

WORKSHOP 1985

Alleviation of Poverty & Starvation and Improvement of Health

Prerequisites for peace

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FOLLOW-UP CONSIDERATIONS AND PROPOSALS

Workshop 1985 was convened by Mr. Norman Borlaug and Mr. Ryoichi Sasakawa, in reaction to the African food emergency, to discuss "The Alleviation of Poverty and Starvation and Improved Health" as prerequisites for Peace. It took place in Geneva on July 8-10, 1985.

Participants in the Workshop included representatives of many disciplines and of public life. Discussion was lively, with many rich interdisciplinary interactions. It concentrated essentially on the situation in sub-Saharan Africa and on how an attack might be made on the problems of that continent, leading to a sustained self-reliance.

The considerations and proposals which follow only reflect upon some of the discussions held during the Workshop. They do not pretend to cover the entire spectrum of issues raised by the present food crisis in sub-Saharan Africa and to a lesser extent in other parts of the world. Therefore, many of the useful ideas, expressed during the three days meeting were omitted.

The Emergency

The world has been shocked into action by the tragedy of the African famines, presented to the public essentially as the consequence of continuing drought. There has been a response of compassionate generosity from the so-called industrialized countries and others, notably India, in the massive supply of cereals and other needs, especially to Ethiopia and the Sudan, where the media have poignantly dramatized the consequences of starvation and disease.

While the main attention, in the present crisis has been focused on Ethiopia and the Sudan, it is important that there should be widespread appreciation of the existence of famine in some dozen or more countries south of the Sahara. The drought in the Sahel was, indeed, far advanced before television made its consequences visible throughout the world, arousing public reaction and forcing governments to take action, which could well have been mobilized earlier. Furthermore, had an Early-Warning System been in operation, intervention could have begun much earlier and been much more orderly, thus saving many lives. The public in Europe and

North America become aware of the realities of such catastrophies only when they are highlighted by the media; otherwise they pass, virtually unnoticed. Furthermore, after a time, public attention becomes blunted and accounts of deaths in distant places become mere statistics in the public consciousness. The crisis over, complacency reasserts itself and the very size and generosity of famine relief distracts attention from the more fundamental need to find remedies to the basic cause. We must ensure that this does not happen in the present situation. There is need for both admonition and action.

Man-made Disaster?

Without doubt the famine which has followed the prolonged drought has been vicious and disasterous. The question must be asked, however, had similar circumstances arisen in other regions, would the results have been equally bad. The answer must surely be in the negative. It is too easily assumed that when the rains fail - and that is no unusual occurrence in Africa, the Sahel - insufficient food is produced and people inevitably starve. This is a misleading and simplistic assumption which distracts attention from the complex causes of famine, an understanding of which is necessary if recurrences are to be prevented. There is sufficient food in the world to feed everyone adequately, but it simply does not reach those who are in distress. In "normal" years in Ethiopia, when there is freedom from famine, it is said that 1000 children die from undernourishment and malnutrition each day. The starving are the poor, who are unable to buy food.

The root causes of the present situation are thus not climatic, but socio-political in nature; they are multiple and complex. They embrace all the concomitants of poverty and disease. In the present situation in sub-Saharan Africa they include lack of adequate infrastructures, imbalance of urban and rural policies, lack of equity in the distribution of land and wealth, too rapid growth of the population, excessive national debts, inefficient management of the economy, too little priority given to agriculture and its investments, lack of credit systems for small farmers and bad policies generally. It has been greatly accentuated by war and political disruption.

In such circumstances, with shortcomings accumulating over the years, an acute drought is able to trigger off a crisis which is, in effect, a breakdown of society, which uncertain governments are unable to contain. This is amply illustrated by one of the aspects of the present disaster, namely the creation of possibly 10 million migrants who have abandoned their own territory to seek food in other parts of their country or across the national boundary. Elsewhere governments are able to find means to avert such mass migration with its many difficult social and political consequences; but this is not so in Africa.

The Aftermath

When the rains return and famine news disappears from the headlines, the consequences of the disaster may persist unrecorded for years. Millions of displaced people will have to be resettled and may, or more likely, may not be given the means to make a new start. It has to be remembered that a large proportion of people in many of the Third World countries have little or no purchasing power and are only marginally related to the formal economic system and the grain trade. Consequently, when the famine is officially at an end there, considerable increase in malnutrition is to be expected.

It is extremely difficult to assess the magnitude of malnutrition or to be clear as to its precise influence on mortality. As a rule, in places where malnutrition is rife there are no statistics, just as in most places where valid statistics exist, there is little or no malnutrition. Yet malnutrition is probably the most widespread of all diseases, and certainly a major cause of infant mortality. Malnutrition weakens the body's resistance to other diseases. A death may be registered as caused by pneumonia brought about by a measles infection, although the real cause of death of the child is malnutrition which makes measles a killer. Even if measles were to be wiped out by immunization, which could be done at a reasonable cost, the child, weakened by malnutrition would probably have succumbed to some other infection.

