THE AFRICAN ACADEMY OF SCIENCES (*)

Report of the Think-Tank on Village Pilot Project Lake Naivasha Hotel, Naivasha, 9-10 May, 1987 (**)

I. Participants

Prof. S. Gombe - Scientific Secretary, AAS, Chairman

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(*) *Chairman*: Professor Thomas R. Odhiambo; *Scientific Secretary*: Prof. Samson Gombe; *Academy Administrator*: Dr. Ne Ngangu Massamba.

(**) Dear G.B., I am very pleased to bring to your attention a very major exercise recently undertaken by the African Academy of Sciences, in developing an approach about the Village Pilot Project that we discussed with you during my March 1987 visit to Rome. I am sending you a copy of the proceedings of a meeting convened by the Academy in Naivasha, Kenya, a week ago, for this specific purpose.

The text to the agricultural problems in Africa is given and from section IV, a design for this Village Pilot Project is given.

I would be most grateful if you would consider the content of these proceedings, share them with Prof. Umberto Colombo and Dr. M.S. Swaminathan, as well as others and let me know what future steps we should take in respect of this design. For myself, I believe it is an excellent starting point.

With all best wishes,

Yours sincerely,

Thomas R. Odhiambo

Director, ICIPE and President, African Academy of Sciences

II. The Problem Addressed

(a) *The Basic Problem Outlined*

The Chairman set the stage for the deliberations by remarking the general problems of underdevelopment in Africa, exemplified most emphatically by rural poverty. The Academy, as a scientific body, and thus endowed with relevant knowledge and scientific skills, is keen to make a contribution towards the amelioration of the rural condition of life. This kind of experiment and example must have a definite practical bearing, must by its technique be realistic, sustainable and attractive, and must be a scheme whose success looks like a probability. The ultimate object is to come up with a clear formula for the inauguration of a "village"-development model. The success of such a project may, subsequently, be tried elsewhere in Africa.

(b) *Broad-based Deliberation on the Basic Problem*

Improvement of the welfare of the rural populations holds the key to stable growth in the African economies and societies. Efforts aimed at rural development must begin with the most basic rural resource and occupation — land and agriculture. The most basic aim must be sufficiency in food. Basic utilities must be made available, to enhance the amenities of life, and to give stability and satisfaction to the rural population.

Naturally, a basic question such as that of food sufficiency touches intimately on other variables. Population is an example of such variables. Food sufficiency relates also to productive skills, industrial methods and technology. There is an interlocking web of separate types of initiative each demanding large-scale attention and input. One cannot meaningfully address oneself to problems of rural poverty without also considering such subjects as: unemployment, division of labour, migration, food-crop and cash-crop patterns, use of appropriate technology in agriculture, infrastructure for agriculture, production inputs, management trends in agriculture, land policy, national policy, etc.

The concept of a model village in rural development, thus, must be isolated on the basis of a priority setting. Such a setting would help to exclude the impracticable, and to determine the content of the initiatives to be included in the village project.

From the perspective of operability, the following four matters were seen to commend themselves to early initiatives: (i) infrastructure for agriculture; (ii) agricultural production inputs; (iii) resource management; (iv) appropriate technology in agriculture.

Attention was given to the intimate connection between the priority areas and other variables. A growing population narrows the food base, and, unless effective food production prevails, rural poverty must become an ever more glaring reality.

(c) *Population and Food*

African population growth rate in the 1980s is 3.03 per cent (medium variant). As of 1985, 46.1 per cent of the total population comprised children of under 15 years. Crude birth rates have remained nearly constant, as 48 per thousand in 1950, and 47.6 per thousand in 1985. Crude death rates dropped from 175 per thousand in 1950 to under 28 per thousand in the 1980's. This shows an increase in food demand from 1950 to the 1980s. The GOP has dropped from 2.7 per cent in 1960 to 0.4 per cent in the 1980s. Food production rates are growing at 1.5 per cent, and demand at 3 per cent. Food sufficiency ratio dropped from 98 per cent in 1960 to 86 per cent in 1985. The land utilisation ratio in the 1980s is only 30 per cent.

