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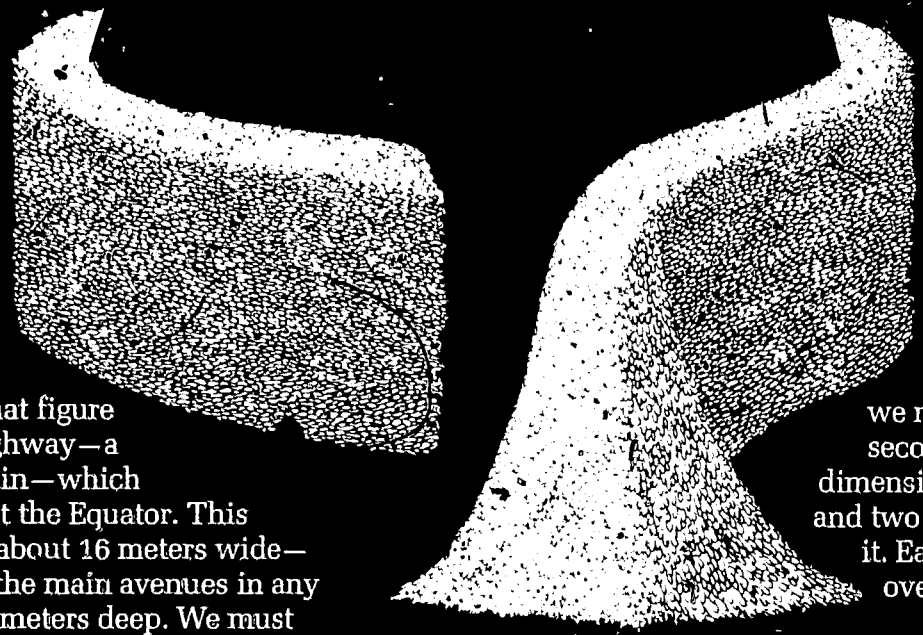
ABSTRACT

Eleven articles comprise this document which presents commentaries on nutrition, population, and environmental education. The articles deal specifically with the crises of a rapidly growing world population, a worsening world food situation, and an energy crisis. A number of specific recommendations, both national and international, are offered to improve the precarious world-food situation. Following an introductory article on these problems, the second article calls for a global effort to help solve the problems through the continued efforts of the United Nations General Assembly's World Food Conference. The third article calls for a buildup of food stocks to give the world a security against serious food shortages through a coordinated system of national reserve stocks of cereals in both developed and developing countries. The following article calls attention to the problems of food in relation to the growing population--problems of both quantity and distribution. Also included is a Declaration on Food and Population presented to the United Nations on April 25, 1974. The problem of the world fertilizer shortage which threatens food supplies is discussed in another article. Other articles deal with food, nutrition, family health, and family responsibilities. (Author/JR)

THE VICTOR-BOSTROM FUND FOR THE INTERNATIONAL PLANNED PARENTHOOD FEDERATION



"The 1971 crop of cereal grains was an all-time record harvest—over one billion metric tons. To visualize what that figure means, picture a highway—a highway built of grain—which encircles the earth at the Equator. This highway of grain is about 16 meters wide—the width of one of the main avenues in any large city—and two meters deep. We must reconstruct this highway of grain each year because we consume it in its entirety. It is not made of cement so that once made one can use it for 30 years with minor repairs. At the same time that we are reconstructing this highway each year, we must begin building a second one of these same dimensions—16 meters wide and two meters deep—beside it. Each year we must add over 1,000 kilometers of grain to the second highway just to keep up with population growth."

Norman E. Borlaug, Nobel Prize, 1970

FOOD AND POPULATION

REPORT NO. 19
SUMMER-FALL
1974

William H. Draper, Jr.
Chairman, Victor-Bostrom Fund Committee

THE VICTOR FUND AND THE VICTOR-BOSTROM FUND

The Victor Fund was established in 1965 with an initial bequest of over $150,000 from Alexander Victor of Victrola fame to raise at least $3 million for the worldwide budgets of the International Planned Parenthood Federation during 1966, 1967 and 1968. With some 25 contributions of $150,000 the Victor Fund was oversubscribed and enabled IPPF to support projects and programs in more than 40 countries.

The Victor-Bostrom Fund was established in 1968 with an initial contribution from Mr. Harold Bostrom. By the end of 1973 the Fund had provided at least a million dollars annually to IPPF for five consecutive years.

The total amount raised is now over $11.5 million. With the base provided by these funds and other private contributions, IPPF has obtained support from some fifteen governments and the United Nations Fund for Population Activities. But private support must also continue to grow. Your help on any scale which you can afford will be gratefully appreciated.

DER F. VICTOR

JULIA HENDERSON

The Victor-Bostrom Fund Report

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"To meet our present crises successfully, the world must reorder its priorities . . ."

Nutrition and Numbers

by

J. George Harrar
President Emeritus
The Rockefeller Foundation

The world today is confronted with three major crises: two of long-standing and one of recent major impact. These are:

- A rapidly-growing world population which may reach 7 billion by the end of the century and could double that figure before the middle of the twenty-first century.
- A worsening world food situation in which reserves are at an all-time low, prices have gotten out of hand, and production projections over the long term, in contrast to demand, are unsatisfactory.
- An energy crisis, long building but currently posing an immediate threat to our industrial potential with especially serious implications for the agricultural industry.

Clearly, these crises must be looked at in context, and massive effort made world-wide, especially in the Third World, to avert the disastrous results of failure to stabilize populations, substantially increase food supplies and resolve the problems of energy for progress. This can only be accomplished through international agreement, planning, and action on a continuing basis towards these ends.

This Victor-Bostrom Fund Report deals with these three crises and offers a number of specific recommendations—national and international—to improve what Dr. Borlaug rightly calls "a precarious world food situation."

Unfortunately, as these articles suggest, the world is substantially out of balance with respect to the production and distribution of needed food supplies. It has long been recognized that there are many agrarian nations whose production levels are low and who regularly fail to satisfy their basic food requirements. Most successful agriculture is practiced in temperate climates, where soils are fertile, rainfall adequate and growing conditions, in general, favorable. Where the climate is harsh, water scarce, soils infertile and economic resources limited, agriculture tends to become a subsistence phenomenon. Where there are complications caused by periodic floods, droughts or other natural disasters, the situation worsens. The Third World has long experienced the effects of an imperfect system of agricultural production and a long-term lag in economic development. Where this situation is compounded by explosive population growth, standards of living and the quality of life are woefully inadequate.

Checking Population Growth

There are appropriate technologies which make it possible to abate population growth. What appears to be lacking is a universal will to embark upon this effort aggressively and continuously. Some nations are still not convinced that the population threat is real, growing, and is contributing each day to a deteriorating world economy which, in turn, determines what standards of living shall prevail. **World leaders, and indeed, the public will have to realize that they *can* make progress towards the improvement of the human condition through the limitation of our numbers.**

As communication improves, it becomes increasingly possible to establish patterns and programs, directed towards reducing birth rates through mass participation. Time is a critical factor and although the world might be able to limit its population to approximately 7 billion, just after the turn of the century, it is more probable that explosive growth will continue well into the next century and that there could be a world population of 10-15 billion by the year 2025. **Theoretical models with respect to potential world food production are interesting but unrealistic. The facts are that the world, in its present state of technology and with its present resources, cannot hope to support in dignity a population of 10-15 billion by the end of the next 50 years.** If these numbers do occur because we are unsuccessful in stabilizing populations, then the least result will be severely reduced standards of living worldwide. But for millions, this will undoubtedly mean chronic malnutrition and starvation.

Nutrition Needs Must Be Met

If population stabilization occurs on an increasing scale, then perhaps we can meet the problems of world nutrition. We are fortunate in having an enormous body of knowledge derived from research on the human diet, which establishes the requirements for energy and body-building compounds. We have become increasingly aware of deficiency diseases and their effects upon pregnant mothers, infants, juveniles and older age groups. We know that juvenile malnutrition can bring about irreversible detrimental effects, both physical and mental, that millions are today condemned to unproductive lives because of their earlier, deficient dietary patterns. We recognize also the interrelationship between many pathogenic conditions and nutrition, and are well aware of the effect of deficiencies of amino acids and of protein malnutrition on body metabolism. Presently, knowledge is available to make it possible often to combat many of these conditions through treatment and a balanced diet.

Effects of Energy Crisis

To provide adequately for the nutritional needs of our present population plus those who join the society every day, the agricultural industry is under ever greater pressure. The energy crisis makes the problem increasingly difficult and complicated, since agriculture depends to a very considerable degree on energy. Adequate fertilizer, machinery, water systems and electrical power sources in concert make it possible to increase efficiency of agriculture with resultant production benefits. If one or more of those elements are subtracted from the system, the total food supply is inevitably reduced. The lack of long-range and forward planning, the inability of nations to act in concert for the common good, the instability of governments and the neglect of food production has brought us to our present crisis which is now being exacerbated by energy constraints.

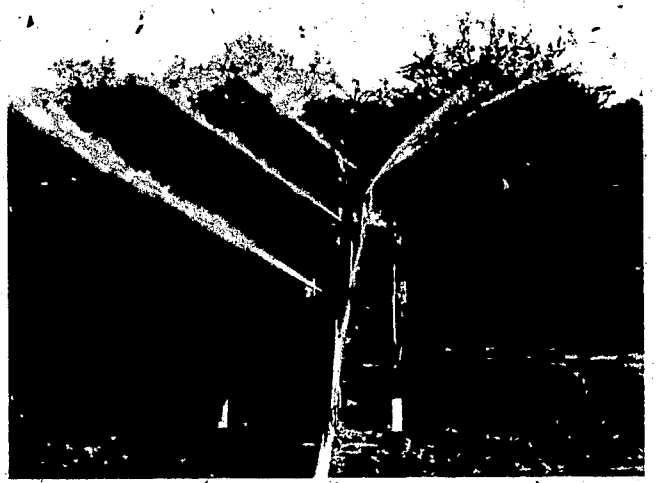
Rapidly growing populations with unmet nutritional needs, inefficient patterns of agricultural production and the

If human nutrition is meaningful it can only be so when based solidly on an efficient agricultural industry. Every encouragement must be given to the agricultural industry worldwide. As Shri Subramaniam of India points out, high priorities will have to be assigned to agricultural systems of management and production including all of the basic ingredients essential to the process. These are principally proper soil management, the use of high-quality varieties and species, adequate supplies of fertilizer and other agricultural chemicals, efficient water utilization, and protection from pests and pathogens. Technology appropriate to the crop and to the local economy, storage, transport, marketing, and credit facilities are all essential ingredients within the total system. Finally, but of critical importance, are stable governments, with progressive agricultural policies designed to assure the efficient utilization of agricultural resources and improvements in the quantity and quality of foodstuffs as basic to an advancing economy and national well-being.

Agricultural Potential Not Reached

The world food picture from today's vantage point is not encouraging. A minimum of four percent annual increase in food production is necessary to feed the present population, the 75 million new individuals who join the world each year (200,000 each day), and to provide for reasonable reserves with which to guard against periods of deficit which occur all too frequently. Moreover, world food production is extremely uneven. There is little relevance between the capacity of one area or one nation to produce food supplies and the actual production figures. **Many nations which have the potential to produce annually vast quantities of food and feed grains never approach the potential figures.** This may be due to limited resources, financial strictures, inadequate foreign exchange, unstable government, and an agricultural community disadvantaged from the standpoint of educational opportunities, extension service assistance, and lack of an adequate infrastructure which provides necessary storage facilities, marketing systems, and needed agricultural credit, among other requirements. Most of the nations of the Third World do have large labor resources. In few, however, is the labor utilized at a high level of efficiency, principally because the essential back-up elements are in short supply or not provided.

It is possible to turn agricultural production around in many parts of the world. Most nations know what their annual requirements for food supplies are apt to be. They also know their annual production figures and their population growth rate. It then becomes readily possible to calculate national requirements in both the short and long term. In the context of available resources and systems, each nation can assess its current situation, determine priorities for the future, and methods for their achievement and begin to take appropriate action toward matching agricultural pro-



long term energy crisis present a world challenge that can be surmounted only by cooperative international action.