A quite different aspect of the aftermath of African droughts is the deterioration of the land, always fragile in the best of circumstances in the Saharan-fringe countries. At times of famine the herdsman naturally move their flocks to the least damaged lands which are quickly overgrazed and eroded. The advance of the Sahara is rapid and appears inexorable and the erosion of the resource base which is accelerated by drought, prepares the way for the next in the succession of famines. There is also evidence that the pressure of the population of men and animals has, in recent years, encouraged a number of communities to spread into areas which were earlier considered to be unsuitable for sustainable agriculture.

In such circumstances it is inevitable that relief measures will be necessary for years to come. However, food aid also brings its problems and can even contribute to the hunger it seeks to alleviate by creating a dependence on imported food, which changes tastes and undermines the price of homegrown food, thus inhibiting local production. It is calculated that in this year 1985, about two out of every five Africans in sub-Saharan countries are living on foreign food and this means mainly on wheat and rice instead of the indigenous sorghum and millet. This is an insidious situation, especially in times when huge surpluses of food have accumulated in the donor countries, encouraged by the payment of subsidies to farmers and their dumping in hungry countries, and this provides an apparently humanitarian cover for the maintenance of high prices at home. Thus while continuing food aid is inevitable and necessary, policies regarding its provision and distribution will have to be worked out with donor governments which take these and other factors into account, with the aim

of discouraging a psychology of dependence in favour of one of self-reliance and of stimulating local agricultural production rather than discouraging it.

The fragility of the sub-Saharan fringe, made more vulnerable with each drought and famine demands an immediate attack on the fundamental and necessarily long-term problem of establishing a sustainable agriculture which will produce adequate food supplies locally and the initiation of this on a pilot basis must be the main thrust of the present exercise.

Prospects for Increased Food Production

The paramount need, therefore, is to enable Africa to produce much more food, to preserve it, and to ensure that it is distributed with equity. The former may be easier to achieve than the latter. Technically the prospects are excellent and we are convinced that Africa can be self-supporting for food by the end of the century, despite the expected large increase of population. Research in plant breeding and other aspects of agriculture in recent years has yielded spectacular results and the achievements of the Green Revolution in Asia and Latin America give grounds for hope that substantial improvements could equally be achieved in Africa, although probably by other means. Emphasis should probably be placed less on agriculture in general, than on agriculture for the small farmer. Little would be achieved by transforming the small farmer into a big farmer in African circumstances, thereby generating land hunger.

The strategy of the Green Revolution that has worked so well in Asia and Latin America has largely bypassed black Africa and there has been too little effort for the improvement of traditional food crops such as sorghum, millet, cassava and bananas. This is a reflection of the relatively poor support that has been given to the institutions of the Consultative Group on International Agricultural Research (CGIAR) system working in or for Africa. Thus the International Crops Research Institute for the Semi-Arid Tropics (ICRISAT) was able to establish its main African program only in 1982. Despite this, it produced a strain of millet that was the only one to survive the 1984 drought in the Sudan. Moreover, the main multilateral aid agencies have tended to concentrate on crops which lend themselves to monoculture, such as maize, wheat and rice, to the neglect of sub-Saharan Africa's traditional food crops. This neglect of African food crops in the past, together with the recent great increase of agricultural knowledge and techniques, itself is a reason for optimism with regard to future prospects.

In suggesting a pilot approach to the production of more food in Africa, it will be necessary to pay attention to many of the complex elements of the problem in addition to the improvement of crops as such and their resistance to drought, diseases, etc. Problems of water availability will be dominant, as also the improvement of irrigation efficiency. The provision of adequate and low interest credit to small farmers is essential as is the introduction of fair pricing systems to provide incentives for food production. Training schemes will be essential and it has to be

recognized that most of the heavy work in the fields as well as the marketing and distribution of food is done by the women.

While resolution of the problems of Africa is ultimately the responsibility of the African nations, the magnitude of the difficulty makes it impossible for the rest of the world to avoid sharing the responsibility. Much help will be required from the Western countries in the form of capital and financial aid to be sure, but also in terms of skills and of wisdom. The last two development decades have not been successful and new methods of approach will have to be found. The implantation of foreign ideas and values into the African environment will not succeed unless there is a deep understanding of the internal mechanisms and the creation of a real partnership with the Africans at all levels, at that of the governments for certain, but also with the African scientists and, above all, with the individual communities and farmers.

A necessary prerequisite is the creation of a political will on the part of African governments to strive for sound development policies which give sufficient attention to the needs of the rural communities, to compensate for the present preoccupation with the problems of the cities and, as an important aspect of this, to accord the highest priority to agriculture, in terms of investment, research, training and education. The declarations of the recent summit meeting of the Organization of African Unity, held since "Workshop 1985" give hope that the recent crisis has engendered a new sense of purpose and of realism.

