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ABSTRACT

This secondary-level resource unit surveys hunger and malnutrition in developing countries and the interdependent factors affecting world food supplies. The main part of the unit is divided into four sections which examine the historical and geographical, economic and political, health and nutritional, and environmental and ecological factors concerning the world food shortage. Suggested classroom activities and questions are provided for each section. Also in the unit are additional classroom activities and readings including a simulation game; comparison charts of food consumption, protein conversions, and world population data; an historical essay on hunger; a descriptive essay on the green revolution; a summary of the World Food Conference Resolutions; and an annotated list of related materials. Hard copy, available through UNICEF, contains an issue of "UNICEF NEWS," a world child emergency wallsheet, two United Nations Development Program brochures and posters, a UNICEF brochure, and a 1975-76 UNICEF publications catalog. (Author/DE)

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# TEACHING ABOUT WORLD HUNGER

## Table of Contents

# GUIDE TO TEACHING ABOUT WORLD HUNGER

## Introduction

How do you teach about something like "world hunger"? Chances are slight that you, a teacher, have ever really experienced hunger, nor is it likely that many of your students have either (although there may be more than you think who have experienced malnutrition, even some of those from relatively affluent homes).

Since it is so unlikely that past direct experience can be called upon as a learning base, and since it is either impossible or highly impractical to involve students in the direct experiences of hunger, we must try to approach our teaching task from other vantage points.

We can approach it from a knowledge base. Students can learn much from the thoughtful study of facts and data on world food production and consumption, and how they relate to world hunger. We can also approach it from an examination of the reported feelings and experience of others who have either suffered extreme malnutrition and hunger or those who have lived and worked closely in areas of hunger, such as doctors, health workers, nutritionists and other specialists employed by international agencies, governments or private groups. Even though they lack direct experience, students can learn much from the attitudes and perceptions expressed by such persons.

Arthur Hopcraft offers a moving first hand description of worldwide hunger in a report in the late sixties entitled Born to Hunger, sponsored by the Freedom from Hunger Campaign. Describing his visit to a famine area in central Bihar state in India where a crowd of 300 to 400 had gathered at the gates of a church to receive a bowl of watery porridge, he writes:

> "They were emaciated, dirty and in rags. They were keeping up a shrill clamour of pleading, harsh and feeble at the same time, and the most chilling sound I have ever heard. Bony fingers, with the skin peeling off them, clutched the railings. More hands reached through, holding out bowls. Every face had the same glazed desperation. At the front of the crowd were several children. One little boy with wasted, dangling arms had a particularly grey look about his skin. I reached out to touch him, and felt a dry, rough texture, not like skin at all but more like matting. It seemed to me that at least one-third of these people had fallen so far below the stage of mere hunger that they needed hospital attention, as well as food. There was not the slightest chance that they would get it." [1]

Commenting on the youngest of the children clinging to their mothers, Hopcraft laments:

> "They were pitiful sights: minute, with faces clenched tight, their bones sticking out under the stretched skin. They dragged behind their mothers, and the air was full of that weak wailing." [2]

As an introductory exercise read these two quotations from Hopcraft to the class. Show the cover of the enclosed "World Child Emergency" issue of UNICEF News and discuss other descriptions the class may have heard or seen.

The ultimate authority on what it feels like to be hungry ought to be one who is experiencing hunger as he describes it. In Lito The Shoeshine Boy, David Mangurian, on a photographic assignment for UNICEF, followed Lito for four days to get the photos he needed. His honest treatment in this photographic essay revealing a whole range of feelings common to all children presents the daily life of this unwanted, hungry child of the streets in Tegucigalpa, Honduras. Describing Lito and his daily struggle to get enough food to survive, Mangurian breaks off his words early in the book stating:

> "I can't tell you any more because I've never even gone twenty-four hours without eating. But Lito can. These are his words." [3]

Lito tells in his own way how it feels to be 12 or 13 (he is not sure which), have no home, be infected by worms, and to beg for scraps of food left on plates when he cannot find shoes to shine.

> "But there are some days when I don't eat. Because there are some days when I don't do any shines. People don't get their shoes shined when it's raining. The day is ruined.
>
> So I walk around, see, with my mouth open catching flies because there's nothing to eat. I feel empty. I get a bad pain in my belly like something hot down there.
>
> And when I don't eat, the worms do like this
> brrrrrrrrrrrrrrrrr
> like a motor, asking for food. The worms I have. And when they're full, my guts go
> chee-chee-chee-chee
> in my belly. It's bad.
> pahzz.....PAHZZ!
>
> Listen
> brrrrrrrrrrrrrrrrr
> See how my guts are going now. The worms are hungry. They haven't eaten since morning." [4]

If the book is available, we recommend its use with this hunger kit as the photos are outstanding and focus on the life of one young teen-age boy with whom other students can identify much better than with statistics on hunger. If the book is not available, ask the students to try to envision what it would be like to live in Lito's circumstances. Then read Litos' words to the class.

Approaching the study of world hunger from facts in general, as we have indicated, can also be useful. As an example let us look for a moment at a few of those facts, based on real data collected by our own government, as expressed from the perceptions of Secretary of Agriculture, Earl L. Butz:

> "One of the obvious facts is that, on the average, the people all over the world eat better and live better now than they did 20 years ago, 10 years ago, or even 5 years ago." [5]

Furthermore, according to Mr. Butz in 15 of those years;

> "world food production per capita has also advanced or kept abreast with the growing population....All told, food production has increased by about 70 percent during the last two decades. Even when figured on a per capita basis - taking population growth into consideration - food production has advanced 22 percent." [6]

These statements were made by Mr. Butz on October 18, 1974 in an address before the National Association of Farm Broadcasters in Kansas City, Missouri. Naturally many broadcasters repeated these "facts" to their audiences through their channels of media across the country. What Mr. Butz failed to say and what many broadcasters and their public may have failed to question is, "What are some of the less obvious facts that are highly relevant to his statement?"

In the first statement that "people all over the world eat better," the student may overlook the words "on the average". Even when noticing them, their significance may not be as "obvious" as the generalization the Secretary presented. The task of the teacher in teaching about world hunger, as in teaching about any important topic in the curriculum, is to help the student gain wider perspectives and broaden his perceptions so that he does not accept simplistic, obvious facts uncritically. Are not averages merely means made up of extremes? Could it be that one segment of the population is consuming <u>far much more</u> food than 20 years ago, (through indirect consumption patterns), while large numbers of people are little or no better off, and could it be that a very significant segment of the population is, in fact, reduced to a level of severe malnutrition and starvation?

As another introductory exercise read to your students the recent statements made by the Secretary of Agriculture and ask them to discuss those facts. Then open the "Spare a Bite" hamburger brochure and read the opening words: "The threat of severe malnutrition or even starvation faces 400 to 500 million children in poorer countries." Read a couple of other selected quotes from this piece and then follow this by sharing with the class the fact that in the four months just preceding the Secretary's statement of facts, the United Nations Children's Fund meeting in New York declared a state of emergency for children in much of the world, its first in the 27 year history of the organization, followed by the United Nations General Assembly's endorsement of the UNICEF Declaration at its meeting in September 1974.

In the discussion of these two seemingly conflicting sets of facts, try to help students pose a variety of hypotheses: (1) about the world food crisis and the world child emergency; (2) about how on the average people all over the world are eating better; and (3) about the possible explanations for each of these phenomena actually existing concurrently. (For more on this see Part II - Economic and Political Factors)

An understanding of the concept of interdependence is important in understanding the interrelationships between the world's peoples and between nations. Similarly,

an understanding of the interdependence of knowledge and facts is important in an understanding of generalizations about such topics as world hunger and patterns of consumption. Uncritical acceptance of factual information or generalizations based upon limited or incomplete data is far too often passed off as education!

One of the primary process objectives of this teacher's kit is to help teachers challenge students to think critically and look at all statements of fact from a variety of thoughtful perspectives. The primary content focus of this teaching kit is world hunger, as well as the UNICEF's response to the needs of those children most severely affected by malnutrition.

This teacher's kit contains a combination of print and visual resource material and a selective annotated bibliography of sources on world hunger. It is based primarily on two major assumptions which the teacher can consider and discuss with the students:

(1) Few if any significant problems are caused by a single factor, and thus single factor perceptions of a problem such as world hunger, which suggest single factor response situations, are usually counter-productive.

(2) The end product of learning is action, and people do not act on what they know but rather on how they feel about what they know.

With these assumptions in mind, much of the lesson material is divided into four parts. In each part inquiry questions are included to direct the students' attention to the many different ways each factor or dimension might be perceived.

The four parts generally correspond to a combination of factors as follows:

(1) Historical and Geographical Factors (yellow sheets)

(2) Economic and Political Factors (pink sheets)

(3) Health and Nutritional Factors (blue sheets)

(4) Environmental and Ecological Factors (green sheets)

Each of these four parts of the kit can be used in a variety of ways. Teachers often find it useful to distribute these color-coded parts to individuals or small groups of students who are particularly interested in pursuing certain factors in the world hunger crisis. Following their study they may share their findings in some form of presentation to the class as a whole or in a written report available to the others. In some cases the teacher may wish to duplicate selected passages from each of the four parts along with study and discussion questions for the class as a whole. As the kit is designed generally for secondary use, the passages selected and levels of study questions provided should vary with the interest and reading levels of each class.

As several of the viewpoints related to the various factors in these four parts of the kit can be controversial, some teachers may want to capitalize upon the interests and viewpoints expressed among students by helping them plan a panel presentation with various students bringing out different viewpoints on each of the factors

of world hunger. Such an activity, planned with motivated students, can facilitate the study of the material in this kit, the materials noted in the bibliography (which can be collected for classroom research) and a variety of current resource material from the newspapers and weekly news magazines.

Some Thoughts on Analyzing Questions

However, before getting into the issues involved in world hunger, the teacher should prepare the class to deal with different types of questions that usually come up in the study of any controversial issue. Certainly this should be a worthwhile question analysis useful in dealing with issues other than world hunger. These three types of questions usually arise in any issue-oriented discussion :

(1) Questions that are based on erroneous assumptions or assumptions for which there exists more conflicting than supporting evidence.

(2) Questions that are worded to evoke only those possible answers that reinforce the bias or position of the questioner.

(3) Questions which deal with the general topic but which are either irrelevant or which detract attention from the central issue.

The following examples of each of these three types of questions may serve as models for further analysis of questions that may arise from your own class.

The first question type may often be phrased using a metaphor which indirectly suggests certain assumptions. For example, one which frequently arises, stated one way or another, is:

(1) Since we cannot feed everyone, why shouldn't we help only those most promising of the poorer countries for whom we have room in the "lifeboat" without "sinking" it?

This question is one which has been in the news under the heading of "triage"* or "lifeboat" theory. Although we cannot adequately answer it here, we can suggest a few problems in its assumptions and call attention to some facts that may help one answer it.

First of all, students should question the assumption that this planet cannot support enough agricultural production to adequately feed its people.

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* French word referring to the World War I practice of dividing the wounded into three groups, to give urgent medical treatment to that group which could benefit most from it, rather than treating those who would die with treatment and those who would live without treatment.

Alan Berg, a food and nutrition expert on the staff of the World Bank and author of The Nutrition Factor: Its Role in National Development refutes the lifeboat and triage theories in a recent article in the New York Times, "The Trouble With Triage."

> "Yet a close look reveals that these theories are not appropriate to today's realities and need not be for tomorrow's. In fact, reasonable and hard-headed assessments of available figures suggest that it is well within the power of humanity to produce enough food to prevent masses from starving. The fact that it is possible to refute the current lifeboat and triage theories, however, does not mean that there is no food crisis." [7]

He further suggests, as do Jean Mayer, Lester Brown and others, that although serious, the situation has been painted too bleak by some, causing a sense of hopelessness. The fact is that if the lifeboat theory were a useful model, we might well note that there are still empty seats, and if those of us taking up more than our share of space would move over a bit, we could accommodate many more. However, there are flaws in the basic metaphor itself.

If we were to act on the lifeboat or triage theories and deny food aid to hungry nations, they would not drown and disappear under the sea as the metaphor suggests. True, many individual human beings would die, but those nations would survive in one form or another, and the resulting violent disruptions would no doubt, staying within the metaphor, make waves large enough to capsize the boat for the others. As many experts in the field have pointed out, there is a real food crisis, but it is as much or more a crisis of price and distribution as it is a crisis of basic supply.

Dr. Sterling Wortman, Vice President of the Rockefeller Foundation and himself an expert in the study of international agriculture, recently reported on the findings of a group of foremost agricultural scientists from the United States following a 28-day visit to study Chinese agricultural practices. China's reputation for centuries past as a land of catastrophic famines can be contrasted with its continued successes in feeding an even larger population today. Noting that Western agriculturists have reacted to such reports with skepticism, Dr. Wortman writes:

> "The most populous nation appears to have achieved the objective of producing enough food for all its people. It has done so largely by adoption of improved strains of rice and wheat." [8]

Recognizing the seriousness of the current world food crisis, Jean Mayer still rejects triage as unworthy of us as well as unnecessary. In the May 1975 issue of Reader's Digest he writes:

> "In spite of all these difficulties, spectacular progress is possible and has indeed been made in such varied areas as mainland China, Taiwan, North and South Korea, the Punjab state of India and a number of areas in Central and South America." [9]

The second type of question often has some of the same elements as the first but is usually worded more like the following example.

(2) Is it fair to expect us to send our food overseas when so many of our own people are hungry and in need right now?

This question is worded so that any immediate answer that does not support the questioner's position is potentially a weak one. Although it calls for a yes or no response, it needs considerable qualification. When held to information and assumptions in the question itself the only seemingly responsible answer is "No, it is not fair."

However, as in the first type of question, there are assumptions inherent in this question that are erroneous in fact and/or invalid in degree. We must challenge its assumptions by further asking, "How many are 'so many' and is it a significant number in quantity and degree of need as compared with those areas identified as most needy in the developing world?"

The question assumes that the reason there are hungry people in the United States is that there is not enough food to go around. It also assumes that we are doing very little to help our own people, while we are giving away large quantities of food to foreign nations.

The facts show that it is not the basic supply of food that is the main problem for the hungry in general, and most certainly this is not true in the United States. It is rather a matter of economics and distribution of available food. Senator George McGovern, in an article for the special issue of Social Education on "Global Hunger and Poverty," clearly states the reason for hunger in America.

> "However, as a panel of nutrition experts reminded the Senate in reports issued in June, the root cause is not in the mechanics of food assistance programs, but in the persistent poverty due to maldistribution of the nation's wealth. The richest one percent of the population has eight times the wealth of the lower one-half of the population combined. And over the last 45 years, the share of national income going to the poorest one-fifth of the people has remained the same. It is clear that more than a 'better' food assistance program is at issue. Fundamentally, people are hungry because they are poor." 10

The ratio of domestic food aid to U.S. citizens as compared to such overseas aid was five times as great for our own citizens through one program alone -- the Food Stamp Program -- which amounted to $4.3 billion last year, not counting domestic food aid through the school lunch and other such programs.

The third type of question, often most difficult to handle, is represented by the following:

(3) In view of the world population problem, why should we share our own food and precious resources with foreign countries to keep hungry people alive who will just produce more hungry mouths to feed?

It would be folly to suggest that the question of world population is unrelated to world hunger. However, it is not a direct one-to-one relationship as it is often presented.

Many people are surprised to learn that in the last 25 years the growth of the world's output of goods and services has averaged about four percent per year while the growth in the world's population has averaged approximately two percent. Rising per capita consumption by the affluent countries accounts for the "missing" other two percent!

With regard to food and population more specifically, Lester Brown, in his book on a strategy to stabilize world population, brings this factor of affluence to light.

> "During the 1970's, rapid global population growth continues to generate demand for more food, but in addition rising affluence is emerging as a major new claimant on world food resources. Historically, there was only one important source of growth in world demand for food; there are now two." [11]

As with the first two types of questions, we still find weakly supported or erroneous assumptions, which in this case detract from a clear analysis of the central issue. If population were the single factor affecting hunger in the world, it is not necessarily true that sharing food with the hungry automatically produces more mouths to feed. In fact, there is considerable evidence to the contrary.