Standard figures on food sufficiency, for Africa, are not always a reflection of the true position. The common yardsticks for the calculation of levels of nourishment generally overlook peculiarly African food sources. This may render inexact such measurements as kilo-calories, etc. Yet attempts to improve rural welfare cannot claim success if they do not take account of the nourishment obtained from indigenous crops. Sometimes it is not the physical availability of a crop that is important to the people; depending on their cultural practices, or their patterns of preferred taste, they may accept, say, black or white or coloured beans. This suggests the need for social research amongst the people, accompanying initiatives to enhance agricultural production. Gross quantities of particular foodstuffs may not by themselves give an accurate picture of the extent to which the population has access to food, nor of the level of amenities existing and the level of stability and security prevailing in any given rural area. Greater food security is likely to come from a diversification of crops and other food sources. Not only will such a diversification give more food security and better nutrition, but, agriculture in this vein when properly managed could give rise to new processing enterprises, and could raise relevant scientific incentives such as those relating to patenting.

(d) *Labour Structure and Food*

The much larger proportion of children to adults leads to overwhelming dependence by children on adults — financially and in other ways. Able-bodied manpower to work on the land is substantially reduced. Adult-time is also taken up in child-care, thus further diminishing agricultural work-time. Adults, being thus over-used, will give poor attention to the children, who are in consequence malnourished and feeble. The weakened agricultural manpower base is desperately enfeebled as children (especially boys), on attaining adulthood migrate to urban areas in search of employment. This renders agricultural labour ineffectual. Even if there were some appropriate technology for enhancing agricultural production, labour that is so depleted and fatigued could not absorb and internalise it so as to be able to use it effectively.

The most remarkable difference between agriculture in the industrialised and in the non-industrialised countries is that, in the former, there is a high degree of mechanisation, and in the latter, minimal mechanisation. What would be the impact of increased mechanisation, in Africa, on labour and food sufficiency?

The natural course of mechanisation is to free labour — thus creating a labour problem. Indiscriminate mechanisation may, besides, tie the farmer to the foreign manufacturer in such a manner that the goal of food sufficiency may no longer be the one being sought. However, the possible scope for mechanisation must be seen in relation to the specific kind of rural labour that may be in question. Depending on the type of crop, or other product being produced, small-scale mechanisation is necessary. This would make production more convenient and more substantial. More substantial production, in its turn, may attract small-scale industrialisation, which ideally should be located at the source of the agricultural product.

(e) Cash Crops vs. Food Crops

Certain crops are planted for sale, locally or internationally. In this category are, for example, coffee, tea, sugar cane, tobacco, cotton. It has often been the case that cash-crop production wholly takes over from food-crop production, so that the principle of food security is seriously undetermined. There are several explanations for such a trend. The pricing structure tends to favour cash-crops, as against food-crops. Cash-crops are a major source of foreign exchange, and on this account state policy may accord them a position of advantage. The management of cash-crops is usually in the hands of authorities to whom efficiency is all-important, and hence agricultural inputs, and other farming needs, are made readily available. Cash-crop farming is usually supported by a large information, marketing and processing structure which is not available for food crops. The entire financing system tends to favour cash-crops. There is little bureaucratic initiative to change this preferential treatment for cash-crops, which goes back many years. In the colonial days monitoring cash-crop development was considered easier, and so more scientific research went to cash-crops rather than to food-crops. Some of the cash-crops are controlled by multinational corporations, which take all steps to ensure the availability of chemicals and other inputs (which sometimes they produce themselves). Most African countries depend on crops whose pricing they do not control, but neither do they control the inputs for those crops. In a situation such as this, the production of such crops may prove too expensive, and besides, may undermine initiatives in the production of food-crops. The marketing of cash crops is not, generally, in the most favourable terms for the rural farmer. Exportation forms part of a pricing system in which remotely-based cartels do not give any favour to the African producer. Such complex, international markets are, moreover, not well understood, nor effectively

husbanded, by African countries. African agricultural products, thus, fail to meet delivery deadlines, taste preferences, technical specifications, etc.

One thus sees a situation in which food sufficiency is not achieved, even as the farmer has not obtained just compensation for his cash-crop. What income then emanates from the cash-crop is further made the subject of public levies for purposes of running the machinery of the public authorities. It follows that an expropriation of the rural asset, in this sense, takes place, to the advantage of official programmes and of urban areas.