Before describing our main proposals, it is necessary to discuss briefly a number of other aspects of the African situation.

The African Arms Race

We strongly deplore the diversion to the procurement of arms of resources which might otherwise contribute to the development of the African countries. While Africa's spending is small as compared to the \$2 billion per day which the world consumes on armaments, nevertheless it is still increasing and, in view of the very low level of total public expenditure in most of these countries, it does represent a disproportionately large item in the national accounts.

As is well known, many of the aid donors are also major suppliers of arms. The flow of wealth from the poor to the rich which arms sales to Africa represent, would seem to cancel out, both financially and morally, the virtue of their aid-giving.

The Population Factor

Although recent years have seen some diminution of the fertility rates in a number of the countries of the Third World, high rates of demographic increase will continue well into the next century with absolute numbers growing faster in the year 2000 than today. Africa is the only continent where fertility rates are still actually increasing. It must be

recognized, however, that population density and increase varies greatly from country to country. It is important that in each case there should be a proper understanding of the relationship between population, resources and environment, in order to have at least an approximate idea of the number of inhabitants the country could support at a particular standard of living.

It is not possible to know with certainty, how much the population explosion has added to the hardships of the present famine, but it is clearly true that the inevitable increases of the next decades will have to be allowed for in the planning of food production and that this will be a heavy addition.

The Plantation Economy

Many of the nations of Black Africa are geared to cash crop exports, an inheritance from colonial times, which has been perpetuated after independence. In the Sahelian countries, for example, total agricultural production has increased since 1970, but the bulk of the incremental increase has been in the form of commodities for export, rather than of food for local consumption. It is understandable that the governments concerned must encourage exports in order to gain foreign currency for other development needs. However, it would appear that the trend has gone too far with sub-Saharan Africa now importing about one fifth of its cereal requirements. Such policies reflect priorities which favour industry over agricultural and urban needs. It seems urgent that governments be asked to reconsider such priorities as part of the new approach to development.

The Fuel-Wood Crisis

Wood has been man's main energy source since his beginning and remains so for the majority of the inhabitants of the planet. Population increase and commercial exploitation of the forests has led to an acute shortage of fuel-wood in Africa. This is a commodity which enters little into the international markets and hence statistics are scarce, yet it is one of the essential elements of life; unavailability or high cost can bring about great hardship of a type which is hardly noticed in the developed world. In many African countries wood gathering is yet another task of the women and it is suggested that this chore which once demanded a couple of hours per day, now requires 5-6 hours. It is suggested that some 1.2 billion people in the Third World are meeting their minimum fuel-wood requirements only by over-cutting and depleting the forest resource base. The inevitable increase in population will greatly exacerbate this problem in the near future. The major problem of deforestation is beyond the scope of this paper, but its relation to the food issue is inescapable and we feel it necessary to stress the need for massive reforestation, particularly with quick-growing leguminous trees which will not only alleviate the fuel shortages but, by nitrogen fixation, contribute to feed production.

Grass-roots Development

Finally we must stress that the production of more and even sufficient food, is in itself not enough. Africa is still growing the greater part of the food it consumes and even in famines there is food available for those able to pay for it. Despite the food surpluses which the Green Revolution has brought to India, mass poverty and malnutrition persist. It is of paramount importance, therefore, that social and cultural aspects of the problem should be tackled simultaneously with increased food yield and increase in the nutritional value of the food in addition to calorie sufficiency. As the title of the Workshop 1985 indicates, poverty is at the root of the problem and a new surge of agricultural development must be orchestrated in the sense of total rural development.

In a sense, the failure of the development effort of recent years can be ascribed to an excessively "top down" approach, government to government contacts, with too little participation of the people who must enjoy or suffer the consequences of decisions made in the capitals. Opportunity for a new start, lies less in large scale development schemes as in the operation of an expanded agricultural strategy at the village level. In Africa, in particular, it is at the village level that most community organization operates and it is here that the greatest opportunities exist. During the Workshop, one of the participants discussed his recent assessment of rural self-development in some 19 countries of the Third World. It appears that, quite spontaneously, groups of villagers and farmers, often aided financially and with advice from the non-governmental development organizations of the North, are organizing to improve their lots so as to acquire conditions of human dignity and modest well-being. It seems that this "barefoot revolution" is already influencing the lives of some ten million people in the Third World, a small proportion, to be sure, of the two billion of the world's rural poor, but extremely significant in its potentiality for expansion. The rural communities, despite impoverishment and isolation are waking up to a realization of their capacity for assuming responsibility for their own economic development. Surely here lies an exceptional possibility for the introduction of improved methods of agriculture and rural development and means must be found for building on a situation which involves will and incentive.

