

FOREWORD

These proceedings contain transcripts of speeches given at the Iowa-Illinois World Food Conference, "Third World Development: From Food Deficiency to Food Sufficiency," which was held in Davenport, Iowa on November 9-10, 1984. The conference was sponsored by the Quad-Cities World Affairs Council, Inc. and the Peoria Area World Affairs Council, Inc., in cooperation with the University of Illinois at Urbana-Champaign. Its purpose was to give the 230 participants an opportunity to examine the progress that has been made in meeting the food and nutritional needs of people around the world, as well as the many complex problems that persist.

The conference was the final program activity of an 18-month development education project, "The Changing Face of World Hunger," which was funded in part by a Biden-Pell grant from the U.S. Agency for International Development.

At the time of the conference, there was substantial U.S. media attention on the famine in Ethiopia and on the severe food shortages faced by at least 24 other sub-Saharan African countries. This helped to underscore the importance of several sessions which focused on Public Law 480 (PL-480), Food for Peace, and the use of food aid to deal with emergencies such as famine. Attention was also given to the use of food aid as a tool of development. In 1984, AID's Food for Peace program celebrated its 30th anniversary.

In addition, the conference provided for an examination of the need for developing countries to provide economic incentives for their farmers; methods for reducing Third World dependency on foreign oil; the role of women in development; shifts from food aid to trade; and the role of the United States in improving the world food system. It concluded with a workshop on how to influence the U.S. government on Third World development issues.

The participants represented farming interests, agribusiness firms, colleges and universities, social action groups, community organizations, and national and international development agencies. The question-answer period which followed each session and the small group discussion sessions gave them an opportunity to interact with each other and with the speakers. Transcripts of the question-answer periods are included in the proceedings.

The appendix includes a fact sheet on world hunger which readers may find useful.

This publication is intended for the conference participants, as well as for others who are concerned with world food issues and Third World development.

Those involved in the planning and implementation of the development education project, including the Iowa-Illinois World Food Conference, were: project manager J. Terry Iversen, head, Continuing Education in International Affairs, University of Illinois, Urbana-Champaign (UIUC); Jean B. Garber, Immediate Past President, Quad-Cities World Affairs Council (QCWAC), Rock Island, Illinois; Roy E. Harrington, QCWAC, Moline, Illinois; Sylvia and Richard Banes, QCWAC, Davenport, Iowa; Nancy Power, QCWAC, Bettendorf, Iowa; Norman P. Giertz, project fiscal officer, QCWAC, Moline, Illinois; Lyle G. Reeser, Immediate Past President, Peoria Area World Affairs Council (PAWAC), East Peoria, Illinois; Judge G. Durbin Ranney, President, PAWAC, Monmouth, Illinois; Richard A. Kalus, PAWAC, Peoria, Illinois; John Bell, PAWAC, Peoria, Illinois; John R. Mohr, PAWAC, Galesburg, Illinois.

Others included the local project coordinators: Stuart D. Hawbaker, UI Cooperative Extension Service, Decatur, Illinois; Mike Sager, UI Cooperative Extension Service, Eureka, Illinois; Dennis Thompson, UI Cooperative Extension Service, East Moline, Illinois; Karen Kral, community volunteer, Cedar Rapids, Iowa; and Marvin Haugebak, realtor, Cedar Falls, Iowa.

The project advisory committee at the University of Illinois, Urbana-Champaign, included: J. Terry Iversen, chairman; Sandra L. Brown, forestry; Mary Keith, foods and nutrition; Earl D. Kellogg, Associate Director, International Agriculture; Harold Kauffman, Director, INTSOY; Emerson D. Nafziger, agronomy; Andrew J. Sofranko, agricultural economics; and Robert G. Spitze, agricultural economics.

J. Terry Iversen
University of Illinois at Urbana-Champaign;
Project Manager

CONTENTS

INTRODUCTION OF PROGRAM.....	1
J. Terry Iversen	
PANEL DISCUSSION: Food Aid as a Tool of Development	
\$32 Billion and 30 Years Later: An Anniversary of an Investment in Third World Development Stephen Singer.....	3
The Role of Private Voluntary Organizations in Administering Food Aid Thomas Zopf.....	9
PL 480 and Its Impact on National Economies in the Third World Cheryl Christensen.....	14
Question-Answer Session.....	19
INTRODUCTION OF KEYNOTE SPEAKER.....	27
Thomas A. Gildehaus	
KEYNOTE ADDRESS: Economic Incentives for Farmers in Developing Countries: A Requirement for Agricultural Development Julia Chang Bloch.....	29
Question-Answer Session.....	33
PANEL A DISCUSSION: Reducing Third World Dependency on Foreign Oil by Introducing Integrated Food and Energy Systems	
William Holmberg.....	40
Donald L. Day.....	44
Everett Hatfield.....	61
Question-Answer Session.....	77
PANEL B DISCUSSION: The Role of Women in Development: From Agricultural Production to Family Nutrition	
Nadia H. Youssef.....	82
Elsa M. Chaney.....	87
Question-Answer Session.....	93
PANEL DISCUSSION: The Challenge of the '80's: The Blending of Development and Humanitarian Goals	
Hannan Ezekiel.....	96
Martin M. McLaughlin.....	104
Question-Answer Session.....	112

WORKSHOP: How to Influence Your Government on Third World Development Issues	
The Honorable Paul Findley.....	120
Question-Answer Session.....	125
APPENDIX.....	130

INTRODUCTION OF PROGRAM

J. Terry Iversen

Head, Continuing Education in International Affairs
University of Illinois at Urbana-Champaign

The Iowa-Illinois World Food Conference, "THIRD WORLD DEVELOPMENT: From Food Deficiency to Food Sufficiency," is sponsored by the Quad-Cities World Affairs Council, Inc. and the Peoria Area World Affairs Council, Inc., in cooperation with the University of Illinois at Urbana-Champaign.

This conference is part of a development education project, "The Changing Face of World Hunger," which has been funded by a Biden-Pell grant from the U.S. Agency for International Development.

To hold this conference in Davenport, Iowa is quite fitting. Represented in this area are many people whose lives are directly affected by agribusiness whether in farming or in the farm equipment industry. Also, we are in the midst of one of the most productive agricultural areas in the world. At the same time that we see vast crop surpluses in the United States, particularly in the Midwest, we see almost daily indications of mass starvation in certain parts of the world, particularly in Ethiopia.

It is also fitting that the conference be held ten years after the World Food Conference in Rome, and thirty years after the Food for Peace program.

Each participant will have a very important role to play in this program. Following the general sessions, you will have the opportunity to ask questions of our speakers, and then during two discussion group sessions, you will have an opportunity to interact among yourselves, as well as with our speakers, and present your ideas about what can and should be done to solve world hunger and poverty.

Printed toward the back of the program are some facts about world hunger to which you may like to refer. These were taken from a study action packet prepared by several of my colleagues at the University of Illinois, Urbana-Champaign, for World Food Day celebrated on October 16, 1984.

When we first began planning the program for this conference I felt that this was going to be one subject area which would not be affected by world events and require last-minute changes in speakers. Those of you who have followed the annual conferences of the Peoria and Quad-Cities World Affairs Councils know that if we have a program focusing on the Middle East, on U.S.-Soviet relations, or a similar topic, generally something will come up at the last minute and one of our speakers will have to be elsewhere at the time of our conference.

Once we began following the events in Ethiopia much more closely during the past ten days, we were fearful that something might affect this program as well; and, indeed, that has been the case. Our keynote speaker, Mr. Peter McPherson, the Administrator for the U.S. Agency for International Development, has just returned from Ethiopia. He has been given instructions to proceed immediately to Santa Barbara to brief President Reagan on the situation in Ethiopia. Julia Chang Bloch, who was scheduled to be one of our

panelists today and is an Assistant Administrator for AID, is going to be our keynote speaker this evening. Stephen Singer, who is the Assistant Director of the Food for Peace program, will replace Mrs. Bloch on the panel this afternoon.

A number of private voluntary organizations are playing an extremely crucial role in Ethiopia and in other African countries. Rudolph von Bernuth, the representative from CARE, is currently in Ethiopia helping with the food aid distribution problem there. Mr. Thomas Zopf, from CARE, replaces him.

PANEL DISCUSSION: "Food Aid as a Tool of Development"

Moderator: Roy E. Harrington
Product Planner, Deere & Company

I would like to add my welcome to each of you. We are approaching two hundred people in attendance for our conference on Third World development. We begin with a panel of three speakers on the subject, "Food Aid as a Tool of Development." This particular subject has had mixed results, and while the results are mixed, the reviews are considerably more mixed. In the Wall Street Journal there was an article which, I think, belongs in the "mixed" category. The title was, "Free Food Bankrupts Foreign Farmers." The first sentence reads, "Food for Peace is most probably our most harmful foreign aid program." I happen to have worked in India for five years, and I believe this is a very one-sided point of view. We hope that our three speakers today can clarify some of these issues.

Each of our speakers today has lived overseas somewhere between two and twenty years, and they are leaders in their specific fields. Our first speaker is the Deputy Director of the Office of Food for Peace in the Agency for International Development (USAID). He is responsible for grants and concessional sales of U.S. food to developing nations. He has done graduate work at the London School of Economics. He has worked overseas in Pakistan (Asia), Colombia (Latin America), and Benin (Africa). He has a very good background. Stephen Singer's topic today is, "32 Billion Dollars and 30 Years Later: An Anniversary of an Investment in Third World Development."

