Jacques Duval

The Challenge of Agricultural Development

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The Sir John Crawford Memorial Lecture has been sponsored by the Australian government since 1985 in honor of the distinguished Australian civil servant, educator and agriculturalist who was one of the founders of the Consultative Group on International Agricultural Research (CGIAR). Crawford (1910-84) was also the first chairman of the CGIAR's Technical Advisory Committee.
The Challenge of Agricultural Development in Africa

Jacques Diouf

It is certainly a great honor for me to come back, years later, to the family of dedicated men and women of the CGIAR, and to address a distinguished gathering of prominent scientists and administrators. Beyond the importance of issues we will discuss today, it is not without emotion that I take this opportunity to pay tribute to the late Sir John Crawford. I met Sir John in 1972, one year after WARDA (West Africa Rice Development Association) was launched, to seek support for that fledging project. As a man of vision, he discerned immediately, beyond the scientific shortcomings of a nascent organization, the great potential of an institution that would seek to foster cooperation among several African states. Even more, he felt the moral obligation to put the weight of his influence behind securing the financial and scientific backing for the WARDA initiative in countries which the CGIAR stood to help.

Almost 20 years later, SPAAR (Special Program for African Agricultural Research), responding to the depth of deterioration in African agriculture, is also seeking to dig in the same field of cooperation among national agricultural research centers, especially through networking relationships. Naturally, this road is not without obstacles and difficulties, but it is the critical path toward a rebirth of agriculture in Africa.

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Sir John had the serene gentleness of those born in humble circumstances whose peers in life elevated to the heights of fame. He distinguished himself not only by his scientific excellence, but more so, by the fact that he had the art of giving the human touch to his action which is the very essence of manhood. Because he dedicated his life "to feed this world," we owe him a great deal and we pray for him.

Ladies and gentlemen, why a lecture on “the challenge of agricultural development in Africa”?

- Firstly, agriculture is of vital importance to Africa. In 1987, 62 percent of its total population and 65 percent of the economically active population were in the sector (FAO, 1988).

- Secondly, Africa is the only continent where food production per capita has been declining, to the point of being a matter of serious concern for the world community.

- Thirdly, those who have the knowledge and the resources necessary for the solution of this vital problem are here or are represented in this audience.

- Lastly, an African should say what he feels and thinks about this challenge to his continent.

Let us therefore examine the facts regarding African agriculture, analyze the causes and consequences of its slow growth, and try to explore the different ways out of the present situation.
Declining agriculture and increasing population

Between 1965 and 1973, agricultural production in Africa was growing at an annual average rate of 2.4 percent, with population increasing at 2.6 percent. Between 1973 and 1980, the annual rate of agricultural production fell drastically to 0.3 percent, while the population rate increased to 2.8 percent. Then between 1980 and 1987, though improvement could be observed, production performance was half that of the first period, while population further increased to an annual rate of 3.1 percent.

According to World Bank indicators for Africa and other parts of the world, nowhere else has the situation evolved so negatively (World Bank, 1989). This assessment is also confirmed by FAO statistics, which show that only the African index of agricultural production per capita has been negative between 1965 and 1986 (FAO, 1987).

What are the consequences?

- The first is that Africa is not able to feed its population. The stark reality of this fact—in images of starving children—has penetrated by television into the day-to-day quiet of affluent societies, giving an ethical dimension to this problem and raising questions for our consciences. Why did human science, if not human wisdom, not help to prevent death, illness and poverty for so many of our fellow men and women? At this very moment, we know that the specter of starvation hangs over millions of Africans in the eastern and southern parts of the continent.

- The second is that Africa’s economic situation has sharply deteriorated because agriculture represents 33 percent of gross domestic product (GDP) in sub-Saharan countries, and for some countries up to 76 percent of GDP. Between 1974 and 1987, cereal imports doubled to more than US$1 billion, despite the infusion of food aid which tripled during the same period (World Bank, 1989). Agricultural exports which constituted the strength of dynamic African
economies, instead of increasing, decreased by 15 percent between 1980 and 1986 (FAO, 1987). After a successful take-off, many of these countries may well have to make a forced landing, back to the lower-income category, to the dismay of Rostow supporters.