PRIORITY AREAS FOR ACTION

In the course of this century the world has acquired the scientific basis and the technology to predict, mitigate and, eventually to prevent famine. Yet the African example reminds us that the melancholy rule of one famine a year is still operative, be it caused by drought, flood, earthquake, plant disease, locusts, civil or foreign war. Nevertheless the Asian case suggests that this rule need no longer prevail. In the long run the African problem is soluble. Agricultural self-sufficiency is possible by the end of the century, but only if there is serious and sustained

commitment by the African nations as well as understanding and support from the developed countries. While applying relevant lessons from Asia and Latin America, projects must address characteristically African problems, such as the fragility of the savanna, and employ regional solutions where appropriate.

The following proposals are far from exhaustive and omit many fundamental long-term measures against, for example desertification and deforestation, for the development of local or regional water and energy resources, the promotion of literacy and education and encouragement of social reform. They do, however, outline areas within which action is urgent, whether for short-, medium-, or long-term goals.

1. Food Aid and Relief Efforts

From the arguments above, it is clear that food aid will have to continue, be made more effective and be an ongoing need. It should be for a pre-determined and finite period and should be designed to encourage development, serve as incentive for local food production and to avoid adverse effects on local food consumption patterns.

With regard to the relief mechanisms, it is important that experience during the recent crisis should be collated and analyzed so that a more effective effort can be made in future emergencies. It would appear that a greater degree of centralization and coordination is to be desired, with a single individual in charge of both bilateral and international relief work. It appears that the various U.N. Agencies have worked together reasonably well in Africa, but it is desirable that the activities of the many voluntary bodies should develop a system of coordination to achieve maximum effectiveness.

We should also work out an international agreement outlawing the use of starvation as an instrument in the waging of foreign or civil wars and to ensure that relief works are free to bring food supplies through battle lines in famine-affected war zones.

2. Mobilization of Grain Resources

Famines can be prevented if we act in time. This has been done on a few occasions as, for example in India in the mid 1960s. At present there are grain surpluses in abundance in North America, so that the basic problem is to get the food to where it is needed as quickly as possible. There are always grain ships on the high seas and if rich, food-importing countries such as Saudi Arabia and Japan would agree to establish sufficient reserves to meet temporary shortages nearby, ships could be diverted to the famine region, as they were to Bangladesh in 1974. This would gain much time, particularly if governments and the international organizations will have developed at least the model of a distribution system. General Staff officers could play a useful role here, since they are trained to move men and materials and organize general logistical support at very short notice. At a certain stage in every famine, limited

availability of skilled mechanics and shortage of spare parts for trucks has seriously inhibited the relief effort and this need should be recognized in future planning. Encouragement should also be given to the creation of local food storage depots in famine-prone areas.

3. The need for an Automatic Response, Early-Warning System

There is evident need to provide means of identifying the early signals of impending famine. Time is of the essence if the snow-balling process is to be contained; that is of acute food shortage turning to famine, with massive movements of population. A comprehensive system is required based on meteorological data, coupled with satellite photography (which registers colour changes in vegetation as droughts become more severe), economic data on food prices and the levels of stored food in famine-prone regions, as well as health data including rates of growth and appearance of poor children in areas at risk. Provision should be made for local observations to be fed into the system. Data (such as climate, soil moisture, phenological data, agricultural-vegetation growth, pests, diseases, yields - employment, wages, etc) could be collected in the same location on a weekly basis, and year after year, in what could be called "Seasons Observatories". This would, for example, ensure that the traditional "wisdom" of the farmers would not be swept aside by alien "knowledge".

The Early-Warning System would best be organized within the U.N. framework. Meteorological and satellite data could be transmitted by the International Meteorological and Civil Aviation Organizations to the Food and Agricultural Organization (FAO) for scrutiny by the monitoring agencies for correlation with other incoming information for the estimation of coming droughts.

Surveillance by FAO of crop prices in threatened areas would provide a sensitive index of impending food shortages. Famines usually strike a population whose nutritional status is marginal at the outset. The state of health and growth of children is, sadly, a fairly sensitive indicator of approaching disaster. Such information would be passed to the World Health Organization (WHO), as is already the case, with data on infectious diseases. WHO is the best candidate for this, because political entities see famines in partisan terms; governments minimize the danger and opposition parties may exaggerate it.

All this information, transmitted to an international office jointly operated by FAO and WHO could, at a certain level of danger, release grain reserves from storage.

Elements of this system are presently in service in a disparate way. For example, a Global Resource Information Database (GRID) has just been established as part of the Global Environment Monitoring System (GEMS) within the United Nations Environment Programme (UNEP). The objective here would be to improve the operation of the system by adding whatever elements are missing and considered necessary.

Such a routine would, of course, operate with a relatively short-term perspective. There is need, in addition, for countries to explore the long-term consequences of national trends and policies. This is particularly important with regard to the interaction of population growth, resource availability (food, water, energy, minerals, etc) and environment, and could expose counter-intuitive consequences of seemingly attractive policies. Under the umbrellas of FAO and UNESCO, work is currently being done in this direction which deserves consideration by the African countries, and could in the form of carrying capacity assessments constitute an approach to an Early-Warning System.