"32 BILLION AND 30 YEARS LATER:
AN ANNIVERSARY OF AN INVESTMENT IN THIRD WORLD DEVELOPMENT"

Stephen Singer
Deputy Administrator, Office of Food for Peace, USAID

I want to start with a brief description of the U.S. Food for Peace program because I am not sure how familiar you are with it. Then we can turn to some of the more fraught questions about the impact of Food for Peace throughout the world, both internationally and domestically.

When you look at the kinds of questions the moderator has introduced, I think it's important, first of all, to distinguish the types of food for peace. Our Food for Peace program has totaled \$32 billion or so over the last thirty years, and is now running about \$1.6 billion a year. \$1 billion of that is concessional sales, which we call Title I, of Public Law 480. These are concessional sales at terms that range up to 40 years: 10 years grace, 30 years for repayment, at 2% during the grace period; and 3% during the repayment period. Very, very cheap money. There are a number of economists who say that you might as well give it away. I happen to disagree with that. It makes a big difference to poorer developing countries, even if discounted at today's rates. The very poor nations still have to come up with the money at some point. So, although it may seem like a gift in a strictly financial sense, it's not when you have to pay it back, even at low interest rates.

The other \$600 million is for the Title II Program. These are grant programs. These are further subdivided. Some of that money goes government-to-government. Some of it goes to what we call PVO's (Private Voluntary Organizations) such as CARE, Catholic Relief Service, CLUSA (Cooperative League for the United States of America), and a number of different foundations. Some of the money goes for emergency programs such as we're now mounting on a very large scale in Africa.

The criticisms of Food for Peace, such as those articulated at the opening, are generally of the Title I Program. Not only is it the largest, but it's pretty hard to criticize the long-term macroeconomic effects of something like an emergency program. What we are doing in Africa today is sponsoring programs designed to relieve starvation. I don't think there is any question that we have a moral imperative to do so whatever the long-term economic effects. Also, I think the effects are minimal because we are not disrupting anything; we are just feeding very hungry people.

Similarly the other Title II programs which are usually programmed in either mother-child health, school feeding, or food-for-work are not subject to too much criticism on economic grounds. The effects of these tend to be vitiated so much throughout the society that we do not receive too much criticism on macroeconomic grounds. We do on other grounds. For example, critics say that mother-child feeding programs which give rations to the mother and then let her take them home, presumably to feed to the more vulnerable people in the family, do not work because the food is spread throughout the family and the nutritional effects are vitiated. I agree with that criticism. I think that we have to minimize those kinds of programs. I think that we have to conduct either feeding on the spot, which is what we do for school feeding programs, or give a large enough ration so that the whole family can be fed and the nutritional level of the whole family can be raised. I think we have to acknowledge that reality, and we are changing our programs to meet those findings.

The food-for-work program is also criticized, not on macroeconomic grounds usually, but on the grounds that either the projects are not ideal, i.e. that this is a very inefficient way to get work done, or that it's not a particularly efficient way to feed people. I recognize some validity in each of those criticisms too. However, if you want to perform both of those tasks together and get some public works done, such as roads built and land cleared, and you also want to use the resource you have which happens often to be food rather than money, I think you would be hard put to develop a program that would better suit those purposes than food-for-work.

I'm in disagreement on this point with many people whose opinions I respect, but I've seen it work relatively well particularly in South Asia. There the concept goes back to the British. They called it "test" relief. The "test" was that the wage was such that a person who had other productive employment would not do this work. It was just enough essentially to keep food in his and his family's belly. And if there were any other productive uses for his labor, he would not be recruited into this test relief program. That concept is kind of old-fashioned, but I still think it's quite valid, and you won't find me an apologist for our food-for-work programs.

Where we absorb the criticism is on the Title I side, and I've left the hardest for last. It's very, very hard to analyze this program in any kind of meaningful way with the kind of data that anybody can unequivocally agree to. I think there are cases in Latin America, for example, where at some times we have provided as much as a third of the basic food grains needs of the country. These are very isolated cases in certain years where we have clearly disrupted the market. I don't think there's any question that it does depress the local production. However, the number of such cases and the number of years in which they occur can, I think, be counted on the fingers of one hand. During the question period, people more knowledgeable than myself can correct me, if they can articulate a number of years that this has occurred in various countries. It's always easy to come up with an anecdotal example, where it may have occurred at one time, but I find very few cases where this has been a consistent pattern.

So what is the effect of Title I? What is the purpose of it? I think an historical perspective is essential. The Title I Program, and indeed the whole P.L. 480 program, the Food for Peace program, grew out of the surpluses of the 1950's. We had agricultural commodities that we really had no very good use for domestically, and so these were sent aboard and were paid for in many cases with local currency. In other cases the local currency could not be used outside the country in which the programs were mounted, and it could not be used inside those countries without the permission of the government. Permission was granted only for very, very specific purposes. I think India and Pakistan had the severest problems. Rupees accumulated by the billions and the total was quite an embarrassment. We finally gave them all back to India when Ambassador Daniel P. Moynihan was there.

In the 1960's, the law was changed--it was no longer simply surplus disposal--it then became a law which required self-help measures on the part of the government. I think here we really get to the meat of the issue on the question of disincentives for local production. Since the mid-60's a government which signs a Title I agreement with us has to agree to certain self-help measures that are negotiated in some detail before that agreement can be signed and before the grain can be shipped. These agreements usually involve agricultural development, but they sometimes lapse into other areas of development as well, such as health and education, but the great bulk is agricultural. So in a sense it's using fire to fight fire.

What we are trying to use is the food we have in order to encourage local food production. Now, this seems contradictory. Let me explain how we view it. In many countries farmgate prices are low, too low to encourage local production. There is great political value in having low farmgate prices to keep the urban prices low enough so that you don't have discontent in the capitols. These are very delicate political issues. We've seen food riots when urban prices were cut in any number of countries. Pakistan, Egypt, and Tunisia come to mind immediately. When urban prices are cut the price of the local staple goes up and the politicians who are running the country get very nervous and for very good reason. The price to the farmer can only be maintained at a sufficiently high level while maintaining the prices in the cities at a sufficiently acceptable level in very poor countries when there is a cushion and when the government is somehow able to pay costs such as transport and processing.

How can the government of a very poor country do that? Well, one way is with the proceeds from the sale of Title I commodities. By putting that additional food in the country we can, if we're careful, not depress, but rather, encourage local production by giving the government the wherewithal to reduce the subsidies to the urban masses or increase the farmgate prices. These are the kinds of policy items that are in fact negotiated when we negotiate our Title I agreements. If they're explicit enough and fine-tuned enough, the agreement isn't even a Title I agreement, it becomes a Title III agreement which is the same thing except that the debt is forgiven.

You might ask, why have Title I agreements if you're going to negotiate these kinds of changes. Why not make everything a Title III agreement? The answer is that the condition for forgiving the debt is, in fact, the carrying out of developmental programs or policies that are agreed to in a very explicit and specific fashion. In my opinion, there are a number of reasons why Title III is not as used as it should be. You've already heard my views on the debt repayment. Getting this stuff at very low rates is not the same as giving it away, no matter what the economists tell you. It's psychologically different in any case. Many countries would find it very embarrassing, indeed, to reach an agreement which would require them to change policies at the behest of the United States. We cannot negotiate with them on the condition that we agree to forgive their debt. It's politically impossible for them both for internal and external reasons. This may seem like a small thing, but I doubt that it seems a small thing for any of you who have worked in the developing world.

Many of these countries are new and they are very proud. They do not take kindly to overt interference in their internal affairs. Also, it takes a pretty sophisticated government to negotiate the kind of explicit detail that we need in order to forgive a debt on Title I and make it into a Title III agreement. Many governments just don't have the capacity. Maybe some of our AID missions don't either, I don't know. In any case, that is the kernel of the disincentive debate with which our moderator opened this session, i.e., whether or not these commodities can be put in a country and be used to stimulate local production rather than depress it. All I can say is if you look at the history of individual cases, I think you'll find that the cases that did in fact depress production were rare and occasional and resulted from extraordinary circumstances.

Let me turn just for a moment to the emergency program in Africa. This perhaps isn't as strictly on the theme as you would like, but I think there's sufficient interest that perhaps I should say just a few words about it. Everything you've seen on TV about Ethiopia is true. It is difficult to exaggerate the gravity of the situation. We've been approving programs for Ethiopia in anticipation of this situation since July. We've been getting the food into the pipeline. The pipeline to the ports is full. There are 200,000 tons of grain being delivered in the final three months of this year. That's more than the ports can handle. Last week we approved another 50,000 tons to arrive in January. We previously had approved some processed commodities that take longer to arrive in February, and I hope that next week we will approve additional commodities for March and April.

We knew the crisis was coming and we prepared for it as best we could. There was very slow recognition on the part of the Ethiopian government. The logistics capacity of the country is very poor. There are three wars going on in Ethiopia right now which makes it very difficult to deliver.

There are a lot of people in my business who resent the media. I am not one of them. I think that the media have been very, very useful. Because of the recognition that was kindled by the media, we were able not only to get the grain, which I really think we would have been able to get anyway, but we have also aroused such attention worldwide that planes, which are essential right now for getting the food that's already in the country from the ports to the areas of need, have been supplied by just about every country you can think of. The last list I looked at shows planes coming in from Great Britain, Germany, Italy, the United States, Canada, and the Soviet Union, which is providing helicopters as well as fixed-wing aircraft. By the end of the week there should be about thirty planes in Ethiopia. I really think that we can do a pretty good job of attacking the emergency in areas such as the ones you've seen on network TV, with helicopters and with the Ethiopian planes for which we've been paying the fuel costs.