Reasons for agricultural decline

Now, why is the agricultural picture of Africa so gloomy? Let us first mention some arguments which certainly have merits, but which do not seem to constitute the most important reasons for the present situation: Climatic adversities are found, to a certain degree, in other continents which experience droughts, typhoons and hurricanes; civil unrest and war are unfortunately not a monopoly of any given region of the developing world; access to markets is no less difficult for African agricultural products than for those from other Third World origins; and unstable world prices are the same for all countries, though some may have a greater capacity to counter the effects of subsidies. I do not mean to say that these factors do not adversely affect agricultural production in Africa in a serious way. They do, and in particular international prices of primary commodities. Some African exporters of agricultural products lost up to one third of their export earnings, due to the sharp decline in world prices. And, the duration of drought in the Sahel during the 1970s and 1980s was longer than anywhere else outside Africa. No economy, even a developed one, can sustain such circumstances for a long period without having its social balance, which is the foundation of economic growth, profoundly disrupted.

Action must therefore be taken in the appropriate fora to correct those factors which are within our reach. Food aid should be provided at critical times through the World Food Program or bilateral arrangements. Terms of trade and protectionism have to be addressed in the Uruguay round of GATT, in UNCTAD and in international commodity organizations. Political issues leading to internal and external confrontation, with destruction and forced migration of populations, need to be settled peacefully, either bilaterally or in the framework of the OAU and the United Nations.
But I wish to stress the fact that one must develop first the capacity to produce efficiently, to be able to stand up to a difficult internal environment and harsh international competition. Under equivalent conditions, some regions managed to substantially increase their agricultural output and Africa did not. Why? I will submit that Africa has not benefitted from the new agricultural technology and many countries did not adopt conducive policies that would have allowed themselves to benefit.

→ The Technology of African Agriculture ←

THE PROBLEMS

Comparatively low yields for the continent

A survey of the main agricultural commodities shows that generally yields in Africa are extremely low, but have increased notably in other continents. Between 1961/65 and 1987, globally, yields of sorghum and millet increased by 46 percent and 26 percent, respectively; for Africa, they remained almost stagnant. During the same period, yields of wheat, maize and rice increased by 93 percent, 65 percent, and 58 percent; in 1987 in Africa, yields of all three commodities were much lower than those obtained in the world in 1961/65. (FAO, 1988.)

We know that average yields, which convey the gross productivity of land, should be used with caution, as only one factor to be taken into consideration and that their significance depends largely on the quality of soil. Other factors could affect interpretation of the results—such as the time necessary for production or the technology used, particularly the supply of water and the inputs applied. Nonetheless, yields are the best available indicator for measuring the productivity of agriculture at the global level.

Inadequate focus on Africa’s major crops

Why did Africa not take advantage of the research breakthroughs in high-yielding varieties developed in the international agricultural research centers? The adoption of those varieties, in Asia particularly, fundamentally reversed the trend
of agricultural production, turning a near-famine situation into one of surplus, positively affecting the lives of a billion people. Why does Africa have only 7 percent of its area sown with high-yielding varieties compared to 17 percent in the Near East, 30 percent in Latin America, and up to 72 percent in Asia, allowing these continents to increase their production at rates of up to 4 percent annually (FAO, 1988)? I will suggest two explanations:

- Firstly, the tremendous financial and scientific resources which the CGIAR succeeded in mobilizing have concentrated on commodities with marginal interest in Africa.
- Secondly, most national agricultural research programs in Africa do not have the capacity to absorb research results that could be useful to their circumstances.

The major crops in Africa are: in the Sahelian zone, millet and sorghum which represent 40 percent and 18 percent of world production, and in the tropical zone, yam, plantain and cassava which represent 95 percent, 70 percent, and 44 percent of world production. Neither rice nor wheat, which spearheaded the Green Revolution, are of importance to Africa. The continent’s output for each is only 2 percent of world production. Besides, the available rice technology was mainly developed for irrigated land which does not suit African conditions where upland, deep-flooded and mangrove swamp rice are prevalent. It could be added that nearly all research was made on oryza sativa, instead of oryza glaberrima which used to be traditionally cultivated in Africa.