The record indicates that in the countries in which food has become more plentiful, and where there have been increases in social and economic well being, fertility has declined. A comparison of the data on gross national product per capita and birthrates of selected countries shows a direct relationship between higher GNP and lower birthrates. If such comparisons are made over the years, it can be demonstrated that most of the countries of North America and Europe and particular countries or areas in Asia such as Japan and Hong Kong have achieved significantly lower birthrates as their income and standard of living have increased.

The opposite seems to be true of poor countries with hungry populations as the following paragraph from a recent Population Bulletin concludes:

> "In the poor countries, however, it is much more difficult to reduce growth rates within an acceptable time frame, at least as things are going now. For one thing, the historical record indicates that birthrates do not usually decline in the absence of a certain improvement in well-being -- an assured food supply, a reduced infant mortality rate, literacy and at least rudimentary health services.
>
> In short, it may well be in the self-interest of affluent societies, such as the United States, to launch an attack on global poverty, not only to narrow the economic gap between rich and poor nations, but also to meet the basic social needs of people throughout the world in an effort to provide incentives for lowering birth rates." [12]

In addressing the question, however, we must not sidestep the serious problem of population as it relates to food supply. Professor Jean Mayer and Dr. Sterling Wortman were pressed to answer this basic question on a "Meet the Press" program just preceeding the World Food Conference. Their answers in part support both the concern for the population problem and a recognition that by sharing food and by aiding developing nations we can serve humanitarian purposes as well as effect a more manageable rate of population growth. We cite two question and answer sequences from the transcript of that special NBC program.

"MR. LEVINE: Dr. Mayer, you referred a moment or two ago to the population aspect of the food problem. Isn't that really the crux of the matter? If the world population continues to grow, is there any possibility of solving the world food problem and providing enough food for everyone?

MR. MAYER: If the population continues to grow at the rate at which it is growing now, I think that the situation may well become desperate. One can hope, and there are good grounds for hoping, that if we can develop the poorer areas, as their income increases, the population, the birth rate, will drop. This has been true in the past.

It is true, for instance, in India, in the areas which are developing, as in Punjab, and this is one reason why we have to think at the time of agricultural development, availability of health services everywhere, reaching into the smallest villages, and even industrial development, at the same time as we think about nutrition.

MR. ROWAN: Some of the experts say there is no conceivable way you will get the population growth down to the point where you can double food supplies in 35 years and meet the needs of that time. Are they being overly pessimistic?

DR. WORTMAN: Yes, I think so. As Dr. Mayer just said, there are indications that where progress is being made on development, population growth rates will go down, and I think that that is quite a hopeful sign."[13]

Roy Brown and Joe Wray in a chapter entitled "The Starving Roots of Population Growth" answer the basic question most explicitly, calling feeding starving children the best birth control program.

"If we wish to limit population growth, the primary thing we must do is to lower infant and childhood mortality rates. When these remain at high levels, fertility will remain high, but when mortality rates decline visibly, fertility will fall within a few years. The most effective way to lower infant mortality rates is to improve nutritional levels. Therefore, the best birth control program is, simply, to feed the children."[14]

The U.S. Committee for UNICEF often gets questions similar to this third example. The following answer is taken from the booklet Why UNICEF (available free on request from the U.S. Committee for UNICEF):

> "UNICEF believes that once a child is born everything must be done to ensure his chance to live, to be healthy and to be educated and trained for his future as a responsible adult. It is in the interest of society in all parts of the world to improve the quality of its human resources and ensure that the child of today can become an active participant in tomorrow's world. If a child is sick, suffering from malnutrition and condemned to ignorance, he cannot do this. And if he does survive to manhood, he will be a burden to society rather than an asset.
>
> As parents look forward to their declining years, children represent their most valuable asset, often the only social security they have. If parents can be convinced that their children will be healthy and survive to adulthood, they are likely to have smaller families." [15]

Questions such as the three we have used as examples do come up frequently, and they are not easy for students or teachers to answer, unless they have access to relevant and accurate information. Nevertheless, helping students analyze such questions to discover their underlying assumptions and implications can be a most useful exercise in building the critical thinking skills so necessary for young people today if they are to become thoughtful, responsible citizens.

## A Complex Problem That Calls for Action on Many Fronts

As we stated earlier, in producing this kit for the teacher and secondary classroom use, we have clearly identified two of our basic assumptions.

We have tried to present the complex problem of world hunger in a format for teacher and student use which recognizes its multi-factor dimensions and stimulates inquiry and thought from as many different perspectives as possible.

We have also tried to weave throughout the parts of the kit the stimulation to action, as we believe learning, if it is effective, pre-supposes an action component on the part of the learner. As you draw upon the various parts and resources included in this kit, we trust your students will be motivated to action which they feel is most appropriate. How they feel about what they learn will be the determinant, as facts alone do not move people to action.

The following are only a few ideas that your students may want to explore. There are a variety of actions that individuals and groups can take. They may range from one person refusing to waste precious food or energy by eating less beef or other simple things like turning out unused lights and walking or bicycling more, all the way to planning a school or community-wide program for raising funds for reliable humanitarian agency such as UNICEF.

Since the need has become even greater in view of the World Child Emergency and the state of children in the "hunger belt," young people of all ages are increasingly becoming involved in action programs to help UNICEF in spring, summer, fall and winter -- not just at Halloween time.

Charles Schulz, of Peanuts fame, has been the inspiration for the UNICEF/LINUS Fund, a special spring fund-raising initiated as a pilot project in seven metropolitan areas in 1975. Linus is the thinker and conscience of the Peanuts family, and his UNICEF "Blanket of Protection" Campaign is raising funds for programs which supply blankets, high-protein food and clean water to imperiled children around the world.

Among the activities popular with young people in the pilot projects are:

(1) Collection with the UNICEF/LINUS Carton

Students have used the UNICEF/LINUS poster and the green spring cartons to collect in public places such as supermarkets, banks, business offices, airline terminals, train stations, department stores. They often set up an information table with student volunteers answering questions about the World Child Emergency and UNICEF's response to it. Many collection cartons have been set up near cash registers in school cafeterias, community centers, snack bars, restaurants, drugstores, and movie theatres.

(2) Benefit Sports Events

This idea has caught on well, and young people have seen it as an opportunity to use their health to help assure the health of the world's children. A large variety of sports activities have been used where major sports are terminating or beginning their season in the spring. Admission charges for spectators, fees for participants, proceeds from refreshments and direct solicitation at the event are all useful ways to raise funds. This is an area where many student groups have used their imagination in planning and sponsoring most unusual events that draw attention.

(3) Vegetarian or Non-Meat Picnic

Many clubs, organizations, PTA's and school classes, as well as other non-school groups to which students can appeal, have held picnics or similar functions serving and selling tasty, homemade natural foods and vegetarian and other non-meat dishes. These functions have often had an educational basis, too, where the foods have been related to cultures and customs and to the world food crisis, with charts or brochures showing varying consumption patterns and their effect on world food supplies.

Your class or school may want to join in the Linus spring campaign in the future as it expands across the country. For free materials and more details on this type of student action write to: UNICEF/LINUS FUND, U.S. Committee for UNICEF, 331 East 38th Street, New York, NY 10016.

Other fund-raising and education efforts which can be effectively combined in your school and community at other times during the year can be planned using some of the information in this kit on hunger and malnutrition. Students can form a coalition with other concerned groups (Jaycees, YMCA, women's clubs, Rotary) asking them to appoint one of their members to a World Child Emergency Coalition. At a meeting of these representatives, student members can spread the word about the food crisis and how it affects developing countries and what can be done in their own community by mobilizing a community-wide effort for the hungry children of the world.

Starvation Banquets have been popular as ways to dramatize and experience the difference between the lifestyle we take for granted and the lifestyle and food intake of so many in the developing world. Simple meals of small portions of rice and beans, or simply rice and water, can be prepared and served at various functions along with a donation or admission to raise funds.

Some high schools have chosen particular days during the year for a fast at lunchtime or a fast combined with an all-day workshop on hunger as one Pennsylvania school had recently. Care should be taken that such events be planned in cooperation with the school administration and food service staff. Usually a film and/or some type of assembly program is planned at lunchtime with a donation-admission equal to the school lunch price. One New Jersey High School that sponsored a lunchtime fast suggests that advance publicity and ticket sales can be most helpful to the student committee and the school food service staff in order that food usually prepared for those who choose to participate in the fast will not be wasted. In the day-long workshops students and teachers planned together to simulate characteristics of hunger and poverty in much of the developing world. Students reported that the fast combined with a simulated experience, films, slide showings and other resources made a most memorable learning experience and they better understood how the money raised for UNICEF would be used to help hungry children.

The Feast or Famine Banquet is more appropriate for some events and has been one of the most appealing and successful for many student groups as it has an element of suspens and helps to dramatize the difference between the world's poorer and richer countries. As with the Starvation Banquet, a simple meal of rice and beans (or something similar) is prepared. A secong meal of richer food (roast beef, green beans, potatoes, dessert, etc.) is also prepared. Two-thirds of the banquet participants receive the simple meal; the other one-third receive the rich meal. However, participants do not know which meal they will receive until the meals are served. One price is charged for all tickets. Talent shows or international films and talks are good accompaniments to such banquets.

The simple role playing/simulation exercise enclosed provides a way to make a point of this variance of food consumed in richer and poorer countries and how one affects the other. However, it is best used as an educational exercise and is more appropriate for lower secondary classes than senior high school students.

Whatever you and your students choose as active responses to their learning about hunger in our world today, the U.S. Committee for UNICEF and its School Services, Information, and Group Programs departments will provide further information and materials to assist your efforts. See the bibliography of resources for the addresses of other agencies which also can supply you with free and inexpensive information and materials on world hunger.

Footnotes

[1] Arthur Hopcraft, Born to Hunger (London: Pan Books Ltd., 1968),pp.94 -95.

[2] Ibid., p.95.

[3] David Mangurian, Lito The Shoeshine Boy (New York: Four Winds Press, 1975), p.2.

[4] Ibid., pp.35-36.

[5] Earl L. Butz, "Incentives -- Our Real Food Reserve", USDA 2986-74 (October 18, 1974), p.6.

[6] Ibid., p.6.

[7] Alan Berg, "The Trouble With Triage", New York Times Magazine, (June 15, 1975) p.26.

[8] Dr. Sterling Wortman, "Agriculture in China," Scientific American (June 1975) p.13.

[9] Jean Mayer, "Why the Food Crisis", The Reader's Digest (June 1975), p.76.

[10] George S. McGovern, "An American Paradox: Hunger in an Affluent Society," Social Education, Vol. 38, No.7 (November/December 1974), p.654.

[11] Lester Brown, In the Human Interest. A Strategy to Stabalize World Population, (New York: W.W. Norton & Company, 1974), p.29.

[12] "Population and Affluence: Growing Pressures in World Food Resources," Population Bulletin, Vol.29, No. 2 (1973), p.23.

[13] "Meet the Press," National Broadcasting Company, Vol. 18, No. 43 (October 27, 1974).

[14] Dr. Roy Brown and Joe Wray, "The Starving Roots of Population Growth",in Ants, Indians and Little Dinosaurs (New York: Charles Scribner's Sons, 1974),p.328.

[15] Why UNICEF? (U.S. Committee for UNICEF publication #1108, 1974), p.14.

## Historical and Geographical Factors

"Throughout most of the recorded history of mankind, most of the world's population has been but one poor crop away from disaster and suffering."[1]

Almost 10,000 years ago human beings who had roamed those portions of the earth that could best sustain them as they gathered nuts, berries and other edible portions of plants, along with the animals they could pursue and kill, made a discovery that changed their lives. They learned that seeds from some of the plants they ate could be used to grow more of the plants. They learned that some of the animals could be captured and cared for, producing herds of animals that provided meat, milk and eggs.

The discovery of agriculture gave humankind a much larger and more dependable food supply than was ever possible before. With a more adequate food supply, people improved their diet and health increased their life expectancy, produced more and healthier children. These children could be better cared for when they were not constantly moving than when they were food gatherers and hunters exclusively.

Following the discovery of agriculture by approximately 4,000 years, there is evidence of a system of irrigation having emerged in the Middle East, and within another 1,000 years still another most significant agricultural development - the harnessing of animal power to break and till the soil. These two development were to increase the food supply many fold and provide for the agricultural surplus which has always been and still is the primary requirement for the development and continuance of civilization.

(Have you ever thought about how someone else is producing your share of food for you and that you have a responsibility to be a productive person in some other way that contributes to civilization ? If you have not, think about the implications and then discuss them together.)

The next major development affecting the world's food supply is relatively recent in historical terms - when after the Europen discovery of the New World (from the Native American's viewpoint it was not lost) there followed a series of exchanges of crops. Wheat, oats, barley and rye from the Old World were shipped west, while corn, squash, beans and potatoes were loaded on eastbound ships, each then planted on opposite shores.

The last three major technological advances in agriculture had their greatest impact, if not their initial development, in the last half of this century. They are: (1) the development of chemical fertilizers and pesticides, (2) the invention and application of greater machine power through the internal combustion engine and (3) the hybridization of corn and other deliberate alterations of the genetic composition of food crops, along with similar advances in breeding livestock and poultry.

Read the enclosed piece, "The Green Revolution Lives," and discuss the ways this revolution is changing the history of food production in many countries.

For a most fascinating story of the recent history of Dr. Norman Borlaug's development of the dwarf wheat strain in Mexico, also read Facing Starvation: Norman Borlaug and the Fight Against Hunger. The following excerpt gives some insight into the work of this Nobel prize winning agricultural scientist. With no air-conditioned laboratory, no fancy research facility nor white-coated assistants, Borlaug endured intolerable hardships, often working from sun up until dark in the fields each day.

> "But it was delicate, time consuming work, and physically exausting. Seated on his little folding stool in the hot sun in front of a plant, he would work his way through every head of wheat using needle-nosed tweezers...one hand holding the wheat head, the other grasping the tweezers, his spine bent as he leaned over the heads of wheat, his eyes staring down into the fine structure of the floret. The physical strain was tremendous as his muscles began to cramp, then ache with tension. Yet there was no relief, except when he stood to move the stool from one row to the next."[2]

What was this man, the father of the "Green Revolution," really like as a young boy growing up in Northeast Iowa, as a high school athlete and as a struggling college student during the depression ? What gave him the unshakable determination to fight hunger ? These are questions of the history of world hunger too. (See the bibliography for a more complete reference. If your school or local library does not have this book, it is one you should request ordered.)

Another event of historical significance affecting the world's food supply was taking place in the Old World, about the time Borlaug was studying hard, working his way through college. In 1935 a young girl named Hildebrande lay hopelessly dying from a blood infection. The doctors of that day knew of no cure for her. In desperation her father, Dr. Gerhard Domagh, gave her an injection of an experimental chemical dye never before tried on any human patient. She lived and this event marked the first use of prontosil, the earliest form of the sulpha drugs, which were to lead the way for a later series of miracle drugs and antibiotics that may well have had a greater effect on demand for the world's food than any other event in all of history.[3] Human intervention through the discovery of agriculture, and later science and technology, had expanded the world's food supply over a 10,000 year period, but with the advent of this new form of death control, medical technology would soon double the life expectancy of human beings and trigger another geometric increase in population.

Commenting on this point Dr. D. Gale Johnson writes:

> "The largest percentage-declines in death rates occurred among the young, who normally suffer first and most with a reduction in food availability.

Those of us who decry the high rates of population growth in the developing countries should not forget that the increases in population growth have been due entirely to reduction in death rates and not at all to an increase in birthrates. There has been an enormous reduction in human suffering that has gone largely unrecognized - pain and grief of parents numbering in the hundreds of millions has been avoided by the reduction of infant and child mortality."

Read the enclosed article by Dr. Johnson, "Hunger: A Historical Presepective." Do you agree with his thesis ? Are his perceptions optimistic, pessimistic, realistic ?

For a more recent look at historical hunger perspectives on the world food supply, read pages 8,9 and 10 of the World Child Emergency issue of UNICEF News. The past quarter century represented a period of what Dr. Jean Mayer called a most precarious balance between increases in world food production and world population.

What does Jean Mayer, top ranking international authority in food and nutrition, see as probabilities for the next few years ? Compare Dr. Johnson's views with ideas presented by Dr. Mayer.

