural towns.

(g) **The Public Investment Program**

120. Investment in agriculture in 1992 was $62 million and has fallen steadily since. In 1995, public investment in agriculture totaled some $26 million, which corresponds to 10 percent of the total Government expenditures, and less than one-half of investment in the social sectors ($57 million) and one-fifth that in infrastructure ($128 million). The share of agriculture

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80 Pingali and Marquez (1994), and Antle and Pingali (1994).
81 This work is also supported by the Transborder National Parks project with funding from the GEF.
spending in the budget is scheduled to fall to 8 percent in 1996, 7 percent in 1997 and 6 percent in 1998.\(^2\)

121. The government’s investment program, the Programa Trienal de Investimento Público (PTIP), ought to respond to the agenda outlined above. Concerning the distribution of investments within the agriculture portfolio, however, the largest claimant of investment funds was irrigation (26 percent), followed by extension (21 percent), food crops (16 percent), and capacity building (13 percent). Research received only 6.5 percent of the total. It was argued in this Memorandum that the emphasis on irrigation is overdone, given the fact that the Government’s pro-smallholder policy is centered on labor-intensive and rain-fed smallholder agriculture, whereas large-perimeter irrigation is capital-intensive, and less than 40 percent of the area equipped for irrigation is actually in use. The emphasis on extension is appropriate, given its expected high returns. Furthermore, the money allocated to research is inadequate in the light of the importance of this function for technical change. More in line with the strategy outlined above would be an increase in research and extension investment and a decrease in irrigation investment.

(h) The Roles of IDA, other International Agencies, Donors, and NGOs

122. IDA has been a major supporter of the Government’s Economic and Social Rehabilitation Program, and of its agriculture, rural development, and environment protection policies and initiatives. Currently, IDA is financing the Agricultural Services Rehabilitation and Development Project in the Northern regions, and the Rural Rehabilitation Project, centered mostly in the Center-North areas. The former supports the development of specific crops, particularly cotton, and includes support to the extension service and land reconnaissance and titling. The latter supports the rehabilitation of small-scale local infrastructure and the financing of local projects. A GEF-funded Transborder National Parks project has been approved, which will support the rehabilitation of some of the national parks and game reserves, severely destroyed by the war or their ensuing abandonment, and the establishment of compatible rules of operation to permit the eventual operational linkage of current and new parks in Mozambique with those in neighboring countries.

123. The current lending program includes an Environmental Support project, to assist the implementation of the National Environmental Action Plan formulated by the Government, with IDA support.

124. IDA was the executing agency for the nation-wide IFAD-funded Second Agricultural Rehabilitation Project (SRS-008-MOZ), which aimed at providing smallholder farmers and artisanal fishermen with inputs and means of production, and at helping the Government to integrate the provision of these inputs with improved extension services. At the request of the Government, the project was redesigned in 1989 to strengthen and integrate agricultural services in various sub-sectors (food crops, livestock, agroforestry, and other crops), and to provide tools and quality seeds. As originally conceived, the project was to be nation-wide, but due to implementation constraints it covered only six provinces (Maputo, Gaza, Inhambane, Manica, Nampula and Cabo Delgado). The project ended in January 1996.

125. A new IFAD-funded project is now under way in Niassa province. The objectives of the project are to improve employment, incomes and food security of the rural population. The project aims to (i) rehabilitate and develop the basic rural infrastructure; (ii) organize effective agricultural services, including extension and adaptive research; and (ii) strengthen institutional capacity for decentralized rural development and project implementation. The latter component includes tertiary roads and the major link to Nampula province.

126. Many bilateral and multilateral aid agencies operate in the agricultural and environment sectors in Mozambique. Due to a lack of coordination, their efforts are fragmented. Multiple donors fund multiple projects each, leading to a plethora of small projects, each calling for local managers, special procurement and accounting procedures, and the like.

127. There has been a recent move towards a more integrated approach to development support. There are two outstanding examples of this. The first is the Priority District Program (PDP). In 1989, the Government adopted the Priority District Program to re-establish the economic, social and administrative infrastructure of areas selected for their importance in terms of population and economic potential. The objective of the PDP was to rehabilitate the local transport network and essential social (education, health, water supply) and agricultural services in forty priority districts over a five-year period. The priority districts were selected largely on the basis of their agricultural potential. The emphasis of the PDP was on the restoration of smallholders’ production and the creation of labor-intensive public works to provide employment and incomes. Another essential aspect of the PDP, in line with Government’s decentralization strategy, was the strengthening of local governments in the planning, implementation and financing of economic and social development. The program was coordinated by the National Rural Development Institute (INDER) and was supported by most donors including IDA (Rural Rehabilitation Project, see para. 122). It was an ambitious program, but was one of critical importance for Government strategy for influencing medium and long-term regional development patterns.