Now, let us look at two of the international agricultural research centers having specific responsibility in Africa. IITA (International Institute of Tropical Agriculture in Ibadan, Nigeria), in contrast with crop-oriented international centers, has to improve systems of agricultural production in the humid tropics. This broad mandate over a vast area and the delays in its operations, due to local constraints, did not allow it to have an impact similar to those of IRRI (International Rice Research Institute) and CIMMYT (Centro Internacional de Mejoramiento de Maize y Trigo) on rice and wheat, respectively. ICRISAT (International Crops Research Institute for the Semi-Arid
Tropics), though covering an important area of sub-Saharan Africa, is located in India. The results in Africa of this important international program cannot match those of a crop-oriented institution in its region of establishment. In short, as Warren Baum, former chairman of the CGIAR, put it: “The green revolution bypassed Africa.” (Baum and Lejeune, 1986)

What we said regarding the productivity of crops important for feeding Africa is valid for those which bring export earnings. Between 1961/65 and 1987, cocoa yields in Africa increased by 10 percent, whereas in Latin America yields almost doubled and in Asia more than tripled. African yields today are at the level where those two regions were 20 years ago. In Africa, groundnut yields have been stagnant over the past 20 years, while yields for other oilseeds have increased: soybean by 65 percent and sunflower by 39 percent. Thus, the African capacity to compete on the world market is seriously jeopardized.

**Most limiting factors not yet addressed**

Why is productivity so low in Africa? It is because research was not able to solve the most limiting factors to increased production. The soils of the Sahelian and sub-humid zones are sandy (20 percent), poor in nutrients, and subject to intense erosion. The soils of the lowland tropics (18 percent) are acidic, with low absorptive capacity, and also poor in nutrients. Other soils are in desert areas (22 percent) or are difficult to use. The high temperatures and the intense luminosity in sub-Saharan Africa are favorable to photosynthesis and plant growth. The rainfall is generally adequate; 54 percent of the continent receives annual rainfall between 900 mm and 1,750 mm. However, the occurrence risk for drought is high for 66 percent of the area.

An FAO study shows that in Africa it is impossible to have direct rainfed production on 46 percent of the land, 8 percent suffers from high variations in humidity, 16 percent has excess humidity, and only 30 percent is adapted to rainfed production (FAO, 1986).
Seeds are performing poorly because very few improved high-yielding varieties are used in farmers’ fields, leaving the great potential of plant breeding untapped. Concrete results may be expected in the not too distant future for rice, millet, sorghum and maize, because these crops have a natural way of reproducing through self- or cross-pollination. For African roots and tubers which reproduce vegetatively new techniques will be required, not only from CGIAR-type centers but from research institutes in developed countries, for basic and fundamental research on such crops.

If breeding can integrate production targets, disease resistance, and food quality requirements, the use of fertilizers and pesticides allows the plant to show all its potential. In many agricultural production systems in Africa, nutrients are reconstituted through shifting cultivation. Using the land more effectively will require both chemical and organic fertilizers, especially phosphate which is low in African soils and often fixed by acid soils in non-assimilable form. Nitrogen which needs careful packaging and is costly could be partially supplied through rotating production involving leguminous plants. Potassium is sometimes necessary, and calcium is useful in acid soils. Many African soils also need copper, zinc and molybdenum.

Insect pests are important constraints in Africa, as they may be responsible for losses of up to 35 percent of the potential crop (FAO, 1986b). As for pesticides and herbicides, their use should be economically justified, due to their cost and possible negative effects on the environment. Adequate responses to many plant diseases, particularly in the African humid tropics, should be provided through genetic screening and breeding for resistance.

**National research beset with problems**

What are the main problems of research systems in Africa? National agricultural systems in Africa have serious financial problems. Surprisingly, it is not the amount spent which is the main problem. The annual investment in research by national systems of sub-Saharan Africa was around US$395 million in 1982 (ISNAR, 1988). Between 1959 and 1980, the budget for
agricultural research by African countries increased 268 percent. During the same period, it increased by 481 percent in Latin America and by 588 percent in Asia. Cereal research expenditure per hectare in Africa is 20 percent lower than for that in Latin America, and 66 percent lower compared to Asia.