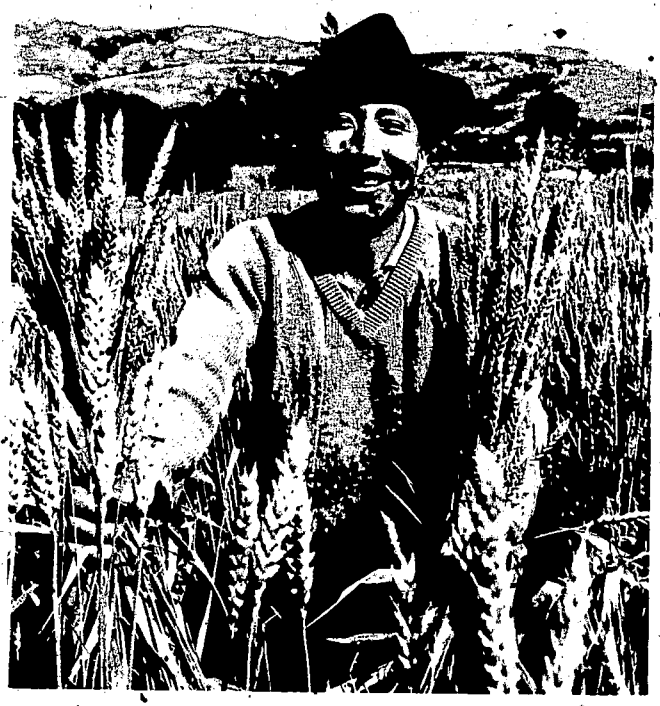
duction with essential food requirements for the society. Obviously, geographic, climatic, and many other factors and parameters guarantee varying production capacities among nations. However, a first and fundamental requirement is that insofar as possible, each nation maximize its food production within its capabilities.

Fortunately, there is an enormous body of available information, a vast technology, improved biological materials, and an ever-growing cadre of qualified individuals who could give meaning and leadership to any national agricultural development plan. **If each nation participates in a global effort to bring about the maximum efficient utilization of its agricultural and human resources for the production of food and agricultural commodities, then it becomes possible to greatly increase total figures worldwide and to plan a system in which food production and distribution can be in harmony with human needs without the convulsion of crisis.**

World Food Production Could Be Doubled

It has been estimated that an organized, integrated plan of action involving all nations could, through improvements in conventional agriculture, at least double annual world food production within a reasonable period of years. If during the same period, substantial progress is made towards zero population growth, then the lamentable and unreasonable gap between the affluent and disadvantaged nations could be substantially narrowed with enormous benefits to all of the society, in a state of peace and progress. In an organized world food plan, all of the nations concerned would have to accept the rationale of balanced production worldwide. Thus, decisions would have to be made as to where individual crops could be most efficiently and economically produced and how these could be appropriately distributed in exchange for other commodities produced elsewhere. This would be in effect a voluntary system of cropping patterns, quotas, and reserves, as proposed by Dr. Boerma of FAO and Dr. Marei, Secretary-General of the World Food Conference. It would be designed and operated for the benefit of all nations to eliminate periods of glut and scarcity and the economic disadvantages these carry with them.

Our present crises are increasingly apparent and threatening. To meet them successfully, the world must reorder its priorities. It must decide how the utilization of our human and natural resources can best be applied for the benefit of society, present and future. We cannot indefinitely draw on our nonrenewable resources for socially nonproductive purposes. In the past, the tools of conflict, at great cost and enormous destruction, at best brought about an uneasy and only temporary period of peace. A civilized world guided by the morality urged by Dr. Itty of the World Council of Churches should be able to agree upon concerted action directed to the alleviation of all forms of human disadvantage and the continuing improvement of the human condition and dignity through decent standards of living and opportunity. Essential to this end is the interaction of nations and the exchange of information, materials, and people, leading to growing international understanding directed to building a future world with a compassionate concern for all those who will occupy it and one worthy of those who currently direct its destinies.



Fertilizer and new wheat varieties pay off in Ecuador

"Millions of lives depend upon our deliberations"

A Global Effort is Necessary

by

SAYED A. MAREI
Secretary-General
World Food Conference

The decision of the UN General Assembly to convene a World Food Conference is of great historical significance. It symbolizes the solemn resolve of the international community to work together to solve the problem of hunger—man's earliest enemy and first concern.

Efforts by the international community to solve the world's food problem have been underway in one form or another throughout the past four decades. In 1937 the League of Nations set up a committee to study the inter-related questions of nutrition, food production and economic policy. This initiative led ultimately to the creation, in 1945, of the Food and Agriculture Organization (FAO) as a specialized agency of the United Nations. In the past 29 years FAO has provided a focus for international action in the field of food and agriculture.

Another important development was the establishment in 1961 of the World Food Programme, as a joint UN/FAO body, initiating a new concept of multilateral aid in the form of food for development. This Programme has made a significant contribution to the alleviation of hunger and poverty.

In 1964 the United Nations Conference on Trade and Development was established as a permanent organ of the General Assembly. This action greatly strengthened the capacity of the United Nations system to tackle the complex international trade dimension of the world food problem. During recent years, the increasing support given to the agricultural sector by the World Bank, the regional development banks, the United Nations Development Programme and other agencies of the United Nations system has had a considerable impact on food production in many regions.

Two other international events which left their mark in this critical area were the first and second World Food Congresses, held in 1963 and 1970, respectively. These Congresses were not inter-governmental in character, but were attended by a large number of eminent persons with major responsibilities in government, in business and in non-governmental organizations and made a number of important recommendations.

Lately, there has been a growing realization that the problems of food production, consumption and trade need to be resolved in the wider context of development problems. It was from this perspective that the General Assembly adopted an International Development Strategy for the Second Development Decade.

Despite these important landmarks and some lesser ones, the world as a whole is still far from providing adequate food for all. In fact, today, in absolute terms we have more people who are hungry and undernourished than we had 25 years ago. Throughout this period the world has alternated between large surpluses and acute shortages, between euphoria and despondency, between hope and despair—but it has not yet devised measures which will effectively banish the threat of starvation, hunger, and malnutrition that hangs over millions of human beings.

New Sense of Urgency

The sudden and sharp deterioration in the world food situation in 1972 and 1973 has created a new sense of urgency in tackling this problem. The most significant manifestation of this sense of urgency is the decision to convene the World Food Conference in November 1974 in Rome.

"The principal task of the World Food Conference," the FAO Conference said in its report to the Economic and Social Commission, "should be to bring about a commitment by the world community as a whole to undertake concrete action toward resolving the world food problem within the wider context of development problems."

Determining an Agenda for Action

The provisional agenda is divided into two parts. The first calls for a careful assessment of the present food situation and the nature and magnitude of the future world food problem, including the identification of a possible food gap between projected requirements and food supply if recent trends in production were to continue.

The second part of the agenda covers national and international action to be taken, grouping together under the following three broad headings a wide range of important measures which could have a major impact on the resolution of the food problem:

- Measures for increasing food production and consumption in developing countries,
- Strengthening world food security through co-ordinated stock holding, emergency relief and food aid, and
- International trade and international agricultural adjustment.

Better irrigation in Libya helps raise food production

It is surely self-evident that the first and fundamental remedy of the world food problem lies in raising food production, in both developed and developing countries. The provisional agenda envisions that it will be possible for the Conference to agree on long-term goals for food production by the world community and to adopt a strategy for achieving these goals through appropriate policies and programmes, with particular emphasis on increasing production in developing countries. These, we hope, will include many concrete and specific plans for the development of land and water resources, agricultural inputs—notably fertilizer, agricultural research for a more appropriate technology—and structural and institutional improvements.

The agenda will also focus attention on consumption and nutrition. It calls on governments to re-examine the nutritional status of their populations and to formulate a strategy for ensuring an adequate diet for all.

The second item will deal with measures to strengthen world food security within a new framework for national and international food policies, the need for which has already been highlighted by the events of the last two years. Even if effective national and international measures are taken to increase production and thus to meet the projected gap between demand and supply of food, there will inevitably be periodical setbacks, for instance, droughts and other disasters, the effects of which will call for a much higher degree of international co-operation.

Emergency Food Reserves Needed

In this context, an important prerequisite is improved co-operation in maintaining food stocks and co-ordinating national reserves policies, so as to ensure that adequate physical supplies are available at all times. This, however, will constitute only the first modest step towards World Food Security—the basic objectives of which have already been endorsed by governments at the Seventeenth Session of the FAO

Conference. The next logical step would be an agreement on more effective measures for providing emergency relief in cases of disaster, including creating international food reserves for use in emergencies.

Another important component of a World Food System would be the formulation of a long-term policy for food aid, linking the concepts of food security and development assistance. Such a policy would allow for improved international co-ordination of food aid programmes, as well as ensuring continuity of food aid supplies and opening the way to an increased role for multilateral food aid.

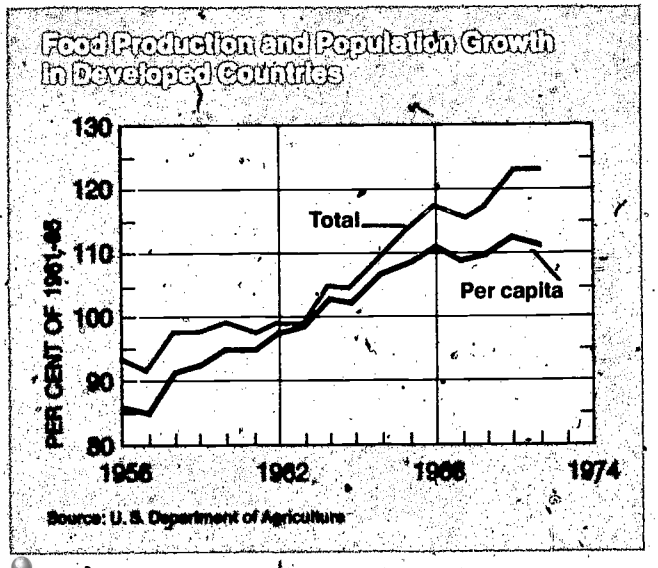
The third broad heading for action is international trade and international agricultural adjustment. It is envisioned that the Conference will seek specific objectives and programmes which have a bearing on the solution of the food problem, and which could be carried out subsequently through existing international machinery, to achieve greater stability in food prices and greater consistency between national and international agricultural policies.

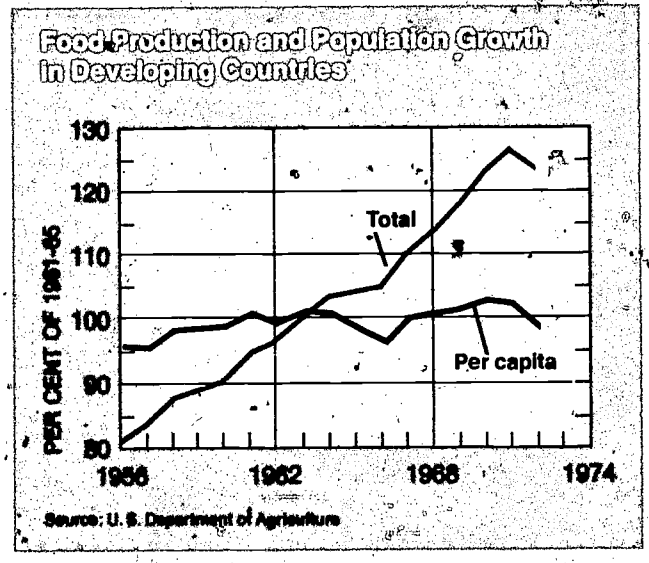
Governments will identify under each agenda item the specific actions and programmes on which the Conference could focus its attention. I am pleading vigorously for a business-like approach, both in the preparatory phase and during the Conference itself. In particular, I hope that we can keep clearly in mind these three areas in which, subject to effective follow-up action, decisive measures can be taken.

Long and intensive work will be required in a very short time by all concerned, and especially by the organizations of the United Nations system directly involved in preparing background material and documents. This will undoubtedly put a considerable strain on the resources and the expertise of the organizations concerned, but I am convinced that they will rise to the occasion.

An even heavier responsibility will fall on the participating governments, since it is up to them to agree on the policy measures and concrete actions that are needed to achieve the Conference objectives.

The challenge that we face today in solving the problem of hunger and malnutrition is greater and more complex than at any time in the past. The way in which the international community meets this challenge will affect the lives of millions of human beings all over the world. **I, for one, believe that success can be achieved only on one basic condition—the nations of the world must agree to act vigorously together in the pursuit of a common overriding goal. All countries have a contribution they can make to this endeavour, and all must share responsibility for its success or failure.** Millions of lives are dependent upon our decisions. It should, therefore, be the firm resolve of all to ensure that the World Food Conference of 1974 marks a milestone on the road this world must travel towards our common goal of banishing, once and for all, the scourge of hunger from our globe.





"The neglect of agriculture has created a potential for disaster . . ."

The Case for World Food Security

by
ADDEKE H. BOERMA
Director-General
Food & Agriculture Organization
of the United Nations

Twenty-five years ago, the General Assembly of the United Nations adopted the Universal Declaration of Human Rights. One of the Articles of the Declaration proclaimed that "Everyone has the right to a standard of living adequate for the health and well-being of himself and of his family." Among the necessary components of this right, the first to be mentioned was food.