128. The other example of an integrated approach is the Pre-Program, which was originally conceived of as a preliminary phase to eventually lead into a full-fledged integrated program of intervention on the agricultural sector. Originally developed by the Vice-Minister of Agriculture and led by the UNDP and the FAO, it soon attracted the support of IDA (several activities originally conceived as a part of the Rural Rehabilitation project were transferred to the Pre-Program) and other donors. As anticipated, the Pre-Program proved too large and complex for the limited implementation capabilities in the Government. Instead of being just a preliminary phase of something larger, it became in itself a full-fledged endeavor, which has demonstrated the advantages, and some of the challenges as well, of a jointly conceived, coordinated multi-donor effort in a country like Mozambique.

129. During 1995 and 1996 intense preparations began for the inauguration of a broad, integrated approach to development support, called the PROAGRI. Practically all the donors were involved, IDA accepting the role of donor of last resort and the FAO taking the function of coordinator on the side of the bilateral and multilateral institutions. The government took strong ownership of the concept from its inception. Plans for all the agricultural subsectors were developed, together with budgets. Institutional arrangements were given particular attention in a series of papers and high-level seminars. Appraisal is envisaged for 1997 and effectiveness for 1998.

130. NGOs have played a major role in providing support to community organization, input supply, technology transfer, and humanitarian aid. They have also played a significant role in
supporting the development of small-scale projects and micro-enterprises; in protecting Mozambique’s biodiversity; and in capacity building at the Government and university levels. They are expected to retain and intensify their role in these areas, particularly under the IDA-supported Rural Rehabilitation project, the GEF-funded Transborder National Parks project, and their eventual successors.

(i) Timing of operations and a short-term action plan

131. It was stressed in the discussion above that there are four major priorities which the government could stress in its agricultural growth strategy. The first would be to reinforce macroeconomic stability. This is a precondition for the development of rural financial markets and significant increases in foreign investment. The second would be to pursue the present objectives with respect to upgrading the road system, and to extend further the efforts in respect of feeder roads, rural culverts, and farm to market tracks, possibly by means of a matching-grant Rural Investment Fund (RIF). These undertakings would reduce transport costs and help more smallholders to market a portion of their output. Through the second Roads and Coastal Shipping Project, these actions are already under way and are bearing fruit. Further extensions of the roads projects for the next ten years at least would be appropriate. The third leg of the strategy would be to continue the gradual reduction of the tax on exports of raw cashew nuts. The fourth priority would be to improve the land legislation, regulations and administration so as to guarantee security of tenure to smallholders and large-scale farmers.

132. Another short-term objective, in the area of trade, is to remove the bureaucratic obstacles to registration for wholesalers and retailers. This can be done within a few months.

133. Medium-term interventions include the following.

- In the area of incentives, the government plans to eliminate all minimum pricing arrangements by July 1999. The Instituto de Cereais de Moçambique should be privatized. Development and dissemination of on-farm crop storage technologies is an important medium-term task for the research and extension agencies. A five-year crop storage program could be envisaged.

- Food aid needs to be phased out. Even without the government’s urgings, the donors may well withdraw all of their support in this area within another two years. In the interests of short-term food security, a unit could be created to obtain and disseminate long-lead climate forecasts, and the efficiency of the port system could be improved.

- In the area of institution-building, the encouragement of the growth of rural financial institutions is an area where the government has a role as a facilitator. This is of particular importance in the smallholder cotton-growing areas, where the growth of smallholder-managed institutions is necessary for the withdrawal of the cotton-purchasing monopsonies held by the ginneries. These new financial institutions would take between five and ten years to work effectively.

- The government could consider selling off its 50 percent holdings in the cotton joint venture companies.

\[^{83}\] Only 29 percent of all smallholders market any of their output at present. See Ministério da Agricultura e Pescas (1994), as quoted by Desai (1996), Appendix Table IX.
The research and extension services should be upgraded. As far as regulation is concerned, the rules and procedures for importing new technologies need to be defined. Methodologies for involving local populations in joint management of wildlife and scenic resources need to be developed and implemented.
### Timing of operations: matrix

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<thead>
<tr>
<th>Year</th>
<th>1997</th>
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<td>III</td>
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<tr>
<td><strong>Priority Areas</strong></td>
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<tr>
<td>Reinforce macroeconomic stability</td>
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<td>Rehabilitating feeder road system</td>
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<td>Reducing tax on raw cashew exports</td>
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<td>Security of tenure for farmers</td>
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<td><strong>Other Short-Term Objectives</strong></td>
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<tr>
<td>Ease registration for traders</td>
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<tr>
<td><strong>Medium-Term Interventions</strong></td>
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<td>Incentive Framework</td>
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<tr>
<td>Eliminate minimum prices</td>
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<td>Privatize Instituto de Cereais de Moçambique</td>
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<td>Develop crop storage technologies</td>
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<td>Phase out food aid</td>
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<td>Disseminate long lead climate forecasts</td>
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<td>Improve efficiency of ports</td>
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<td>Institution-Building</td>
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<td>Facilitate smallholder financial institutions</td>
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<td>Withdraw JVC cotton monopolies</td>
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<td>Sell government holding in JVCs</td>
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<td><strong>Public Services</strong></td>
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<tr>
<td>Upgrade research and extension services</td>
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<td>Develop methodologies for wildlife mgt.</td>
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