4. Settlement of the Population

Experience shows that once a famine has struck, people start moving about the country in search of food, generally converging where hospitals are located. The social breakdown which develops makes the famine harder to cope with and the reestablishment of order more difficult. Children are lost. People drink ditch water and epidemics spread. Adolescents form foraging groups, attacking food convoys; once these youngsters have acquired a taste for successful banditry, they are difficult to rehabilitate after the crisis is over. For these and other reasons it is imperative to keep local populations in place by the rapid creation of additional first aid stations, staffed by nurses and medical students, as a form of reassurance. However, relief convoys will not be safe unless police, drivers and other workers are assured of food for themselves and their families. Price controls are useful only when food becomes available again. An information network of food stocks must be cast over the affected area so that relief work can be most effective.

5. Improved Agricultural Planning

As we have already stressed, Africa will need steady, and for a time increasing food aid which must be very carefully managed so that it does not undermine local farmer's buying power or incentive to produce food. Famines generally occur where most of the people work on the land. They must be helped to develop strong agricultural systems and this can only be inhibited if their earning power is brought down by dumping free commodities on local markets.

The techniques of the Green Revolution have enormously increased the potential to fulfill the need to develop strong agricultural systems. We know a lot of what should be done; improved road systems; better soil and water management; (dry farming, alley cropping, etc), greater availability of nitrogen, potash and phosphate fertilizers and pesticides, insecticides and rodenticides; a change from slash-and-burn agriculture to appropriate tillage methods or even no tillage; better herd health and the genetic improvement of the herds; more research in high-yielding crops suited to African soils and climates (together with preservation of the germplasm of existing and potential food importance); for farmers, primary education and agricultural extension, programs in rural health and birth control; a rural

credit infrastructure; development of agro-industries such as canning, farm equipment repair and fertilizer production.

It should be noted that there is a considerable difference in the timing and approaches that will be necessary for "fixed" and for nomadic or herd agriculture. The technology of the Green Revolution can be applied directly to fixed agriculture, although research must continue on its application to African soils, climatic conditions and indigenous food crops. Here, the greatest obstacles to progress are socio-economic rather than technical. African villagers are far less ready than those of Asia to implement the new techniques. First of all, many need to be able to read and write; but beyond that they must practice labour specialization and farm management, set up systems of irrigation, create systems of rural banking; in short, they have to establish the infrastructure necessary to practice modern agriculture.

There is no "miracle crop" available for nomadic agriculture. Here progress will be slower. Additional research is needed to replace varieties of forage crops, although alternative forages can be developed in some areas and this should be pushed vigorously. One area which can move faster is the improvement of the health of herds (and herdsmen). In this context, special efforts should be made to recruit and train African scientists and to foster the growth of academic research facilities in Africa.

6. Improved Communications

Another urgent need is for better communications by both road and rail. The existing network is essentially that developed by the former colonial governments for their own needs and mainly consists of links between inland capitals, mining centers, etc, to the ports. Communications between the many African countries are lamentable. Even in the current famine, which affects much of the continent, there are a few areas of food surplus, but owing to the lack of overland routes to the famine areas, the need for additional grain has not promoted the buying of crops in Africa. Improvement of internal African communications is, of course, a long-term and costly matter, but it must be given early priority, not only to ease future emergencies, but also for general development purposes.

7. Encouragement of Networks of Indigenous NGOs

If strategies for agricultural improvement at the village level are to succeed, through, for example, self-help and local self-reliance, approaches such as we have described earlier, which give hope and provide incentive to the individual farmers, adequate human and financial support will have to be provided. The creation of such self-help networks can best be stimulated through selected and experienced foreign NGOs which should be given bilateral and multilateral backing for the purpose. It is important also that central and provincial governments be persuaded as to the efficacy of this approach so as to provide at least benevolent support.

Too often, initiative at the local level, especially if it is successful, is seen as a threat by local officials.

8. Rural Credit Facilities

Although the need for a rural credit infrastructure has already been mentioned as one of the essential ingredients of agricultural planning, it requires specific mention, as, amongst the various factors of production, it is the one least supported by the international community. Yet, it is one of the very few means of guaranteeing direct and immediate investment in agriculture and of promoting self-help and innovative initiatives by farmers.

The introduction of widespread rural low-cost credit schemes in Africa would necessitate a change in the policies of the international financial institutions as well as of the major bilateral donors, but this should be pressed for as it would lead to beneficial and cost-effective results.

A particular aspect of this is the need to open up credit possibilities for rural women. 80% of subsistence agriculture in Africa is done by women, yet general credit facilities do not cater to their needs, because of problems of land ownership, collaterals, etc. It is suggested that some preliminary work should be undertaken through a reputable specialist body to establish the basic principles of operation for women's credit systems and to suggest pilot schemes.