There are many people in the world, especially in the richer countries, who will regard this as a fine statement of the obvious. There are many others, especially in the poorer countries, who will also regard it as a fine statement, but of a remote ideal. **For the fact is that the world has never come anywhere close to a situation in which everyone has had enough food for an adequate standard of living. Neither in the more distant past nor in the twenty-five years since the Universal Declaration was adopted. Nor today. Today, in fact, there are grounds for believing that, as a result of events in the last year or so, the situation has actually become worse.** It is more critical than it has been at any other time since the years immediately after the end of the Second World War. At the middle of this year, the wheat stocks of major exporting countries may be down to about 20 million tons. At present the outlook for the harvest seems good; some major producers have increased their wheat acreage and the weather so far has been favorable, with the possible exception of the Soviet Union. But the fact remains that the world has become dependent for its basic food supplies on the outcome of a single season's harvests and a single season's weather. If there is a substantial shortfall in any region we could be face to face with crisis on a considerable scale.

Even with good harvests the world continues to be faced with shortages and high prices both for cereals and for the chemical fertilizers which are needed in vast quantities if any considerable increase in food production is to be achieved.

In the prosperous countries of the world this situation has contributed to a level of inflation which is causing a great deal of concern; for the developing world it is an almost intolerable burden. The Food and Agriculture Organization of the United Nations (FAO) has recently estimated that the developing countries' import bill for cereals will rise from $4,000,000,000 in the 1972/73 crop season to nearly $10,000,000,000 in 1973/74. The increase alone equals about two-thirds of the yearly total of official aid that they have received in recent years.

Fertilizers And Energy Costs Escalating

This current situation is a direct outcome of the poor harvest of 1971 and then of 1972 when world food production actually declined for the first time since the Second World War. Then in 1972 came massive grain purchases by the Soviet Union which further severely depleted stocks. Over the same period, increased demand and inadequate manufacturing capacity have caused a growing shortage of fertilizers. Recently, the jump in oil prices has helped to push up the cost of the limited supplies of fertilizer which have been available.

Although these recent events may have precipitated the present critical situation in the developing countries they are not the basic cause of it. For this one must look to the lack of sufficient investment of effort and of money in agriculture in recent years. There have been modest gains in food production it is true. During the 1950's production in the developing world increased annually by 3.2 per cent and in the 1960's by 2.7 per cent. But most of this extra production was taken up by in-

creased populations and in many countries where food consumption levels were already dangerously low 20 years ago they have declined further or, at best, remained stationary. **This neglect of agriculture has thus created a potential for disaster which could easily be realized in the next year or so unless we make a fresh and more vigorous effect to meet what is, after all, man's most basic material need.**

Our most immediate and urgent need is to rebuild food stocks to give us security against serious food shortages and, with this in mind, last year I proposed a co-ordinated system of national reserve stocks of cereals in both developed and developing countries. These stocks would be held, owned, and controlled nationally but there would be an international policy link-up with regular consultations to agree on the action needed to meet the threat of a food shortage in any given area of the world.

This proposal was endorsed by FAO's Governing Conference last November. It is now being embodied in a formal undertaking for acceptance by governments. In view of the present situation and in the light of the positive reaction by governments in November there is every reason to believe that the proposal will be accepted. The task now will be to translate an idea into a specific programme for action.

For a start it is clear that if the scheme is to work, all governments which adhere to it will need to think out very carefully what their national stock policies should be. In the case of smaller and poorer countries little more can be expected than a commitment to their own survival. More powerful countries, especially those which are major exporters of food, will have to consider not only their own needs but also those of others.

Measures to help developing countries build up their own stocks have been given particular attention. Discussing the question in November 1973, the FAO Conference drew attention to the role which the World Food Programme could play with its more than ten years' experience in the distribution of food supplies to meet emergency situations and to back programmes of national development. The Conference urged governments to make additional pledges to the WFP. The World Bank (IBRD) and the regional banks, including

In many developing countries there is little additional available land which can be easily brought into production.

the African Development Bank, have expressed their willingness to finance storage facilities and other infrastructure while the IBRD has also suggested that it might be able to finance the initial food stocks themselves, as part of an overall project. The International Monetary Fund has indicated that it could assist countries in tiding over temporary, or medium-term, balance of payments problems that could arise in building up and maintaining reserve stocks.

Substantial support is thus beginning to build up for these proposals and I have real hope that we are on our way towards a World Food Policy which will include mutually-agreed stock-holding policies; measures for price stabilization; more effective food aid arrangements to deal with emergencies; and more systematic long-term food aid policies better adjusted to more general requirements. To these I would like to see added an improved food information and outlook system covering the whole world.

Today, the technical possibilities exist for great increases in production in virtually every developing country—there is absolutely no doubt about that. But, as I have already noted, we have conspicuously failed to make the effort that is needed; rich and poor, we are all to blame.

Clearly, the main effort must be made by the developing countries. They must work more energetically to introduce improved technology into their agriculture. They must make more efficient use of the resources and technology that they already possess.

There is a crying need for social reform. In too many developing countries customs of land tenure, of the employment of labour, of provision of rural credit, and of marketing are antiquated and wasteful. Some countries must give more thought to their population policies. **The limitation of population growth is not a magic key to progress but it is certain that the present rate of population growth is a burden on many economies and often on limited natural resources.**

The world must take more energetic and intensive measures to slow down the present headlong rate of population growth, especially in the developing countries. While it is true that the world has the technological capacity to feed much more than the present population of this planet, I do not think that the ghost of Malthus has been exorcised. For technology is only one factor in the food and population equation.

At the same time, the developing countries are going to need much greater support from the more prosperous countries. It might be remembered that only a few years ago the United Nations General Assembly as a whole agreed that the developed countries should be able to

The world fish catch after reaching a peak in 1970 has declined in recent years.

devote 0.7 per cent of their gross national product to aid by 1975. Today the level of official aid is about one-half of that figure and the general flow of aid seems more likely to decline than increase. Yet I do not see aid from the richer countries as disinterested charity; it is a long-term investment in the world economy as a whole which will ultimately pay dividends to all countries.

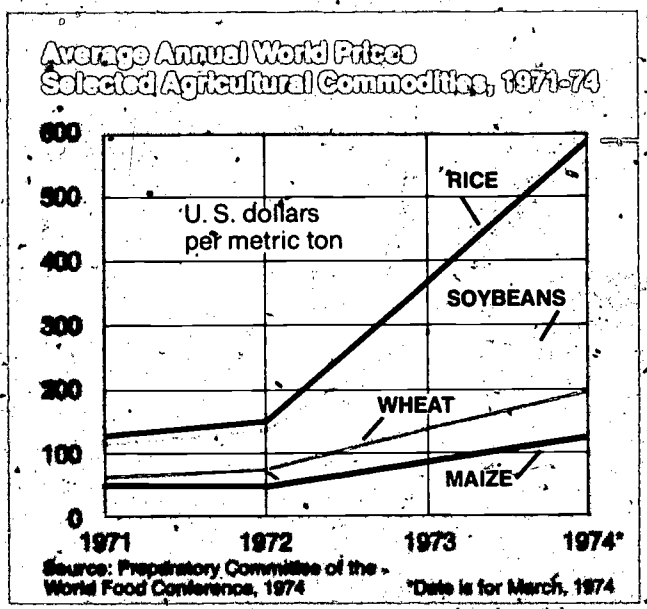
I believe that together with an increase of aid from the traditionally rich countries there should come greater economic help from the newly-rich oil-producing countries. I think it is a very welcome portent for the future that several of them have already announced steps to channel resources into existing or new development funds. An example close to FAO is the decision of Saudi Arabia to pledge $50 million to the joint UN/FAO World Food Programme for 1975-76.

Aid to the developing countries means also giving them a fairer deal in international trade. They need to earn more foreign exchange in order to speed up their economic and social development. But we all need them to earn more as a contribution to a healthy and thriving world economy. At FAO we have drawn up proposals for measures of adjustment to national agricultural policies which could contribute to this aim. Our studies have shown that very modest trade concessions, which would hardly be noticed in the agricultural economies of most of the developed countries, could give a very substantial boost to the economies of the poorer agricultural producing countries.

Cooperation Could Bring Success

I do not believe that the long-term outlook for food production is a gloomy one as long as we do not continue to drift as we have drifted for too many years.

I do believe that today the food situation is more immediate and more obvious to most people than it has been in years. Everybody is affected by shortages and higher prices for food. I think most people are nervous about what the future may bring and this is not an unhealthy state of affairs. In November, a special UN World Food Conference is to be held in Rome. **If present concern and apprehension can then be transmuted into a firm commitment for action by the countries that take part then we could begin to hope that the aim of freedom from want might become an attainable hope for the world at large.**



Improved technology can increase food yields.

We have seen men on the moon but can we help men on earth?

Challenge and Opportunity: The World Food Problem

by

Shri C. Subramaniam
Minister of Industrial Development
and Science and Technology
Government of India

The over-all requirement for food is greater than its availability and the gap between the two is widening. Failure to achieve a durable balance between the two portends a downhill course of poverty, disease and social disorder for many hundreds of millions of people.

It took 18 centuries for world population to increase from about 210 million to one billion. It took only a little over a century thereafter for the second billion to be reached; the third needed only 30 more years. At present rates of growth, it will take hardly 15 years for the 4 billion mark to be reached. That will happen within a year or two. Much of this increase is taking place in the underdeveloped world.

The problem of food in relation to the population to be supported by it is not only a problem of quantity and quality but also of distribution. Today, one third of the world's population uses two thirds of its grain. Much of this goes to feed live-stock to supply the milk, the eggs and the meat for consumers in the affluent countries. As a recent article in **The Economist** (London, April 20, 1974) put it succinctly:

> Some countries will pay more money for the grain to keep their livestock alive than others will be able to afford for their starving population.

As within nations, so also among nations, without the purchasing power, mere physical availability of food does not imply that all will be well fed. News of large harvests merely mocks at the deprived, whether they be nations or classes of people within a nation.

The optimism that characterised the middle sixties on the ability to produce adequate food for the world's population is now quite muted. 1972 and 1973 witnessed a sharp deterioration in the world food situation, with large areas being affected by drought, dwindling reserves and mounting pressure on prices. A further spell of drought in parts of Africa and Asia could well tip the scale in the present precarious balance between requirements and availabilities and drive millions to the verge of Malthusian starvation. It is against this background that the World Population Conference and the World Food Conference are to be held later this year.

These Conferences offer a valuable forum not merely to review the immediate problem but also to work out a consensus on the main contours of a **world strategy** to avert this looming danger. **Reaching an accord on a genuinely cooperative action programme designed to strengthen national and international programmes to fight hunger and malnutrition wherever it may exist should be the guiding spirit of the deliberations at these Conferences.**

Food Is A Complex Situation

Both from the point of view of *what* has to be done and from the point of view of *who* will do it, the whole chain—food production, handling, distribution, and consumption—must be considered as a complete system. Corrective measures on various aspects of the imbalance between supply and demand for food will need to be devised in full awareness of their inter-relationships with a view of optimizing the results for the

system as a whole.

On the supply side, low crop yields in the developing countries often indicate considerable untapped production potential in their farms. At the margin, returns on additional inputs in these areas are likely to yield better returns than in areas where the potential is already being exploited more intensively and crop yields are already high. This will be a relevant consideration in planning the further deployment of scarce inputs for achieving the increase in output that the world so urgently needs.