The geographical factor of hunger is a dynamic which could be said generally to change over historical time from a focal point on physical geography to economic geography. In other words hunger and famine as we go further back in time were primarily due to physical geographic factors: i.e. (1) temperature, with its extreme variations; (2) precipitation, with its irregularities causing floods and droughts; and (3) soil, with its wearing out, leaching away of nutrients and actual disappearance due to erosion from wind and water. Also with litlle development of communication and transportation systems for warning of famine danger and subsequent distribution of needed food if it were available, the chances for avoiding hunger in a given famine area were were very small indeed.

The limited evidence available indicates that there must have been hundreds if not thousands of famines over the world since the discovery of agriculture. The great famine of 436 B.C. in Rome, the Indian famine of 1291 A.D., and the famines in England, Scotland, Ireland, Italy, Egypt, India and China from Medieval to Modern times are noteworthy examples.[4]

With the industrial revolution and the later development of instantaneous electronic communication and more rapid transportation via rail and steamship, with eventual air drops of emergency food supplies following disasters, hunger and famine in any particular geographic locale were much less threatening. However with these changes also came a shift from the old hunger of a geographic locale type to a new hunger of economic deprivation.

Today in this increasingly interdependent world, our economic systems are linked together much like our transportation and communication systems. Thus to a greater degree those persons with economic purchasing power are less affected than before, even when famine hits hard in their part of the world. Conversely

people in areas rich in food production may be more affected than before if they do not have the purchasing power to bid successfully for food at the world market prices. What examples of this can be seen in our own country ? Try to find examples of hunger in various parts of the world that is caused more by economic factors than geographical factors. Can you find any countries that are very low in per capita caloric consumption but which export food ? Why might this be ?

Despite these economic factors there still exists fairly generalized geographic areas of hunger which taken together are sometimes referred to as the hunger belt. Find the following countries and areas on a globe or world map: the Phillipines, Indonesia, Bangladesh, India, Sri Lanka (Ceylon), Nepal and Afghanistan in Asia; Somalia, Ethiopia, Sudan (southern part), Chad, Central African Republic, Niger, Nigeria, Upper Volta, Mali, Senegal and Mauritania in Africa; and Brazil (northwestern area), Bolivia, Peru (southeastern part), Ecuador, Haiti, and El Salvador in Latin America. (See the list of 36 countries identified as among those whose children are in greatest danger, on page 2 of the "Can't You Spare a Bite ?" brochure.)

When you have plotted these countries on your globe or map in what way does their common location resemble a belt ?

Read these three articles in the enclosed UNICEF News magazine: "Life on the Altiplano," "Tragedy in the Sahel," and "Bangladesh Faces Another Crisis." What problems do each of these areas have in common in addition to widespread hunger? What responses has UNICEF made in each of these geographic areas?

For a more complete treatment of the "History and Geography of Malnutrition" read chapter two of Lester Brown's By Bread Alone (see bibliography).

Footnotes:

1. Johnson, D. Gale, "Hunger: A Historical Perspective;" the interdependant, monthly newsletter of the United Nations Association, April 1975, Volume 2, Number 4.

2. Bickel, Lennard, Facing Starvation: Norman Borlaug and the Fight Against Hunger, Reader's Digest Press, pp. 122-134.

3. Ritchie-Calder, Lord, "UNICEF's Grandchildren", UNICEF News, January 1975, Issue 78, page 5.

4. Brown, Lester R. with Erik P. Eckholm, By Bread Alone, Praeger Publishers, page 36 .

## Economic and Political Factors

"We are a land of shortages" my Bengali host commented, "short of food, safe water, clothing, shelter, you name it - we haven't got it!"

This passage is excerpted from an article in the enclosed UNICEF News by Glan Davies, UNICEF Special Representative in Bangladesh, writing about the many scarcities there.

The concept of scarcity, better stated as relative scarcity, is basic to any consideration of economic matters. However, it is the political factor that is often just as important to understanding scarcity, so much in fact that a new phrase has come into common use recently - the politics of global scarcity.

From the economic viewpoint scarcity is determined primarily by supply and demand. For example, no matter how much or how little of something exists, it is scarce only when the demand begins to exceed the supply. But from the political viewpoint decisions are sometimes made which overrule economic factors of supply and demand. For example, when a group of the oil producing nations agree not to sell their product to certain nations regardless of the existing supply of oil or demand for it, a new kind of "scarcity" enters the picture. (This is not to be confused with arbitrarily raising the price of oil, whether politically motivated or not.)

In terms of world food supplies, the parallel political dimensions of scarcity can sometimes be seen in the decisions made by the nations which control the bulk of surplus food in world trade. (Did you know that more than two-thirds of all food that moves in international commerce originates on the North American continent ? Did you know that our country in recent years has used its food assistance programs for political purposes; in some years even to a much greater degree than food assistance for either basic economic purposes or humanitarian aid ?)

For example, most people have heard about our "Food For Peace" program outlined in Public Law 480 which Congress enacted in 1954, but few understand the economics and politics of it. Very simply Public Law 480 was passed as a political instrument to implement an economic policy of disposing of large U.S. farm surpluses without placing them directly on the world market (which would have depressed our domestic farm prices). It was also enacted for the purpose of combatting hunger and malnutrition and to encourage economic development in the developing countries. Title I was for food sales at low interest rates for long terms. Title II provided for food grants directly to governments and through private voluntary groups as well as through international relief agencies of the United Nations such as UNICEF and other World Food Program outlets. This law in effect did make a significant impact in the area of humanitarian aid with over $22 billion in "food and other commodities" going to needy persons in 130 countries over the past two decades.

But there is much of a political nature that the general public does not know about this program. Of this amount nearly 3.5 billion or about 16 percent was not spent for food at all, but rather for tobacco and other non-food commodities. Was this done to aid hungry people or to use a tax-supported program to maintain the prices of a crop like tobacco as advocated by the powerful tobacco lobby in Washington ?

Also many people believe most foodstuffs distributed under Public Law 480 are given away to the most needy countries where hunger is widespread. The fact is that most of the food under this program is sold under concessional sales (Title I), at market price but on a very easy credit basis. Concerning allocation of the food, for the past few years it has been primarily a political decision based on foreign policy rather than the most critical needs of the recipient country. Well over two-thirds of our food assistance in 1974 went to countries with whom we had military assistance agreements or countries listed as vital U.S. security interests. In that same year nearly half of all our food aid went to South Vietnam and Cambodia and in the early months of 1975, $7.5 million worth of tobacco was sent to South Vietnam alone.

In the face of the mounting world food crisis, many U.S. citizens and their legislators believed this to be wrong, and Congress recently restricted the "political" use of one category of food assistance to not more than 30 percent of the total, with at least 70 percent of the food assistance program earmarked for those countries on the United Nations list of most severely affected by the current economic crisis and shortages of food and other essential commodities. How might this change in national policy be viewed in terms of political and economic factors in world hunger ? Discuss the implications of the law. Do you think the current 30 percent limitation in political use should be smaller or larger ? Compare the idea of using food concessionary sales to countries as a political instrument of foreign policy to using the sale or withholding of the sale of petroleum for similar political or foreign policy reasons. Did you know that North America controls a larger share of the world's exportable surplus of grain than the Middle East controls of all current world petroleum exports ?

Another aspect of the political side of the world hunger crisis is that of political upheaval within nations or political decisions made to attack neighboring countries that have more food or land in cultivation. Read the article starting on page 4 of the UNICEF News issue enclosed, in which the scenario has the armed forces and police joining with large bands of hungry teenagers fighting their way to the government emergency food stockpiles.

Without going into all of the reasons for the war Bangladesh fought for its independence, one cause was the continued hardship and scarcity faced by many of its people and the belief that the central government in Karachi, Pakistan was not responsive to those needs. Read pages 35 and 36 of the article "Bangladesh Faces Another Crisis" in UNICEF News for an economic report by the National Planning Commission. Since the celebration of independence which followed the fierce fighting, Bangladesh has found itself having the distinction of being among the poorest of the Third World countries with an ailing economy and food deficit more serious than any nation of comparable size in the world. The hardships suffered before, during and just after the war were made intolerable by the world-wide economic crisis.

Consider these seemingly irrelevant economic events that in an increasingly interdependent world directly affected Bangladesh's chances for a post-war recovery. Secretly in 1972 and in succeeding years, the Soviet Union contracted for the purchase of 28 million tons of grain to be taken from the world market, most of it from the U.S. By hiding the size of their purchase, they succeeded in "cornering" the market, getting their wheat at a very low price and then forcing the world grain prices to all time highs by depleting supplies at a time when demand was beginning to rise rapidly. The U.S. taxpayers lost heavily as they paid farmers over $3 billion not to grow crops (fearing another surplus), and the farmer lost by selling too cheaply, unaware of the Soviet intentions. But those who were hurt most seriously were the people of countries such as Bangladesh and India, which were caught in competitive bidding for scarce grain supplies on the world market at a time when they had been threatened by famine from both man-made and natural disasters! What made this development even more ironic than it might have been is the fact that much of the grain the Soviets purchased was not to be fed to human beings, but rather to livestock, with a net loss of from 80 to 95 percent of the nutritional value and protein. (The Soviet Union has increased its consumption of grain fed livestock significantly, along with Japan and the Western nations as they became more affluent.)

Another dimension of the economic factor of hunger related to livestock is the real cost of different meats. As Mayer noted on page 9 of the enclosed UNICEF News, it takes 6.5 pounds of grain to produce one pound of beef (actually a very conservative estimate as the 10 or 12 pound figure for lean boneless beef is now being used used by more authorities), compared to approximately two pounds to produce a pound of poultry. Stated as a ratio it takes over three times as much grain to produce a pound of beef as a pound of chicken. Grain fed beef is significantly less economical not only in price per pound, but in the multiples of wasted grain from the world grain supply.

There is no doubt that an uneconomical use of grain does directly affect the ability of the poor in developing nations to get enough to eat. Read the statements by Walter Cronkite on page three of the enclosed "Can't You Spare a Bite ?" brochure regarding the haves and have nots competing for the same food stocks. Is there any doubt as to how the have nots will fare in such a competition ? What are the moral and economic implications of the above for Americans ? What would you say to those who unthinkingly dismiss the problems of people on the other side of the world by saying "Live and let live" ? Does how you choose to live possibly affect whether or not someone else will live ?

Economics also means making choices on consumption and allocation of money and resources for various goods and services. If Americans choose to limit themselves and make wise and humanitarian choices, we can make a significant step towards alleviating suffering and starvation for hundreds of millions of children and adults.

Senator Richard Clark (Democrat of Iowa) in a speech at a hunger seminar at the Ford Foundation on January 24, 1975, outlined the extent of limitation or sacrifice each American would be called upon to make if we alone were to have picked up the tab for the entire estimated shortfall of 5.5 million tons of food needed until after the harvests in the developing world. It would have cost us

about $5.00 per person, or about the cost of one moderately priced restaurant meal. He made a direct comparison between that cost and the same amount we pay for one Trident submarine, about $1.2 billion. Jean Mayer, speaking of the money spent on items such as Trident submarines, reminded the UNICEF Executive Board at its annual meeting on May 27, 1975 that the world spends over $250 billion on such armaments in the name of "national security." "However," he said, "unless the children of the world are fed there will be no security for anyone."

At the World Food Conference in Rome the delegates passed a resolution calling for the reduction of military expenditures and for that savings of money to be allocated for increasing food production. Find out if our government has reduced military expenditures this year. (See the enclosed "Summary of World Food Conference Resolutions", Item 14.)

Find out the total amount of money your government allocates for military expenditures annually and compare it to the amount given for food assistance and other forms of humanitarian relief. Do you think the U.S. is the first in the amount spent (per capita) on such aid, or at least among the top ten ? Find out how the political decisions made by your representatives affect the economics of world hunger - and don't forget to look at the personal decisions made by you and how they might affect hungry human beings who have the same basic needs for survival as you do.

> "With sufficient resources, UNICEF can offer practical help in the countries most seriously affected. It can help governments establish nutrition programs, train parents and community leaders to increase local food production and support emergency child feeding projects.
>
> Unlike other parts of the United Nations system, however, the Children's Fund is entirely dependent upon voluntary contributions from governments and people." *

* Henry R. Labouisse, Executive Director, UNICEF

## Health and Nutritional Factors

"Malnutrition, possibly starvation, now threatens some 500 million children in Asia, Africa and Latin America."

This statement from the enclosed World Child Emergency wallsheet is most difficult to comprehend, not only in terms of the number but in terms of what is happening to the minds and bodies of these children.

When looking at world hunger from the viewpoint of health and nutrition, we must realize that the human body makes two basic kinds of demands upon its food supply. These two dimensions of hunger can be thought of as quantative and qualitive demands. Prolonged undernutrition or starvation is the result of a failure to meet the body's quantitive demands for calories or "fuel" to provide the critical level of energy needed to sustain basic life systems.

Malnutrition, on the other hand, is the result of failure to meet the body's qualitative demand for nutrients necessary for growth and good health. Although they are separate and distinct problems of hunger, they are most often found to exist together in areas where food is in short supply.

It has been established that nearly one billion people in this world (one-fourth of the world's population) suffer from undernutrition - the serious overt quantitive deficiency that leads eventually to death by starvation (unless the weakened body is fatally attacked by diseases, many of which may be relatively mild to the well-fed body). Although reliable statistics reflecting the number of people in the world who suffer from some form of malnutrition are not easily available, some authorities suggest it may be nearly two-thirds of the world's population. If we were to include the number of people suffering from obesity and other nutritional problems resulting in <u>overconsumption</u> of food, the figures would be even higher.

Look at the two charts entitled "Annual Per Capita Consumption..." and "World Population, Health and Hunger Data..." Compare the average calorie intake per person per day in each part of the world. Which region or continents have the greatest average caloric intake, and which the least ? Do you see any pattern, i.e. economic or geographic similarities between regions or areas that have similar per capita incomes or fall in similar latitudes or climatic zones ? Can you suggest a possible reason for greater calorie intake in some parts of the world than in others, beside the factor of greater availability of food?

Compare the average calorie intake of people in India with people in your country. Study the chart showing consumption of cereal grains. How can one person "consume" five times as much grain as another and only take in approximately 50 percent more calories ? (Clue: discuss the difference between direct consumption and indirect consumption.) Find out and compare the average per capita incomes of countries that have high indirect grain consumption patterns.

Remember that calorie intake is a good indicator of general nutritional adequacy, but it is primarily associated with the quantitive dimension of hunger, or undernutrition. Protein intake is one of the most important indicators of the qualitative dimension associated with malnutrition. Find the daily total protein intake for the ten selected countries on your consumption chart. Note that the average protein intake in the United States is 96 grams per day, fully double that of the average Indian's protein intake of 48 grams per day.

How do these basic differences in consumption of overall calories and protein affect the health and nutrition of the children and adults in the world ?

Although there are no absolute figures we can rely upon with certainty, experts in this field generally agree on an average range of minimum requirements of calories and protein for human beings. Even these ranges, however, vary with respect to age, size, sex and environmental factors such as heat loss in cold climates and evaporation of body fluids in dry climates. A range of 2,300 calories to 2,700 calories daily per person, including an intake of from 40 to 60 grams of protein per day (also depending on the quality of the protein) can be accepted for most purposes. We find that on the average people in the more highly developed countries get 90 grams of protein per day while in the poorest nations that average is about 40 grams per day. Note that we cautioned before, data that are stated in averages can hide less obvious data. If everyone in the developing nations were to receive at least 40 grams of protein per day there would still be a widespread problem of protein deficiency. But the fact remains that hundreds of millions of people receive far less than the average.

The effects of such undernutrition and malnutrition are many, and taken together they are creating a global crisis of proportions far beyond that conceived just a few years ago. These effects are usually seen first among the children of the world, in any shortage the most vulnerable segment of the population. A variety of serious health problems including goitre, cretinism, certain forms of blindness, anemia, and the classifications of protein calorie malnutrition (PCM), marasmus[1], kwashiorkor[2] and combinations thereof are taking a heavy toll on children, particularly in the poorest 40 to 50 countries of the world. In many areas of these countries, 30 percent of the children die from malnutrition related causes before they reach their fifth birthday. Too often children who do survive bear the subtle mental and physical scars of malnutrition for their entire lives. Such serious dietary deficiencies that permanently damage and rob children of their opportunity to develop into healthy, mentally alert and physically capable productive adults represent far more than an individual or family tragedy. Such individuals constitute an immense drain on national and global resources, since their potential productivity is not only absent but a negative factor in that hundreds of millions become dependent rather than productive.