9. Improvement of Nutrition

Not all malnutrition is due to caloric undernutrition. There are, throughout the world and in Africa in particular, a number of conditions, for example, blindness from lack of Vitamin A, goiter from lack of iodine, kwashiorkor, the protein deficiency of young children and various kinds of anemias which are not primarily due to food shortages but to faulty eating habits (often societally generated) or to lack of supplements. In particular, the protein deficiency syndrome in small children is often found in households where plenty of protein-rich food is available but not given to the children. The traditional treatment of infectious diseases of young children precipitates many nutritional deficiencies.

It is essential to develop rural health services which will deal with nutritional deficiency diseases, nutrition, education, and family planning.

10. Population Planning

Africa is the only continent where the rate of population growth has not yet begun to decline; it is also the one with the highest infant mortality rates. Slowing population growth and the eventual stabilization of the population are as crucial to the feeding of Africa as are agricultural improvements. African governments have shown a marked change of attitude towards family planning since the beginning of the 1980s; the United Nations Fund for Population Activities and the World Bank are

receiving an increasing number of requests for help in developing family planning programs. The donor nations should provide strong, but quiet support in the form of funding or supplying birth control information, education and materials. The initiative has to come from the African nations themselves; success or failure of the effort will depend on donor response.

Declining birth rates are strongly linked with reduced infant deaths, rising levels of female education and increased status for women. Thus, assistance in family planning can be combined with more highly visible support for measures to reduce infant deaths and to improve the position of women.

The impact of the present crisis will be felt for many years to come and may well be repeated. Short- and medium-term measures in the areas for priority attention, mentioned above as well as the spreading of pilot approaches to agricultural improvement, now to be described, must be accompanied by and constitute part of a comprehensive long-term strategy for Africa. The Lagos Plan of Action exists. It should be reviewed with the intention of giving a higher priority to agriculture. In the meantime, the many ad hoc, piecemeal responses must be brought together in a well-coordinated and cohesive work program going beyond the year 2000.

SELECTED PROPOSALS FOR ACTION

Many proposals were made during the Workshop. Most of them are reflected upon in the above considerations. They all have their merits and should be studied further. A few of them are singled out here. They are more elaborate. They also appear to fall well within the perspective of one of the objectives of the Workshop, which was to identify some approaches to tackle problems for the eventual defeat of hunger, and to study proposals which when implemented could serve as pilot projects. Focusing on recent innovations in agricultural techniques, especially in the field of maize and sorghum, could be used to make a break-through in the production of these crops in parts of Africa.

New technologies, plant materials in the form of improved varieties in hybrids with considerably higher yield potential than the traditional materials are presently available and even, as in the case of maize, have been released in most instances by the national maize Programs in sub-Saharan Africa. This is the result of years of scientific research at the national and international level. It is already commonly used in many Developing countries. However, it is underutilized, either by not being used promptly or by not even being adopted.

The adoption of new technologies do not constitute the unique answer, the panacea. It is not universally accepted as the right answer. Other approaches, often complementary, are advocated. They tend to focus more on other dimensions of what can be called the food system, or else they tend to concentrate on the food system as a whole. Technology is only one of the elements of the food system in which a number of interdependent factors are at work and which altogether affect food availability. Technology is, however, one of the critical factors. Widespread adoption of an appropriate and efficient technology could contribute a great deal to the much searched break-through in increased food production. What is thus needed is to find ways to make it available to tens of thousands of small farmers to whom its potential should be demonstrated by setting up hundreds of pilot farms where production practices would be tested and married to proper economic and social policies.

Such a scheme, which some have estimated could take place in parts of Africa within the next six to eight years, implies, firstly, a number of prerequisites which were included in some of the proposals made during the Workshop and which will be dealt with forthwith.

Proposal to aid in the rapid transfer of ICRISAT
materials and technology to two countries

1. Background:

"...The large variation in environments within a small geographic area is a feature of the semi-arid tropics which tends to defeat strategies to develop widely useful information. Despite careful efforts in designing the technology, plant varieties and agronomic techniques may have only narrow and specific use within certain areas of a geographic region. The reduced variability and improved growing conditions found on experiment stations where research is conducted cannot be matched in the usual farm situation. To assess the potential of the technology at the farm level research conducted on typical farm locations in varying environments may be used to verify the value of materials and technologies prior to their extension to farmers and to identify constraints to management at the farm level.

National capabilities for research and extension are generally inadequate to develop, promote, or pursue all valuable agricultural needs of their countries, despite general staff commitment to and enthusiasm for the task. Thus widespread promulgation of the value of materials and technologies through meetings and elementary training, the production of initial quantities of seed, and demonstrations of innovations are not accomplished to the extent necessary.