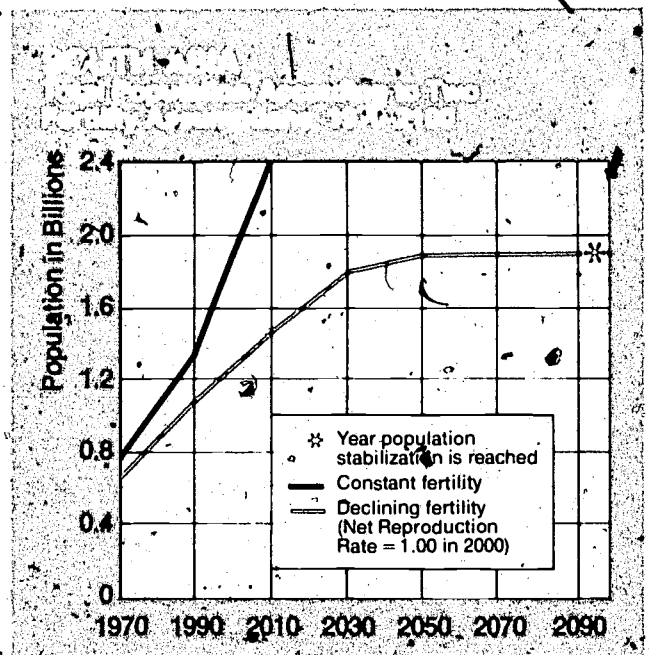
Scientific Approach to Agriculture

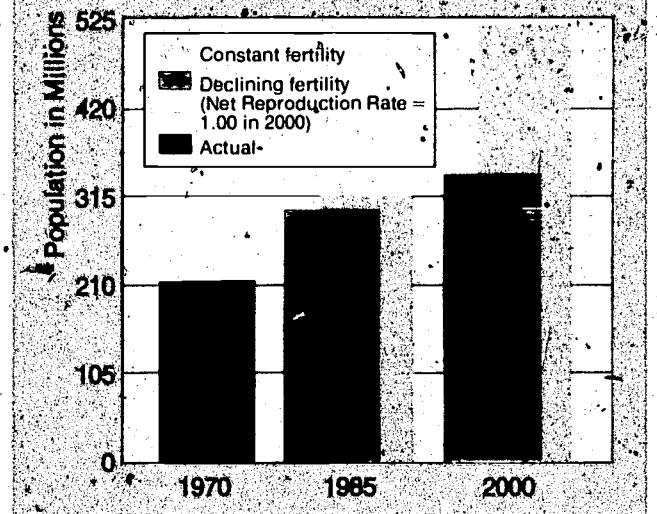
Agricultural research has significant technological breakthroughs to its credit in improving yield potential of some of the major food crops such as wheat, rice, sorghum, maize and pearl millet. Crop yield is not, however, a simple function of the variety of seed used. It is dependent also on soil and climatic factors, on availability of water for irrigation, on effectiveness of pest control measures and, of course, on the socio-economic frame-work in which the farming community operates. **Research work in major international centres for improving genetic potential of seeds needs to be carried further and adapted through a net-work of local research stations in order for the results to be most meaningful for different local environments.**

Another area where further research, development and extension is urgently required for improving agricultural productivity in the developing countries, is in carrying out soil and water surveys on a comprehensive basis, and in popularising scientific soil and water management techniques.

A specific commitment from the developed countries at the forthcoming Population and Food Conferences for help in initiating or strengthening activities in the developing countries to promote increased agricultural production would be timely and valuable. UN agencies can also assist in promoting an atmosphere where national Governments are encouraged to bestow the required priority for modernizing their agriculture.

A technological breakthrough in agriculture is not automatically or easily converted into a production advance. For this to happen the requisite inputs – high-yielding varieties of seed, plant nutrients, plant protection, chemicals – will have to be supplied to the farmers, in time and in adequate quantity. The demands





SOURCE: International Statistical Programs Center, U.S. Bureau of the Census, based on data provided by the Community and Family Study Center, University of Chicago, January 1974.

Additional projections for most developing countries are available free upon request from the Victor Bostrom Fund Committee

that this aspect of agricultural development make on the production and delivery systems are immense. National governments will have to accept primary responsibility for ensuring, that this set of activities is attended to on a priority basis. Even here international assistance in disseminating information and in providing technical and training facilities could be fruitful.

Recent Asian and African experiences highlight the fundamental difference between techniques needed, on the one hand, for promoting industrial development based on the concept of *mass production*, and techniques needed for stimulating agricultural advance which must be based upon a concept of *production by masses* for it to be relevant to most developing countries. The institutional and managerial innovations that this implies are far-reaching.

Wastage Must Be Reduced

One aspect of the food supply problem, in relation particularly to the developing world, that perhaps has not received as much attention as it has deserved relates to the savings in grain that are possible by cutting down losses between what is produced and what is available for consumption. Estimates of losses in total production owing to lack of care at the harvesting and post-harvesting stage vary widely. But by all accounts they are large and to a great extent avoidable. Measures for improving prevalent techniques can save millions of tons of valuable foodgrains and protect their nutritional value, making all the differences between starvation and survival for large numbers of people. Simple equipment must be devised and brought into use that reduce wastage and check deterioration in food value at various stages of transport, storage and processing.

Family Planning Requires High Priority

The Pearson Commission's warning in 1969 that "no other phenomenon casts a darker shadow over the prospects for international development than the staggering growth of population" found its echo in the UN Declaration on Population in 1970 which appealed to national Governments to recognize family planning as one of their vital interests. **It is one of the more encouraging facets in an otherwise gloomy picture that an increasingly large number of Governments in the developing world have specifically accepted policies**

and promoted programmes for limiting growth rates in their populations. This commitment now extends approximately to two-thirds of the population of the developing areas. In terms of actual coverage by specific programmes, however, progress has been much slower. As per one estimate*, roughly 10 per cent of the married women of reproductive age in 18 countries with specific operational programmes of family planning have accepted the programmes and are practizing contraception. **Extending this coverage and improving the effectiveness of family planning programmes will demand high priority in any programme for meeting the world food problem.**

*Populating Planning—Sector Working Paper—World Bank, March 1972—p. 18.

Available evidence clearly indicates that for sustaining a family planning programme effectively, it is often helpful to relate it around a comprehensive health care system. It is hard to find examples where attempts at reducing population growth have met with significant success when death rates of infants and children have continued to be high. Recognizing the fact that bridging the nutritional gap for the entire population in the developing countries will be a long term endeavour, a Report commissioned by the United Nations on "A Strategy for Fighting Protein Hunger" (1970) argued that Governments should in the first instance, concentrate on meeting the nutritional requirements of vulnerable groups in the population, namely, the infants, the nursing and the pregnant mothers. In most countries there is also considerable scope for increasing the nutrient value of existing diets at no great additional cost by a suitable combination of diets or by supplementing deficient elements. International assistance for further research, development and extension in this field would pay handsome dividends in upgrading nutritional levels among large masses of the people in the developing world.

A Global Plan or Many National Plans?

A central issue that the forthcoming Conferences on Population and Food respectively will need to face is whether action, designed to meet this threat of hunger and malnutrition, at a time when science and technology can provide us with the tools for combating the threat effectively, will be left to the planning and executive capabilities of each national Government, or whether a global plan of action could be evolved by mutual agreement so that the challenge is tackled as a common threat and by cooperative endeavour.

The situation, of course, poses no direct threat to some of the countries. But the long-term problems flowing from the massive increase of populations concern the world as a whole, and not merely particular nations. The anxiety voiced with over-all "Limits to Growth" underlines this commonality. For some of the developing countries, these limits are already not hypothetical. The per capita agricultural land available in India, for instance, is only about .0.37 hectare, whereas the authors of The Club of Rome report **Limits to Growth** envision a minimum requirement of 0.4 hectare per capita for ensuring adequate nutritional standards.

Even for the more advanced nations where the problem of food deficits is yet to emerge, mass production technology developed by them calls for intensive use of various non-renewable forms of energy. We must work to evolve new technologies of agriculture and patterns of distribution and packaging which use less energy and non-renewable resources. **A leading ecologist once said that when we eat potatoes, we are in fact mostly eating oil. This statement well characterizes the agricultural practices of the industrialized countries.** Recent studies have shown that in some cases, the fossil fuel subsidy is so great that the food calories obtained by the consumer are even less than the input of calories from non-renewable resources.

Self-Reliance in Food Advisable

In the discussions relating to the world food problem, it is necessary to shift the emphasis from trade to production and the means for achieving higher production. Let the deficit nations be helped to become self-reliant within a foreseeable future. Under such an approach, programmes designed to train research workers, to supply equipment, to provide extension aids, to upgrade managerial skills in the rural context assume special significance. In terms of costs, such a policy is not likely to impose undue strains on the resources—financial or human—of the developed world, compared with what it would cost directly to find adequate food to keep the growing millions in the developing areas adequately fed by production of stocks in and by the more

advanced countries. It is better to supply the seed, the nutrients and the pesticides in time to prevent the famine than to supply the grain to fight starvation after allowing it to occur. It is better moreover to help the national governments to produce an adequate stock of well-trained scientists, technologists, administrators and extension workers who can help in the efficient production and use of the improved seeds, fertilisers and other chemicals than to perpetuate helpless dependence of one block of countries on another block of countries to secure their minimum food needs. This is not to argue against possible advantages of international specialisation. **But in such a vital commodity as basic foodstuffs, each nation should feel itself sufficiently self-reliant that its national survival is not tied to fickle changes of climate – both natural and political.**

Build-up of such capabilities, skills and organisations in the countries that lack them presently to meet the elementary food requirements of their vast and growing millions will take time. In the meanwhile, international action for creating a buffer stock to meet emergency needs will once again require consideration at the highest level. The World Food Congress provides a welcome opportunity for considering this question. **Can we at least arrive at some understanding that surplus countries will hold a certain minimum level of reserve stocks and operations on this reserve would be subject to international monitoring? The aim should be to guarantee an agreed level of emergency supplies for use in areas that may need them at short notice for sheer survival and for ensuring a reasonable stability in prices.**

To recapitulate briefly, we need to concentrate efforts at achieving agreement on a global programme of action in regard to the following six major areas:

(1) Massive assistance for improving agricultural production through strengthening scientific and managerial capabilities among the developing countries;

(2) Supply of requisite raw materials for production, particularly of nutrients and power, at prices that will be within the paying capabity of the developing countries;

(3) An Agricultural Inputs-Bank under international auspices for the benefit of the developing world with distribution to be made on the basis of mutually agreed priorities and prices;

(4) reducing loss and wastage to minimise the present gap between production and consumption;

(5) special efforts at meeting the nutritional deficiencies of vulnerable segments in the world's population; and

(6) a Food Buffer, if not directly internationally owned, then at least operated as per internationally devised guidelines.

The forthcoming conferences of world leaders should particularly beware of engaging in endless discussions that do not lead to a clear-cut programme of action. **If the challenge facing us is not met *now*, with imagination and compassion by the international community, the breathing spell provided to us by the scientists would have been lost through failure of statesmanship. Let us hope that the same enthusiasm and energy that characterised the U.S. programme of "Man on the Moon" before 1970, will at this juncture in human development, be captured at the international level for saving, from avoidable starvation and malnutrition, "Men on the Earth".**

Grains are the basis for the diets in developing countries.

The following Declaration on Food and Population, which has now been signed by over 2,200 distinguished citizens from over 100 countries was presented to United Nations Secretary-General Kurt Waldheim on April 25, 1974. Messages of support for the Declaration were received by a number of government leaders. The Response by the Secretary-General is printed below. The Declaration together with the list of signers, the Secretary-General's Response and the Messages of Support have been printed in Arabic, Chinese, English, French, German, Portuguese, Russian and Spanish. These are available free upon request by writing to Food and Population, Suite 200, 1835 K Street, N.W., Washington, D.C. 20006

To Governments, Organizations and Men and Women Everywhere We, the Undersigned, Address this Declaration on Food & Population

o link unites the family of man more than his need for food. For food is an essential condition of life, common to all people; wherever they are, whatever they do they share alike in this need.

The stark truth is that man's ability to produce food is not keeping pace with his need. Despite efforts by governments and the international community to solve world food problems, more people are hungry today than ever before.

Hundreds of millions of the world's people are undernourished. Population growth is adding 75 to 80 million more people each year, 200,000 each day. Within the next 25 years or so our present numbers of nearly 4 billion will be nearly 7 billion. They must all be fed.

he world food situation took a sharp turn for the worse in 1972 and 1973:

1. Stocks of grain have hit an all-time low since the end of World War II. Surplus stocks formerly held in reserve have nearly been exhausted and no longer offer security against widespread hunger and starvation.

2. Food prices have reached new highs. Last year, despite a record world harvest, escalating demand nearly doubled grain prices. The increasing cost of food threatens to cause serious hardship for many people already spending most of what they have on food.

3. Less of the cheaper protein foods, which normally supplement grain diets, is available. The world's fish catch and per caput production of protein-rich legumes, the staple diet in many countries, have declined.

4. Food shortages have created serious social unrest in many parts of the world and are particularly severe in countries where hunger and the diseases that thrive on under-nourished bodies are prevalent. This scarcity has been aggravated by the consumption of more and more grain to produce meat, eggs and milk.

5. Mounting fertilizer and energy shortages are reducing food production in certain areas and increasing food prices.

In this new and threatening situation, a bad monsoon in Asia (which could occur in any year), or a drought in North America (like those in the 1930's and 1950's), could mean severe malnutrition for hundreds of millions and death for many millions.

his dangerously unstable world food picture, when seen against an unprecedented population increase, has created an immediate sense of urgency. The dangers of food shortages could remain a threat for the rest of this century—even if, hopefully, bumper crops in some years create temporary surpluses and even if the trend toward reduced birth rates becomes general throughout the world.