Does this mean that you will cease to see those scenes at Koram and Mechili? It does not. Somebody on my staff returned yesterday from Ethiopia and he tells me that by the time the people reach those camps coming in from the hinterlands, they cannot be saved. They are in such an advanced stage of malnutrition that they die.

As the moderator mentioned, my boss, Peter McPherson is conferring with the President today. At least two weeks ago the President called him and essentially gave him carte blanche to do what was necessary in Ethiopia. Before that, about two months ago, we had called in all the private voluntary organizations and ask them to do more and more because at that time we did not have a government-to-government program in Ethiopia. We concluded negotiations with Ethiopia last week on a government-to-government program. The private voluntary organizations have responded magnificently, so I now think that we have sufficient channels to feed Ethiopia until the situation improves which may very well be more than a year from now. The next significant harvest may not be until December.

I spent a good deal of time talking about Ethiopia because I think it's on all of our minds, perhaps excessively so, in view of the situation in the rest of Africa. I think we've fulfilled our original concern; our concern was to get the aircraft there and to make sure the immediate situation was taken care of. We had to make certain that the ports were full with all they could handle until other donors could gear up to respond, and I think we've done that. I hope that we take a lower profile and that we assume less of a role in Ethiopia now that other donor responses are coming in. There is a logistics limit.

What I hope happens now is that the other donors come into Ethiopia and that we start concentrating on Mozambique, Kenya, Sudan, Niger, Chad, and I'm not too certain about Upper Volta or Mali either, although we're getting reassurances, but I'll feel better when I know a little bit more about those. I was on a receiving end of the Sahel relief effort of the early 1970's, and all I can tell you is that this year is much, much worse and much more widespread. The response has been very, very positive. The PVO's have geared up. Congress is essentially saying, just tell us what you need. I think that as Americans you have a right to be proud of the response of your country, both private and public, to the African drought.

Let me drop from that idealistic note. I spoke to some Knox College students this morning on a similar topic and the question I got at the end was, "That's all very well, but what's it doing for Illinois?" It does a great deal for this part of the country. You can quantify it to some extent. We bought around \$45 million worth of agricultural products from Iowa last year, and \$68 million from Illinois, and we'll probably buy more this year because our needs will be much greater. Then you can add on to those the forward and backward linkages, which I'm sure will at least double the figure. There's storage, there's trucking, there's buying the trucks for the trucking, and all that. Economists can give you the adequate multiplier. I've heard it's 1.7 for those of you macroeconomically inclined. There is a feedback. There is a benefit.

One has to remember that PL 480 is justified not only on development grounds, but on two others as well. One of the others is the national interest of the United States which is the justification, for example, for our huge program in Egypt, where we do a great deal of business every year as part of the Mid-East peacekeeping initiative. But it's also justified on the basis of the development of markets abroad. I think that that will stand scrutiny. Of our ten largest customers for agricultural products, eight are former PL 480 recipients. The two that are not are Canada and the Soviet Union.

If you look at a development success story anywhere in the world-- South Korea, Taiwan, any number of places--you will see that they formerly received PL 480 to help them over the hard times, and now that they are self-reliant they are buying our products. This is part of the total initiative that we're pursuing in development. In AID, we are trying to help these countries attain self-reliance in any number of ways. Food is one of the essential elements which we must put into that effort to make an effective package. I really think that is how our food program has to be viewed--not only as an emergency relief effort, which it clearly is as anyone can see, but also as part of a total developmental package with which we're trying to help the Third World build a decent life for its citizens.

I've been talking about food aid, but it's my very sincere conviction that food is only part of general development assistance. The time line on food aid is I think frequently misunderstood and underestimated. The reasons for that are very easy to understand. The Marshall Plan did such a wonderful job that I think after five years of the Marshall Plan we thought we could develop the rest of the world in five more. It didn't turn out that way at all. I think you have to think in much longer time frames. Even in Asia, for example, where you have, relative to Africa, much better human and physical infrastructure, much better education systems, and much better roads, dams, whatever, you have to look at time lines that are at least in ten year blocks. In Africa it's much longer.

In Indonesia, one of our development success stories, where I happened to be working before I went to Food for Peace, we started an ag-research effort in 1970-71. Our projects were frequently in five year blocks. After five years they were reviewed and if they looked good we would go on or, perhaps we had accomplished what we wanted to accomplish and we got out, or if they didn't look good we would cut them off. This project was reviewed in 1975. The conclusion was that it didn't produce anything so we had better get out of that business. At that time we had a change of management in the mission and the new people who came said NO! This doesn't look right, we think we should give it another shot.

If you look at a graph of Indonesian rice production, the staple in that country, you see that Indonesia went from being one of the largest rice importers in the mid-70's to self-sufficiency now, despite a population that increased rapidly. They also have, by the way, one of the best family planning programs. They are currently feeding 160 million themselves with all the rice that they need, whereas before they couldn't feed 120 million. The lesson here is simply that whenever you get into that kind of an endeavor, you have to allow whatever time is appropriate to do it. If you are doing agricultural research it takes a couple of years to get set up, a couple of years to get the yields in, a couple of years to get the stuff out to the field, and time to come up with the concomitant irrigation, fertilizers, etc. You cannot think in two-year blocks. In Africa without the basic infrastructure, I think we have to think in even a longer term.

Roy E. Harrington: Our second speaker is Director of Evaluations and Sectoral Assistance at CARE, probably one of the best known nongovernmental or private voluntary organizations. He's been with CARE for sixteen years. During that time he served in five countries in Asia and Africa, most recently directing CARE missions in the Congo and in Egypt. He's had a variety of developmental experience, planning and implementing projects in nutrition, nutrition education, animal husbandry, agricultural development, water and sanitation, and primary health care. About the only thing I see missing is family planning. Prior to that he worked with the Peace Corps and he was the first director of the Experiment in International Living. Tom Zopf will speak to us on the role of private voluntary organizations in administering food aid.

"THE ROLE OF PRIVATE VOLUNTARY ORGANIZATIONS IN ADMINISTERING FOOD AID"

Thomas Zopf

Director, Evaluations and Sectoral Assistance, CARE, Inc.

Thank you. I am supposed to talk about private voluntary organizations (PVOs). I'll try to cover, in general, what I know about private voluntary organizations, but you'll have to forgive me if I speak more about the one I know best and that's CARE. I'm not sure why they call us private voluntary organizations. I know we're private because we're not governmental, voluntary in that no one is forced to work for them I guess. We ask people to volunteer to give us money to help us with our work. But quite often this term gives an impression that somehow the people who work for these organizations are working in some voluntary capacity and that they're not necessarily professionals in their field. Let me assure you that the people who work for these organizations are certainly volunteering part of their time because our salary scale is not quite comparable to the private business world or the government. But, indeed, we like to look upon ourselves as professionals.

I think this opportunity I have today to talk about the administration of food aid overseas can give you an idea of the scope of professional work and the need for professional people in this field. The programming of food, be it for a humanitarian effort or a development effort, requires certain skills and certain activities with which many of you people in this room are familiar.

We have the problems of receiving commodities at a port, inspecting them, reporting any damaged or lost commodities, and so on. We have to develop a certain amount of expertise in port facilities, receiving ships, off-loading, and dealing with shipping companies, all of this in a foreign environment with everchanging rules. Once the food is received, it has to be stockpiled if it is going to be an efficient program. So that means the treatment of commodities, warehousing and in some instances it means construction of warehousing, it means using existing buildings which were not designed as warehouses. So it is a great job just keeping these commodities whole until they reach the beneficiary.

Then there are the logistics of transportation by train or by truck (or by headloads in many cases), by boat, or by barge. We have to arrange for the commodities to reach the proper place at the proper time, under very primitive conditions, as was pointed out by our previous speaker. In situations like Ethiopia, these facilities in many cases do not exist. So we have to start with airplanes and so on because there aren't roads into these areas. Then there's the whole matter of scheduling and programming of the food. It isn't just handed to someone. We have to identify certain groups, certain individuals who are going to receive this commodity. We have to get it to them at the proper time.

With programs which provide nutritious meals you have to order the food at the beginning of the year according to what your requirements are. If you miss a week or a month of feeding you don't make it up. You've missed it. So you have to have very careful handling of the commodities to see that they're there when they're needed or before they're needed.

Then, of course, there's the whole area of accounting, from the receipt of the commodities at the port to placing them on the truck or the train or whatever means of transportation, getting them to the places where they are going to be distributed; then accounting for the distribution, that the food was received by the beneficiaries. Books and records are kept of all this and this information goes into an accounting system.

Then there's the whole area of negotiating, because we cannot do this alone. We can't walk into a country and say we're here to distribute the food so please step aside. We are doing this with the concurrence, with the assistance, with the interference of the government of that country and other agencies. So we have to negotiate and we have to conclude a working arrangement that will allow us to reach the beneficiaries we want to reach in the manner in which we want to reach them. The negotiating isn't so much presenting your side and their presenting their side, quite often it's an act of major diplomacy to get ideas across to other people, to get their support of your program.

Then there is the whole area of preparation. Many of our programs, such as a school feeding program in which we provide a hot meal to attract children to school, require that foods be prepared in a certain way and on a daily basis and that the children get them. I don't know what the figure is, but I think in India alone we're dealing with 50,000 different distribution points for the feeding program. That is a lot of school teachers or a lot of health workers, or a lot of child care workers that we have to work with.

We have to motivate people, because we can't force them to do these things, so quite often it's encouraging them to do these things. And of course we're not there to administer these programs forever. We're there to administer them temporarily, and by that token we want our counterparts and those with whom we are working to eventually administer these programs. So we have, along with all of this, a training role, training people in warehousing, treating, scheduling, programming, and accounting, as well as food preparation and distribution, and so on. So we have an active role in not only doing our job, but in continually training someone else to do it.