The shameful part of this situation, not to be borne by those who are the victims of such malnutrition, is that at least some of these problems can be solved relatively cheaply. In most cases where costs are not considered cheap, they are still far less than the direct and indirect costs of malnutrition to the economy, not to mention the immeasurable costs in human suffering. The direct increase in costs for prevention of malnutrition are far less than the massive long-range costs to society.

Read pages 10 and 11 and discuss Jean Mayer's comments on "solving acute problems cheaply" and "striking at malnutrition." Do you believe some of these problems can be solved "cheaply?" Compare this idea to recent stories in the news media and theidea that seems to be spreading among many people that the situation is so bad that it is hopeless and therefore not worth trying to help!

Bangladesh is often used as an example of such widespread extreme hunger and malnourishment that there is little hope. Read the article "Bangladesh Faces Another Crisis" in the enclosed issue of UNICEF News. Discuss the section on page 38, "Nutrition Centers Offer New Hope."

Banglasdesh certainly represents a most extreme and serious example, but writing of this Dr. Mayer warns against the danger of overstating the problem as follows:

> "The recent nutritional disasters -- in the Sahel, In Bangladesh, and increasingly in other areas of Asia, Africa and Latin America -- have been magnified by some well-intentioned (though ill-advised) advocates. They, in their anxiety to procure the necessary relief, have indulged in verbal overkill so extreme that it may well prove to be counter-productive by being overly discouraging. The Director of this study has had, in the past few months, numerous opportunities to meet representatives of printed and electronic media from all over the world. He is increasingly concerned with the defeatist attitude of opinion molders in the richer countries which is creating the impression that the problems involved in feeding the hungry of the world are so complex as to be insoluble and that the scope of the developing world shortages is so great as to be beyond existing resources. If this impression were to become the dominant one, millions of children would perish." 3

What can you do about the health and nutrition of children in the world ? Did you know that for three cents UNICEF can provide three high dose Vitamin A capsules, enough to protect one toddler against nutritionally caused blindness for a year ? (For less than the price of one candy bar, you could assure that a young child would have enough Vitamin A to prevent nutritional blindness, for after five years of age the eyes are more fully developed.)

There are many other simple nutritional needs that can be met by small amounts of money donated to UNICEF. These include: 1) a garden rake, junior-size, so that a child enrolled in a school nutrition program can be taught to grow nutritious vegetables ($.96 cost); 2) payment for inland transport of enough donated high-protein supplementary food to feed three hungry malnourished children in a drought-stricken country for one month ($1.00 cost); 3) a junior-size spade, for use in a school vegetable garden ($2.00 cost); and 4) stocking of a pond with baby fish for potential protein supply for a rural village ($5.00 cost).

Regardless of how you respond to the worldwide nutrition and hunger crisis, you need to know and to share with others certain information about it. Remember, on the average there has been substantial progress made in effecting better nutrition in all parts of the world for the past 20 years. It is a fact that the

domestic American demand for grain to feed livestock has dropped almost 30 million tons since late 1974. While this was happening, the United States food aid budget has been increased from $890 million to $1,600 million. Department of Agriculture officials note that Americans are cutting back on their meat consumption more than anticipated and that pork production is now lower than any time since 1945. This in itself is evidence of what can be done.

At the international level the delegates at the World Food Conference in Rome resolved "to eliminate within a decade hunger and malnutrition" and called for a variety of policies and programs to improve nutrition throughout the world. See the enclosed summary of resolutions, Item 5. Discuss the recommendations with your class.

The problems of hunger and malnutrition are not simple nor are they so difficult as to be hopeless. The important thing is to realize that you can inform yourself and do something about the problem yourself - for your own health and nutrition and that of young people all over this world.

Footnotes:

1 A disease resulting from deprivation of protein and calories to a similar degree, characterized by very low body-weight, muscle wasting and growth retardation.

2. A disease resulting primarily from a protein deficiency relative to calorie intake, characterized by edema, often accomapanied by poor appetite, dark patches on skin and lightened loose hair. Kwashiorkor may be superimposed upon any degree of marasmus and is commonly precipitated by infection.

3. "Priorities in Child Nutrition in Developing Countries," E/ICEF/L.1328 , March 28, 1975, page 6.

## Environmental and Ecological Factors

"New signs of agricultural stress on the earth's ecosystem appear almost daily, as the growing demand for food presses against our ecosystem's limited capacities." [1]

Humankind's efforts to obtain more food to satisfy the demand of its rapidly increasing numbers have had a profound effect upon the environment, just as the environment has affected and limited its supply of food. As human beings learned to bring land into crop cultivation and to domesticate and herd animals for meat and other food products, their numbers grew more rapidly.

In the past when more land was needed, people simply migrated to adjacent frontiers and "new worlds" as if they were spreading over an unlimited plain. Concern for the deterioration of the environment and ecology is relatively recent. It was not until people began to meet other frontiersmen coming around the other way in search of more land that the finite nature of this planet became a practical reality in their minds. As with many other resources, a real concern for the quality dimension arose only when limitations on the quantity dimension came into focus.

E.F. Schumacher shares some very thoughtful insights into the quantitative dimensions of environmental economics in his book Small is Beautiful. He makes a strong case for what he calls "economics as if people mattered." Referring to the proper ecological and economical use of the land, Schumacher writes:

"Among material resources, the greatest, unquestionably, is the land. Study how a society uses its land, and you can come to pretty reliable conclusions as to what its future will be.

The land carries the topsoil, and the topsoil carries an immense variety of living beings including man. In 1955, Tom Dale and Vernon Gill Carter, both highly experienced ecologists, published a book called Topsoil and Civilization. I cannot do better, for the purposes of this chapter, than quote some of their opening paragraphs:

'Civilized man was nearly always able to become master of his environment temporarily. His chief troubles came from his delusions that his temporary mastership was permanent. He thought of himself as "master of the world," while failing to understand fully the laws of nature.

Man, whether civilized or savage, is a child of nature -- he is not the master of nature. He must conform his actions to certain natural laws if he is to maintain his dominance over his environment. When he tries to circumvent the laws of nature, he usually destroys the natural environment that sustains him. And when his environment deteriorates rapidly, his civilization declines.'" [2]

How often do those of us that live much of our lives on concrete, blacktop, carpeting, tile and other surfaces fashioned by human beings really give thought to our life dependency on that few inches of the some 4,000-mile deep earth below us ? At the rate our society is withdrawing that precious topsoil from use, we may be headed for decline as well. Did you know that the loss of arable land in the United States, beyond that lost to erosion and the spread of deserts, is nearly a half-million acres annually ? This is the estimated loss in the United States each year to more roads, parking lots, recreational facilities, shopping centers, airports, housing developments and other non-agricultural uses. We do this, often with little thought of the environmental and ecological impact of our actions, but it is hoped that we can learn from other environmental disasters before it is too late here.

The interdependent relationships of human and livestock populations and delicate ecological balances have just recently been demonstrated on a massive scale in the Sahel region of Africa. Here widespread hunger struck peoples who, although living a marginal existance, had been self-sufficient for hundreds of years. Read Leon Davico's first-hand account of the environment in this region in the article "Tragedy in the Sahel" in the enclosed issue of UNICEF News. Among other causes the food requirements of larger numbers of people in this region led to reliance on larger livestock populations with the following result described by Lester Brown:

> "Overgrazing and deforestation have caused the desert to move southward at an accelerated rate all along its 3,500-mile southern fringe, from Senegal in the west to northern Ethiopia in the east. A U.S. government study indicates that the desert is expanding at up to 30 miles per year in the more devastated areas. As human and livestock population retreat before the encroaching desert, they put even greater pressure on the receding fringe area. This in turn contributes to more overgrazing and deforestation, setting in process a self-reinforcing cycle." [3]

Unfortunately, as Schumacher and Brown point out, the pressures of human and livestock populations upon environment for more food have the exact opposite result - the food-producing capacity of the land decreases rather than increases, and the environment becomes less suitable for human habitation. Recognizing the importance of proper land use and limits of carrying capacity on different kinds of land and soils, the delegates at the World Food Conference passed a resolution calling for a soil and land capability assessment on a worldwide scale. See the enclosed summary of their resolutions, Item 6. Then read the section, "Many Factors Cause Famines" on pages 14-15 of the enclosed UNICEF News. How might land assessment, followed by recommended soil protection and conservation measures, help to avoid famine such as that caused in part by deforestation and soil erosion in Ethiopia ?

Water is a problem not only in the Sahel and Ethiopia, but increasingly in all parts of the world. On the high windswept plateaus of Bolivia and Peru, known as the Altiplano, is another hostile environment with little water and thin air. Read "Life on the Altiplano," particularly pages 19 and 20, in which the special

ecological nature of this area has caused it to be bypassed by the "Green Revolution." What are the special environmental problems for which the Bolivian government has asked UNICEF assistance in solving ? With Bolivia's nutritional deficiencies already "among the grimmest" in Latin America, can you see how the environmental problem of contaminated water becomes one of the principal "child killers ?"

No discussion of hunger and food production from an environmental point would be complete without including the pros and cons of pesticides and other agricultural related chemicals and poisons. Read the resolution passed by the World Food Conference summarized in Item 10 of the enclosed summary sheet..Note that the need for and use of pesticides is very important to the more developed and developing countries alike. However, even the resolution drawn up by the World Food Conference delegates, responding to a critical world food crisis, expressed concern for the residual effects of pesticides.

Agricultural pesticides and industrail wastes are combining to add increasing amounts of highly toxic mercury to the biosphere, or organic life-supporting system in our environment. Mercury levels in many places in the world have reached beyond the tolerable limits for human health and have caused serious illness and death through the intake of water, fish or other foods containing mercury. Although fish is a very important food in countries such as Sweden and Japan, their governments have recommended restricting their consumption drastically to avoid poisoning from chemicals.

Lester Brown in a chapter on "Ecological Underminings of Food Systems" explains how pesticides, designed to fight hunger by expanding the world's food supply, can instead affect food at many levels as they move up through the food chain.

> "Pesticides are by definition toxic to at leat some species of life. If taken in sufficient dosage, many can be debilitating or lethal to humans as well. Indeed, the misuse of most major pesticides has fatally poisoned humans at one time or another. What sets DDT and other chlorinated hydrocarbons apart from the more traditional pesticides, consisting of compounds of arsenic, lead, mercury, and copper, is their persistence. The synthetic pesticides do not break down or decompose readily in nature; thus, as long as use continues, the amount in the environment keeps mounting and circulating widely in water and air currents. DDT and many related fat-soluble pesticides accumulate in aquatic organisms, and the levels present multiply rapidly as one moves up the food chain."[4]

Because of the growing use of chemical fertilizers for food production, drinking water has become polluted with nitrates in many places. In some communities in the United States, children have died from high levels of nitrates in their drinking water. State and federal officials are concerned, and the need for nitrogen fertilizers to produce more food is being measured against the need to ensure safe drinking water. Inquire about nitrate water levles in your area and your state. What kinds of safeguards are being taken if you live in a high nitrate groundwater area ?

Water, in quantity and of quality, may in the long term be the key to expanding food production, more than any other critical environmental resource. In the first 5,900 years of the 6,000 years since irrigation was first used, no significant amount of acreage was irrigated. Thus we have a relatively short period of history in which to study the overall effects of irrigation on human beings and the environment. The acreage under irrigation now has increased nearly five fold since it hit the 100 million acre mark at the beginning of this century with rice, the staple of so much of the populous areas of the world, accounting for more than half of all irrigated crop land.

The positive effects of irrigation are well known, and its importance in the "Green Revolution" and in adding greatly to crop yields in much of the hungry world has been well documented. We must not understate the importance of irrigation in combatting hunger. Nevertheless, from the environment viewpoint there are some negative factors we must consider as well.

Some of the negative factors in irrigation over a continued period of time are water logging and salinity - the result of an accumulation of underground water near the earth's surface, inhibiting the growth of plant roots and leaving a concentration of mineral salts from the extra evaporation of water in the fertile topsoil. Although this continues to be a problem, some controls have been devised and new methods of reclaiming hundreds of thousands of acres of abandoned land will be used on a global scale, if the actions in support of another one of the resolutions of the World Food Conference are carried out. See Item 7 in the summary of resolutions.

Another negative factor is that of the health threat to hundreds of millions of people from bilharziasis or schistosomiasis, a persistant disease that thrives where continuous irrigation is used. You may be surprised to know that this snail-borne disease has spread most rapidly with the spread of irrigation systems and is now one of the world's leading infectious diseases!

As water scarcity becomes a greater factor in world food production, many ideas and plans have arisen for increasing its supply. Reversing the flow of rivers to take them into areas where climate and fertile land offer potentially greater use and using the water from the oceans through large scale desalinization projects are just two such ideas that are directly related to our environmental concerns. What do you think are the major drawbacks in each of these plans ? Find out how much energy must be consumed in currently known processes for desalinization of water. In the case of reversing river flows where such rivers flow through international boundaries, what problems can you forsee ? Find recent examples of international problems caused by partial diversion of river water for irrigation use. (You might start with these -- the Indus, the Jordan, and the Colorado Rivers.)

As for the effects on the total ecological system, Soviet planners have considered blocking the northward passage of four main rivers into the Arctic Ocean to bring that water to the southern part of the Soviet Union. When this became known to other nations, international leaders concerned with global enviroment quickly pointed out that this interruption of the warm flow of water into

the Arctic could alter climate not only there but in large areas which are linked through global climatic systems in such a way that rainfall upon which the world's food supplies depend now could be significantly affected. (For more on this see By Bread Alone, p.100.)

Food is basically an energy source fueling human and other animal energy outputs. Viewed from that perspective, the supply of energy fuels in our environment and their wise use should be a major concern in any program to expand the supply of food energy for the hungry world. Energy for agricultural production, besides that directly from the sun, comes from either human and draft animal muscle power (which consumes food for fuel) or machine power (which consumes fossil fuels.) In times past in the developed world and currently in many parts of the developing world, traditional farming relied on both forms of muscle power to produce food. In modern times, as we have noted, the total output of agricultural production has been multiplied many times by machine power based on the many-fold increase in energy inputs derived from petroleum products. But what has been the cost in terms of ecology and the environment ?

If we do our accounting of food production based on energy consumed rather than on dollers spent, we may have some different perceptions of the efficiency of traditional agriculture as compared to modern agriculture. Brown writes:

> "The books are not balancing for the more advanced agricultural systems, which are running up an energy deficit. As the geographic distance from producer to consumer lengthens, as the degree of processing increases and as energy is substituted for labor and land, the deficit increases accordingly.
>
> In some of the simplest agricultural systems, the return on energy applications is very high. For example, in the shifting cultivation (slash and burn) practiced in many tropical regions, the estimated return for every calorie of human labor invested in 20 calories of food energy. The figure is similar for wet rice cultivation, where the principal input is human labor at planting and harvesting times. The intensive cultivation of corn and soybeans, range-fed beef and grass-fed dairy cows also yields an energy surplus. Intensive egg production and feedlot beef, however, may easily consume three to fifteen times as much energy as the products contain." 5

To make matters worse, the deficit in modern energy-intensive food production has constantly increased in this country, and by 1970 were consuming nine calories of energy for each calorie contained in the food produced on the farms. But as if that were not enough, the energy used to process and distribute our food is far greater than that used to produce it. Why might this be ? Consider the movement of population to the cities and the need for transport and refrigeration. How are food products packaged ? Find food items in your stores where the energy used in processing and packaging may be several times the energy used in its production. Have you and your family ever used a three thousand pound automobile to transport a small bag of groceries or possibly a loaf of bread and

a quart of milk ? Think of other ways energy is wasted in our food products system. What kinds of food packaging are used which are either wasteful and/or ecologically unsound ? Do such practices affect world hunger ? What can you as a consumer do about this situation ?

Writing of the overall problem of an economic system that tends to disregard environmental and human values, Schumacher says:

> The farmer is considered simply as a producer who must cut his costs and raise his efficiency by every possible device, even if he thereby destroys -- for man-as-consumer -- the health of the soil and the beauty of the landscape, and even if the end effect is the depopulation of the land and the overcrowding of cities." [6]

But what if we could find a way to produce more food economically and, by environmentally sound practices, restore the health of the soil ? Read the "Green Revolution Lives." If agricultural researchers can develop the "super cereal" they are now working on, such a cereal could produce new high yields of grain while at the same time fixing nitrogen in the soil and manufacturing much of its own fertilizer, thus skirting the energy crisis in several ways.