World food production in the years ahead must rise at least 2 percent a year to keep pace with the present rate of population growth. But it must rise a good deal more if the world's people are to be provided with an adequate diet. This required annual increase in food production is considerably greater than that which occurred during recent decades—and seems to be increasingly harder to achieve each year. But unless there is this necessary and continuous increase in food production, there will be even more hunger and malnutrition and soaring food prices.

The need to seek solutions is pressing. The nature of the problem, the precarious state of world food production made critical by predicted expectations of continued population growth, calls for concerted action by the world community. There is only one cure for hunger and that is food. No palliatives or panaceas in the form of reports or resolutions can alleviate the pain of empty stomachs that must be filled. International resolutions, however high-minded, are a mockery if they do not have a tangible impact on the human condition.

he United Nations is now providing leadership on both these problems. In August the United Nations will convene the World Population Conference in Bucharest. In November it will convene the World Food Conference in Rome. These are the first occasions when governments have agreed to meet to consider these crucial questions and to consider taking action on them.

With these two conferences only a few months away, we urge governments, acting before, at and after these two global conferences, to consider realistic and purposeful measures such as the following:

1. Give high priority to programs in each country which will increase the production of grains, legumes and other staple food crops; ensure the availability of protein-rich foods, particularly to the more vulnerable population groups; expand the production of fertilizer; and improve the opportunities for small farmers to make a reasonable living. Develop a comprehensive and constructive World Food Plan for adoption at the World Food Conference.

2. Support sound population policies relevant to national needs which respect national sovereignty and the diversity of social, economic and cultural conditions; accept and assure the human right of each couple to decide for themselves the spacing and size of their families;* and recognize the corresponding responsibility of governments to provide their peoples the information and the means to exercise this right effectively.** Embody these policies in a World Population Plan of Action to be agreed upon by governments at the World Population Conference.

* United Nations Teheran Declaration of Human Rights, 1968 (para. 16)

** Resolution 1672 (LII) of the United Nations Economic and Social Council, 1969

3. Recognize that the interdependence of the world community creates an obligation to assist in the necessary funding of food and population programs by both developing and developed countries. This calls for the elaboration and implementation of a global strategy by the United Nations and its family of agencies, including the Food and Agriculture Organization of the United Nations and the United Nations Fund for Population Activities.

4. Establish sufficient food reserves through national and international efforts to provide continuing vital insurance against food shortages.

5. Recognize that, in our finite world where resources are limited, the family of man must one day, and hopefully fairly soon, bring birth rates into reasonable balance with the lowered death rates that have been achieved. Many governments see the need to guide national policy toward this objective.

solution to the present world food crisis must be found within the next few years.

The social transformation which can lead to a reduction in the world rate of fertility, along with lowering the rate of mortality, will take decades to accomplish. But a start must be made now because the millions of people being born each year place a heavy burden on the resources available to many nations for education, health, employment and the maintenance of environmental quality. A reduction in population growth could help alleviate this burden. Effective measures toward resolving both the world food and population problems must come within a total strategy of development. Not only is social and economic development desirable in itself, but also it contributes to moderating population growth. All these measures are designed to improve the quality of life.

In this Declaration, we focus on food because it is the most critical of the pressures on the world today. It is the greatest manifestation of world poverty, which has many aspects. The absolute number of desperately poor are far greater today than ever before in history. The need to eradicate acute poverty is being recognized more than ever as a collective responsibility. It is a task which global partnership and the demands of social justice make imperative.

We repeat, food is crucial because literally tens of millions of lives are suspended in the delicate balance between world population and world food supplies. Growing populations, denied sufficient food needed for survival, resist all efforts to secure a peaceful world. With increased production and more equitable distribution of food, the future could provide a prospect of less misery and more hope for countless people now deprived of the basic necessities that are their right.

The World Food Conference represents a unique opportunity. This opportunity must not be missed. Comprehensive international agreements must be reached to assure at least minimal food supplies, with sufficient annual carry-over stocks. Disastrous breakdowns in the world food supply can thus be avoided. All nations may then rest secure in the knowledge that this, the most critical of their immediate problems, is being attacked with wisdom, vigor and unity of purpose.

In the name of humanity we call upon all governments and peoples everywhere, rich and poor, regardless of political and social systems, to act—to act together—and to act in time.

Response by UN Secretary-General Kurt Waldheim

Following is the text of the statement made by Secretary-General Kurt Waldheim on receiving the Declaration on Food and Population presented by a group of eminent intellectuals and scientists at a ceremony at United Nations Headquarters, April 25, 1974.

I am grateful to be given this Declaration. It is marked by a profound concern for the improvement of the human condition. The Declaration is important of itself by virtue of the authority of the signers whose standing in all walks of life is reflected by the stature of those who have come to the United Nations today to bear witness to it.

I have recently described the times we are living in as being characterized by mass poverty, food shortages, an energy crisis, a continuing oppressive burden of military expenditure, inflation exacerbated by world monetary instability, and the prospect before us of a doubling of human numbers by the turn of the century.

The Declaration addresses itself primarily to the dramatic depletion of available food reserves and the shortfall in world food production. There is no more immediate task than that of rescuing the world from a situation which, for many, has always been precarious and is now even more hazardous. Short-term measures, while essential, must not be allowed to become palliatives, for the coming years will increase our vulnerability.

Virtually in no other area is it more pressing than in the one to which your Declaration addresses itself: the need to assure that the men, women, and children of Africa, Asia, Europe and the Americas, whatever their origin, their religion, their political philosophy, their age, their social condition have the basic foods which are the one essential and undebatable pre-condition of a life of dignity and decency. Without an assured supply, all our other aspirations for peace, for social justice, for growth and creativity, both as individuals and as nations, lose their meaning and take on a hollow ring.

I cannot but be sharply and painfully conscious of the dangers posed by the Declaration, having recently returned from the Sahel. There, the suffering provoked by a six-year drought is resulting in premature death, disease and a dreadful sense of helplessness. The tragic spectacle of dying cattle and their owners fleeing the encroaching desert induces a sense of desperation into what should be the objective analysis of the world's food situation and prospects.

It is no accident that this Declaration is presented at the United Nations. This body was established in the final phase of the most devastating war in history not merely to embody the highest aspirations of mankind, but to provide an operational vehicle for global action. The present crisis and those that we can see looming ahead can be overcome. They are indeed a serious challenge to use all our forces, our determination and ingenuity to provide a better life for future generations.

This is a year in which the international community, with some brutally abrupt reminders of what the future may hold, is facing up to the situation. At its present special session, the General Assembly is devoting its attention to finding the basis of a more equitable and workable economic system—a system which takes into account not only the needs of all nations, but also the imperative interrelationships of the several parts of the problem: poverty, the conservation and just apportionment of natural resources, the preservation of the environment, and the problems of trade and monetary system. Food and population, the two urgent issues to which your Declaration addresses itself, form an integral part of this whole.

In August, in Bucharest, for the first time Governments will hold a world population conference. Shortly afterwards, in Rome, the World Food Conference will offer Governments the opportunity to tackle the world food problem. Your call therefore for international co-operation to ensure supplies of food comes at an opportune moment. The World Food Conference will present the Member States of the United Nations with the unique opportunity to take immediate practical and urgently needed steps to redress a tragic situation which we can no longer afford to ignore.

The unprecedented growth of the world's population is compounding man's difficulties in feeding himself. The time at our disposal is very short. You point out that the world's food production has barely kept pace with population increases. Our goal is not mere survival but a life of dignity and peace with hope for each new generation to improve the conditions of life for the billions of men, women and children who will inhabit the earth in the coming decades.

Whether or not we can increase food production depends, as the Declaration states, not on a torrent of words and resolutions, but on adopting new and tangible objectives, hammering out the global strategies needed and revitalizing the machinery to achieve them. In spite of its ideological complexity and the political and other constraints that must exist in any global body, the United Nations can and will respond.

It is in this same spirit of commitment and determination that I receive this Declaration. I am confident that the international community can and will find humane solutions to the serious problems of food and population which confront mankind.

"All of our efforts will be in vain . . . unless we stabilize world population"

Precarious World Food Situation

by

NORMAN E. BORLAUG
Director
The International Wheat and Maize Improvement Center
Nobel Peace Prize 1970

The present world food shortage is a new development, the implications of which are only now becoming fully apparent to consumers and governments. As late as spring 1972, the world felt very complacent about agriculture. There seemed to be adequate food reserves. Then drought began in late 1971 and continued throughout 1972, adversely affecting wheat production in the Soviet Union, the People's Republic of China and Australia. Also in 1972 a poor monsoon reduced rice, sorghum and millet production in South Asia and in Africa south of the Sahara.

In a few months' time many of these countries, beginning with the Soviet Union, were forced to import large quantities of grain. Stocks which had previously been thought "surplus" disappeared overnight. Prices of grains, such as wheat, for example, increased from about $1.60 per bushel in July 1972 to something over $6.00 at the beginning of 1974. They have now settled at about $3.60 or $3.70 a bushel—which represents a doubling of wheat prices in just two years.

With the disappearance of the food grain reserves, the whole world food situation is precarious. Without food people can only live for about three weeks at best. If major drought occurs in the world now, or a crop failure in any of the large grain-producing areas of the world, tens of millions could die in an international disaster and little could be done to prevent it. It was only a small change in production that triggered off these potentially catastrophic events and brought famine so close.

Cereal grains provide a good indication of total food production. The 1971 crop of cereal grains was an all-time record harvest—1,1000,000,000 metric tons. To visualize what that means, picture a highway—a highway built of grain—that encircles the earth at the Equator. This highway of grain is about 16 meters in width—the width of one of the main avenues in any large city—and it will have a depth of about two meters. Such a highway would approximate the volume of the 1971 record grain crop.

Building A New Highway of Grain Every Year

Yet each year we must reconstruct this highway of grain because each year we consume it in its entirety. It is not made of cement so that once it is built it can be used for 30 years with minor repairs. This highway of grain we demolish by consuming it each and every year. So each year we must reconstruct this highway. Then at the same time each year we must also begin building a second highway of the same dimensions—16 meters in width, two meters in depth—and 1000 kilometers long in order to provide for population growth.

How do we do this?

We have two choices:

- —increase the land area under cultivation, or
- —increase the yields on the area already under cultivation.

Except for a few countries, there is little additional good land that can be brought under cultivation. Only costly, time consuming projects such as irrigation will provide new farm land. North America has some addi-

tional land which could be brought back into production—perhaps 10 - 15 million acres, but most of the land which once lay fallow has already been brought back into production. Certainly in the vast problem areas of the world where the great majority of the world's population—and some would say overpopulation—already lives, there is hardly any additional land that can be brought into production rapidly.

Therefore production per acre must be increased on the lands already under cultivation. In most of those densely populated areas, agriculture is so old that the soil has been exploited for decades or even for centuries. It has been depleted of essential nutrients such as phosphorous, potash, nitrogen, and other elements.

Agricultural Research Vital

The only way to restore productivity to this soil is through research—research to determine what the limiting factors are—and chemical fertilizers to replenish the depleted soil. Only in that way can the soil be made responsive to the needs of those improved crop varieties which will hopefully increase yields dramatically. **Fertilizer is a must for most of the depleted soils of the developing world. Unfortunately, it is in very short supply.**

Further research must be undertaken to develop new high-yield crop varieties such as those we have developed for wheat at the International Wheat and Maize Improvement Center in Mexico. The International Rice Research Institute is examining ways to increase rice yields. Research is underway elsewhere in the developing nations to meet indigenous needs for certain other crops.

These new varieties of plants are genetically engineered to respond to better nutrition in the local environments and to produce heavy yields of grain. These plants must also have built into them resistance to the major diseases and inspect pests that are present in different areas. Otherwise, the addition of fertilizer could stimulate weeds and pests rather than wheat or rice.

Much research must be done locally. Even though seeds that have been developed elsewhere can be used temporarily as a stopgap means, in the long run research programs must be established in developing countries. New people must be trained. These are costly and time consuming projects, but they must be undertaken.

To this already difficult and precarious task, the present energy crisis has added an immense burden—largely through higher petroleum prices. Within the last few months, about twelve to fifteen of the Third World nations which export petroleum products have become, in effect, very wealthy. But the remainder of the developing nations are in a worse situation than ever, as the case of India illustrates.

India's Crisis

In 1971 India spent approximately $560 million on the import of three basic products: crude oil, fertilizer, and about 2.1 million metric tons of food grains.