CARE, as an organization, relies a lot upon its national employees. We have over 3,000 national employees, that is persons of the country we're working in, who really are the backbone of our administrative programs. As an example, we went into Somalia in 1981 at the request of the United Nations High Commissioner for Refugees to take over the logistics of the refugee relief program there. We chiefly manned that program with Indians who had been working with CARE for a number of years in our food programs in India.

So this gives you an idea of what's involved, or the kind of steps involved in the administration of food programming overseas.

What is the role of the PVO's? In 1984 there were twelve PVO's who received and programmed PL 480, Title II food. These PVO's programmed about \$300 million worth of food commodities. Of these twelve, CARE and Catholic Relief Services (CRS) were the largest distributors. Together we distributed about 90 of these commodities. Again, CRS, like CARE, relies heavily upon its national staffs. We've both been in this from the beginning. We work closely together in many countries. We have arrangements where we collaborate and cooperate. So as I mentioned earlier, with this expertise in the administration of food programs, it is not surprising that organizations, other than the United States government, call upon us from time to time.

I've mentioned the UN High Commission for Refugees who has asked us so many times to help with its programming. In some cases we have contracted with the World Food Programme to monitor some of their food distribution programs. We have received food commodities for distribution from the governments of Canada and the Netherlands.

We are here to talk about the problem of hunger and the role of the voluntary organizations in hunger. I think this group is quite cognizant of what has happened in the field of world hunger. In 1974 the World Food Conference said it wished to improve world food security in basically two ways, one, by increasing production and the other by reducing price fluctuations on world markets. It was assumed that if these two approaches could be achieved this would insure that the market demand could be met. And quite often this is where we make a mistake. We're talking about market demand, and we read that a country has reached 95 food sufficiency or 100 sufficiency in meeting the market demand. This means that all the people who want to buy food can buy it. But we have some people who are outside the market, who do not have the funds to buy food. This is the core problem of world hunger.

The Declaration of Human Rights of the UN in 1948 expressed as one of these rights the right to food. Of course, no real political sanctions have been applied to that, and there is really no way to say how we are going to enforce that right.

In recent years there's been a growing consensus in the international community that it has an obligation in emergency and disaster situations, and this is being borne out by what's going on in Ethiopia today, as our previous speaker indicated. So one of our tasks is to define the problem and then look at what can be the solution.

The hungry of the world are concentrated where the income is low, in certain countries of Asia, Africa, and Latin America. They fall basically in three categories. First are the destitute people, widows, elderly, orphans, people who have no way of taking care of themselves or earning funds to take care of themselves. Second are those who are in temporary distress, victims of drought, flood, and political strife who are temporarily cut off from their normal food supply.

Then there's the third category which includes families of the un- or underemployed, landless laborers, and so on. Quite often the breadwinner in this family has gone off to an urban area to seek employment and has left his family behind, and the woman who heads the household has no source of income, but must take care of the children. These people lack the wherewithal to buy food. So there is an immediate need of food to stay their hunger, to give them the sustenance which is required for them to meet the longer term challenges of decreased income. But there is also a need to meet the long-term and long-range challenges through development activities.

Food is not the answer; food is only a part of the answer. Food does not in every case even do what is expected to do. We would expect that if we gave someone more food that there would be an equivalent increase in nutrient intake. Rarely is this true. In many cases the food is treated as additional income. It is used or bartered for other basic needs, such as shelter, medical or health care, education in the form of school fees, and so on. Sometimes the food is not deemed by the recipient as a preferred food and it is traded and used for something which is preferable. Sometimes it is used to purchase consumption goods, to brighten a rather drab existence. People who have lived with hunger all their lives sometimes like something which gives them a temporary relief from it.

The nutrients in the food do not always reach the beneficiaries because their traditional household distribution is against the women and children in the family. If there is extra food, the breadwinner naturally would get that food because that means he can do more work and he can bring more resources into the family. The women and children suffer.

Also, the recipients may be plagued with certain diseases which either inhibit the absorption of the nutrients or prevent them from using these nutrients. So we have to look at this situation and the problem as something more than just what food can solve.

As was mentioned before, there has been criticism of food aid/food assistance. It was hard to sort through this and sift through these criticisms. Some of them appear to be valid. Some of them were criticisms of food aid projects which were not good projects. They would not have been good projects even if they had not been food aid, but had been cash aid. But the blame was put on the food in every case.

CARE, as an organization, has been interested in food, and our activities have been based on food for a number of years. In the mid-1940's, when CARE started, we were sending food to the needy people of Europe and Japan. A few years later that need was not there and our efforts shifted to the Third World. We played a major role quite proudly and gratefully in the PL 480 program over the past 30 years. CARE has continued to program food but at the same time we do not look at ourselves as exclusively a food programming organization. CARE today has programs in 35 countries. In only 16 of these countries do we have food aid programs. Thirty of the current 120 projects CARE has worldwide are food assistance projects. CARE wishes and endeavors to program more food, but we want it to be valuable, considered food programming.

Towards this end we have established a food aid policy and guidelines within our organization, because there was some ambivalence about the role that food played in CARE's programming. The need to develop a policy was based on the belief that food programming and food as a resource has a positive role in development assistance. We want to expand this role and improve this role. So, a couple of years ago, wishing to establish this food aid policy, CARE brought together a group of its staff, both domestic and overseas, as well as other people from the development community and other organizations, to look at the criticisms of food aid and how CARE could integrate and have a policy of its own.

Basically what we came up with was a policy based on the advantages of food aid and established certain principles which I would like to share with you. The principles which we apply or hope to apply to our food aid program are: (1) That the priority for our programming be on low-income food-deficit countries and, of course, to the disadvantaged segments of the populations of those countries. (2) That food aid projects or programs must be based on development criteria. (3) That in the programming there must be participation by the beneficiaries in the development and design of the project, and in its implementation and evaluation. This is necessary if there is to be self-reliance at the conclusion of the project.

We also stated certain minimum standards which had to be applied to food programming. There must be participation as I mentioned. The problems of the food project must be defined. We must expect results. We are not just providing food for the sake of providing food. We must be able to define what we expect to happen because of this food. There must be a plan on how the food will be used. There must be a time frame, albeit, not a short-term time frame. There must be evaluation. And we must describe our expectations so we can measure the success of our activity. And, of course, because the commodity is valuable, there must be rigorous standards of accountability.

Another principle was that the true costs of the food aid must be understood. Quite often in past food aid programs, the value of the food was not really communicated to the recipient. It was not included in their budget. If a minister of education in a country had a school feeding program, the expenses for moving the food and paying the teachers would be included in the budget, but not the value of the food itself. When the time came to turn this effort over to the local governments, as has been done in many cases, it came as a shock to them to find out how much money they would need to take the program over.

To reiterate, we said that one of our principles of food programming should be evaluation for further understanding of the processes of food assistance and for improvement in design of projects. The projects must meet development criteria. And CARE must find the structure and the resources necessary to implement this policy. This brings us to the problem that food must be coupled with other resources as part of a program. So by receiving more food and having more food aid implies at the same time that there has to be more financial aid. Food is not the answer, it's one of the answers and we need financial resources in order to program the food. So if we want to program food effectively we have to provide resources to go along with the food. We have a large task ahead of us. We are in the process of reviewing our existing projects, trying to enhance food aid projects by including activities such as primary health care activities, income generation activities, and looking beyond the immediate need for food. I hope that I've given some insight into the intricacies of food administration.

Roy E. Harrington: Our third speaker, Cheryl Christensen, is Chief of the Africa/Middle East Branch in the International Economics Division, Economic Research Service, U.S. Department of Agriculture. She has a Ph.D. from MIT. She has taught at the University of Edinburgh, and was a teaching assistant in Uganda. She's written numerous articles on food aid in relation to economic development, national security, and politics. A lot of her work has focused on her background in Africa. Included in that is her ability to speak Swahili. I think that anyone who learns a foreign language learns not only something useful, but in the process learns a lot about the culture. She will be looking at the longer range. Her topic is, "PL 480 and Its Impact on National Economies in the Third World."

"PL 480 AND ITS IMPACT ON NATIONAL ECONOMIES IN THE THIRD WORLD"

Cheryl Christensen

Chief, Africa/Middle East Branch, International Economics Division,
Economic Research Service, U.S. Department of Agriculture

Thank you. Everyone else has deviated just a little bit from the announced topic and I'd like to do the same. I want to focus on the longer term implications of food aid. I want to look at those in a general sense, but I think that given the fact that most of my work has been in Africa, and that some of what I see as the most difficult long run problems with food aid in development are also going to be in Africa, I would like to focus my remarks more heavily on Africa than might have been the case if you had recruited someone from the Asia or Latin America branch.

Let me give you just a little bit of background; first of all, on what has happened to trends in food aid over the last couple of decades to give you an idea of why the focus on Africa is occurring; then secondly to give you an assessment of what I see as three interrelated issues involving food aid and longer term economic development; short-term issues, medium-term issues, and long-term issues. I'll skip over some of the short-term issues, talk quite a bit about medium-term issues, because I think at least in the African case some of those are critical, move on to the long-term issues, and then finally go out on a little bit of a limb and try to suggest to you some directions that we have not already taken with our food aid that we might take to make more effective use of it in solving some of these development problems.