The allocation is particularly inadequate; most resources are spent for personnel, leaving out equipment and operational costs. This situation worsened in the 1980s, with a large increase in expenditure on research staff as part of the total budget. Also, the timing of allocation is not regular, creating cash flow problems, often at a crucial period in the evolution of a biological process and causing irreversible damage. Fluctuation in the annual amount of funds available creates uncertainty and difficulty in planning. As a consequence, infrastructure, offices, laboratories and field experiments are usually not properly maintained. The equipment is often obsolete and unreliable.

National agricultural research in Africa also has serious problems with human resources. Here also, it is not the number of researchers which is the most limiting factor. Some 5,500 scientists were employed in national systems in 1982 (FAO, 1986b). The man-years of research staff per hectare are only 17 percent lower than Latin America and less than half the figure for Asia. The distribution between scientific and supporting staff, both technical and administrative, is often inadequate. On the scientific team, there is no proper mix among breeders, soil scientists, pathologists, entomologists, and engineers. Also in most national research centers, the number of economists and sociologists is deficient. Managerial staff has been seriously lacking in three ways: in the planning and conduct of research projects, the use and accounting of financial resources, and the administration and motivation of personnel.

Training and management are critical

Training remains at the center of any initiative to reinforce national agricultural research systems in Africa. But it must be realized that training needs have evolved over the years. There is a corps of Africans with graduate degrees (who sometimes are unemployed) which did not exist in the 1960s and early
1970s. Nowadays, what is most required for research staff is post-graduate training. Fellowship in the international agricultural research centers and the research centers of developed countries is also needed to acquire experience with team work and to establish the personal linkages for future collaborative work. To this effect, exchange of research staff should be organized particularly during sabbatical years. The training of supporting technical staff could be undertaken with those Africans who have participated in appropriate programs of the international agricultural research centers. Special training programs for managerial staff, not only of research projects but mainly of the financial and administrative aspects of research programs, should be initiated on a large scale. This is a necessary condition for effective use of the important resources to be obtained for the rehabilitation of research in Africa.

**Link missing between universities and research institutes**

Universities are another important source of untapped potential for research expertise which has not been adequately mobilized in Africa. The current isolation of different departments (especially in the absence of special training for agricultural graduates outside the university) prevents the necessary interaction which was so successful in the land-grant university experience of the United States. Therefore, the skills and resources of high-level teachers, teaching assistants, laboratories and documentation centers that are available in the places of higher learning are ignored by agricultural research, which so desperately needs such scarce resources. For this reason, there should be a mechanism of interface between universities and research centers in English-speaking countries, and among universities, high-level schools of agriculture and research centers in French-speaking countries. The effective operation of these two and three-part systems is one of the most important conditions for the enhancement of agricultural research in Africa.
THE SOLUTIONS

CGIAR-style support for research

When I tried to get WARDA into the CGIAR system, after many ups and downs, only the network of coordinated nursery trials was considered worthy of support, because it could serve as a link between the work of international and national agricultural research centers. The rice research projects on upland in Bouake, deep-flooded in Mopti, mangrove in Rokupr and irrigated in Richard Toll were excluded because they were supposed to be duplicating work already going on. Today, it is surprising to read that “WARDA had continued its activities of testing technologies imported from Asia rather than generating new technologies with its own applied research.” (Baum and Lejeune, 1986) Yet, it could not have been otherwise because, if we put aside some serious mismanagement of the institution, the centers that over the years could have generated the technology suited to African conditions did not have the proper support.

I can, however, say that the CGIAR, in those days, was far ahead of most institutions because of its concern for supporting agricultural research in Africa, and it was its assistance which allowed WARDA to survive. A cautious attitude could be expected from those who had the responsibility of putting an emerging CGIAR on a firm basis which since then has been the success story of world agricultural research. But I should mention that I visited many bilateral and international organizations for support and from many of them I got these startling responses: “We support development, not research,” or “We support a small applied research component in our projects.” Since then, fortunately, thinking has evolved in the right direction and their difficulties in executing successful development projects—without first mastering the technology required—has led most organizations to accept the principle of supporting research.