If India were to buy the same amount of those three products today—which it cannot afford to do—India would find that the price of crude oil and the price of fertilizer have gone up about four- or five-fold. The price of food grains has tripled. Finally freight rates to transport these commodities from point of production to point of import have also doubled and tripled because they too are dependent on energy. **In order to obtain the same amount of these products as purchased in 1971, India would have to pay approximately $3.1 billion—or more than five times as much as in 1971.**

Each year we must build a highway of grain.

Completely impossible. India's foreign exchange earnings from all sources are about $2.4 billion. India has to cut back on crude oil imports. This, in turn, cuts down not only total industrial production, but also Indian domestic fertilizer production which, again, adversely affects food production. In 1974 production of wheat alone will be on the order of about five million tons less because India was unable to get enough fertilizer. The shortfall may be even more because India's domestic production of fertilizer is also reduced.

What can be done about situations like this?

Fertilizer Production Must Be Expanded

Fertilizer production must be expanded. In order to maintain per capita food consumption at the present level the world will have to build 15 new fertilizer complexes each year at a total investment about $7 to $8 billion a year.

A big job lies ahead. One future development which, hopefully, will occur is the production of fertilizer in the Middle East. Natural gas which is now being flared off Arab oilfields and wasted is the best raw material for the production of nitrogenous fertilizer. I have encouraged Arab nations, as well as Iran, to install greater fertilizer capacity. It is good business from their standpoint both to export one of the most basic of human needs into world markets and to try to remove the destructive waste of flaring gas.

High yielding rice requires fertilizer and pesticides

Today the world has no food grain reserves, despite the fact that last year, 1973, produced an all-time record harvest of grain. I hope that at the World Food Conference in November in Rome, arrangements can be made so that responsibility for financing the storage of reasonable stocks in many parts of the world can be agreed upon, and so that all nations can participate at least by token contributions. Those nations which have the capability should approach this issue on a global basis.

In conclusion, let me emphasize that you cannot consider food without considering population. Whenever you talk about planning for food production, you need to know how many people you are setting the world's tables for. Therein lies the other side of the coin. The rapid reduction of death rates has precipitated rapid population growth. **All of our efforts to increase food production will be in vain, unless we stabilize world population.**

Population Growth Affects Everyone

Population growth today is a monster with many tentacles that reaches out and tries to suppress standards of living throughout the world. Even those who have already achieved economic development, such as the USA and the USSR, are threatened.

In the short time that it takes to say "This is monstrous," there are five more people born into this world than have died. That is a serious situation. It is difficult for democratic governments to deal with rapid population growth when a country is already over-populated. The potential for violence is enormous. Yet in countries with good educational programs, combined with good family planning programs and clinics, the birth rate and death rate can be brought into balance, helping to ensure a better life for the people.

Let us not be misled into believing, however, that any developed country can very conveniently isolate itself as a nation from all of the unstable and explosive political situations that are appearing in many parts of the world.

Governments will tumble unless these problems are met. Internal civic strife will become revolution and revolution may become international.

The limits of agriculture could be reached by century's end

World Fertilizer Shortage Threatens Food Supply

by

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The world is now in the grip of an acute shortage of fertilizer. Prices have risen dramatically during the past 18 months and show no sign of abating. The present shortage of fertilizer will continue for many years and will have a severe impact upon agricultural production in developing countries. During 1974 the shortage of fertilizer will probably result in crops no higher than 1973 crop levels in many of the larger developing countries such as China, India, Bangladesh, Rakistan, Sri Lanka, Indonesia, Philippines, Thailand, Turkey and Egypt.

An adequate fertilizer supply is a tremendously important component of agricultural development programs. In the last twenty years approximately one-half of the gain made in food production output was due to increased fertilizer usage. Increased irrigation, high yielding seed varieties, bringing more land into production and all other items accounted for the other fifty per cent. Unfortunately, fertilizer will be the limiting factor in the further development of agriculture in the next twenty-five years.

Developing Countries Hardest Hit

It is ironic and tragic that the world fertilizer shortage will restrict agricultural productivity in precisely those countries which can least afford to grow less food. One ton of fertilizer applied on the fields in a developing country will yield twice as much additional grain as it would have produced in a developed country. Yet the developing countries with their populations doubling every 28 years use only about a tenth as much fertilizer per person as do the developed nations.

The fertilizer shortage has its roots in the dearth of two other items—investment capital and manpower. Fertilizer plants are very expensive to build. It is doubtful that the fertilizer industry can expand fast enough to keep up with the demand.

The shortage of large capital investments to build new plants is exacerbated by the shortage of engineers capable of designing and building fertilizer plants. With the worldwide push to build new oil refineries, nuclear power plants, coal conversion plants, etc., fewer and fewer trained engineers are available to build the fertilizer plants which are so desperately needed.

The foregoing view of the future fertilizer situation does not mean that fertilizer production is going to decline. Far from it. Fertilizer production will continue to increase at a high rate for many years, but demand will increase even faster than production. If this proves to be true, the present shortages will become more acute. It behooves every country to become as self-sufficient in fertilizer as is economically possible.

The rapid increase in demand for fertilizer in developing countries is linked to three factors—population growth, the need to improve per capita caloric intake and the relatively low level of fertilizer usage in these countries. Between 1956 and 1973—years for which good statistics are available—the developing countries increased their fertilizer consumption by 705 percent and grain production increased by fifty percent. Be-

Fertilizer Usage Per Capita Selected Countries, 1972-73

Country	Nitrogen Fertilizer Consumption (1,000 Metric Tons)*	Population (Mid-1973)	Per Capita Fertilizer Consumption (kilograms per Capita)
France	1,524	52.3	102
U.S.A.	7,372	210.3	77
Germany, Fed.Rep.	1,131	59.4	55
U.S.S.R.	5,182	250.	47
Brazil	394	101.3	15
China	3,459	799.3	6
Pakistan	346	68.3	6
India	1,778	600.4	4.5
Indonesia	347	132.5	3.4
Bangladesh	145	83.4	2.3
Nigeria	11	59.6	.3

*Nitrogen Fertilizer only; thousands of tons, 1972.

Source: Fertilizer data is from FAO Production Yearbook 1972 and Annual Fertilizer Review 1972.

cause of the rapid population growth, however, grain production per capita increased by only one percent. With few prospects for a rapid decrease in the rate of world population growth, we can expect an acceleration rather than a diminution in the demand for fertilizer.

Further, the depletion of world grain reserves, bad weather, and the consequent price increase, have combined to place world food production in a very precarious position. In the developed nations food prices have risen dramatically. In certain developing countries, however, millions of poor people are being held hostage to drought, famine, and malnourishment. Hundreds of thousands cannot tighten their belts any more without succumbing to starvation or protein deficiency. Food assistance has and will continue to be required to make up for short term production shortfalls.

Fertilizer Aid More Efficient Than Food Aid

It would be wise, however, for the industrialized nations to reevaluate their food and fertilizer assistance programs for the long term. Food assistance can breed dependency and illusions about the urgency of agricultural development in low income nations. The suppliers of food assistance, on the other hand, could probably save money by giving food deficit nations adequate fertilizer to grow their own food rather than by growing it in the developed nations and shipping it to those needing assistance. For example, to supply an Asian country with 4.5 million tons of a cereal grain would cost a developed nation about $750 million. If a chronic food deficit nation received enough fertilizer in advance to grow this many tons of a cereal grain, however, it would cost the developed nation only one-third as much — a savings of $500 million.

Food, fertilizer and population are interdependent. While every effort should be made prior to and after the World Food Conference to step up agricultural production, we must recognize that there are limits to the number of acres on which food can be grown. Continued population growth, even at declining rates of growth during the rest of the century, will make it increasingly difficult for the developing countries to hold their own in per capita food production. In fact, before the end of the century it is quite possible that the limits of agriculture will be reached and per capita food production in the developing countries will have declined below present levels. Every effort must be made, therefore, consistent with national sovereignty and human dignity, to slow population growth before those limits are reached.

Fertilizer applied in a developing country yields twice as much additional grain as in a developed country.

Health of mothers and children are seriously affected by malnutrition.

Food, Nutrition and Family Health

by

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In the last year, the world has been jolted out of its slumber over food and nutrition problems by the severe famines which have occurred in the Sahel Region of Africa, India and to a lesser extent, in other parts of the developing world. This is not a new phenomenon by any means. In many developing countries chronic hunger, aggravated periodically by droughts and floods, always affects large numbers of the population. The United Nations has drawn attention to the fact that one third of mankind goes to bed hungry every night. This one third is in practice restricted to the "Third World." It therefore means that upwards of 50 per cent of the populations of developing countries are badly fed and suffer from various degrees of malnutrition. The food and nutrition problems which are primarily a result of poor agricultural and social development, in turn, help to aggravate the seriousness of all other development problems.

Vulnerable Groups Must Be Helped

Even within countries where overall malnutrition is a problem, "vulnerable groups" which include pregnant women, lactating women, infants and young children are by and large the people who suffer most from the consequences of severe malnutrition. This means that at the family and household level, the health of mother and child are most seriously affected (either directly or indirectly) by nutrition problems.

Mothers and children are most affected because their physiological needs for food are greater than societies generally recognise. The conditions most frequently seen are protein calorie malnutrition which is a mixed deficiency of proteins and calories—the extreme forms being Kwashiorkor and Marasmus—primarily affecting children from the time of weaning until they are able to partake fully of the household foods. In developing countries, the pre-school child period is considered one of the most susceptible periods for malnutrition. It is estimated that 900,000,000 children suffer from severe or moderate protein calorie malnutrition each year. Malnutrition throws a severe strain on individual, household and national resources and is itself a major cause of mortality. **It has been estimated recently that out of every 100 children under five years of age who died in various parts of Latin America, five per cent died from causes directly due to malnutrition, while another 55 per cent died with malnutrition as an associated cause of death.**

Vitamin A deficiency, which is due to lack of green leafy vegetables or carotene-rich fruits in the diet, is also widespread and leads to night blindness or even destruction of the eyes. Another very widespread condition is iron deficiency which causes anaemia, especially in pregnant women. It has been amply demonstrated that diseases which children and women in other countries can live with or get over quite easily become killers in the face of severe malnutrition. Malnutrition, therefore, acts synergistically with other conditions to cause the very high levels of mortality found in developing countries.

The nutritional status of developing countries has many complicated inter-relationships with the total development problems of these countries. The major source of difficulty is food production. Agricultural

development is very slow in many of the countries of the Third World because the methods used are largely elementary and very inefficient. There is a low level of capital inputs and low fertilizer usage. The recent fuel crisis has affected the fertilizer industry so badly that the cost of food production is bound to increase. In many places, the food crop production is entirely dependent on climatic and weather conditions. Whenever these conditions become adverse, man is exposed to the ravages of nature.

In addition to actual production, storage and processing difficulties are immense. Of the foods produced in tropical Africa, for example, between 10 and 30 per cent of all the grain is destroyed by insects and vermin of various kinds. There is much wastage also during the distribution and marketing of the food.

The increase in population which is taking place in many of the developing countries at more than two per cent per annum means an increased number of mouths to feed. With higher levels of education and urbanization, the number of able-bodied people consuming rather than producing food is considerably increased. Finally, the disproportionate investment by governments in cash crops such as cotton and coffee, as opposed to food crops has helped to aggravate the situation.

Education affects nutrition and food choice of an individual both directly and indirectly—indirectly, because the better educated a person is the more likely he is to get a well paid job and able, therefore, to afford a variety of foods. With a good income the percentage of a salary spent on food is small and permits flexibility in times of rising food prices. The poorly paid do not have this flexibility and as costs rise tend to buy only the cheapest and least nutritious foods. The more educated people are freer from taboos and have a better understanding of the reasons for the choices in food than others. Even the methods of food preparation used by those ignorant of nutrition can diminish the food values.

There is also the question of "pecking order" of those who consume the food. In many homes in developing countries, for instance, the father has first choice of the more nutritious part of the food; the women and children come last. Where there is plenty of food and a wide variety of it, this hierarchy has very little influence on family nutrition and health, but where the food available is only marginally adequate for the family, then the distribution of that food within the home becomes a matter of some considerable importance. The women and children who need them most may have the least of the protein-rich sauces that generally accompany the staple rice or grain.