(f) *Rural-Urban Migration of Manpower and Money — to the Impoverishment of Rural Areas*

Investment tends to be concentrated in the urban areas, and the quest for employment brings able-bodied persons from the rural areas into the towns. This rural-urban migration deprives the rural areas of essential manpower, without which productivity falls and food insecurity grows. Besides, what little agricultural produce still comes from the rural areas, in the case of a commodity that supports some processing industry, will find its way into the urban areas, still undermining the food sufficiency of the rural area. The cash crops grown in the rural areas also support the public purse, and this entails the movement of the earnings of the rural areas into the urban sector.

For reasons of taste, financial considerations, etc., there is a tendency for large sections of the rural population to migrate into the towns, and this is evidenced by a fast growth of urban centres. To control this tendency and create stability, it is essential that the rural areas be supplied with the missing amenities. Self-sufficiency in the village is all-important, to that end. The basis of such initiatives must be agriculture, and food sufficiency. A combination of labour and plant that does not render the rural population idle needs to be devised, as a method of enhancing the stability and self-sufficiency of the rural areas.

(g) *Ineffectual use of Technology for Agricultural Production*

There are few farmer-tested technological devices, for each agricultural commodity, in use in Africa. Most of the technology in use is really for high-yield areas, rather than for the marginal areas which should be made more productive and more food-sufficient. This is partly because appropriate technology has not yet been designed for a more widely-based application. Partly, this is because even the relatively knowledgeable farmers in the marginal (and indeed even less marginal) lands are not being offered much from the central stream of expertise and the educational system.

The first problem in this regard is one of communication. Appropriateness of information, the manner in which it is transmitted, the cost of obtaining the information, are all factors which determine whether the farmer will know about, accept and try any particular technology. The medium of communication

to the farmer normally used the most is the bureaucratic set-up. The co-ordination between the bureaucratic and the extension worker is usually ineffective. The preferred use of a progressive farmer in the locality to set the example may not have the desired demonstration effect. The ordinary farmer really wants to obtain information and inspiration from other ordinary farmers. The typical researcher in the countryside never gets to know the specific needs of the farmer. The researcher and the extension man ought to collaborate in their dealings with the farmer. Moreover, social work also needs to inform the attempts to bring technology to the farmer. As it is now, there is hardly any link between the farmer's product, which may have a localised cultural or other regime, and the formalised technology being brought to him. This makes it necessary to put on the site a multi-disciplinary team. It appears that a scheme of this kind would be cost-effective and appropriate.

Is it desirable that official policy should provide for institutionalised scientific consultation, with regard to the question of appropriate technology? In Africa generally there is no provision for scientific teams to monitor development at a national, regional or sub-regional level. The ministerial and the bureaucratic set-up are rather too rigid to allow of a meaningful governmental consultation and exchange of views with relatively informal scientific set-ups.

(h) *Resource Management*

It is often assumed that Africa habours vast tracts of arable land. However, this land is both expensive to bring to cultivation and vulnerable to the mono-culture typical of modern agriculture. Although there are some fertile and highly productive parts, extensive areas will not support farming, owing to difficult physical and climatic conditions. The expansion of agricultural production has often been accompanied by devegetation, which has depleted soil fertility by reducing the water-holding capacity and increasing soil degradation. The arid lands of the Sahel and the fragile soils of the coastal and central parts of the continent present unusually difficult physico-chemical environments for agricultural production. Africa is by and large a dry continent where efficient use of water for increased bioproductivity must be maximised.

The relevant management problems, naturally, extend to other resources: soil, labour, inputs, by-products, etc. There should be a carefully planned use of biomass, with plant residues being replenished back into the soil — in place of chemical fertilisers. Irrigation should also be developed and used extensively. More knowledge of the resources themselves is essential, as a condition for exploiting them to the advantage of the African populations. This requires a careful stock-taking, as well as policy orientation guided by scientific knowledge.

The agricultural base would be greatly supported with a captive utilisation of the by-products — such as soil conditioners and animal feeds or other purposes. Effective use of the by-product would require locating appropriate industrial plants in agricultural areas.