The farmer of the semi-arid tropics is a producer oriented primarily to his own consumption needs, and secondarily to the needs of others. Farmers are aware of risk; the penalty for failure is often starvation. Their adoption of innovations which call for adjustments or revisions of their production practices must be explained, demonstrated, and proven.

Production for sale is possible only with reasonable, assured prices and markets.

2. Proposed scope and objectives:

ICRISAT proposes to initiate pilot programs in two countries where our sorghum varieties have been accepted by the government, to stimulate the rapid transfer of technology and catalyze development of infrastructure for rapid spread of technology based on improved varieties and production practices in dry land zones. We will have the following objectives:

1. To assist the National Research Program in developing adaptive research programs and provide technical support and funds to: (a) organize and conduct on-farm research trials to identify the adaption zones within which improved varieties (from ICRISAT and other sources) are clearly superior to present varieties; (b) to determine farmer constraints and needs such as fertilizer supply, animal traction, seed, practical training, credit, market availability, and prices; (c) to develop seed production capability for superior varieties; (d) evaluate seed and grain storage facilities needs on farms and at seed production sites; (e) to monitor seed quality and food quality and acceptance; and (f) to train national program personnel in technology transfer procedures.
2. To assist the National Extension Program with technical advice and funds to (a) conduct demonstrations of improved sorghum varieties; (b) conduct training meetings for farmers; (c) assist in distribution of production inputs; and (d) conduct follow-up visits to areas and villages where new varieties are being used to identify and solve problems.
3. To compare the results from the countries involved for deriving general recommendations.

3. Proposal concept:

ICRISAT proposes to supply one Agronomist/Trials Officer in each country, who will be supported by consultants from other ICRISAT locations and from other sources to assist in the planning and conduct of the program. Funds will be disbursed to the cooperating national research and extension agencies to fulfill the objectives. ICRISAT will confer with national agricultural leadership on a periodic basis to evaluate progress of the pilot program when required to enlist government aid to overcome impediments to progress of the program.

ICRISAT will furnish training to all participants prior to beginning the research and extension work. The general sequence of events are: Year 1 - Determination of test sites network, rapid village surveys at sites, on-farm testing, evaluation of food quality. Year 2 - On-farm testing continues under observation of extension service. Rapid village surveys at end of second growing season and final delineation of adaptation

zone. Preparation for seed production for year 4. Year 3 - National demonstrations of improved technology and farmer's meetings, farmer-managed trials, seed production begins. Year 4 - Distribution of seed and other needed inputs, extension and research survey of progress. Final evaluation of results.

The sequences will be flexible enough to accelerate or delay the process as yearly evaluations will indicate.

Proposal for regional research programs of sorghum
improvement in West and East Africa

1. Background:

In both West and East Africa, sorghum constitutes one of the most important crops. National research capabilities could be improved in both regions in order to create the conditions to place improved sorghum materials at the disposal of the farmer.

2. Program objectives for West and East Africa:

As an overall goal ICRISAT wishes to strengthen National Research Programs (NRP) of the regions by increasing their capabilities, through research support, training, and services, to enable them to adequately provide for their own research needs. Major emphasis will be placed on development of improved sorghum materials which will be equal to or better than local varieties under very low-input conditions but which are much more responsive to increased inputs.

Specific objectives are:

1. Develop varieties, hybrids, and improved lines for use by the NRP. Subobjectives are evaluation of local and elite germ plasm, development and transfer of techniques and methods to evaluate materials for pest and climatic stress, assist with regional trials and nurseries, provide off-season crossing blocks, advise about seed production activities, and assist in food quality evaluations.
 2. Conduct agronomic research to improve cropping systems, increase efficient management of soil and water resources, and assist in materials and technology verification and transfer through on-farm research.
 3. Provide support services and technical information through workshops, symposia, training tours, and short-term consultancies and visits among African NRP and between ICRISAT and NRP.
 4. Provide training opportunities within the regions, at ICRISAT Center, and by other appropriate means at other locations.
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5. Provide funds and technical support to NRP to assist in regional trials, experiment station development, on-farm research, and other research activities.

3. Concepts:

The programs will deal with sorghum improvement of the African countries on a regional basis. Two regional Programs would be set up in West Africa and one in East Africa. Direct collaborative research will be conducted with countries who have active sorghum research programs and where sorghum is a priority crop. Countries with smaller programs will draw direct technical support from ICRISAT. ICRISAT technical assistance, based on regional research results, including those of NRP, will be given through frequent country consultations and at least annual meetings of all appropriate research workers in the region. Regional goals and priorities will be set by a Regional Network structure drawing membership from each country and meeting annually. ICRISAT will, to the limit of its resources, provide financial aid to country programs for joint research. Sorghum improvement programs in West and East Africa will be closely linked to and supported by ICRISAT Center in India and the SADCC/ICRISAT program in southern Africa.