A woman should normally gain the equivalent of twice the birth weight of her child during pregnancy. Yet a sizeable proportion of women in developing

Better nutrition must be taught mothers to help provide good diets for children.

countries are unable to put on this much weight during pregnancy—indicating inadequate nutrition. Some gain no weight at all. Since the baby is biologically dependent upon the mother, this means that the mother's own nutrition is being sacrificed for the child. In such circumstances frequent, closely-spaced pregnancies help to deplete the mother of the nutrients she needs. Frequently, she becomes anaemic, loses teeth and weight and may finally die with one of the pregnancies. **In short, the heavy maternal mortality of developing countries is due not only to infectious and communicable diseases, but also to anaemias and general undernutrition which are essentially preventable. All are more hazardous in closely spaced pregnancies.**

The children themselves may be marked from birth. They may be premature or their birthweights and their natural stores of nutrients and immunity may be low. The more malnourished the mother, the less satisfactorily can she breast feed the baby. If she becomes pregnant again, the baby is weaned from the breast. In the absence of satisfactory weaning foods or the money for buying such food, closely spaced pregnancies themselves become a direct cause of infant and young child malnutrition and consequent death.

Supplementary Food Programs Needed

It is conceded that improving family income and encouraging the production of varied foods are essential to adequate nutrition. Certain specific measures may be undertaken in addition to assist especially vulnerable groups. A surveillance of families to identify those at special risk would enable health and nutrition workers to concentrate on these. Such vulnerable groups should be the targets for supplementary feeding programmes which might include skimmed milk, corn and soya milk preparations as well as mixtures of local cereals and pulses. These programmes should aim at educating families to be able to eat more adequately from locally available foods.

Intensive nutritional education efforts should be aimed at encouraging breast feeding, satisfactory weaning practices and adequate birth spacing. Family planning education and services must be included in the total programme, which should also include vaccination and other efforts to control infection and to cleanse the environment.

Daily Calorie Consumption for Selected Food Groups by Region

	Cereal	Meat	Eggs
Sub-Saharan Africa	1109	61	3
Mexico & Central America	1197	131	16
South America*	898	203	13
South Asia	1300	8	1
South East Asia	1589	77	8
West Asia	1480	78	7
Eastern Europe	1498	314	31
EEC Nations	878	474	50
North America	659	610	64
USSR	1544	240	27
Developing Countries Average	1300	89	8
Developed Countries Average	1127	371	44

*Excludes Argentina and Brazil
Source: FAO Food Balance 1964-66

It is necessary for sovereign governments to understand the importance of adequate nutrition to the national development effort. **Governments should give food and nutrition high priority and evolve strategies for improving the production, processing and distribution of food.** Specific attention should be given to the production of low cost weaning foods, based essentially on local ingredients. Governmental and voluntary programmes concerned with food, nutrition and family planning should be expanded and strengthened.

The United Nations should renew its call for a nutrition fund which will help give visible evidence that food and nutrition have high priority. Such a fund would complement the population fund and show that the world recognizes the two-way relationship between food and nutrition problems and population. International efforts must be intensified in the search for alternate natural and synthetic sources of proteins and the major vitamins. In the long run, international action in both nutrition and family planning can only gain universal acceptance when the nations of the world demonstrate their concern with social justice and their willingness to reorient international trade, commerce and general development to help diminish the gap that exists today between the rich and the poor.

"Population growth is the dominant source of expanding demand for food."

Food: Growing Global Insecurity

by

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The soaring demand for food, spurred by continued population growth and rising affluence, has begun to outrun the productive capacity of the world's farmers and fishermen. The result has been declining food reserves, skyrocketing food prices, intense international competition for exportable food supplies, and export controls on major foodstuffs by the world's principal food supplier.

We appear to be entering an extended period in which global grain reserves, which provide a crucial measure of safety when crop failures occur, will generally remain on the low side, and in which little if any excess cropland will be held idle in the United States. Food prices are likely to remain considerably higher than they were during the last decade. Meanwhile, the world has become overwhelmingly dependent on one continent—North America—for exportable food supplies. **From a global perspective, the world is likely to be in a vulnerable situation on the food front in the years ahead. Particularly alarming in the immediate future is a world shortage of nitrogen fertilizers which may restrain production gains in the developing nations for several years to come.**

High food prices and shortages are an inconvenience for the more affluent societies and individuals, but they place poor nations, and the poor within nations, in an especially dangerous predicament. For the sizable segment of mankind that spends 80 per cent of its income on food, a doubling in the price of wheat or rice cannot possibly be offset by increased expenditures. It can only drive a subsistence diet below the subsistence or survival level.

Worldwide, population growth is still the dominant source of expanding demand for food. If world population were to continue to expand at nearly two per cent annually, merely maintaining current per capita consumption levels would require a doubling of food production in little more than a generation. But rising affluence has also emerged as a major claimant on food resources. In the poor countries, the annual consumption of grain per person averages only about 400 pounds per year. In the United States and Canada, by contrast, per capita grain utilization approaches one ton per year. Of this total, only about 200 pounds are consumed directly in the form of bread, pastries, and breakfast cereals. The remainder is consumed indirectly in the form of meat, milk, and eggs.

As incomes rise in the northern tier of industrial countries, stretching from Western Europe through the Soviet Union to Japan, a sizable share of the additional income is being converted into demand for livestock products, particularly beef. These nations are importing increasing amounts of livestock products, or of feedgrains, and soybeans, with which to expand their livestock production.

Four Critical Resources

As the world demand for food climbs, constraints to further expansion of food production become increasingly apparent. The traditional approach to increasing production—expanding the area under cultivation—has only limited potential for the future. This approach is especially constrained by the lack of availability of water for agricultural purposes. In many regions of the world, fertile agricultural land would

Planting high yield varieties, better irrigation and the application of fertilizers result in greater crop yields.

be available if water could be found to make it productive. But most of the rivers that lend themselves to damming and to irrigation already have been developed. The expansion of irrigated area is likely to slow down as we run out of easy opportunities to continue expanding.

In many developing countries, intensification of agricultural production on the existing cultivated area will require a several-fold increase in energy supplies for running tractors, milling, harvesting, drying and the like. With world energy prices increasing rapidly, the costs of intensifying food production will rise commensurately.

Fertilizer is now in critically short supply, and the outlook in this case, too, is higher prices. One reason for the fertilizer shortage is a lag in the construction of new production facilities which will not be rectified for several years, but the rising cost of energy will also keep fertilizer prices high, since the manufacture of nitrogen fertilizer—the most widely used chemical fertilizer—commonly requires natural gas or naphtha as a raw material, and the process of manufacture requires large energy inputs. In 1974, there are signs that many nations—including some very populous ones, such as India, Indonesia, Pakistan and the Philippines—will be unable to obtain the needed amounts of fertilizer regardless of price as Japan, Europe, and the United States cut back exports. **It appears certain that reduced fertilizer supplies during 1974 will cause a drop in food production in several key developing countries even if weather conditions are good, substantially increasing food import needs at a time when global reserves are already at dangerously low levels and prices at record highs.**

A major constraint on expanding the supply of high-protein foods is the fact that oceanic fisheries are no longer expanding rapidly. From 1950 to 1970, the world fish catch climbed dramatically, going from 21 to 70 million tons. But since 1970, the catch has declined for three consecutive years which clouds future prospects. Many marine biologists now feel that the global catch of table-grade fish is at or near the maximum sustainable level.

Extra Food Production Hurts World Ecology

In many parts of the world, the growing demand for food is putting more pressure on the food-producing

ecosystem than it can withstand. Two dramatic examples among the many possible may be cited. One is now all too evident in the drought-plagued Sahel in Africa. Over the past thirty-five years, human and livestock populations along the sub-Saharan fringe have increased rapidly, putting more pressure on the ecosystem than it can withstand. The result is over-grazing, deforestation, general denudation of the land, and the southward movement of the Sahara at rates up to 30 miles per year.

Coping with this situation requires far more than temporary famine relief. The world must recognize that a continuing food relief effort for this region will be required indefinitely. But relief only treats the symptoms of ecological overstress. Failure to address and alleviate the causes of ecological stress in this region—through land management and stabilizing population growth—will mean the destruction of a significant portion of Africa's food-producing capacity.

The Indian subcontinent presents a second dramatic example of ecological overstress. During the past fifteen years, as human and livestock populations have increased, the subcontinent has been progressively deforested. During August of 1973, Pakistan experienced a devastating flood, by far the worse in its history. With deforestation continuing, one can only predict that the incidence and severity of flooding in Pakistan, India, and Bangladesh will be much greater in the future than it is at present. In effect, deforestation caused by population pressures may be undermining the food-producing capability of a subcontinent on which a population of nearly three quarters of a billion people now depends.

Global Food Reserves Depleted

Since World War II the world has been fortunate to have, in effect, two major food reserves—one in the form of grain reserves in the principal exporting countries, and the other in the form of cropland held idle under government programs in the United States. The sum of global reserve stocks and the potential grain production of idle cropland gives a good indication of the actual total reserve capability in the world food economy in any given year. As the following table demonstrates, the world is now in a situation of extreme vulnerability. **In 1973 and 1974, world reserve capabilities in relation to consumption needs have fallen far below any previous level in the postwar era.**

The Changing Pattern of World Grain Trade*

Region	1934-38	1948-52	1960	1966	1973**
	(million metric tons)				
North America	+6	+23	+60	+50	+83
Latin America	+0	+1	0	+3	−4
Western Europe	−24	−22	−36	−27	−21
Eastern Europe & U.S.S.R.	+6	—	0	−4	−27
Africa	+1	0	−2	−7	−4
Asia	+2	−6	−17	−34	−30
Australia & New Zealand	+8	+8	+6	+9	+7

*Plus sign (+) describes net exports; minus sign (−) denotes net imports.
**Estimate.
Source: Based on U.S. Department of Agriculture data.

North American Breadbasket is Precarious

The extent of global vulnerability is particularly underlined by the growing dependence of the world on North America for exportable food supplies. Over the past three decades, North America—particularly the United States, which accounts for three-fourths of the continent's grain exports—has emerged as the world's breadbasket (see table). North America today contributes a larger share to the world's exportable supplies of grains than the Middle East does to the world's supply of oil. This extreme dependence leaves the world in a very dangerous position in the event of an adverse crop year in North America. Both the United States and Canada are affected by the same climatic cycles, and share a history of droughts every twenty years.

The global food outlook calls for the creation of an internationally managed food reserve system, which would provide a measure of price stability in the world food economy. This would be in the self-interest of all nations. Clearly the world community has a basic humanitarian interest in ensuring that famine does not occur in the densely populated low-income countries following poor crop years—an assurance the affluent

nations may be less able to provide in the future if the current system of autonomous, nationally oriented food planning is allowed to continue without modification.

The time has come for the United States to undertake a major reassessment of its food aid program. The surpluses on which the program relied in the past are likely to appear much less frequently in the future. A new commitment must be made to ensure the availability of needed levels of grant and concessional food aid regardless of whether commercial surpluses exist at the time. International pledges to the World Food Program must also be increased beyond the $440 million target for 1975-76 to offset the recent commodity price rise.

A close examination of the extent of overfishing in many of the world's fisheries underlines the urgency of evolving a cooperative global approach to the management of oceanic fisheries at the 1974 Law of the Sea Conference. Failure to do this may result in continuing depletion of stocks, declining catches, and rises in seafood prices that will make those of the early 1970s seem modest by comparison.

A variety of forces should compel those countries like the United States to reduce the demands they place on world food resources. This can most readily be accomplished through the substitution of vegetable-based protein for animal protein.

Over the longer run, the greatest opportunities for expanding food supplies lie in the developing countries, where the world's greatest reservoir of unexploited food production potential is located. Large increases in food supply are possible in these countries—at far lower cost in resources than in agriculturally advanced nations—if farmers are given the necessary economic incentives and have access to the requisite inputs. International and bilateral support for agricultural development in the poor countries needs to be strengthened considerably.

A crash effort to increase world fertilizer production will be necessary if current shortages are to be alleviated. Great potential exists for combining energy and capital in the Persian Gulf with industrial technology to produce ample amounts of low cost fertilizer for use in developing nations.

World Food Security Index

	Reserve Stocks of Grain	Grain Equivalent of Idled U.S. Cropland	Total Reserves	Reserves as Days of World Consumption
	(million metric tons)			(days)
1961	154	68	222	95
1962	131	81	212	88
1963	125	70	195	77
1964	128	70	198	77
1965	113	71	184	69
1966	99	79	178	66
1967	100	51	151	55
1968	116	61	177	62
1969	136	73	209	69
1970	146	71	217	69
1971	120	41	161	51
1972	131	78	209	66
1973	103	20	123	37
1974 (proj.)	89	0	89	27

Source: Prepared on the basis of U.S. Department of Agriculture data.