(i) *Infrastructure for Agriculture*

The availability of infrastructure is vital to effective agricultural production. This serves, for example, in the movement of commodities from areas of high supply to those of low supply; for the transportation of inputs; for the transportation of by-products to industry; for communication with suppliers and with experts; for the servicing of agricultural implements; etc.

To some extent, the machinery of financial system may be seen as part of the infrastructure. An example is a case where funds are advanced not on the basis of a collateral, but on the basis of guaranteed production. Banks should be able to consider making such loans, on appropriate terms.

(j) *Production Input*

Effective agricultural production takes expensive inputs — seeds, drugs, implements, etc. The availability and cost of inputs has immediate effect on the productivity of the farm. Most inputs are currently imported, a fact which makes it difficult to be certain on time of delivery. Sometimes, moreover, the inputs come through government initiatives, as part of some broader package. This increases the uncertainty. The farmer, thus, is unable to carry out a proper forward planning. He may, therefore, fail to provide for an impending army-worm attack, etc.

It cannot be said that all the inputs currently used are the most suitable. Greater use of traditional inputs needs to be encouraged. The biological fertilisers are more readily available and easier to use than the chemical fertilisers.

(k) *Land Policy*

A structural question in land control tends to have a negative effect on agricultural productivity. For historical and social reasons, women form the main manpower base of African agriculture. But women are in this regard only giving manpower; they do not control the land as such. They are, in practice, the persons with access to the land; yet they do not control this land. Those who control the land are the men, who are often not actually working on that land. This weakens the hand of the women, and somewhat undermines their commitment to and effectiveness in production. A structural change in this regard is desirable — to enable those holding the burden of production to have a more secure access to the land.

III. Upshot of the Broad-Based Deliberations

Agriculture must be the starting point in any attempt to improve rural life. Agriculture, by its productivity, will give food security. Agriculture, if effectively and scientifically practiced, will lead to an integrated rural life, with supporting industries, with essential infrastructure, amenities and employment — a condition

that is likely to retain the local populations who will then continue to supply manpower for sustained and growing production.

IV. The Academy's Model Village Project

The Academy is proposing a scientific lead in rural development, resting upon a model village built on a proper and judicious management of Africa's most basic resource and industry — agriculture. The Academy's main contribution, in this regard, is that of scientific conception, advice and monitoring; for the actual physical operationalisation, it is hoped that reliance can be placed on firmer institutions of implementation — governmental or non-governmental, the co-operation of government administration in the rural areas will be of the greatest importance.

Criteria of Selection

(a) *Basic Requirements*:

The selection of the village is to be based on the following criteria:

— It is to be located in a rural area.

— It is to be located in a typical (average) rural area.

— It is to be located in an area with available land, for renting or purchasing — to be used for a permanent demonstration unit.

— It is to be located in an area where the land tenure regime is consistent with stable occupation and development.

— It is to be located amongst a relatively resource-poor population of farmers.

— It is to be located in a traditional food-deficit area.

— It is to be located in an area where mixed farming is possible.

— It is to be located in an area where basic technology exists for some kind of farming.

— It is to cover a population of about 5000 persons, which should approximately coincide with the smallest administrative unit in the country in question.

— The first experiment should take place in Kenya, for ease of advice and monitoring, by the Academy.

(b) *Additional Requirements*

— It should be located in an area where the people are receptive to change.

— The model is to be one that would commend itself to both males and females.

— It has to be a model that could stem the tide of migration in search of amenities. It has to make provisions for utilities — food, water, sewerage, cash infrastructure, education, health, etc.

— It has to be a model that is adaptable — in the face of changing influencing factors.

— It should be located in an area in which there exists an organisation(s) with a proven capacity to operate projects of a similar kind.

(c) *Basic Considerations*

— The model should exploit raw materials *in situ* and use by-products to replenish productive capacity in agriculture.

— The model should produce marketable products — to be sold locally or further afield.

— The model should minimise wastage and maximise returns.

— The model should ensure continued long-term utility of the land — not degradation of the land.

— The model should accept to incorporate small-scale irrigation as one of its practices.

— The model should take crop farming as the substructure of the entire initiative.

— The model should aim at efficiency, productivity and self-sufficiency.

(d) *Time Scale*

The Academy should endeavour to have this village project in full operation within the next 5-10 years.