Let me go back then to the beginning and talk just a little bit about what has happened with food aid, where it has gone in the past, where it is going right now, and how that history brings us to focus more on Africa than we might have otherwise expected. As you know, the U.S. has a 30-year history of giving food aid and I think it's clear from the previous speakers that a lot of that initial emphasis was on countries that have long since ceased to be major recipients of food aid. In the case of the Europeans, they are now, from the Department of Agriculture's point of view, one of our major competitors and we're no longer thinking of them as a food deficit area at all.

A second major recipient of food aid, and an area that got a very large quantity of food aid in the late 1950's, but primarily throughout the 1960's, was Asia. Those of you who remember the Indian famines of 1963 and 1965 may remember the discussions about the very large quantities of food aid that were programmed to India on an emergency basis and then on a regular basis to meet problems in Asia. The largest quantity of food aid that we gave, both in absolute terms, in dollar terms, and in per capita terms came during that period and went primarily to very large countries in Asia. As earlier speakers have alluded, the Asian situation now looks much better and India is no longer a major recipient of food aid on an emergency basis. While the equity problems and malnutrition certainly haven't disappeared, the country is in a much better position than it was. Some of the countries in Asia that received food aid earlier have become self-sustaining economies and some of them are major customers of the United States.

The third phase really began in the early 1970's. At that time a couple of things occurred. The first was that, as a result of Congressional scrutiny of the food aid program, we began to be urged to target more and more of our food aid toward low income countries. Some of the reasons for that were essentially political. Congress felt that food aid had been used to support a number of objectives including political ones that had gone beyond the scope of what the program was intended to do. So the idea was to pull the program back a bit and focus it on needier countries, on countries more severely affected by the oil shock, by global recession, and countries with greater levels of poverty. At the same time that the Congressional change was occurring, we found that countries in Africa were making the headlines with a series of food emergencies in the early 1970's that have become known as the Sahel drought or the Great Sahelian drought. And for that combination of reasons, food aid began to flow into Africa.

Now what is perhaps more difficult to get across to an audience that doesn't always look at Africa is that over the decade from 1974 to 1984 when conditions in many parts of the world improved, when the per capita food production as a whole went up, there was quite a different pattern going on in Africa. Throughout this period most African countries experienced a decline in their per capita food production. That means that in 1984 less food is produced per person in almost all of the countries of sub-Saharan Africa than was produced at the beginning of the 1970's. The second thing that's happened is that while food aid has increased and imports have increased, they have not made up for the shortfall in domestic production.

Thus, in about half of the countries of sub-Saharan Africa, the average quantity of food now available per person in the country is lower than it was in 1969 to 1971. Thus, when a country that has chronic problems with its agricultural production and consumption, and whose food availability is

already below FAO minimum nutrition recommendations, is hit by a famine or flood or makes a serious policy mistake, its margin for taking care of its chronic food problems from internal resources becomes very, very thin. I think if you understand that background it may be easier to see why since 1980 there have been so many food emergencies in Africa. People may still remember the droughts that affected Somalia in 1980. They included parts of Ethiopia and parts of Kenya as well. There were serious food shortages in southern Africa. Only a couple of years ago some of those countries were still affected. Last year more than 20 countries in sub-Saharan Africa faced serious food emergencies. This year the number has increased.

In addition to that, the intensity of the food emergency has grown dramatically. We now have cases of large numbers of people being on the verge of starvation or actually starving in four or five countries over the last two years. If we're going to respond effectively to this kind of a situation with our food aid, I am going to argue to you that we have to do two things. We first of all have to look at what food aid can do and what it can't do over the long term and the short term. And secondly, we've got to look at some innovative ways of using our food resources to deal with a particularly intractable set of problems that I'm willing to argue will not get much better on their own. They will only get better if there is positive change both in the African environment itself and in the response that we're able to make to those problems. So having said that, let me go back and talk then about what I see as the short-term, the medium-term, and the long-term linkages between food aid and economic development, again focusing my examples on African countries.

I think the short-term impacts and the fact that in the short term the paramount objective is to feed people in danger of starvation or malnutrition have been excellently covered by the first two speakers. I learned a good deal about how private voluntary organizations operate and I wouldn't want to add anything to the two excellent presentations we have had. Let me just make one additional point. A food emergency when it occurs even in the short term is a bit like the dropping of a pebble into a stream. And what we've been looking at in famine relief is the first circle. There are a couple of other circles that go out from these same kinds of food emergencies, particularly in countries such as the African ones that are already very hard pressed by global recession, debt problems, and in some instances real declines in their own national per capita GDP's.

One of those impacts is that the cost of handling the food emergency in the country can sap government resources that are available for investment in, not only the agricultural sector, but also other sectors and can pull them out of productive use, not just in the year of the emergency but two or three years later. Let me give you an example. Kenya, in order to respond to its food emergency this year, will get a good deal of food aid. The country is also making very large-scale commercial purchases which it had to do in order to get the quantity of food it needed into the country and distributed on schedule. The estimates that we've heard from people suggest that Kenya has spent the equivalent of its agricultural investment budget for the next two years in trying to relieve the current drought. With a population growth rate of 4%, if you take that literally, you're talking about investment programs back on stream two or three years later with a substantially higher population growth rate and substantial investment necessary just to get you back to where you were.

Why is this important? This is important because our study of eleven of the African countries, including countries that either had a severe food emergency last year or have one this year, suggest that if you take the past history as your base, the probability that one of these countries will have a shortfall in its domestic production of 30-50% in any one year is about 32-33%. That is, the chance is one in three based on recent experience that you are going to have a production shortfall that severe. These kinds of droughts and these emergencies are not a single crisis that you get rid of. It's a short-term problem that you solve in the short term which sends out a circle of disruptions that may start to taper off just about the time that statistically you would expect another one. So the cumulative impact of a lot of short-term situations makes a long-term problem.

The second thing I'd like to add is that in countries where the production is extremely variable, a shortfall in one year can be followed by a surplus in the next, and that's where the disincentive effect of humanitarian emergency food aid can come into play. If we don't get food coming into the country at the right time, we can end up delivering emergency food aid to a country after the people who have been hungry have already gone through the adjustment and at just about the time that a good harvest is appearing on the ground.

Ghana is a good example of that. Last year Ghana had a very severe drought. There was a need for a lot of food aid. Some of that food aid arrived this year when Ghana had a bumper corn crop. The price of corn in Ghana this year is one-twentieth of what it was last year. The government doesn't have the funds to buy food from the farmers, and the farmers who depended on the increased production are getting very low prices. (This is not a story that will be unfamiliar to any farmer in this room.) So the timing has to be very careful. Even in handling the short-term cases what we do has implications for the medium and long term.

Let me then move to talking about the medium term. What do I mean by the medium term? I'm thinking about a period of up to five years, during which, I will argue, governments and food aid donors have a chance to set in place some changes that will make it less likely that countries will face as much variability in their production and will have as much of a chance of undergoing a severe food emergency. What kinds of changes do I mean. One set of changes builds again on something that both of the other speakers talked about, that is, the policies that have been followed by governments in many countries stimulate or do not stimulate agricultural production and marketing within their own countries.

I think if I had made this talk in 1980, I would have started out by saying that almost across the board governments did not offer sufficiently high prices and incentives to farmers, that they did not have effective marketing systems, and that for those reasons their agricultural sectors were not able to do as good a job as they might have of meeting their own food needs.

In 1984, I'd say it a little differently. I'd say that many governments have realized that they have to give more attention to their agricultural production. While they have begun to make some changes in that direction, they have not in many cases been able to put together their resources: the food, the foreign exchange, and the internal money necessary to implement those policy changes. I'm going to emphasize the need to implement those changes because in the short term if farmers are not given the basis for increasing their production and productivity, the longer term programs are not going to have much chance of success.

Let me give you a couple of examples and then suggest how food aid can be of assistance. There are a number of countries in Africa where much of the production occurs on farms that don't produce to market. They produce in the main part to meet their own food requirements but they will market in excess of that if there's a market available. This means that when production falls, marketed production (production the government relies on to feed politically important urban areas) falls by even more; and when production goes up, marketed production will go up by a very high proportion because, once farmers have what they need and can store, they will put the rest on the market.

The government of Zambia, for instance, may increase its prices, but may then find that the weather doesn't cooperate and that even with a higher price, although farmers planted more, they don't have what they need to feed the cities. As occurred in Ghana last year, the government may raise the price, farmers may plant a good deal, the weather may cooperate, but there is so much production that the government can't afford to buy it. Farmers take a certain signal from that, and production goes down the next year.

We can make a very big contribution by making sure that we try to key our food aid to the medium term so that it supports these kinds of governmental changes and doesn't work against them. We must try to target our food aid so that when governments are beginning to make changes, but for reasons beyond their control food is not available, we can make sure that needs are filled, even though the aid may not come in the form of emergency assistance. The food aid may even be the much-maligned Title I that's so fraught with difficulties. On the other hand, when governments find themselves unable to handle the surplus, I think we need to pay more attention to giving them the tools to balance out their own production cycles.

This is a medium-term program because the rain-fed cycle generally goes over at least a five-year period. If we really want to do something about giving Third World farmers enough incentives and enough confidence to make changes in their practices or inputs or to become more productive, it has to be shown that they can get through that cycle and not be wiped out on either end because the government can't follow through on those reforms it has put into place.

Now what about the possibility that food aid offered under Title I programs is going to be a disincentive to this whole process. Can we answer some of those questions? I think some are easier to answer than others. In particular, we need to be extremely careful when we give our food aid, that the food aid is timed and delivered in such a way as to minimize the disincentive on local production. I think there's been a lot of discussion on how to do that. A lot of it revolves around whether or not the food aid goes to people who would not have the money to buy food without it, or whether it just simply comes into the market and pushes out some other potential supplier. I think, the experience with targeted programs in Asia has shown a number of ways of solving those problems. Secondly, we need to make sure that it's not a disincentive indirectly, by giving policy-makers a sense that they can rely on food aid both for emergencies and to supply urban markets when they ought to be taking appropriate policy measures within their own country to solve those problems.