Proposal for maize seed production training project for sub-Saharan Africa

1. Background:

By 1985, most national maize programs in sub-Saharan Africa had released improved varieties and hybrids with considerably higher yield potential than the traditional materials grown on most of Africa's 9 million ha of maize land. What is lacking, then, is not the basic germ plasm resources but infrastructure for delivering it. The amount of improved germ plasm to be found on farmer's fields, especially small farmers' fields, is discouragingly low.

It has been estimated that less than 10% of the total maize area in sub-Saharan Africa is planted to good quality maize seed, including all kinds of hybrids, varieties and composites. The use of good quality seed (i.e., with genetic purity, good germination, free of diseases and insects, and treated with insecticides and fungicides) could increase maize yields 10-15% almost immediately. Although the technology for the maintenance and production of improved varieties and hybrids is available, little of this technology is employed in most African countries. Kenya and Zimbabwe are the primary exceptions; both have well-organized programs for hybrid maize seed production, quality testing, and distribution. Their efforts are, however, primarily directed to large landholding farmers.

One of the major constraints in the development of efficient, well-organized seed programs in Africa is the lack of adequate seed production skills in most national programs. Those African seed production

specialists who have been trained have attended seed technology programs in Europe and the United States. Unfortunately, much of the training received is limited to seed technology aspects and is not appropriate to the conditions and problems faced by seed production and distribution organizations working in Africa. This proposal seeks to reduce this limiting factor through seed production training courses to be given in Africa.

2. Project Description:

To help get maize moving, we propose that a seed production training facility (small-scale seed processing pilot plant) be established to serve maize research and production programs in sub-Saharan Africa. Recurring training courses (often lasting a full crop season, 5-7 months) would be offered, that cover important aspects of seed production -- from breeder seed through commercial seed production. The course would be similar in structure to the International Maize and Wheat Improvement Center's (CIMMYT) in-service maize production course in its tutorial, hands-on approach to develop trainee competency levels to achieve practical results. The course would encompass all activities, from planting to detasseling to rouging to harvesting to seed conditioning (processing). Special attention would be given to organizational issues in seed production, including relationships with crop research programs that develop the improved materials and with growers who produce the commercial seed. Various aspects of seed distribution and marketing would also be covered. A range of training materials that describe key concepts and procedures in seed production and marketing would be produced and made available to trainees and seed organizations throughout the continent.

The proposed work plan for the seed training program would also include development of suitable information systems (newsletters, workshops and symposia) to keep African seed production specialists apprised of recent developments in seed technology. Technical advice to national programs would also be provided by the project staff on the organization of effective seed production and distribution programs and on equipment purchasing and facility planning.

CONCLUSIONS

Hundreds of projects are presently being implemented in sub-Saharan Africa. Many more have just been approved or are still on the drawing board. Hundreds of international bodies, governmental agencies, and non-governmental organizations are active in the preparation and implementation of those programs. African countries are often, thus, submerged by projects put through by a myriad of organizations. This is a

situation which is sometimes difficult to face, which stretches some of the resources of African countries (administrative, and financial, for example) to their limit. In view of this, it is important that any new project should not provide only a marginal contribution or create an additional burden, but really provide an original solution to one of the world's most pressing problems.

The proposals made here are, to some extent, not original. Bits and pieces of what is proposed are already being implemented. They arise from a design, based on past successful experiments, to spread the knowledge of available technologies and the existing know-how, to initiate and incorporate these new practices among the tens of thousand of small farmers who bear the grave responsibility of producing food for Africa.

The spread of technical approaches in itself is quite insufficient. There is a primary need to produce more food, and food of high nutritional value. However, this food must be available locally and regionally to all. Thus food production and distribution must be seen in a broad ecological, socio-economic, cultural and even political framework. The specific proposals made during the Workshop constitute, in this context, only the core of the projects likely to emerge and to be implemented. They are still in draft form. They have to be further studied. This task will be achieved under the supervision of the Steering Committee of the Workshop, with the additional cooperation of other interested participants and specialists. Its objectives are to:

1. Identify one or two original pilot projects which will effectively serve to demonstrate the appropriateness of the proposal and thus contribute to an increase in food production. In selecting a pilot scheme, the ecological, economic, social, and human dimensions will be carefully examined. It is likely that these chosen schemes will receive financial support, which has been generously offered by Mr. Ryoichi Sasakawa, Chairman of the Japan Shipbuilding Industry Foundation, for a period of five years.
2. To determine, in consultation with decision-makers in African States, feasible sites for pilot projects suggested by the Workshop. These consultations will include discussions on the various needs and priorities of the African States.
3. To seek institutional support from existing International Organizations, public or private, and governments, in the implementation of designated pilot projects. Financial support will also be solicited.

The Workshop will not evolve into a new organization. It is likely that Proposals will be implemented in close connection with other projects. Other workshops might be organized in the years to come. The Centre for Applied Studies in International Negotiations will continue to provide the needed secretariat/ administrative services and to be involved in the coordination of follow-up work.