Good will, commitment and direct involvement

Can the goodwill and strong commitment of most national, regional and international organizations to help Africa over-
come its problems be turned into an operational concept? What can the now-mature CGIAR and willing multilateral and bilateral donors do to face up to the challenge of African agricultural production? Those are the questions.

About 40 percent of CGIAR funds are used in Africa, and hundreds of its scientists have their main research focus, or a significant part, on problems of African agriculture (1988/89 CGIAR Annual Report). The creation of SPAAR is another step in the right direction, as it signals the recognition of the specificity of the African problem, the difficulty of the present system to respond to African needs, and the necessity to organize concerted and coordinated action.

The CGIAR strategy seems to have been, so far, to approach national research problems from the periphery. It has tried to use international centers as vectors, and even created ISNAR to boost this action, but it has carefully avoided direct action in the national research centers. It is hoped that the CGIAR will now consider a new policy—with some form of involvement in the funding, operation and evaluation of national research centers in Africa. A venture in African research will be successful only if it draws upon the lessons from experience of the CGIAR system and adapts them to the realities of the present environment.

**SPAAR—devising new approaches**

SPAAR should mobilize the full financial and scientific capacity of the CGIAR and its members. To this effect, it should devise a way for developing a step-by-step pragmatic plan of action which would require a commitment, on a voluntary basis, of appropriate resources. It should be implemented by an integrated system involving the international centers for agricultural research, selected research institutions of developed countries, regional research organizations, networks, and national agricultural research centers. Owing to the large number of institutions to be involved and the difficulty of operating this huge and complex machinery efficiently, priority-setting will be a key factor for success. It might also be necessary to structure the program along regional and sub-regional groupings, based on geographical and ecological con-
siderations. The research review of the World Bank has already started to do so, by dividing sub-Saharan Africa into two parts, the west on one side, and east and south on the other.

An independent mechanism set up by SPAAR and the CGIAR, and relying on TAC, should evaluate, monitor and review the scientific value and operation of the selected projects. A similar structure should be established for the financial management of projects with annual external auditing. Such a system would replace the often conflicting and duplicative mechanism of bilateral and multilateral organizations. Research results and their effective use in the production process should be reported annually to SPAAR and the CGIAR.

National agricultural research centers should be involved in the planning of research projects that are to be conducted with their participation at regional and national levels. The possibility of bearing the cost or topping-off the salaries of African staff involved in the projects is also required. On the other hand, African counterpart financial contributions as a condition for operation should not be required. The facilities of the CGIAR and other centers for agricultural research should be used to train scientists and managerial staff, as well as technical and administrative support staff.

**Expediting the research process**

The time dimension of this venture has to be reckoned with, if one considers that 6-14 years are necessary to develop a variety and 3-6 years for testing and release. This system will have to invent new ways to force the pace of development in research for rainfed agriculture, as Africa's irrigated land is only 4 percent of the world total. The optimum trade-off will have to be found between the length of time that is indispensable to yield research of scientific value and the necessary shortening of the time lag before applied research effectively has impact on production. Several ways to this effect could be explored:

- The analytical work done by IBPGR (International Board for Plant Genetic Resources) and the germplasm existing in the CGIAR, other centers, and developed countries should lessen the time for collection and characterization.
• The use of new “techniques” of gene transfer and recombination should shorten the duration of traditional techniques of hybridization and cross-pollination.

• It will be difficult to have an affect on the time necessary for screening or segregating lines, selecting elite lines, and testing yields. A wide geographical distribution of trials may, however, allow identification in one season of stresses which otherwise would not exist or need several years to appear in one location.

• With plant regeneration and cell and tissue culture, it should be possible to overcome problems for vegetatively propagated crops and phytosanitary limitations to their international testing.

**Better use of available technology**

But more than these necessary long-term solutions, there is already an immense stock of improved plants available at the international level which could be obtained through exchange programs. Even in the national agricultural research centers, there is a body of useful knowledge and material which has not found its way through to the farmer and which, properly packaged and used, could dramatically change the rate of production in sub-Saharan Africa.