Is this just a dream ? Possibly so, but the "Green Revolution" was only a dream a few years ago. It did not solve all the problems of hunger, nor did Borlaug predict that it would. But it did buy some time. The problem now with us is how much time we have left for the environment and for the hungry population of this planet. How would we choose to use more time if such a "super cereal" were to be developed to solve today's hunger problem ?

Read "New Sources of Food" (page 33 in the enclosed UNICEF News). Find out what crop has been found to yield more calories per acre for energy-giving than any other natural food. If nutritionists and leaders can help people get at least minimal amounts of protein and needed vitamins and minerals, this high energy food can be used more effectively as an important fuel for muscle power to produce more nutritious foods in the hungry world.

Footnotes:

1. Brown, Lester R. with Erik P. Eckholm, By Bread Alone (New York: Praeger Publishers), 1974, p.46
2. Schumacher, E.F., Small is Beautiful. Economics as if People Mattered, (New York: Harper & Row Publishers), 1973, p.96
3. Brown, p.46
4. Ibid., p.53
5. Ibid., p.106
6. Schumacher, p.99

*Administrative Offices: 331 East 38th Street, New York, N.Y. 10016. (212) 686-5522.*

# Information Center on Children's Cultures

*A Service of the United States Committee for UNICEF*

An International Unit for Grades 7-9

Cereal Grains and Legumes Against World Hunger

Materials needed: Small plastic containers of corn, wheat, oats, barley, millet, rice, rye, buckwheat, sorghum, soybeans, peanuts, dried peas, chick peas, alfalfa and clover. In most areas you can easily get small handfuls free from any farmer or farmer's exchange or local seed grain store. Urban teachers can call on their teacher friends and colleagues from the Midwest and Plains states to send them samples in clearly marked envelopes. Some health food stores carry packages of un-milled whole grains and legumes. Or resort to buying them from seed companies in 1 lb. bags and split the cost among a group of teachers in your district. Be sure to get unhulled and unprocessed grains. Seed companies where you can get grains and legumes in small quantities are:

EREWHON
33 Farnsworth Street
Boston, Mass. 02210

AGWAY STORES
in many localities

or consult your yellow pages.

You will also need to locate as many books on food grains and legumes as you can find in your school or public library. For suggested titles send a #10 self-addressed envelope with 10¢ in stamps to the Information Center on Children's Cultures and ask for the Foods and Cookbooks list.

Put each of the different grains and legumes in a small, clear plastic container. (Empty plastic pill bottles are ideal). Put a code number or letter on each container and make a master list for yourself, identifying the grain or legume in that container. For example:

| Bottle or container reads | Your master list reads |
|---|---|
| #1 | #1 = Rice |
| #2 | #2 = Wheat |
| #3 | #3 = Barley |

etc.

Be sure to do this carefully, one at a time, because the grains are very difficult for a new-comer to tell apart.

Now, assemble a list of questions by reading up on world food problems, and on the ways in which these grains and legumes meet our food needs in different parts of the world.

(over)

Examples of the type of questions you can ask are:

1. Which of the things in these containers are cereal grains and which are legumes?
2. What are the differences between grains and legumes?
3. Which grain or legume is eaten by more of the world's people than any other?
4. Which grain or legume provides the highest amount of protein? Which the lowest?
5. Which grain or legume is used extensively not only as an animal and human food source, but also in countless industrial products?
6. Name the 3 top producing countries for each of the grains and legumes.
7. What percentage of _____ (grain or legume) is consumed by animals and what percentage is consumed by humans in our country? World wide?
8. How many pounds of what types of grains and legumes does it take to make one pound of beef (approximately)? Of chicken? Of lamb? Of pork?

Etc.

After you have assembled the types of questions you would like your students to consider, decide whether you will assign them as group or individual research, or simply answer them directly in your class.

Open the first session by playing a guessing game with the containers of grains and legumes. Line them up and have students separate them into cereals and legumes. Call out the name of a cereal or legume and ask for a volunteer to come up and pick out the appropriate container. Or make a sheet with the names of all 15 grains and legumes and then pass around the containers; the students must then put the correct number next to the name of the grain or legume. For urban children this will be very difficult so you may wish to stress such things as how far we are removed from the original natural products contained in our foods, and how little we know about them. Urban teachers may wish to show that they too find it hard to identify the different grains and legumes by taking the test along with the students.

At the end of your session, after you and your students have learned as much as possible about these important grains and legumes, you may wish to grind up some of the grains or legumes (or cook some whole where appropriate) and then discuss the factor of taste and how it influences food buying and eating habits of the public.

Two excellent cookbooks are:

COOKING WITH WHOLEGRAINS by Mildred E. Orton. Farrar Straus, 1971.

WHOLE GRAIN COOKERY by Stella Standard. Paperback Library, 1972.

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# Global Interdependence and World Food Supply
## Simulation/Role Playing Exercise

Objectives:

To involve children in a role playing exercise which can help to develop empathy for people in the poorer nations as they face the problem of getting enough food to survive.

To demonstrate the interdependent effects of food consumption patterns by setting up a simple simulation reflecting real world alternatives of cereal grain allocations.

Materials:

classroom world globe

30 small plastic bags or baggies (enough for one for each child in class)

approximately two pounds of corn cereal, for example corn flakes and/or corn chex (enough for about one ounce of corn per bag)

3 portions of a dried beef product of approximately 3/16 ounces each, for a total of 9/16 ounces (preferably beef jerky)

Optional items - small packages of sliced dried ham and poultry

Alternate items - 1 ounce boxes of corn flakes which usually come eight to a package may be used instead of plastic bags

Suggested Levels:

Recommended for grades 4-8. For use with younger or older children teacher should adjust vocabulary and procedures accordingly.

Suggested Procedures:

Call attention to the globe and locate Asia, Africa and Latin America. Note that most of the poorer countries often called developing countries are located on these continents, many near the equator. Show how much of the globe is taken up by oceans and seas, and then note that only slightly more than 10 percent of the dry land surface is suitable for cultivation of crops.

Discuss the following before introducing the exercise. People in the developing countries depend heavily on cultivated crops such as corn, wheat, and rice for food to survive. Food in many parts of the world is becoming scarce partly due to floods, droughts, other natural disasters or wars that have disrupted planting and harvesting. Also, more people are staying alive longer, resulting in more people to be fed. Since the recent price increases in



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petroleum products it has been difficult for farmers in poorer countries to afford fuel for tractors and irrigation pumps and fertilizer to help grow enough food for their increasing population. People on all parts of this globe are beginning to feel the effects of such shortages. On the average people in most of the developing nations eat or consume about one pound of grain per day, while we in the United States and Canada consume on the average over five pounds of grain per day. (With younger children, particularly at this point, keep the discussion as simple as possible and hold further discussion until debriefing.)

Explain to the class that they are going to play a simple simulation with role playing (use the term "let's pretend" exercise for younger children) and that they are to assume the role of people at the lowest poverty level, well below average for the developing countries. In fact on this particular day they have only a very small portion of grain for one meal. Pass out the small bags of cereal one to a child, ask them to look carefully at their portion, and ask them to think how they might feel if that were all the food they had for the day. Tell the class that the amount of grain in each plastic bag represents more food than many millions of children in the world may have to eat today.

There will usually be a variety of remarks such as "That's not much food," "You wouldn't be very healthy if that's all you ate," and "How can anyone live on that?" Explain that the answer to the last question is, "They can't live on it for long and millions of them are actually starving." Refer to the globe again and find the "Hunger Belt" - South Central Asia, the Sahel in Africa, and in South America, northeastern Brazil and the Bolivian Highlands.

At an appropriate time during such a discussion, if it has not already emerged, suggest that it isn't a very tasty or interesting meal either without something else to go with like milk, sugar, spices, other vegetables or some kind of meat. Ask how many would like some beef? Give the three sticks of beef jerky (or suitable dried beef product) to the first three who speak up or raise their hands in response. Encourage them to start eating the beef and to tell the rest how good it is. Request the others not to eat the grain they have yet.

At this point some child will usually say, "That's not fair, as all we get is grain and they get meat, too!" If it does not occur spontaneously initiate the idea. Once the injustice of the situation is felt you have reached the teachable moment where the feeling and invested active interest of the learner is at its height. Then the point of the exercise can be made. The teacher should say something to this effect. "That's not quite the way it is. It may seem unfair that some get so little grain to eat and even more unfair that others get meat and you do not, but you were mistaken when you said 'all we get is grain,' because at this moment we must take your grain away from you. Everyone hand in your bag of grain."

Depending upon the classroom climate and the seriousness with which the children are simulating a very poor society in a developing nation, some may play their role further by resisting or starting a revolt. Whatever the nature of the responses, it is at this time that the "debriefing" or discussion of the implications of this exercise in the real world should be started.

Start at the simplest of levels for the younger child. When asked, why did you take the grain away, move toward developing an interdependent concept, by asking the question, "Where did the stick of beef jerky come from?" If the child

responds, "from the store," ask the necessary questions step by step to help the child see the chain of interrelated events back to the beef animal eating the corn to be fattened for market. If the children make a distinction between grass-fed range beef and corn-fed beef, congratulate them on their awareness and discuss the efficient conversion of grass and forage types of cellulose to beef protein as compared to the very inefficient conversion of grain to beef protein. However, most beef on the meat counters today has been fattened by grain in a feedlot before shipped to market.

During the debriefing the teacher may use some of the following data to explain the quantitative relationships in this exercise:

1) The basis for figuring the corn cereal measured weights to the beef jerky is one 3/16 ounce piece of beef jerky of approximately 15 percent moisture equals 15/16 ounces of fresh lean beef of approximately 75 percent moisture. If we use a ratio of 11 to 1 grain to beef, we need about 10 ounces of grain for each stick of beef jerky. Thus, 30 one ounce bags for three sticks of jerky which will serve to demonstrate this lesson to a class of approximately 30 children.

2) It takes 10 to 12 pounds of grain to produce one pound of lean beef, and it takes over 20 pounds of protein fed to beef cattle to produce one pound of protein for human consumption.

3) It takes a little over 6 pounds of grain to produce one pound of pork and a little over 8 pounds of protein fed to hogs to produce one pound of protein for human consumption.

4) It takes around 3 pounds of grain to produce one pound of poultry (less for chicken, more for turkey) and about 5½ pounds of protein fed to poultry to produce one pound of protein for human consumption.

5) Beef consumption per capita in the U.S. nearly doubled in about 20 years (from less than 60 pounds in the early 1950's to nearly 120 pounds in the early 1970's).

6) The recommended daily amount of protein is about 50 grams per day. In the U.S our average intake is over 96 grams per day just double the 48 grams per day for the average person in India.

7) Protein in excess of that our body can use is converted to carbohydrate and used as energy, a rather expensive and wasteful energy source, or excreted by the body as waste.

Optional procedures may be included for older children using sliced dried ham (pork) and chicken or turkey to show that substituting ham instead of beef, only one half the grain would have to be taken from the class during the simulation exercise and with an equal portion of poultry substituted for the beef, only from one-fourth to one-third of the grain would have to be taken. As another optional activity some children may care to keep a weekly record of the amount of cereal and cereal products and the amount of beef, pork and poultry they eat. The class could then have another discussion session on the implications for interdependent effects on world food supplies. (The teacher should note that pork and poultry products are usually not as handy for classroom use as they are more often packed in larger quantities with greater moisture content and need refrigeration.)

One note of caution: Younger children tend to look for simplistic conclusions sometimes failing to see the interrelationships involved. Be certain it is made clear in the debriefing discussion that we are not suggesting that it is wrong to eat beef. Beef is a good source of complete protein and any decision to stop eating beef altogether or to become a vegetarian is a personal decision to be made only after carefully studying nutritional alternatives. The central point of this exercise is to demonstrate how the total world food supply is directly effected by the consumption patterns of people in each country. If we allocate excessively large amounts of grain to feed animals, the supply of grain on the world food market is diminished accordingly. In an interdependent world, "Live and let live" is no longer a valid phrase as how we live may determine if another human being will live or die.

Some children may begin to question the seeming simplicity of the lesson. The following question should be raised by the teacher, if not brought up by the class. How do we know that the grain released by eating less grain-fed beef will go to feed hungry people? This is a good question. We cannot know for certain that it will immediately help feed hungry people, but we do know that the pressure of market demand will be lessened and developing nations will be better able to compete for such grain on world markets. More importantly by eating less beef and substituting more efficiently produced protein foods we can save money and send part of that money to a humanitarian agency such as the United Nations Children's Fund. UNICEF has emergency food programs, short term supplementary feeding programs and applied nutrition programs which help in rural and village areas to improve the long term health and nutrition of children through various self-help projects. (For more information on such UNICEF-assisted programs in developing nations write: Information Office, U.S. Committee for UNICEF at the address listed on the the bottom of the first page.)

## Additional Resources

BY BREAD ALONE, Lester R. Brown with Erik P. Eckholm (New York/Washington: Praeger, 1974) $3.95 softcover.

DIET FOR A SMALL PLANET, Frances Moore Lappe (New York: Ballantine Books, 1969) $1.50 softcover.

EARTH: OUR CROWDED SPACESHIP, Isaac Asimov, (New York: John Day Company, Inc., 1974) $2.50 paperback edition available from U.S. Committee for UNICEF

TEACHING ABOUT INTERDEPENDENCE IN A PEACEFUL WORLD. Teacher's Kit #5418 $1.50 Available from U.S. Committee for UNICEF. (Designed primarily for elementary schools)

TEACHING ABOUT WORLD HUNGER. Teacher's Kit #5410 $1.50. Available from U.S. Committee for UNICEF. (Designed primarily for secondary schools, but also useful for teacher background and some upper elementary classroom use)

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" THE GREEN REVOLUTION LIVES "

By Alan Anderson Jr.

One morning in late February, Dr. Norman E. Borlaug, the Iowa farmer and plant pathologist who won the 1970 Nobel Peace Prize, arose at 6 in the Cost de Oro Motel in Ciudad Obregón, in northwestern Mexico, pulled on his khaki trousers and work boots and walked to the motel coffee shop. There he swapped gossip with the local farmers who gather there each morning, and downed his customary breakfast of huevos rancheros. Finished, he put on his baseball cap (Borlaug introduced Little League baseball to Mexico, and proudly sports the cap of the Mexico City Aztecas, the last all-star team he coached), and walked to his Chevrolet in the shortened splay-footed gait he has acquired from a lifetime of navigating the U-shaped furrows of plowed fields.

Borlaug's dedication to agriculture has always been intense to the point of fanaticism; his involvement with baseball was urged upon him years ago by a colleague who perceived that Borlaug was suffering from overwork and exhaustion. Almost single-handed, Borlaug has been responsible for quadrupling the production of wheat in Mexico since 1950, and for more than doubling wheat output in both India and Pakistan between 1968 and 1972, and for working out techniques of breeding, fertilization and irrigation that have since been applied to rice and other crops in a broad but now controversial movement known as the Green Revolution.

The Green Revolution refers to the effort that began about a decade ago to stimulate agriculture in developing nations through the use of high-yielding varieties of grains - especially wheat and rice. The varieties usually have short, stiff stalks, respond quickly to fertilizer and resist common plant diseases. Their proper cultivation usually requires insecticides, pesticides and irrigation, in addition to fertilizer and good farming practices. The earliest successes of the grains came in Mexico, a nation that moved from large-scale wheat importing to self-sufficiency to modest exporting in less than 15 years. The most dramatic leap forward came in India and Pakistan, where the Green Revolution produced its first headlines. Before the advent of Green Revolution wheat in India, most farmers would expect to harvest about one metric ton of wheat and 1.5 tons of rice per year per hectare. With the new grains, fertilizer and good farm management, the same farmer saw his harvest soar to five tons of wheat and seven tons of rice per hectare. Lesser, but increasing gains in wheat yields were under way in Iran, Turkey, Jordan, Syria, Egypt, Libya, Tunisia, mainland China and dozens of other developing countries. New rice varieties were pushing up yields in the Philippines, Thailand, Bangladesh, India and elsewhere in Asia.