If I were making a trade-off at this point between the importance of direct and indirect effects I would say the possibility of these indirect effects is at least as important as the possibility that we may directly end up reducing prices or reducing the incentive to farmers by food aid.

Let me then turn very briefly to the long run. I think, ironically enough, we have probably done more in the direction of long-run programs than we have the medium ones, and that may be part of our difficulty. There are a number of programs underway to encourage research in agricultural techniques that are appropriate to African and Third World settings in general. I think we recognize the importance of those things in institution-building. What we probably need to do now is to provide for a bit more continuity, and here again I support the point that was made earlier. Five years isn't long enough to know whether a research effort is going to pay off. I live two miles from an agricultural research station and I frequently point out that that facility has been there for a long time. No one would work with a five-year budget and phase out that research station because over that five years it didn't produce something dramatic. It has to be a long-term commitment.

When governments face very severe restraints on their budgets, and very severe foreign exchange restraints, we have to think of new and creative ways for our food aid program and our foreign aid program in general to provide the long-term support necessary to build up the research capabilities within the countries themselves. That's going to require a willingness to make longer term commitments, that we haven't made in the past, to institutions and not just to projects.

What I'd like to suggest in conclusion is that food aid does have an economic impact. It does have long-term, medium-term, and short-term impacts. I would agree with many of the criticisms of food aid that have been made in the discussion, and I'd be happy to explore those further in the question and answer session. I think, however, we can be too quick to conclude that because those failures have existed and because the situation is a difficult one, we have essentially exhausted the capability that food aid has for being relevant to the development process. And I think I'm trying to challenge you to think about that issue in a somewhat different way, to try to expand the time frame that you have from the short-term emergency to the medium and long term which requires a little bit more commitment even when problems cease to be exciting and dramatic.

We must make the follow-through that's necessary to enable us to be genuinely effective in carrying out programs over that longer time horizon, making sure that we really do use America's agricultural resources in the most productive way possible to contribute to the development of countries that are now major recipients of our emergency aid. Thank you.

QUESTION-ANSWER SESSION

Q: What is the relative effort in your programs on food versus programs for long-term development?

Zopf: The great majority would be development food relief. The figures I mentioned are Title II regular programming which didn't include disaster relief which would be a separate category. The great majority is certainly development programming.

Q: The Department of Defense has a massive capability to move materiel and other items by ship or by aircraft to any place in the world in rather rapid fashion. Is there any reason why that capability cannot be used under the conditions we're facing in Ethiopia and elsewhere in the world?

Singer: One of my duties is to serve on the Africa Drought Task Force that's been formed to deal with Ethiopia as well as the rest of the problem in Africa this year. We don't use military transports unless we have to because they're more expensive than the private sector. It comes out of our budget. It's cheaper to go, as we did in this case, to TransAmerica. We rented a couple of C-130's from them and that was cheaper than going to the military.

Another factor is that in a bad security situation, such as Ethiopia, it might not be such a great idea to have American military aircraft involved. Also, there are already planes in Africa or near Africa that we could tap from private sources. For all those reasons we went to private sources rather than public ones. If time is of the essence and nothing else is available we sometimes do use military aircraft. We used them in Bangladesh, for example, in 1971. They have certain capacities, for example dropping food, that you sometimes can't get from a private plane. In other circumstances they also have other features, such as self-starting engines, which you sometimes can't get in privately owned aircraft. Some private planes are not set up to work out of the airfields that you have down there. So we use military aircraft if we have to, but we prefer not to.

Q: Dr. Christensen, you spoke earlier of new and imaginative ways to address medium and long range issues of development. Looking into your magical crystal ball, what do you see as new and imaginative methods to address medium and long range issues?

Christensen: No, I didn't plant that question. I'm glad you asked that. I think there are a number of things that are going on that if put together a little more effectively, could provide us with that kind of capability. I think, first of all the World Bank, in shifting some of its lending from other projects to agricultural programs, has encouraged a number of governments to make reforms. Governments will agree to reforms, particularly those which involve the International Monetary Fund (IMF) but then they are dropped. The government has to find the resources to actually follow through on the implementation of reforms.

First, I think we should give a lot more attention to the implementation of programs. For example, in countries which have agreed to raise their agricultural prices, the United States could use either counterpart funds from PL 480 programs or matching funds, in cooperation with the government, to create a pool of local currency that can be used to buy vehicles and to pay farmers in cash on time rather than giving them IOU's which can be redeemed anywhere from one to eighteen months later.

Secondly, we could use the same counterpart funds to put together a pool of money to make sure that there are enough resources so the government can go ahead and continue buying when production is high rather than turning farmers away from buying stations, or as some African governments have had to do, raise the quality standards on grain to the point where they only buy a fraction of the crop for financial reasons. I think those are some very practical things that would make a big difference in the way that farmers respond to policy changes that could be done with the resources we have if we use them just a little differently.

Let me suggest one other thing. As we give food aid, we provide governments with a certain amount of foreign exchange because they pay less for the food aid than they would for commercial purchases. Some of that saved foreign exchange could again be earmarked to make sure that farmers are able to import the inputs needed to improve their agricultural production. So in years when fertilizer somehow gets squeezed off the import list because foreign exchange is tight, we could use some of the foreign exchange generated or saved by food aid programs to make sure that farmers were able to get what they need to produce. All of those things are fairly concrete practical things that could be done if we had just a little different vision on how to use the resources already in hand.

Q: I just wanted to follow up on my first question by making the point that military equipment and personnel are constantly being exercised or trained and there really isn't any reason why a shipment of humanitarian materiel can't be counted as a training exercise. I just wanted to bring to your attention that U.S. Senator Denton recently had included in an appropriations bill an amendment that authorizes that activity for Central America.

Q: Dr. Christensen, given your analysis of the need for more continuity, as you define it, in long-term planning, what do you see as a realistic shift, if any, in defense spending going to these kinds of long-term planning in the next four years? In other words, do you see any realistic hope that our government will be shifting more funds from the defense budget to either PL 480 or other agricultural funding necessary to implement what you've nicely defined as a long-term commitment to Third World peoples?

Christensen: No. I really don't see anything like that at least from my reading of the situation. I'm not a political appointee and I don't have any political connections, but my intuitive sense is that's not where any additional funding would come from if it were made available.

Q: Do you see any problems in that the commodities we ship to Africa are often commodities easily produced in European, or at least in temperate zones, and that we're converting the urban masses from the consumption of locally produced commodities, sorghum and other grains, to wheat, and so you may have an in-country surplus of local grains but severe shortages and urban riots because there's no white bread in the markets? Do you see any solution to this in the long term?

Singer: I think this is a problem that has been exaggerated. To begin with when grains are equally priced we try to ship the appropriate grain that's used in the country. Sorghum and wheat are not that far apart in price. If it's a sorghum-consuming area that's what we tend to ship, and if it's a wheat-consuming area, we ship wheat. The problem arises when you have traditional rice eaters. Rice costs about twice as much on the international market. With a given budget you can feed essentially twice as many people if you give them wheat, and that's the reason we send wheat, not for anything more elaborate than that.

The reason I don't think it's so much of a problem is because poor people in any society tend to eat what's cheapest. I'm talking about any poor society, any really poor society we know of. That's not true in some of the developed countries, but in the developing countries this tends to be the case.

By most principles of economics, if the cheapest grain that can be bought in those markets is, in fact, American wheat, then that's what they should be eating. Even on the land that they would use to produce more highly-priced grain, they should produce it either for export or they should be producing something else on it. That's a little simplistic; we know it doesn't always work that way. The masses will eat whatever is cheapest. I'm not really concerned with the fact that we've taught a generation of Bengalis to eat wheat.

Let me just add, since I have the mike, a couple of footnotes on some of the other previous comments. First, Congress has been very, very generous with us when it comes to emergency funds. Last year, I think we asked for \$90 million; they gave us \$150 million and we spent most of it. We have only \$30 million left and I think that will go next week. They professed themselves very willing to respond to what we need this year as well. So, there is money forthcoming on the emergency side at least.

By no means would I seek a fight with my distinguished colleague, Cheryl Christensen. However, let me just say from a field practitioner's point of view, any scheme which involves programming of resources by the government, such as setting aside the theoretical proceeds of local currency for a given purpose, or saying, well, you saved so much foreign exchange and now we want you to spend it on the following project, may sound good, but it's very, very difficult to negotiate with those governments. They tend to view those resources as their own, which they are. To tell them how they should spend those resources is very problematic, sometimes impossible.

Christensen: I agree that it's very difficult. No question about that. I think one of the key things on that though is whether there are additional funds available, and it's always easier to get those kinds of commitments with additional funds than by reprogramming existing ones.

On the question of wheat, I think in general I agree that it's not as significant an issue as some analysts have suggested, especially in relation to food aid. What we've seen is that in most countries, and there are a couple of exceptions, the demand for wheat is a commercial demand as much as a concessional demand. For example, the countries in Africa where wheat imports have really skyrocketed and where wheat is grown as a preferred staple for urban areas, are those that have the greatest wealth. You'll certainly find that happening in Nigeria and in other countries that have oil revenue. The impetus to consume wheat in urban areas is an income and a status impetus, and food aid doesn't change that much. I think if we get into the business of trying to program commodities coming in to adjust tastes when they're backed by purchasing power, we're into a very difficult situation. I think that to the extent that those tastes have developed, they have developed independently from our food aid programs rather than being triggered by them or reinforced by them. As I said there are a couple of cases where that's not so clear, but in the majority of cases I think that is the situation.