**Linking research efforts to on-farm constraints**

This situation brings us to the problem of interface between research and development which constitutes one of the main weaknesses of African agricultural research. Very often, development partners are not involved in the identification of production constraints and farmers’ real-life technical and socioeconomic conditions. Consequently, the conception of research projects and field tests is a solo exercise by researchers. No wonder, therefore, that there is sometimes “a black hole” between what is imagined on research stations and what is happening on the farm. Priority should therefore be given to setting up a mechanism of proper interface between research and development and identification of results which could have an immediate impact on production. But knowl-
edge itself is not enough to increase production. It is a way for farmers, if trained efficiently, to maximize their results through a combination of physical resources—seed, fertilizers and pesticides—in an environment involving soil, water and solar energy. It is development policy which has to ensure the optimal mix of these factors at the farmers' level and to create conditions for the output to be financially profitable and thereby constitute an incentive for investment in the agricultural sector.

Agricultural Policies in Africa

The ideological debates on agricultural development which prevailed during the 1960s and 1970s are toning down in the face of today’s realities in the world market for commodities and financial resources. They, nevertheless, had a great influence on agricultural policies which are still prevalent in Africa. The issues, among others, that should be mentioned are: priority to the industrial sector, the question of ownership of the means of production, the problem of optimum farm size and the principle of price stabilization.

The advocates of priority to the industrial sector, sometimes heavy industries, found their rationale in the arguments of two economists: Friedrich List who in his growth stage theory regarded domestic industrial development as the most important generator of agricultural progress. J. H. Boeke who, in his static dual-economy model, underlined differences between social needs of traditional societies and the economic need of western societies, and concluded that it is futile to try to introduce western technology and institutions to modernize traditional agriculture. (Hayami and Ruttan, 1985).

John C. H. Fei and Gustav Ranis, however, in their dynamic dual model, recognized that “an underdeveloped economy which attempts to force the pace of industrialization while disregarding the need for a priori or at least simultaneous revolution in its agricultural sector will find the going most difficult.” But it is W. W. Rostow who, despite the shortcomings of
his leading sector theory, had the merit of emphasizing “the critical importance of rapid growth in agricultural output during the early stages of economic development.” (Hayami and Ruttan, 1985).

Today, planners are discovering what John Stuart Mill said so evidently: “When following an improvement in the cultivation of the soils, half of the active population is sufficient to produce food necessary for the whole society, the other half may try to satisfy the other needs of humanity or their fantasy.” And it is recognized that “industrialization and agricultural development are not valid alternatives. Raising agricultural productivity and inducing a marketed surplus of farm products must be a major concern, as must development of linkages between the two sectors that will give effect to the interdependence required between them in a modern industrial economy.” (Southwork and Johnston, 1967). This realization of the importance of agriculture in economic development of Africa is translated as a principle in the Lagos Plan of Action of April 1980 and quantified in terms of investment by the United Nations’ Program of Action for African Economic Recovery and Development, 1986-1990.

The debate on the question of ownership of land and factors of production was triggered by the Marxists who mandated collective appropriation and farming of the land: the means of production being, in the first stage, under the control of a cooperative, the kolkhoz, supported by a station of agricultural machinery and tractors; in the second stage, under the responsibility of a state enterprise, the sovkhoz (Academy of Science, USSR). This basic scheme was implemented in most socialist countries with varying degrees of adaptation. The attempts to implement it in sub-Saharan Africa generally did not go beyond state ownership of land and creation of some usually unsuccessful state farms.

More recently, the European Economic Community triggered another debate that concerns farm size. Impressed by the efficiency of large American agricultural enterprises, as Marx was with English farms, it recommended large production units, a kind of cooperatives and farms with integrated land use, allowing for more effective combination of labor, land and capital.
(EEC, Mansholt Plan, 1964). However, the application of the theory of economies of scale to the farm quickly reaches the limits imposed by the law of diminishing returns in an activity which is essentially biological.