In 1972, however, the movement was staggered by a succession of blows. The Ukranian wheat crop failed, and crafty Russian traders subsequently pulled off the biggest Chicago grain purchase in history, leading to the sudden disappearance of grain reserves in North America. A worldwide fertilizer shortage developed, as consumption began to outpace production, and the situation was aggravated by the Arab oil embargo (nitrogen fertilizer is made from petroleum products). Worldwide inflation did not help, nor did an epidemic of bad weather that continued through 1973 and 1974. In a period of two years, wheat prices rose 250 per cent, rice prices 300 per cent and fertilizer prices as much as 700 per cent. It became painfully clear during those years, too, that whatever the successes of the Green Revolution, they were not enough to prevent

starvation in areas of drought or con[illegible] population explosion, and predictions of dire food shortages grew common.

"It's so damned hard to comprehend," Borlaug said over his breakfast. "Sometimes I feel that we're running a losing battle all the way along the line, because the emptier the stomachs get, the more political the questions get. But let's go out to the station and perhaps I can explain some of it."

"We're in this shape now because of bad planning, not lack of food," he said in a tone of frustration. "The grain surpluses we had in the sixties would have made it possible to export food cheaply during this crises, but we' couldn't decide who should finance our grain surplus, so we got rid of it. People prevented subsidies because they would have gone to a minority group - farmers. Seen in hindsight, it might just have been worth it...

"Now governments are regulating the price of grain, but not of fertilizers, and the poor countries can t afford it. At the World Food Conference in Rome, they never even got down to dealing with fertilzer prices. They should have locked all the delegates up without food for 10 days. Then they would have made some hard decisions about food."

Borlaug turned into the driveway of the 500-acre research station known as CIANO, or the Northwest Agricultural Research Center. The station is owned by the Mexican Government, and cooperates with CIMMYT (pronounced SIM-it), the Centro Internacional de Mejoramiento de Maiz y Trigo, or the International Maize and Wheat Improvement Center. Headquartered in El Batan, 30 miles from Mexico City, CIMMYT is financed by U.S.A.I.D., the United Nations Development Program, the International Bank for Reconstruction and Development, the Ford and Rockefeller Foundations and other groups. Both CIMMYT and CIANO grew out of the work of Borlaug and his colleagues, and have formed the model for a network of eight international centers, including the International Rice Research Institute in the Philippines and others in South America, Africa and Asia.

"He is some guy, that Borlaug," says an admiring Mexican colleague at CIMMYT. "He isn't part of the U.S., and he isn't part of Mexico - he is part of the whole world. He stands up on a mountaintop and looks and says "Let's take something from here and put it there."

Cereals, or grains, as they are commonly called, are the fruits of cultivated grasses - enlarged and pampered versions of what a suburbanite would see if his lawn were allowed to go to seed. Grains are the single most important component of the world's food supply, and the most widely grown types in the world are wheat, rice, maize, barley, millet, oats and rye.

Wheat is by far the most important of the world's grains. It is nourishing, adaptable, and easy to grow. Its taste is mild, and it can be stored for many years or shipped easily around the world. The protein of wheat, gluten, has an elastic quality unique among grains. Because of this elasticity, wheat dough is able to hold the tiny gas bubbles emitted by yeast during fermentation, so that light, fluffy bread can be produced from wheat flour.

Borlaug stopped the car. We hopped over an irrigation ditch and walked into the wheatfield where two men wearing straw hats sat at an aluminum table. One man riffled through a pile of notebooks and talked rapidly into a walkie-talkie. "This is the crossing table," Borlaug explained, "where we do our match-making. These notebooks have records of every mating we've done between two wheat plants. This fellow is talking to that fellow (he gestured at a figure several hundred yards away) who is looking for a good 'bull,' and to that other fellow (another figure stooped over a wheat plot in the opposite direction) who is finding a 'cow' to mate with 'him.' We make about 10,000 of these crosses each year just in the bread wheats - and they all have to be done by hand."

Wheat, like nearly all grains except corn, is by nature a self-pollinating plant: Every head of wheat bears 60 or more flowers, each complete with both male and female parts, and without interference, each plant bears offspring that are faithful copies of the parent. Interference, however, is the name of the breeding game, a wearying and muscle cramping operation central to the entire CIMMYT program. Seated motionless on a three-legged stool, the breeder must carefully remove the pollen-producing anther from each flower of each plant that is to be a female. This "emasculation" prevents self-fertilization, creating a "cow" which must be carefully covered with a paper envelope to prevent accidental pollination by another plant. For each cow, a bull is selected on the basis of some desirable trait, such as disease resistance, straw strength, or good milling and baking qualities. When both bull and cow are ripe, the head is severed from the bull, brought to the cow, and twirled quickly inside the protecting envelope. This scatters pollen over the 60 or more ovaries.

We came to a dense stand of large-headed wheat, and Borlaug pointed a blunt finger. "Here's the star of our show - number 8156 itself. This variety is being used by so many countries that it has over 30 different names. It's a very high-yielding variety - as much as seven tons of grain or more per hectare. We are trying to cross its genes for high yield into other varieties. This is tricky to do without losing other desirable genes. That's the heck of it. It's a little like collecting a cageful of butterflies. You find one you like, and as you put it into the cage, some of the others fly out."

Through the late nineteen-forties and early fifties, Borlaug spent all his time crossing wheats. Improvements came quickly, but the tradition-bound farmers were skeptical, and refused to try the new seeds. When he was able to point to rich demonstartion fields, however, and talk to the farmers in terms of pesos and centavos, they began to listen. By the mid-fifties, the new wheats were catching on, and by 1956 Mexico was self-sufficient in wheat, as she has been ever since. Even greater yield increases came with the introduction of dwarf wheats, developed in the state of Washington in the nineteen-fifties by Dr. Orville Vogel - short, stiff-stalked plants that could be fertilized heavily without lodging. By 1962, Mexico was releasing its own tropical dwarfs, and yields leaped from four and a half tons per hectare to six, seven and even eight tons per hectare. Demand for the dwarf seed was so brisk that black markets flourished for years; the same thing happened later in India and Pakistan.

One of the secrets of CIMMYT's success is its network of international nurseries in nearly 100 cooperating countries. "The most important information we can get about a variety is how well it grows on the other side of the world", I was later told by Dr. Maximino Alcala, director of the nurseries program. "Some of the places our seeds are grown are Alaska, South Africa, Bangladesh, Nigeria, Kenya, Norway and New Zealand. They grow in altitudes of 10,200 feet in Ecuador, below sea level in the Netherlands, in the desert in Libya and southern Egypt and near the Arctic Circle in Scandinavia. Each of the nurseries sends us a report on how well each variety yields and how well it resists diseases. If a variety does well in all of those places, we are pretty confident it is adaptable enough for worldwide use."

Despite the obvious achievements of the Green Revolution, Borlaug and his colleagues are well aware of the bad press that has been stirred up by the set-backs of the last few years. That evening, back at the motel, I asked him about an article in Fortune, which charged that "the price that has been paid for the high productivity may be a lack of adaptibility." He grunted, and took a sip of a margarita. "You'll see a lot of nonsense that we are becoming susceptible to disease because we are just growing a few varieties. But those few varieties are the result of so many crosses made within our program and in affiliated countries that there is tremendous built-in resistance. More genetic variability is being put into grains now than ever before in the history of the world."

Well, I went on, what about the charge that the Green Revolution grains are "addicted" to large diets of fertilizer, without which they are even less productive than native varieties ? Again, his answer was blunt. "People are always asking us to develop a kind of grain that doesn't need fertilizer. All right, I say, I'll have that grain for you in six months or a year after you develop a man or woman who doesn't need to eat. Once you've established the principle, I can apply it to grains."

Dr. Keith Finlay, deputy director of CIMMYT, shook his head when I mentioned fertilizer addiction to him later in El Batan. "In general, the new varieties are more productive over the full range, from no fertilizer or water to the ideal conditions we have at CIMMYT. The reason is that a dwarf plant is more efficient: it puts more if its energy and total plant matter into grain than a taller plant does. Many countries can and do grow these new varieties without fertilizer, and they still get yields as good as or better than their native varieties. But there's no way you can increase production much without fertilizer and good farming practices, such as weed control, proper depth of planting and soil preparation."

A recently released U.S. Government report, "The World Food Situation and Prospects to 1985" (Economic Research Service, U.S. Department of Agriculture), argues that the full effects of the Green Revolution cannot yet be judged: The impact of the new wheat and rice grains has yet to be felt in most parts of the world. The Green Revolution has been highly concentrated in Asia, and within Asia, India and Pakistan have planted 81 per cent of the new wheats sown so far, while India, the Philippines, Indonesia and Bangladesh together have planted 83 per cent of the new rices. "The Green Revolution has not been a solution to the food-deficit problem in the tropics," according to the report, "nor has it failed because shortages have re-emerged. Only a few years have elapsed since the HYV's

(high-yielding varieties) were first disseminated in Asia, and just as it took from one to two decades for hybrid corn in the United States and HYV wheat in Mexico to achieve full adoption and high sustained yields, it will take time in Asia.

At the same time CIMMYT scientists are pressing for full adoption of the new grains in Asia and elsewhere, they are plunging ahead with new projects in the confidence that the Green Revolution can and must continue. The most promising "crossing" scheme at the moment is not genetic at all but mechanical: The idea is to stir together seeds from 750 varieties of 8156 that look, taste and feel the same but that contain slightly different genes for rust resistance. Because a single race of rust can attack only a single variety of wheat, a field of such a mixture would possess a tough defense against diseases. An individual race of rust would be confronted by such complex host diversity that rapid spread would be impossible.

The next day, Borlaug showed me the most exciting triumph of the CIMMYT breeding program: triticale, the world's first man-made cereal. Triticale (triti-KAY-lee), a cross between wheat (Triticum) and rye (Secale), combines the high yield of wheat with the extreme hardiness and disease resistance of rye. In the beginning, the chief obstacle was lack of fertility: By natural laws, crosses between different species are usually sterile, like a mule. But by genetic accident ("natural, promiscuous, unplanned, probably in the dark of the night at CIANO," guessed Borlaug), a triticale "mule" managed to cross with a dwarf of wheat. Triticale goes into semi-commercial production this year in the central highlands of Mexico. In Texas and California, there are already more than a dozen triticale products on the market including Tritiflakes, Triticakes and Tritipizzia.

Triticale, novelty though it is, may prove to be genetic child's play compared with some of the "wide crosses" being attempted today - both sexual and asexual crossing of such distant relatives as oats, barley, wheat, wild grasses and even legumes such as soybeans, common beans and peanuts. Such crossing will not occur without elaborate technological trickery. Botanists have recently learned how to grow entire plants from single cells in a test tube; they can also create new species from the nuclear material of body cells as well as sex cells, a process that makes possible the crossing of plants too genetically different to mate in conventional fashion.

The most exciting goal at the moment is a long-dreamed-of "super cereal" combining the high yielding ability of a cereal with the legume. Soybeans and other legumes grow in symbosis with colonies of bacteria that possess the priceless ability to "fix" nitrogen, or convert it from the free gaseous state into solid nitrogen compounds that can be used by plants to build proteins and other essential chemicals. A cereal that could fix its own nitrogen would manufacture much of its own fertilizer, skirt the energy crisis and save farmers hundreds or thousands of dollars a year.

Last summer's sad scenes of starvation in parts of Africa, coupled with current food shortages and price inflation, have propagated a wave of pessimism perhaps unequaled since Thomas Malthus write his influential essay in 1798.

California biologist Garrett Hardin says it is time for a new system of "lifeboat ethics." The Environmental Fund, a Washington-based group, declares that "we have reached, or nearly reached, the limit of the world's ability to feed even our present numbers adequately." In their book "By Bread Alone", Lester R. Brown and Erik P. Eckholm predict "...a period of more or less chronic scarcity and higher (food) prices." Some critics of the Green Revolution say that its very goal is inappropriate: Greater food production will increase the number of people who must eventually starve.

Borlaug, who spent nine and a half months last year traveling and lecturing outside Mexico, is also worried by what he has seen and heard. "It's not just physically I'm beat to a pulp," he admitted that evening back at his motel lobby. "It's all the political demagoguery that's doing me in. I've dealt with demagogues in Socialist countries and Communist countries and capitalist countries and after all the dust has settled they all have the same problem - they all have to eat. There is no free flow of information among nations - the Russians didn't tell us about their grain failure in 1972 until it was too late. The only way to absorb those shortfalls is to know about them in advance. Then we have to have an international granary to supply emergency grain, but countries can't agree on how to set one up. The U.N. is the only body we've got to organize this, but it's so damned ineffective. You'd think they'd shape up a little and develop a sense of urgency.

"What we need more than anything," said Borlaug, banging his fist on the table, "is the will and commitment of governments to support dedicated agricultural scientists as leaders. And these leaders have got to go out into the field with the farmers. If we can't get the Green Revolution to the little guy, there is no revolution."

These days, he went on, population is at least as much on his mind as food. "I've calculated that in 1971, the year of the record harvests, the world produced enough grain to lay a highway all the way around the equator, 55½ feet wide and 6 feet deep. Each year another 78 million people are born, and to feed them we have to grow enough grain to extend that highway 625 miles. Unless we want those 78 million people to starve, we have to grow that extra grain."

Borlaug stood up to go off to bed, then paused. "I guess I shouldn't be too depressed about all this. I lectured in 1967 across Canada on fertility and the food problem, and touched a lot of sensitive nerves. I was a little ahead of my time. But Glenn Anderson, the associate director of the wheat staff, went back last year on the same tour with the same message and found very receptive audiences everywhere. I've been finding the same thing. It's not considered poor taste any more to mention food and population in the same breath." He smiled and stretched out his hand. "Well, let's call it a night. There's a lot to do tomorrow."

# Hunger: A Historical Perspective

by D. Gale Johnson

Famine is the most horrible of the manifestations of food insufficiency. It is sad if there is one famine death in a year anywhere in the world and it is sadder still when thousands of such deaths occur. But it would be incorrect to deduce from the pictorial evidence of famine that we now see, that the world is more prone to famine than in the past. Quite the contrary. Both the percentage of the population afflicted by famine and the absolute numbers involved during the past quarter century have been small compared with what has prevailed during the period of history for which we have reasonably reliable estimates of the number of famine deaths.

There appears to have been a rather steady reduction in the incidence of famine since the last quarter of the 19th century, when perhaps 20 to 25 million died from famine. Adjusting for population increase, comparable figure for the third quarter of this century would be at least 50 million and for the quarter century we are entering, at least 75 million. For the entire 20th century to the present, famine deaths have probably been about 12 to 15 million and some were the result of mistaken governmental policy or of war. Those who believe that the food situation for the poorer people of the world has deteriorated during the past quarter century have no satisfactory explanation for a development unprecedented in recorded human history, namely the dramatic increase in life expectancy in the developing countries. During the 1950s there were many developing countries in which life expectancy increased at the rate of one year per year - something never achieved in Western Europe or North America.

I do not say that improved per capita food supplies were primarily responsible for such a dramatic development; other factors such as DDT (the control of malaria) and improvements in sanitation (sewage and water supplies) were far more important. But the increase in life expectancy almost certainly could not have occurred if there had been a deterioration in the quantity and quality of food. The largest percentage-declines in death rates occurred among the young, who normally suffer first and most with a reduction in food availabilty.

Those of us who decry the high rates of population growth in the developing countries should not forget that the increases in population-growth rates have been due entirely to reductions in death rates and not at all to an increase in birthrates. There has been an enormous reduction in human suffering that has gone largely unrecognized - pain and grief of parents numbering in the hundreds of millions has been avoided by the reduction in infant and child mortality, True, there have been costs imposed by the rapid growth of population, but the benefits should not be ignored.

Life expectancy in the developing world increased from 35 - 40 years in 1905 to 52 years in 1973. When was a level of life expectancy of 52 years achieved in the United States? in England? in France? in Italy? The approximate years were 1910 for the United States, 1905 for England, 1915 for France and 1925 for Italy. In the Soviet Union life expectancy probably reached 52 years in the 1930s.

There has been substantial growth in food production in all areas of the world over the past two decades. In fact, the growth of food production has perhaps been greater than at any time in the past. Unfortunately, in terms of achieving a significant improvement in the nutrition of the poorer half of the world's people, the rate of population growth has been the most rapid since reasonably-reliable population data were available.

A German food-economist, Adolph Weber, has compared per capita calories of the developing countries as of 1971 with the French per capita consumption of 1780. In 1780 France was one of the leading world powers - economically, socially, culturally, militarily. All of the developing countries of the world had by 1971 surpassed the French per capita caloric consumption of 1780. It was not that the average for the world had reached the 1780 French level, but that the lowest average for any country exceeded that level.