Q: Regarding some of the specifics of the commodity, or product mix, that are involved in some of the PL 480 Title II food aid programs, especially as they relate to some of the value-added products which have a very specific application to people in this room, what are the prospects in the medium and long term for continued use, or even expansion, of some of the value-added products that are in your portfolio of food aid and what might that mean to the economics of the Midwest?

Singer: The answer is unfortunately simple, very little. It's simply a budgetary constraint. It is a matter of simple hard, cold cash. A processed commodity can cost sometimes as much as six or seven times more a ton, if you're talking about oil as opposed to wheat, for example. It's simply that we have only so much of the pie to split up and it depends on how many people you want to feed. Clearly there is room for much more processed food, and if we have the money we'll buy it. But it's just a question of feeding a lot of hungry people the best way we can. The Ethiopian case is an interesting one because it's such an emergency that the PVO's came to us and asked for 150,000 tons of processed commodities and we swallowed hard and said O.K. because we realized there were a lot of people, children in particular, who really needed those commodities. The budgetary aspects didn't bother us that much because it was such an emergency and because we really thought we could save lives by using those commodities. We found the delivery times so long that we have had to put that off until the March-April period, and we have had to fill in with sorghum in January. We wanted to make sure the pipeline was full above all else.

So I guess I'm answering your question two ways. For our regular programming we do use a lot of value-added commodities. The prospects of increasing the use of them will depend exclusively, from my point of view, on budgetary concerns. In the emergency case, sometimes you can't get it fast enough, but when you can it's really essential to prevent loss of life.

Q: I have two questions. The first one is for Mr. Singer. What safeguards are there to prevent a government which receives PL 480 aid from turning around and selling that in international markets and then turning around and using the cash from the sale of the food to buy arms? I'm thinking, in particular, of a country like Egypt, that might have a reason to do this, or a country like South Vietnam in the 1960's.

Singer: This is called the usual marketing requirement (UMR). Of course, it doesn't matter whether it's the same grain or grain that they would have had to use otherwise, and that's why we don't pay much attention to that grain. We do have very strict legal requirements so that nothing of this sort happens. We follow our grain around in the Title II program, and have very strict accounting of it. Furthermore, they can't sell any other grain if they're over and above their usual marketing requirement. All I can say without getting into the details is that it's very, very strictly watched. I remember once in an African country there was a report that someone saw corn going across the border when we were bringing in corn. We were all running around very frantically until the report was disproved, because that would have been grounds for cutting the program.

Q: The other question I have is for Dr. Christensen. You talked about long-term planning and commitments. I was in the Peace Corps in Tunisia and one thing I noticed was that a lot of the smaller farmers, farmers up in the hills, seemed to have quite an erosion problem. I could see that the erosion problem in the long term can pose a real significant problem for the agricultural productivity in the country. I just wondered how much attention is paid to the problem of soil erosion in designing programs for developing agricultural productivity in a country.

Christensen: I think that varies from country to country. The problem that you're describing is an important one and that, combined with the problem of the encroachment of the desert in a lot of the West African Sahelian countries,

is something that does get addressed. There have been reforestation or afforestation projects and attempts to introduce terracing. I think it's something that needs more attention, but to date the projects I'm familiar with have not been overwhelmingly successful. I might see if you have anything to add to that from the West African side.

Singer: Not so much from the West African side as from the Asian side. This is a problem all over--erosion--in our country as well, but more so perhaps in Latin America, Asia, and Africa. I view it as largely a population growth question. As the population grows people move into more and more marginal areas. They start plowing the hillsides and the mountain tops and we really have a problem. As far as success goes, there are some hopeful signs. If you are going to do something about erosion, it has to be cost-effective in the short and medium term.

Several years ago I was involved in Chile in a forestry project which found that exotic plants, such as our Monterey pine from California, grow like weeds when you get them down there. You get usable lumber in six years. That kind of thing can be used to prevent these sorts of erosion problems. Eucalyptus is also very, very promising, and it's used all over the world for the same purpose. So I think the short answer is that everybody's working on erosion and nobody's found any ultimate solutions. It is a big problem, as are so many others.

Q: I would be interested in a detailed analysis about how one officially designates a country as being in need of food aid. Is this basically a bilateral kind of a negotiation, or is there an international mechanism by which the world community is informed that there is, in fact, a real food problem in a particular country and, therefore, developed countries and international organizations should come to their aid? How does that work?

Singer: I assume you are referring to emergency food aid. It's both bilateral and multilateral. We need a request from the country, but that usually comes almost after the fact. Before that, we have our missions in the country, or our AID regional offices talk to the right people, listen, and review the situation. In addition, we supplement that with UN World Food Programme (WFP) and Food and Agriculture Organization (FAO) data. Data from USDA is our best source really. We also use weather satellites and anything else we can think of. Based on that you start to get a feel for the needs of the country.

The next thing you have to analyze is where other food is going to come from. Because we respond more rapidly than other donors, which is part of our having larger field staffs than other donors, we tend to put a lot of our share up front, just as we are doing in Ethiopia now. Then as the other donors develop their responses they can take over and we move on to the next emergency.

In answer to your question, the process is pretty ad hoc and it is hard to make it otherwise. Logically you would think that the WFP would assume this responsibility and they do partially. But there's nothing like the first-hand data from your own people on the ground and your own Foreign Agricultural Service. All of that data when it comes together forms a picture in the field to give us an idea of the situation.

As far as any kind of official declaration, we don't need one for food aid. Our Office of Foreign Disaster Assistance (OFDA) does need an official disaster declaration by the country in order to come up with some of the supplementary transport funds which are essential if the food aid is going to get to the country involved. This is for in-country transport. In certain cases, and I believe Kenya may fall into this category, for political reasons the country doesn't want to declare it, even though there's truly a disaster. So we can't use OFDA funds to help on food transport in Kenya. Instead we have to turn to one of two mechanisms. One is monetization which is bringing the food in free, selling it on the local market, taking the money and paying for transport with that. Pretty cumbersome, but in many cases, including Kenya, necessary because it's not enough just to put food out for free distribution. If you don't put some in the markets as well, you'll have too much call for free distribution, and by putting food on the local market, you can reduce your calls on the freely distributed food.

The other mechanism that we have as of about three or four weeks ago, is to use Title II money to directly pay for in-country transport costs. That's a very useful tool that's been added to our toolbox. The problem is that the money that we use to pay for transport can't be used to buy food. So we're kind of loath to do it. One of the problems that I'm working on right now is deciding when it's appropriate to bring food in and monetize, i.e., sell the food and pay for local transport, and when it is appropriate to pay right out of our pocket. It's cheaper in many cases to pay right out of our pocket. In Kenya it will cost us \$28.5 million to bring in enough food to generate \$15 million worth of local currency. The transport costs, the internal distribution costs of that food, and everything else make it cost almost twice as much, but we have to have that food on the local market, so we're going to do it in any case. But to put some sort of a value on the food in the local market is very difficult and we're having to make ad hoc judgments where I would rather like to have a much firmer analytical base.

Whenever I talk to any academic setting, I throw out this challenge: Can somebody come up with a model for me to enable us to calculate the value of having that food on the market? Is it really worth the \$13.5 million additional? You said you were asking a detailed question. I'm giving you a somewhat more detailed answer than you probably want. But these are the day-to-day concerns that we're wrestling with full-time right now.

Q: So what you're really saying right now is that the United States is de facto the international switch on these things. Right?

Singer: No, sorry, let me make myself clear. I'm talking about the aid that we give. Other countries have their own mechanisms, but of course, we're talking all the time particularly to the major donor countries. When you're talking about food aid you're only talking about a few players. There's Canada, there's the European Community, to some extent Australia, and to some extent Japan. So it's really an ad hoc arrangement. That means anybody who is seized with a problem, anybody who happens to have the best information, which frequently turns out to be the United States just because we often have a larger presence, will call. For example my boss, Peter McPherson is calling together all the donors on Ethiopia very soon. Probably he will see them at a meeting on December 4.

Q: There is no formal mechanism for that to happen other than the good will and communication that may be among these nations. Is that right?

Singer: I don't know. There may be something written into the WFP charter. De facto this is the way we do it. Do you know, Cheryl?

Christensen: I don't think there's any formal authority. Who calls the conferences from time to time varies. For example, the FAO called two emergency conferences on African food disasters in the last three years, but again, that really depends on the assessment and on the judgment of somebody in that process. I don't know of any automatic triggering mechanism or anything of that sort. In terms of how you designate countries, FAO does identify countries with unusual food emergencies and countries with unusually severe weather conditions. USDA will go through and do similar kinds of things, but none of those trigger any kind of formal designation. They're used, as was described, in a process of exchanging information and usually allocating your own food aid. There isn't, to my knowledge, any organized automatic process for designating those countries.

Q: Do any of you see any need for a change, or is it working very nicely as it is?

Singer: I see a big need for better coordination in the process. I'm not sure that you get that coordination by creating an automatic mechanism. I think, at least on the U.S. side now there's been a good deal of effort to improve donor coordination. The danger with any kind of automatic mechanism is exactly the one that I mentioned with our OFDA funds. I really prefer the ad hoc method because I'm afraid of being shut out waiting for some switch to be flipped, or something like that, before we can go into action if we have something more formal.