Population Growth Must Be Slowed

The prospect of an emerging chronic global scarcity of food underlines the need to slow and stabilize population growth as rapidly as possible. Given recent demographic trends, one can conceive of this occurring in the industrial countries, but in the poor countries, it will be much more difficult to achieve population stability within an acceptable time frame. The historical record indicates that birth rates do not usually decline dramatically unless certain basic social needs—a reasonable standard of living, an assured food supply, a reduced infant mortality rate, literacy, and health services—are satisfied, providing the basic motivation for smaller families.

Population-induced pressures on the global food supply will only continue to increase if substantial economic and social progress among the world's poor is not made. A greatly expanded program to make family planning services available to all who desire them, in rich and poor nations, is certainly necessary. Access to family planning services alone, however, will not break the dismal cycle in which most of the increases in food production have always been consumed by an ever expanding number of mouths to feed, leaving much of mankind hungry.

"The world is shrinking fast into a small neighbourhood"

Human Family Responsibilities

by
CHIRAPURATH I. ITTY
Director, Commission on the Churches' Participation in Development
World Council of Churches

What happens in one place inevitably affects another; every calamity has global repercussions. This is true of the present scarcity of food and the famine situation in some countries. For one thing, the causative factors behind such local or national situations are as much global as national. This is a new factor of the present stage in history. When famines occurred in the past, they were wholly or mainly due to local conditions. Today, due to improvements in national and global transportation systems and commodity markets, famine is generally more evenly spread among the world's poor and the locale of intensity may be shifted.

To illustrate, the grain sale between the United States and the Soviet Union, and the consequent depletion of American reserves and spiralling price increases, have been a factor in the acute food situation in certain countries of the Third World. **In this global village in which we live, no nation can take a unilateral action without considering the inevitable effects in the world as a whole. To allow some members of the human family to die of starvation when other members have the means to prevent it is nothing less than callous or even cruel.**

The range of moral implications of the present situation can be seen more clearly if one analyses causes and some possible remedies. How did the present food crisis come about? The simple answer is that production has lagged behind demand. This leads to two other questions. Why has production not increased adequately and why has demand reached new levels?

No doubt the major reason for the present shortage was the adverse weather conditions in many parts of the world during the 1972-73 period. Favourable weather conditions in the immediate future could solve the short-term problem. But the factors involved are many and varied. What happened in recent months is symptomatic of a long-term trend in the production of goods. This causes alarm.

Shortage of Available Land

On the one hand, there is a serious shortage of land that can be used for agriculture. In densely-populated regions such as Europe and Japan, agricultural land is being taken over to make room for industrial expansion, recreational facilities and urban growth. Elsewhere, a good deal of agricultural land is lost through erosion, for example in the Indian sub-continent, North Africa, the Middle East, Central America and the Andean region. In some other areas, the available land cannot be used due to inadequate water supply. However, if the world is taken as a whole, there is additional land in many parts which can still be brought under cultivation. But this would require a global approach to the problem and a change in outlook of certain nations with potential land resources which could be used to feed the world's population.

Increasing Per Acre Yields

The other viable possibility is to increase the yield of the land in use. For example, wheat yield per acre in the USA is three times that of India, while rice yield in Japan is three times that of Thailand. Increased yields, however, demand capital input in the form of fertilizers, pesticides and technology as well as educational efforts among the farmers of the poor countries. Additional effort is needed, as the so-called "Green Revolution" has

not yet fulfilled the great expectations that were raised when it was launched.

The sad fact is that poor countries have insufficient capital to improve their production. The appeal by the United Nations at the beginning of this Second Development Decade to the rich nations to allocate one per cent of their gross national product to development assistance has been ignored by almost all. In fact, the net flow of development assistance to the poor countries has actually diminished in recent years due to the outflow of debt payments and inflation. Worse still, the present economic order, including trade relations, monetary systems and investment policies, is geared to the rich becoming richer and the poor poorer. In many respects it is the same system that enables the rich to grow that prevents the poor from advancing. Unless the exploitative pattern built into the present economic order is radically changed, development prospects, including increased food production, will continue to be bleak.

If mankind is one human family, it is the moral duty of the rich one third to help the poor two thirds. An attitude of charity is not enough. What is called for is a system that is free of exploitation and injustice.

Population Growth Must Be Slowed

The question of increasing demands for food also needs examination. There are two main factors. One is the growth of population and the other is rising demand caused by increasing affluence. World population grows at about two per cent each year and is expected to double in 30 years. This fact alone explains a corresponding increase in the demand for food. **It is obvious that, if the world is to avert a major catastrophe, efforts should be made to curb the increase in population along with efforts to increase food production.**

The problem is more serious when one considers the situation of the poor nations, societies and families. Four-fifths of the annual world population increase of an estimated 70 million occurs in the poor countries. **In many of these countries, which are already faced with mass poverty and lack of resources for growth, the increase in population means additional burdens and greater misery. Even in these countries, the poorest societies contribute more to the population increase, resulting in increased poverty for themselves and their children. Therefore, mere common sense dictates the need for a concerted effort at family, national and global levels to bring down the rate of population growth.**

This is easier said than done. One measure that the world as a whole and nations in particular can and must take is massive educational programmes on family planning and making cheap and effective contraceptive methods available to all, particularly, to poor families.

However, from a moral and religious point of view it is necessary to emphasize that governments must recognize the fundamental right of parents to determine the size and spacing of their families, as stated by the United Nations Conference on Human Rights at Teheran. At the same time, the parents have the moral obligation to exercise their rights in the light of their responsibility to the larger society.

According to a statement "Population Policy, Social Justice and the Quality of Life" issued last year by the World Council of Churches, "If a government considers that some intervention is required, that government must;

(1) Demonstrate that continued unrestricted liberty poses a threat to human welfare; that the common good is threatened;

(2) Demonstrate that the proposed restrictions on freedom promise in the long run to maximize options of choice;

(3) See that the restrictions on free choice fall upon

Refugees from the recent drought in Ethiopia

all equally;

(4) Choose the programme that entails least intervention."

Issues of Social Justice

An equally important aspect of this problem is the interrelationship between social justice and population growth which was also pointed out in the above mentioned statement:

Recent studies relating to Taiwan, Mexico, Turkey, Egypt and the India-Pakistan-Bangladesh sub-continent suggest that programmes of social justice in particular localities may lead to a decline in birth-rates, while birth-rates remain high where growth is not governed by social justice. Such indications if confirmed by subsequent research could bring a significant shift in the approach to population problems. **Instead of stressing economic growth and reduction in birth-rates as the main preconditions and agents of social well-being, improvement in the lot of the common man may be seen as essential for an effective population policy.** . . . Just as distributive injustice within a developing economy contributes to the misery of the masses and gives a visible face to the population problem, so lack of international economic justice contributes to the impoverishment of the Third World. Thus it is necessary to consider international economic justice as an essential remedial measure for the global population problem.

require emergency food supplies and medical care.

The increasing demand for grain caused by affluence also needs consideration. In North America per capita grain consumption currently approaches one ton per year—about five times that of the Third World. The main reason is that substantial grain resources go to feed cattle and poultry in order to produce meat, milk and eggs. It is estimated that if grain production were increased by 30 million tons per year, eight million tons of it would be necessary to meet increasing demands by the affluent and the rest for the increasing poor population. Therefore, alongside the efforts to curb population there is a need to curb the increasing demand arising from the rich by reducing their animal protein intake.

For this and other reasons, it is fair to say that the imbalance between population and resources which is the crux of the population crisis is carried more by developed than by developing nations. By a much higher per capita use of resources, developed nations are aggravating the existing disequilibrium. In developed nations the main stress needs to be not only on reducing population growth, but also on reducing wasteful use of the world's resources, together with an attack on environmental and ecological problems that pose a threat to all mankind.

Reevaluation of Priorities Required

We have reached a point of decision. For years it has been assumed by many that development of the poor societies could be achieved without any cutback in the rate of growth and consumption of the rich nations. The present food and energy crises have proved this assumption false. It was also thought that a little more aid, or slightly better terms of trade, would bring about a reasonable rate of development in the poor countries. This assumption has also proven to be false.

Unless the present world systems that govern international economic relations and behaviour are radically altered and the policies and structures of countries changed in order to bring together social justice and self-reliance as enlightening principles of economic growth, the world will be faced with unprecedented calamities and tensions. If mankind is one human family, it can maintain itself only on the basis of justice, solidarity and peace.

"Business As Usual" Cannot Continue

by

HAROLD W. BOSTROM
President
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Much has been written and more will be written on the problems that beseige mankind globally. There is an energy crisis. There has been, for some time, a population crisis. Today there is a food crisis while mineral and other shortages are developing. Yet there is still a tendency, in all nations, not to recognize the magnitude of these crises but, instead, to look hopefully for "business as usual." The tragic fact is that 3.8 billion people may be developing or seeking a life style that is more than nature or the eco-system can bear on this planet of finite resources. **Great tragedy will befall us unless overly rapid population growth can be slowed down and life styles and consumer demands in many nations become more modest.**

Enormous sums have been spent to develop hybrid mutant strains of cereal grains with which to buy time, food, and therefore hope for the human family. Years have been spent laboring in the laboratory and the fields successfully improving yields. For this work Norman Borlaug received the Nobel Peace award. Food gains, however, have not been sufficient. Ominously, increases in the cost of fertilizer may soon slow the rate of increase in agricultural production.

All Resources Are Limited

At one time, it appeared that resources, for all practical purposes, were without limit. We are now entering a new era in the history of mankind. In these coming decades, many changes and sacrifices will be required if the human race is to survive in a viable world society. What are these changes? For the U.S.A., Margaret Mead, the anthropologist, suggested that if each citizen ate one less hamburger a week, that could provide sufficient protein to ameliorate hunger in the developing countries and to buy time to perform the long term task of checking population growth. I would make some further suggestions: Millions of small farms and acres of farm land in the U.S.A. and elsewhere have been abandoned, either because farming is no longer profitable or because other land uses such as roads or suburbs have seemed more urgent. Means should be found to return people to land which must be reserved for food production. Wasteful use of foods for pets, extensive fertilizing of lawns and golf courses, and above all, massive expenditures on armaments cut directly or indirectly into the amount of food available for hungry people. Priorities should be reevaluated and reorganized in the developed countries. These issues should be debated in an international forum—the United Nations for example. Developing nations should be advised that help will be provided if they too focus on internal reforms, population management and other priority programs.

The frontiers of the physical world—such as the amount of arable land which can be brought into production—are closing, but technology is still capable of titanic innovation. A great constituency of human beings must band together to urge political leaders everywhere from the smallest nation states to those having the most powerful nuclear muscle to find a new equilibrium between man and nature. There can be no true peace or prosperity until this challenge is met. Visible progress was made at the UN Environmental Conference at Stockholm in 1972. The second great opportunity will be in Bucharest, Romania in August 1974 at the World Population Conference. There will be other meetings to follow. But time is also a resource, not infinite in terms of the problems needing resolution.

Time is in very short supply today as nations must apply the full measure of human intelligence, ingenuity, and good intentions to banish the terrible prospect of continuing world hunger and deprivations from this planet.

R. T. Ravenholt Receives Hugh Moore Award

Dr. Reimert T. Ravenholt was awarded the 1974 Hugh Moore Memorial Award on June 20 at the Hotel Americana during the International Convocation on the World Population Crisis in New York. Ravenholt is the Director, Office of Population, Bureau of Population and Humanitarian Assistance for the Agency for International Development (AID).

"Few people so richly deserve an award as much as Ray Ravenholt does," stated William H. Draper, Jr., Honorary Chairman of the Population Crisis Committee and Master of Ceremony during the award presentation. "It has been under his capable leadership and guidance that the United States mobilized talent and resources to assist developing countries to help solve their own population problems. When Dr. Ravenholt began eight years ago, the Agency for International Development had only two fulltime professionals in the Population Branch and a budget of a few million dollars. Today, he directs a staff of more than 100 employees and a program of about $125,000,000. He has forged a splendid team of professionals throughout the world who have been responding successfully to the many requests for population and family planning assistance from developing nations. All of us who work in the population movement, and in fact the world, owe him thanks and appreciation." In presenting the award to Dr. Ravenholt, Mrs. Hugh Moore heartily congratulated him on behalf of the Hugh Moore Fund and the Population Crisis Committee, of which she is a director.

The Hugh Moore Memorial Award is given annually to an outstanding individual who has demonstrated imagination, initiative and vision in the population field.

The award is given in memory of Hugh Moore, the inventor of the Dixie Cup and a founder of the Population Crisis Committee. The annual recipient of the Hugh Moore Award is chosen by the Population Crisis Committee in consultation with the International Planned Parenthood Federation, the Association for Voluntary Sterilization and the Population Institute—all organizations which Hugh Moore supported.

Last year the award went to Dr. Malcolm Potts, then Medical Director of the International Planned Parenthood Federation.

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