Foreigners who visit the developing countries often report the very low yields of grain that are realized. But even here there has been significant progress and the lag of the developing countries behind North America or Western Europe is not so great as often believed. If the world is divided into two groups - the developing countries and the industrial countries - grain yields were almost identical in 1935 - 39 at about 1.15 metric tons per hectare. In the late 1960s the average yield in the industrial countries was 2.14 tons or about double the yield 35 years earlier. In the developing countries, yields had incread to 1.41 tons per hectare by 1969 - 70, which above the average yield in the industrial countries as recently as 1952 - 56.

Throughout most of the recorded history of mankind, most of the world's population has been but one poor crop away from disaster and suffering. The new world now has the capacity in terms of intellectual and natural resources to prevent large-scale suffering and to improve the per capita food supply of the world's poorer people.

(Dr. D. Gale Johnson, "Hunger: A Historical Perspective", The interdependent, April 1975, Vol. 2, Number 4; page 1)

SUMMARY OF WORLD FOOD CONFERENCE RESOLUTIONS

1. Objectives and Strategies of Food Production. This resolution resolves that all governments should accept the removal of the scourge of hunger and malnutrition. It calls upon the developing countries to give high priority to formulating plans, both short and long-term, for food production through agricultural and fisheries development; to promote changes in rural socioeconomic structures; and to develop adequate supporting services. Governments are called upon to increase their development assistance, facilitate greater access to inputs by developing countries, support the U.N. Special Program and the Agricultural Development Fund, and reduce the waste of food and agricultural resources.

2. Priorities for Agricultural and Rural Development. This resolution calls for appropriate agrarian reforms and institutional improvements aimed at generating employment, income, and integrated development in rural areas; eliminating any exploitative patterns of land tenure, lending, and marketing; improving credit, marketing and input distribution systems; and promoting cooperative organizations for farmers and rural workers.

3. Fertilizers. This resolution asks developed countries and various international agencies to help meet developing countries' fertilizer needs by providing material and financial support for the International Fertilizer Supply Scheme; extending grants and concessional loans for fertilizer and raw material imports; organizing a joint program to improve fertilizer plant efficiency; assisting in building new fertilizer production capacity in appropriate developing countries; and by assisting all developing countries to establish storage facilities, distribution services, and related infrastructures.

4. Food and Agricultural Research, Extension and Training recommends increased support for programs related to the survey, conservation, and effective utilization of all agricultural resources, particularly soil, water, and plant and animal resources. A global network of plant genetic resource centers is urged, to be followed by work on animal genetic resources.

5. Policies and Programs to Improve Nutrition recommends that each country formulate integrated food and nutrition plans and policies based on careful assessments of malnutrition in all socioeconomic groups and preconditions for improving their nutritional status. The objective is "to eliminate within a decade hunger and malnutrition." FAO, in cooperation with the World Health Organization, the U.N. Children's Fund, the World Food Program, the World Bank, the U.N. Development Program, and the U.N. Educational, Scientific and Cultural Organization and assisted by the Protein Advisory Group is to prepare a project proposal by mid-1975 for assisting governments in developing broad food and nutrition plans.

The resolution calls for a worldwide control program to reduce deficiency of Vitamins A and D, iodine, iron/folate, riboflavin, and thiamine; an inventory of noncereal vegetable food resources and a study of possibilities of increasing their food production and consumption; a food contamination monitering program to provide early warning to national authorities, FAO, WHO, and UNICEF; a global nutrition surveillance system to monitor food and nutrition conditions; and an internationally coordinated program in applied nutritional research.

6. World Soil Charter and Land Capability Assessment recommends that governments apply soil protection and conservation measures to all attempts to increase agricultural production. It also recommends that FAO, U.N. Educational, Scientific and Cultural Organization, U.N. Development Program, the World Meteorological Organization, and other international organizations prepare an assessment of remaining cultivatable land, taking account of forestry for protection of catchment areas required for alternative uses. FAO is urged to establish a World Soil Charter as a basis of international cooperation for most rational use of the world's land resources.

7. Scientific Water Management: Irrigation, Drainage, and Flood Control calls for corrected action by governments, FAO, World Meteorological Organization, and other international agencies to undertake extensive surveys of climate, water, irrigation potential, hydro-power potential, energy requirements for irrigation, and expand irrigation as rapidly as possible; develop safe uses of brackish water; reclaim areas affected by waterlogging, salinity, and alkalinity; identify and exploit ground water resources and develop better ways of improving crop production in arid areas; complement flood protection and flood control measures; establish drainage systems to control salinity in swampy areas; develop controls for desert crops; and develop better water technology and delivery systems. Extensive aid to developing countries and extensive research into the use of solar, geo-thermal and wind energy in agricultural production are urged.

8. Food and Women calls on governments to involve women fully in the decision making for food production and nutrition policies; promote equal rights and responsibilities for men and women and include in national development plans provision for education and training of women in food production and agricultural technology, marketing and distribution techniques, as well as credit and nutrition consumer information; and provide women with full effective access to all medical and social services, food for pregnant women and lactating mothers, means to space their children, and child health and development education.

15. Food Aid to Victims of Colonial Wars in Africa requests FAO and the World Food Program "to take immediate action to intensify food aid to Ghinea Bissau, Cape Verde, Mozambique, Angola, Sao Tome, and Principe;" and requests the U.N. Secretary-General and other U.N. organizations "to assist the national liberation movements or the governments of these countries to formulate a comprehensive plan of national reconstruction."

16. Global Information and Early-Warning System on Food and Agriculture cites the urgent need for a worldwide food information system to identify areas with imminent food problems, monitor world food supply-demand conditions, and contribute to the effective functioning of the proposed International Undertaking on World Food Security.

17. International Undertaking on World Food Security endorses the objectives, policies, and guidelines of the proposed IUWFS and urges its adoption and implementation. The resolution affirms common responsibility of the international community for adequate policies on world food, asks all states to participate, and calls for national stocks, particularly of grain, to be maintained with the objective of ensuring a globally sufficient amount.

18. An Improved Policy for Food Aid affirms the needs for forward planning of a continuous, augumented amount of food aid. Donor countries are asked to provide commodities or financial assistance for a minimum of 10 million tons of grain for food aid a year, in addition to other food commodities, starting in 1975. Donor countries are also urged to channel more food aid through the World Food Program, increase the grant component of bilateral food aid, consider applying part of food aid repayments to supplementary nutrition programs and emergency relief, and where possible to purchase such food for aid from developing countries.

19. International Trade and Adjustment requests that all states cooperate in expanding and liberalizing world trade and improving the trading position of exports from developing countries.

(Some schools or classes may want to organize a Model World Food Conference, if convenient on an anniversary date of the Rome Conference (Nov. 5-16, 1974). Representatives from other schools might also be invited with each group responsible for preparing a presentation on one or more of the above resolutions from the viewpoint of different nations. Participants might discuss the social, economic, political, health, nutritional, ecological and environmental implications of implimenting actions called for in the resolutions as well as prepare important new resolutions.

Excerpts and summaries from "Annex: Summary of World Food Conference Resolutions," The World Food Situation and Prospects to 1985, pp.87-90.

9. Achievement of a Desirable Balance between Population and Food Supply points to the increasing difficulty in meeting the food needs of a rapidly growing world population and to concensus on a World Population Plan of Action reached at the August 1974 World Population Conference. The resolution calls on governments and peoples everywhere to support rational population policies which ensure couples the right to determine the number and spacing of births, freely and responsibly, in accordance with national needs within the context of an overall development strategy.

10. Pesticides.* This resolution recommends international coordination of efforts to assure an adequate supply of pesticides, including where possible the local manufacture and establishment of reserve stocks; programs to increase the efficiency of protection measures taking into account the elements of supply, information, training, research, and quality control; and the promotion of a strong continuing program of research into the mechanism of resistance in both plants and pests - especially as applicable to the development of integrated pest management in tropical and sub-tropical areas - and on the residual effects of pesticides.

11. Program for the Control of African animal trypanosomiasis asserts that an integrated economic development plan for Africa should begin with trypanosomiasis and tsetse control. It calls for a small coordinating unit at FAO to immediately initiate as the first phase of the program training, pilot field control projects, and applied research, in perparation for future large-scale operations for the control of African animal trypanosomiasis.

12. Seed Industry Development urges developing countries to make continuing commitments of manpower, institutional, and financial resources for seed industry development; recommends policies and legislation for the production, processing, quality control, distribution, marketing and promotion of quality seed and education of farmers in their use; and proposes that the FAO Seed Industry Development Program be strengthened to meet demands for seed production, seed export, and training of competent technical and managerial manpower.

13. International Fund for Agricultural Development resolves that an International Fund for Agricultural Development should be established immediately to finance agricultural development projects, primarily for food production in the developing countries.

14. Reduction of Military Expenditures for Increasing Food Production calls on countries to rapidly implement all U.N. Resolutions pertaining to the reduction of military expenditures on behalf of development, and to allocate a growing proportion of these sums to finance food production in developing countries and establish reserves for emergency cases.

* Includes insecticides, herbicides, fungicides, acaricides, rodenticides, growth regulators, and other pest control measures.

## WORLD POPULATION, HEALTH & HUNGER DATA IN BRIEF *

| REGION OR COUNTRY | Population Estimate Mid-1975 (millions) | Birth Rate ** | Death Rate | Rate of Population Growth (annual,%) | Infant Mortality Rate *** | Population Under 15 Years (%) | Life Expectancy at Birth (years) | Dietary Energy Supply (calories per person, per day) | Per Capita Gross National Product (U.S. $) |
|---|---|---|---|---|---|---|---|---|---|
| Africa | 401 | 46.3 | 19.8 | 2.6 | 156 | 44 | 45 | 2,250 | 240 |
| Northern Africa | 98 | 43.3 | 15.2 | 2.7 | 126 | 44 | 52 | 2,240 | 300 |
| Western Africa | 115 | 48.7 | 23.0 | 2.6 | 178 | 45 | 41 | 2,220 | 150 |
| Eastern Africa | 114 | 48.1 | 20.7 | 2.7 | 160 | 45 | 44 | 2,240 | 160 |
| Middle Africa | 45 | 44.4 | 21.7 | 2.3 | 165 | 43 | 42 | 2,120 | 170 |
| Southern Africa | 28 | 43.0 | 16.2 | 2.7 | 121 | 41 | 51 | 2,720 | 790 |
| Asia | 2,255 | 34.9 | 13.6 | 2.1 | 102 | 38 | 54 | 2,160 | 270 |
| Southwest Asia | 88 | 42.8 | 14.3 | 2.8 | 112 | 43 | 54 | 2,760 | 510 |
| Middle South Asia | 838 | 41.7 | 17.0 | 2.4 | 138 | 43 | 48 | 2,070 | 120 |
| Southeast Asia | 324 | 42.2 | 15.4 | 2.7 | 106 | 44 | 51 | 2,070 | 150 |
| East Asia | 1,006 | 26.2 | 9.8 | 1.6 | 50 | 33 | 62 | 2,220 | 420 |
| North America | 237 | 16.5 | 9.3 | 0.9 | 18 | 25 | 71 | 3,320 | 5,480 |
| Latin America | 324 | 36.9 | 9.2 | 2.7 | 79 | 42 | 61 | 2,530 | 650 |
| Middle America | 79 | 42.2 | 9.4 | 3.2 | 66 | 46 | 62 | 2,490 | 670 |
| Carribean | 27 | 32.8 | 9.2 | 1.9 | 69 | 41 | 63 | 2,320 | 680 |
| Tropical South America | 180 | 38.3 | 9.2 | 2.9 | 90 | 43 | 60 | 2,470 | 530 |
| Temperate South America | 39 | 23.2 | 8.9 | 1.4 | 62 | 30 | 66 | 2,940 | 1,120 |
| Europe | 473 | 16.1 | 10.4 | 0.6 | 24 | 24 | 71 | 3,150 | 2,380 |
| Northern Europe | 82 | 15.8 | 11.2 | 0.4 | 16 | 24 | 72 | 3,140 | 2,870 |
| Western Europe | 153 | 14.6 | 11.1 | 0.6 | 18 | 23 | 72 | 3,230 | 3,380 |
| Eastern Europe | 106 | 16.6 | 10.2 | 0.6 | 29 | 23 | 70 | 3,240 | 1,410 |
| Southern Europe | 132 | 17.7 | 9.2 | 0.7 | 29 | 26 | 71 | 2,990 | 1,440 |
| U.S.S.R. | 255 | 17.8 | 7.9 | 1.0 | 26 | 36 | 70 | 3,280 | 1,400 |
| Oceania | 21 | 24.8 | 9.3 | 2.0 | 50 | 31 | 66 | 3,270 | 2,480 |

| Birth Rate ** | Death Rate | Rate of Population Growth (annual,%) | Infant Mortality Rate *** | Population Under 15 Years (%) | Life Expectancy at Birth (years) | Dietary Energy Supply (calories per person, per day) | Per Capita Gross National Product (U.S. $) |
|---|---|---|---|---|---|---|---|
| 46.3 | 19.8 | 2.6 | 156 | 44 | 45 | 2,250 | 240 |
| 43.3 | 15.2 | 2.7 | 126 | 44 | 52 | 2,240 | 300 |
| 48.7 | 23.0 | 2.6 | 178 | 45 | 41 | 2,220 | 150 |
| 48.1 | 20.7 | 2.7 | 160 | 45 | 44 | 2,240 | 160 |
| 44.4 | 21.7 | 2.3 | 165 | 43 | 42 | 2,120 | 170 |
| 43.0 | 16.2 | 2.7 | 121 | 41 | 51 | 2,720 | 790 |
| 34.9 | 13.6 | 2.1 | 102 | 38 | 54 | 2,160 | 270 |
| 42.8 | 14.3 | 2.8 | 112 | 43 | 54 | 2,760 | 510 |
| 41.7 | 17.0 | 2.4 | 138 | 43 | 48 | 2,070 | 120 |
| 42.2 | 15.4 | 2.7 | 106 | 44 | 51 | 2,070 | 150 |
| 26.2 | 9.8 | 1.6 | 50 | 33 | 62 | 2,220 | 420 |
| 16.5 | 9.3 | 0.9 | 18 | 25 | 71 | 3,320 | 5,480 |
| 36.9 | 9.2 | 2.7 | 79 | 42 | 61 | 2,530 | 6501 |
| 42.2 | 9.4 | 3.2 | 66 | 46 | 62 | 2,490 | 670 |
| 32.8 | 9.2 | 1.9 | 69 | 41 | 63 | 2,320 | 680 |
| 38.3 | 9.2 | 2.9 | 90 | 43 | 60 | 2,470 | 530 |
| 23.2 | 8.9 | 1.4 | 62 | 30 | 66 | 2,940 | 1,120 |
| 16.1 | 10.4 | 0.6 | 24 | 24 | 71 | 3,150 | 2,380 |
| 15.8 | 11.2 | 0.4 | 16 | 24 | 72 | 3,140 | 2,870 |
| 14.6 | 11.1 | 0.6 | 18 | 23 | 72 | 3,230 | 3,380 |
| 16.6 | 10.2 | 0.6 | 29 | 23 | 70 | 3,240 | 1,410 |
| 17.7 | 9.2 | 0.7 | 29 | 26 | 71 | 2,990 | 1,440 |
| 17.8 | 7.9 | 1.0 | 26 | 36 | 70 | 3,280 | 1,400 |
| 24.8 | 9.3 | 2.0 | 50 | 31 | 66 | 3,270 | 2,480 |

* Abstracted from 1975 World Population Data Sheet, based on United Nations statistics. A complete 18½" x 23" Worldwide Data Sheet covering each country is available from Population Reference Bureau, Inc., P.O. Box 35012, Washington, D.C. 20013 (enclose 35¢ per copy)

** Birth and Death Rates: Annual number of births or deaths per 1,000 population.

*** Infant Mortality Rate: Annual number of deaths of infants under one year of age, per 1,000 live births.

Annual Per Capita Consumption of Grain and Meat with Corresponding Consumption of Meat, Total Protein and Calories Per Day in Ten Selected Countries

| | Grain Consumed Directly (pounds) | Grain Consumed Indirectly (pounds) | Total Grain Consumed (pounds) | Daily Total Meat Consumed In Grams | Daily Total Protein in Grams | Daily Total Calorie Intake |
|---|---|---|---|---|---|---|
| Canada | 202 | 1,791 | 1,993 | 247 | 96 | 3,200 |
| United States | 200 | 1,441 | 1,641 | 301 | 96 | 3,210 |
| U.S.S.R. | 344 | 883 | 1,227 | 106 | 92 | 3,180 |
| United Kingdom | 169 | 856 | 1,025 | 214 | 90 | 3,180 |
| Argentina | 223 | 625 | 848 | 320 | 102 | 3,190 |
| West Germany | 160 | 588 | 748 | 200 | 82 | 3,150 |
| Mexico | 305 | 242 | 547 | 55 | 66 | 2,620 |
| Japan | 320 | 211 | 531 | 36 | 75 | 2,440 |
| China | 312 | 118 | 430 | 47 | 57 | 2,050 |
| India | 288 | 60 | 348 | 4 | 48 | 1,880 |

Source: United Nations Statistical Yearbook 1972 and FAO, Food Balance Sheets, based on 1966 - 1968 reported data.