The intervention of the state in regulating prices is considered as a self-evident necessity, which both French- and English-speaking African countries inherited from the colonial era in some form of organization of markets for agricultural commodities. It was accepted that “economic history teaches that state interventions, more or less vigorous, are necessary to correct the imbalances of the law of supply and demand on the agricultural markets. Overtime, food markets have always been regulated and controlled.” (Milhau and Montagne, 1964) It is not surprising, therefore, that marketing boards and stabilization funds flourished throughout the continent. The dominance today of the theory of minimum state intervention, supported particularly by Milton Friedman and William E. Simon, should not make us lose sight of the historical perspective of this problem.

Beyond theory, which elevates the discussion on African agriculture, we should draw upon the lessons of experience which indicate that accelerated agricultural development is possible.

THE PRACTICE

Market interventions and distortions

Most African governments have intervened in price-fixing, either by providing subsidies or collecting taxes. These direct actions in agriculture have distorted the market at a cost in different countries. Under a no-intervention policy, the level of internal price equilibrium depends on world market prices at the border, the exchange rate and domestic marketing margins. The first problem is that the border price is distorted by subsidies in the countries of origin either directly or by manipulation of the nominal exchange rate. In 1984, developed countries spent more than US$30 billion to subsidize agriculture. The second problem is that world market prices vary widely due to climatic changes, the low short-term elasticity of supply and
demand in relation to prices, and the seasonality of most crops. The price instability indices for some commodities may vary up or down the trend value by 10-91 percent. Under such circumstances, many African countries, with a view to lessen the effect of these variations, had to develop mechanisms for stabilizing prices and systems of equalization when several commodities were concerned.

If it is difficult to object to the principle, the end results of the implementation, and in particular the cost incurred, made the system unsustainable. The beneficiaries have been mainly urban populations, because well-organized trade unions in cities have constituted a forceful pressure group capable of obtaining lower prices for consumer goods which are included in the indicators used for evaluating the purchasing power of workers. Farmers who tend to consume local products, often available on the farm, are unable to take the same advantage of national resources so diverted. This in itself could be acceptable, as these subsidized products enter, in large part, into the diet of the urban or suburban poor who cannot afford supplements of fish, meat and vegetables. But problems arise when subsidized products are diverted to neighboring countries to be supplied at a lower cost than the world market, when they are used in animal feed, or when they discourage local production of substitutes. All these deviations were observed in Africa. Therefore, adjustment programs have strongly focussed on cutting these subsidies, particularly when funds set up to this effect were in the red, as was often the case.

I would argue that a “laissez-faire” policy, despite its declared advantage on long-term adaptation, is not a feasible solution. Not only could it bring about food riots, as was observed in some countries, but a stabilization system can operate efficiently if the level of subsidy is not too high and if it is flexible enough to allow correction based on past trends.

The same objective was pursued in Africa with the fixing of farmgate prices. It is, however, a much more perilous exercise, because the proper relation has to be established with border prices and the profitability to farmers which depends on the cost of production. This is why many governments have devel-
oped subsidy schemes for seeds, fertilizers and pesticides, and in some cases, extending them to agricultural equipment. The objective is not only to maximize farmers' revenue, but to encourage the use of modern techniques for increased output.

**Mistaking institutions for policy**

Here again, perverse effects were observed with transnational transfers and over-utilization beyond optimum needs. The schemes are now being scrapped with the advent of new policies, but one cannot help being puzzled by the early consequences: farmers are not using new improved varieties but retaining their seeds to a point of degeneration, fertilizer and pesticide consumption is going down, and some farmers are stopping production. Even if we take into consideration the latency period before the operation of market forces and the corrective factors of diverted uses, all things being equal, there can be no productivity gains without increased use of inputs. It seems that very often the policy has been mistaken for the institutions implementing them, mostly marketing boards and stabilization funds which were in general badly mismanaged at both the financial and operational levels.

**Sectoral bias**

In the early stages of agricultural modernization and growth, reasonable incentives toward these factors of production is most useful. But agricultural policies should not be analyzed in isolation from other sectors, because they are an integral part of economic policy. Decisions taken in the industrial or the services sector interact with actions in the agricultural sector. Labor, goods and capital flow from one sector to the other on the basis of comparative advantage which could be distorted by taxation, subsidies or trade restrictions.

But Africa is far from being the part of the world where the bias of industrial protection against agriculture is the highest. On the contrary, on the relations between the agricultural and financial sectors in Africa, there is much to say. Agriculture, being an important source of revenue for the budget, incurred huge outward transfers of funds through direct taxation on
marketing margins. New policies have tended to correct this situation, often by moving from one extreme to the other. Yet without comparative alternative sources of revenues being generated, countries are now having difficulties in balancing their budgets.

**Breakdowns in agricultural credit**

The other serious problem has been the breakdown of many state-owned credit institutions specializing in agriculture. Loans were given without adequate collateral; farmers' debts were forgiven during climatic crisis without adequate provision to compensate for them; low preferential interest rates were fixed without consideration to the cost of resources; and financing of seasonal credit was made at farmgate prices that were higher than equivalent border prices, creating losses not always reimbursed by stabilization funds.

Restructuring of the banking system should give birth to new and efficient credit institutions with much less influence by the state in management. New operating rules guided by market interest rates and with a proper independent control should encourage local savings and attract external lines of credit. But it is impossible to develop the agricultural sector with short- and medium-term loans when interest rates exceed 16 percent, for example; projects will be unable under such conditions to generate adequate internal rates of return. It is, therefore, indispensable to have “interest rebate funds” despite their distorting effect in relation to sectors not benefitting from them.

The relation between agriculture and currency is much more complex. A lot has been said about the over-valuation of the real exchange rate defined as the ratio of the prices of traded goods to the prices of non-traded goods. Statistical evaluation does not show a correlation between devaluation and economic growth. If it is true that currency manipulation is an efficient tool in adjustment programs, the structure of the economies in Africa and the implications of monetary unions would command careful scrutiny of alternative solutions. Very often it might be more feasible to act on prices and interest rates.
Above all, it should be stressed that agriculture suffers the repercussions of adjustment programs in Africa. The restrictive measures on spending have an impact on investment. The closing down and streamlining of private companies or parastatals increase unemployment and negatively affect the demand for agricultural products.

A Long-term Scenario for Recovery

An overturn of the economy and of agricultural productivity cannot be achieved in the short term. There will be a long transition period toward recovery and growth. During that period, Africa will need the long-term commitment of resources and technical support on the basis of agreed policies periodically monitored and realigned. The flow of resources will have to be massive and sustained over a 10-20 year period.

Solutions should be found that avoid over-using and stretching the scarce human resources of African countries. The preparation and evaluation of projects and programs are too demanding on African staff time and projects and programs often have to be renegotiated on a bilateral basis, after agreement in multilateral meetings such as consultative groups or Paris and London Club meetings.

In this presentation, sub-Saharan Africa has been described as one unit with average indicators. However, more refined analytical tools would have shown deviations from the apparent uniformity. Most countries are at different levels of the low-income category, and nearly all the remaining countries are in the middle-income category. Climatic conditions and soils vary widely over a large area stretching from the northern to the southern hemispheres. The policies induced by history, ideology and personality have resulted in varying degrees of success in agricultural production and productivity. But what has been said remains generally true even if averages shadow excellence and water down failures.

Africa is trying to rebuild its agriculture under very difficult conditions. Governments are struggling to pay monthly salaries
of civil servants under the pressure of trade unions defending the interests of their members. They are on a tightrope to pay the debt service of bilateral and multilateral creditors under the threat of further assistance being suspended. They have, despite the dramatic consequence of falling world prices on their financial capacity, to meet their obligations with households, firms and the local banking system. They are obliged to balance their budgets, though their capacity to collect revenues from duties and taxes is hampered by reduced economic activity. For governments, crisis management leaves little scope for investment in the future, however essential.

Today, Africa needs a hand of solidarity to address its poverty and to develop its own potential for feeding a population which will almost triple by the year 2025. Let us collectively make sure that Africa, the continent which saw the emergence of man, does not in the next century, for lack of food, become a desert of starvation.
Selected references


European Economic Community. 1964. The Mansholt Plan.