## BIBLIOGRAPHY AND RESOURCES

### Books


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Biography of Dr. Norman Borlaug and his one man struggle against world hunger. Good reference for the history of the "Green Revolution."

Borgstrom, Georg. The Food and People Dilemma. (North Scituate, MA: Duxbury Press), 1973. paperback, $3.95.
A brief study aimed at shedding light on the complex food-and-people issue while also focusing on its historical and biological dimensions. Exploring the interactions of world agriculture with food processing, transportation, industry, urbanization, and energy consumption, Borgstrom a noted professor of geography and nutritional science also offers a most useful 24 page appendix of supplementary tables.

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Latest compilation of interesting data on the world food problem. Brown's talent for synthesizing information and effectively communicating it in a way that prompts response makes this book a must for teachers or students interested in world hunger.

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A discussion of food scarcity and social needs in view of population concerns--stabilizing world population, abandoning pursuit of superaffluence, sharing resources among countries. Questions the notion of our being able to consume as much food, energy, and other resources as we wish.

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Companion to Diet for a Small Planet, it offers recipes and diets for eating less meat and more protein.

Freeman, W. H., Food -- Readings from Scientific American (San Francisco: W. H. Freeman), 1973. $11; paperback, $5.50.
Reprints of 28 mostly still relevant food and nutrition-related articles that appeared in Scientific American over the past quarter century.

Hardin, Clifford M. Overcoming World Hunger. (Englewood Cliffs, NJ: Prentice-Hall Inc.), 1969. $4.95; paperback, $1.95.
Four important essays that discuss both sides of the population-food equation and review "the possibilities and obstacles to decelerating population growth and accelerating food production."

Hopcraft, Arthur, Born to Hunger. (London: Pan Books Ltd) , 1968.
A compelling narrative of one man's observations on aspects of massive deprivation as he traveled in ten nations of Asia, Africa and Latin America, plus the Caribbean. Skimming a "parade of statistics" Hopcraft emphasizes the factor which "makes the vastly varied people of these places as one...They are the poor and the threatened. The threat is hunger, and they are born to it."

Lappe, Frances Moore, Diet for a Small Planet. (New York: A Friends of the Earth/ Ballentine Book), 1971. paperback, $1.25.
Explains what protein is, how it is used and needed by our bodies, and offers non-meat recipes and eating plans to achieve good protein balance. Very concise and easy to read.

Mayer, Jean, Human Nutrition: Its Physiological, Medical and Social Aspects. (Springfield, Il: Charles Thomas), 1972. $12.95.
A compilation of 82 essays by the Harvard nutrition professor and Washington Post columnist who is one of nutrition's most effective political spokesmen.

McGill, Marion and Orrea F. Pye, "World Food Patterns and Protein Economy (New Jersey: United Nations Association of the United States of America), 1975.
A collection of international recipes representing various patterns of grains with other food to supply protein. Calls attention to important issues of energy and food conservation.

Muessig, Raymond H., editor, Controversial Issues in the Social Studies: A Contemporary Perspective. (Washington, D.C.: National Council for the Social Studies), 45th Yearbook, 1975.
Of particular interest for studying world hunger and interdependence see Chapter 7, "Should We Believe That Our Planet is in Peril?" and Chapter 8, "Should the Nation-State Give Way to Some Form of World Organization?" Chapter 7 related to ecological and environmental factors while Chapter 8 relates more to economic and political factors.

Rich, William, Smaller Families Through Social and Economic Progress Monograph No. 7, (Washington, D.C.: Overseas Development Council), 1973.
Cites countries (including poorer countries) in which birth rates have dropped sharply where the majority of the population has shared in greater economic and social benefits of national progress. It calls for a combination of family planning and equitable national development planning as key to hunger problems.

Rural Development (Washington, D.C.: The World Bank), 1975. no charge.
Outlines policies and programs to increase agricultural production and improve the lives of the rural poor. Similar World Bank monographs are available on Land Reform and Agricultural Credit.

Schumacher, E.F. Small is Beautiful. Economics as if People Mattered (New York: Harper & Row Publishers), 1973.
Although not specifically concerned with hunger, Schumacher proposes a new concept which breaks down the artificial separation of more as producer and consumer of food, goods and services and directs attention to basic human values.

Simon, Paul and Arthur . The Politics of World Hunger. (New York: Harpers Magazine Press), 1973.
For more background in depth on the economic and political factors related to Part II of this kit.

Ternes, Alan, editor. Ants, Indians and Little Dinosaurs. (New York: Charles Scribner's Sons), 1975.
Despite a title which gives little clue, the lay reader will find several interesting articles related to world hunger written from an ecological perspective. "The Coming Famine," and "The Starving Roots of Population Growth", "The Withering Green Revolution" (a critics view) and "The End of an Energy Orgy" will be particularly valuable readings for the Environmental and Ecological Factors part of this kit.

World Food Conference: Note by the Secretary General. (United Nations Economic and Social Council), 1974. no charge.
A summary of the outcome of the meeting.

The World Food Situation and Prospects to 1985. Economic Research Service, U.S. Department of Agriculture, Foreign Agricultural Economic Report No. 98. no charge.
An excellent quantified analysis of the problem and the needs. A good presentation of complex and controversial material to the informed lay reader.

Books for Young Readers

Asimov, Isaac, Earth: Our Crowded Spaceship. (New York: John Day Company), 1974.
Available from the U.S. Committee for UNICEF in paperback, $2.50.
Clear absorbing treatment of human population from the ageless hunger and search for energy. Written in the same fascinating style of Isaac Asimov's science fiction. Includes interesting graphic and pictorial representations.

Jelliffe, Derrick B., Child Nutrition in Developing Countries (Washington, D.C.: Government Printing Office), 1969. $1.25.
Written for Peace Corps volunteers and others with no technical training in the health field, this book outlines general principles of nutrition and suggests basic actions for successful programs.

Mangurian, David, Lito The Shoeshine Boy (New York: Four Winds Press), 1975. $5.95.
Moving non-fiction story of a young teen-age Honduran abandoned by his family. Told in his own words and made visually alive by Mangurian's excellent photographic essay, Lito's story is not only believable, but is one with which many young people can identify particularly the urban youth.

Mosher, Arthur T., Getting Agriculture Moving. (New York: Praeger Publishers), 1966. $6.50.
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Ratner, Marilyn and Terry Cooper, Many Hands Cooking (New York: Thomas Y. Cromwell and Company in cooperation with U.S. Committee for UNICEF), 1974. Available from the U.S. Committee for UNICEF, $3.50.
Delicious, nutritious and easy-to-make recipes from 40 countries with colorful illustrations.

Raw, I. and others, What People Eat. ( William Kaufman), 1975.
This innovative introduction to food science and chemistry at the freshman college or senior high level is based on laboratory examination of foods from the student's diet. An attempt to link laboratory knowledge to relevant living values.

Sebrell, William H. and James J. Haggerty, Food and Nutrition. (Time-Life), 1967. $8.80.
This volume from the Life Science Library series serves as a good introduction to the subject and a good reference source for 13-17-year olds. Profusely illustrated in traditional life style.

Wilson, Charles Morrow, Green Treasures. Adventures in the Discovery of Edible Plants. (Philadelphia: Macrae Smith Company), 1974.
A look at the role, nutritional and medical value, importance and possible destruction of plants with a plea for care and development of new species for food crops.

Woodham-Smith, Cecil, The Great Hunger. (New York: Harper and Row Publishers, Inc.), 1962. $7.50.
This dramatic and well-documented account of the Irish potato famine of the 1840's is a literary ornament in a collection of food literature possessing few.

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Why UNICEF? . Available from U.S. Committee for UNICEF. no charge.

Wood, Jayne Millar, guest editor, "Global Hunger and Poverty", Social Education, Vol. 38, No. 7 (November/December 1974).

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Teachers Kits

"Focusing on Global Poverty and Development: A Resource Book for Educators" by Jayne Millar Wood. Overseas Development Council. 1974. $12.00.
Designed for secondary students, the guide attains a cross-cultural perspective by combining domestic and international views of many topics dealing with world poverty and interdependence. Instructions for integrating guide into courses, as well as readings, charts, maps, film guides, and list of organizations providing resources.

"The Hunger Kit", available from the Program of Studies in Peace & Human Development, St Joseph's College, 54th & City Line Avenue, Philadelphia, PA 19131. $1.50.
This packet contains reference and informational materials focused on two major areas of world hunger - problems in developing nations and domestic responses to them. Incorporates a special appeal from religious and biblical perspectives.

"Hunger on Spaceship Earth", available from the American Friends Service Committee, 15 Rutherford Place, New York, NY 10003. $2.00.
Includes background readings, action ideas, global ramifications, and a simulation exercise for classroom use.

"The Needs of Man", available from Zen-Du Productions, P.O. Box 3927, Hayward, CA 94540. $1.25.
This teaching aid for intermediate and middle school teachers is a brightly-colored wheel device that correlates human needs such as food, social institutions and interdependence with suggested project activities.

"Peace Studies Packet", available from Robert Ribsley, The Christophers, 12 West 48th Street, New York, NY 10017. no charge.
Contains course outlines, bibliographies, resource listings and informational pamphlets.

"Population", available from the U.S. Committee for UNICEF. $1.50.
Study of the interrelationship between economic and social development and rapid population growth. Includes a 44-page magazine "The Child in a Crowded World", pictorial wallsheet, poster and population data charts.

"Womanpower in the Third World", available from the U.S. Committee for UNICEF. $1.50.
Materials and resources on women in developing countries, their role, their potential and opportunities and their changing images. Includes a teacher's guide, readings from UNICEF and other UN sources, a wallsheet, a poster, and an annotated list of related materials and sources.

Games and Simulations

"Check Stand," available from Washington State University, Cooperative Extension Service, Box 2038, College Station, Pullman, WA 99163. No price given.
Teaches wise food buying.

"Lingo", available from the U.S. Committee for UNICEF. $2.50.
A game played like "Bingo", using names of nutritious foods in English, French, and Spanish.

"Menu Rummy", available from University of Minnesota, Institute of Agriculture, St. Paul, MN 55101. $1.00.
A deck of 52 cards picturing food items to teach sound nutritional practices.

"Nutrition Game," available from Games That Teach, Graphics Company, P.O.Box 331, Urbana, IL 61801. $9.95.
Players learn the principles of nutrition and health.

"Nutrition Insurance Game", available from Illinois Teacher, 342 Education Building, University of Illinois, Urbana, IL 61801. $1.00.
Players sell insurance policies to each other for protection against specific nutritional deficiencies.

"Poppin' Swap", available from Pillsbury Company, 1776 Pillsbury Building, 608 Second Avenue S, Minneapolis, MN 55402. Single, $5.00; set of 5 decks, $22.50.
Card game teaching food sources of various nutrients.

"Soup's On. The Balanced Diet Bingo Game." available from Didactron, Ann Arbor, MI 48106. $10.00.
Includes 40 cards, a selector board with 84 different foods and food composition table.

"Third World Banquet", available from CROP, 1305 14th Street N.W., Washington D.C. 20005.
Organize a fund-raising banquet with a surprise menu. One-third of the diners are served a standard American bountious meal, one-third a modest bowl of rice dressed with a bit of broth, and one-third s small fired cake with a little gravy on top. The three dishes are served in a one-two-three order all around the table, so each person is sitting between two others eating two different meals. The experience is a capsult illustration of what is actually happening in the world today, and presents very real dilemmas to the participants: some will share, some will not, some will be frustrated and angry. It is an interesting and not-soon-forgotten experience.

Films

"A Future for Every Child"* 1974, 9 minutes, color, animated, 16mm, non-narrative.
Contemporary Films, McGraw Hill, 1221 Avenue of the Americas, New York NY 10019
Suggests two alternate futures: one a nightmare of overpopulation, shortages, pollution conflict and absense of human rights; the other a dream of adequate life space, plentiful produce, healthy environment, peace, and concern for the rights of individuals. Not recommended for use below intermediate grades.

"All Our Futures",* 20 minutes, color, 16 mm.
Narrated by Peter Ustinov, this film highlights UNICEF's dynamic aid in health, education, nutrition, and in emergencies with glimpses of the unforgettable faces of children. Some are caught in tragic circumstances of their daily lives or are survivors of war or of natural disasters; some radiate hope for a better future. (Ages 10 and up).

"Diet for a Small Planet", 1973, 28 minutes, color, 16 mm. $295; rental, $30.
Bullfrog Films, Inc., Box 114, Milford Square, PA 18935.
Based on Frances Moore Lappe's book of the same title, it features Frances M. Lappe, Ellen Buchamn Ewald and biochemist Dr. Kendall King exploring the ecological costs of meat protein and the art of cooking with complimentary non-meat proteins.

"Food for Thought.",* 10 minutes, black and white.
A village in Orissa, India, tells about the problems of nutrition, and how people--helped by their government, UNICEF, and FAO -- are attempting to solve them. This film was produced by the Indian Film Unit for showing in India. (Ages 12 and up).

"Hunger", 12 minutes, color, animated, 16 mm., non-narrative. $165; rental, $15.
Learning Corporation of America, 1350 Avenue of the Americas, New York, NY 10019.
Aman whose insatiable appetite swells him to grotesque proportions is haunted by a nightmare in which he himself is consumed by the starving people of the world.

"Hungry Angels"*, 20 minutes, color, 16 mm.
Three Guatemalan children born the same day in the same ward fight for life when malnutrition results from ignorance and superstition. The film was produced by the Institute for Nutrition for Central America and Panama. (Ages high school and up).

"Tilt", 1972, 19 minutes, color, animated, 16 mm. $225; rental, $25.
CRM Educational Films, Del Mar, CA 92014
A very provocative and highly controversial "alternative view" of inequalities in the distribution of wealth among the world's people. Highly recommended.

"When a Man Hungers"*, 28 minutes, color, 16 mm.
This excellent documentary of the 1966-67 drought in Bihar, India captures the excitement and industry of the people when UNICEF and other agencies aid government efforts to fight the famine. Of particular interest is a sequence demonstrating age-old methods of water supply.

(* In order to make UNICEF films more readily accessible to a greater number of people, the U.S. Committee for UNICEF is placing as many films as possible in local film centers across the country. Lists of these regional and local distribution points nearest you can be obtained from Mrs. Dana Wyles, U.S. Committee for UNICEF, 331 East 38th Street, New York, NY 10016.)

List of Organizations

American Friends Service Committee
15 Rutherford Place
New York, NY 10003

Bread for the World
602 East 9th Street
New York, NY 10003

Center for War/Peace Studies
218 East 18th Street
New York, NY 10003

Food and Agriculture Organization
Room 2258
United Nations
New York, NY 10017

Institute for World Order
1140 Avenue of the Americas
New York, NY 10036

Overseas Development Council
1717 Massachusetts Avenue, N.W.
Washington, D.C. 20036

Population Reference Bureau
1755 Massachusetts Avenue, N.W.
Washington, D.C. 20036

Protein Advisory Group
United Nations
New York, NY 10017

United Nations Development Program
Division of Information
Room 5404
United Nations
New York, NY 10017

United Nations/ Office of Public Information
External Relations Division
Room 1045B
United Nations
New York, NY 10017

U.S. Department of Agriculture
Washington, D.C. 20250

World Federalists U.S.A.
777 United Nations Plaza
New York, NY 10017