Q: This is for Dr. Christensen. You mentioned in your conversation and speech that we should furnish them the tools to even out the hills and valleys of the supply situation. What are those tools that may work? Don't we have the same problem in the U.S.?

Christensen: Well, I can give you the answer that is supposed to work. If you don't stand behind your prices, which is the case of a lot of the countries, then there is going to be a lot of production for which farmers don't get paid. The result is that you don't develop the kind of regular commercial markets in those countries that we take for granted here. Once you acquire that surplus in one particular year, what you're doing, if the government is setting prices, ought to set the relative prices among those commodities in such a way that people will shift their acreage out of the commodity in surplus and into another commodity that will make better sense. I think in practice we've found that that's fairly difficult to implement in this country.

I think the difference is that we're talking about a situation in the United States where we do have a well developed commercial market and the market extends across the whole country. In the African setting, I'm really talking about doing something to try to develop that kind of a market. From what we can tell, none of the countries that we're dealing with are going to be faced with the problem of chronic surpluses for years to come. It's really a matter of making sure that the government establishes the kind of confidence and lays the basis for the development of the market. In the end, if the price signals don't adjust and you keep paying relatively high prices on a surplus commodity, you're going to have problems.

J. Terry Iversen

On behalf of the Quad-Cities World Affairs Council and the Peoria Area World Affairs Council, I would like to extend our thanks to 33 private voluntary organizations and government agencies, national and international, participating in our Resources Fair which is being held in conjunction with this conference. There is a wide variety of organizations represented.

There are several people of the more than 200 here this evening who should receive recognition. We have been involved in this development education project, funded by the U.S. Agency for International Development, for over a year. There are several people who played a key role in advising us when it came to the proposal writing, and in assisting us in lining up speakers to participate in various phases of the project. There's probably one person in this room whom I have consulted as frequently as anyone else, and that is Professor Earl Kellogg, who is the associate director of international agriculture at the University of Illinois, Urbana-Champaign. We also have two gentlemen here representing foreign missions whom I would like to recognize. First is Mr. Richard Mariki, the minister plenipotentiary of Tanzania. Second is Mr. P. Santoso, who is the economic Counselor with the Consulate General of Indonesia in New York City.

At this time it is my pleasure to present to you Jean Garber, the immediate past president of the Quad-Cities World Affairs Council.

Jean B. Garber
Immediate Past President
Quad-Cities World Affairs Council

I want to welcome everyone on behalf of the Quad-Cities World Affairs Council. And I will say that we are so elated at the size and quality of this audience. There are many people here who are authorities in their own right, but what is very gratifying to know is that we have been able to attract so very many people who are interested in the problems, the many facets, of world hunger and poverty and feel that they can become more knowledgeable from other authorities who are on our speakers' roster.

Now it is my pleasure to present to you Mr. Gildehaus, who will formally introduce our speaker for the evening.

Thomas A. Gildehaus
Executive Vice President
Deere & Company

Good evening ladies and gentlemen. Not this program, but a program you received somewhat earlier indicated that the person who is supposed to be here this evening is Mr. Robert A. Hanson, the Chairman of Deere & Company. Unfortunately, Mr. Hanson was unable to be here and he asked me to fill in for him and it is a great pleasure for me to do so.

Your program also indicates that the keynote address this evening is to be delivered by Mr. Peter McPherson, the administrator for the U.S. Agency for International Development, but as you heard this afternoon, Mr. McPherson has just returned from Ethiopia and is on his way to Santa Barbara, California to confer with President Reagan on the food crisis in that country. Perhaps some of you were able to see the 5:30 news this evening on NBC where, in fact, Mr. McPherson was reporting on his return from Ethiopia at a press conference. So you've got two pinch-hitters tonight, me and the person I will introduce shortly, Julia Chang Bloch.

Before I introduce her, perhaps I may express a personal opinion or two on the many complex issues concerning Third World development. One is a humanitarian concern, demonstrated vividly not only by what I've just said is the reason for Mr. McPherson's absence, but also by the terrifying recent reports on television and in the newspapers about the plight of hundreds of thousands of people in Ethiopia. All of us share a desire to eliminate hunger and malnutrition which are affronts to human decency and human dignity. The problem is how to do this, how to address the political, the social, and the economic circumstances that are at the root of Ethiopia's problems, and at the root of similar problems in other Third World nations; how to address the problems of poverty, of inadequate food distribution networks, of lack of education, of lack of harbors and roads, and of conflicting ideological aspirations. How do we deal with caste and tribal jealousies, age-old customs that are resistant to change, or the enormous population growth?

If I had the answers to these colossal problems, of course, I'd be going to Stockholm one of these years to collect a Nobel Prize. I don't have the answers, obviously, nor does anyone at this point, but let me say this: I believe that until solutions to these problems are found, continued and even increased economic and agricultural assistance to the poorest nations is in our national interest generally, and in American agriculture's interest specifically. It is in our national interest because from the political viewpoint hunger and malnutrition are potentially destabilizing forces. The sooner they are eliminated, the better. From an agricultural viewpoint the more fully nations are able to participate in the world market economy, the better the possibilities of their becoming customers for our food commodities, and, I might add, for some farm equipment.

There are limits to what can and should be accomplished in terms of providing economic and other assistance to needy nations, as Dr. Christensen suggested in the discussions this afternoon. Nevertheless, it seems to me that a major strategy for improving the lot of people living in these countries, and hence in the long run possibly our own well-being, must be through investments in their human resources, in their institutions and physical infrastructure. After all, it wasn't so many years ago that many Americans regarded South Korea as a hopeless case, deprived by partition of both natural resources and necessary entrepreneurial skills. And it wasn't so many years ago that people thought that India was destined to perpetual economic dependency on others. It hasn't turned out that way, thanks in part to American aid and investment in the development of these nations. I can see no reason why the same results cannot be obtained elsewhere. In this, I would think that our keynoter, Mrs. Bloch, would probably agree with me, I hope, at least in a general sense.

Mrs. Bloch, the Assistant Administrator for Food for Peace and Voluntary Assistance for the U.S. Agency for International Development, is really quite a lady. Consider, for example, this description of her written a couple of years ago by the editor of Horizons magazine:

If a lightning bolt were ever to take human form that form would be Julia Chang Bloch. A diminutive dynamo, she sends off waves of electric charges, powerful enough to make even the most stick-in-the-mud bureaucrat sit up and take notice.

Mrs. Bloch has held her present job with AID for about three years now, and in that position she is one of the highest ranking members of her sex in the Reagan Administration. She is also a former Peace Corps volunteer, serving in Malaysia, and later as a training and evaluation officer, conducting education and training programs in the Dominican Republic, the Philippines, Malaysia, India, and Canada. She is a former aide to Senator Percy. Her other experience on Capitol Hill includes a stint as chief minority counsel of the Senate Select Commission on Nutrition and Human Needs. She was also the Deputy Director of African Affairs at the International Communication Agency where she managed public diplomacy programs in 43 sub-Saharan African countries.

Mrs. Bloch, born and brought up in China, came to the United States in 1951 as a refugee. She and her family settled in San Francisco. She was graduated from the University of California at Berkeley in 1964, and in 1967 she earned her masters degree from Harvard University in Government and Regional Studies-East Asia. Of all the impressive jobs Mrs. Bloch has held, according to the Horizons magazine, the one that has had the most profound impact on her life has been the one for which she got no pay, Peace Corps volunteer.

Let me conclude my introduction by quoting her remarks to a group of Peace Corps interns a couple of years ago, "I've been personally committed to dealing with the problems of world hunger for the last decade," she said. "In that time I've come to greatly appreciate the major role the United States and its citizens have played in alleviating world hunger and poverty. Yet," she continued, "much remains to be done. Our challenge as a nation lies in furthering the efforts of developing nations to become more self-sufficient and to attain economic stability. Our challenge as individuals is to promote better understanding of the importance of this effort among our fellow Americans." Mrs. Bloch...

KEYNOTE ADDRESS: "ECONOMIC INCENTIVES FOR FARMERS IN DEVELOPING COUNTRIES:
A REQUIREMENT FOR AGRICULTURAL DEVELOPMENT"

Julia Chang Bloch
Assistant Administrator for Food for Peace and Voluntary Assistance
U.S. Agency for International Development

Thank you very much, Mr. Gildehaus. I hope that I can live up to that kind of an introduction. It's awfully good to be here. I bring you greetings from Peter McPherson who wishes that he could be here. As Mr. Gildehaus said, President Reagan sent Peter McPherson as his special disaster coordinator to Ethiopia last Sunday. He's just gotten back and is on his way to Santa Barbara to brief the President on what he saw and what he thinks needs

to be done. I can tell you that Peter McPherson came back from Ethiopia very moved by what he saw, and ever more committed than ever before that the United States must do what we can to save what lives can be saved. I think, if there is any audience that can understand why he is not here with us all this evening, it is this audience.

We are, as Mr. Gildehaus pointed out, the pinch-hitters for the second team. But all of you here are part of the first team and I am sure that our discussions will not be diminished by the fact that Mr. Gildehaus and I are only pinch-hitting. But anyway, I appreciate very much your tolerance in accepting me as a surrogate for Peter McPherson.

This conference and others like it are important to the American people. The American people have a need to know, i.e., what their government is doing in foreign aid, why it is being done, how it is being done, and the results that are being obtained. This is especially true in food assistance, a United States effort to help people in developing countries help themselves to food sufficiency.

Earlier today you participated in discussions that covered a number of topics. On my behalf, Deputy Food for Peace Director Steve Singer detailed our Food for Peace program which has been, we think, an American success story for 30 years. You've also discussed the important role of private voluntary organizations and the work of the United Nations. Tonight, on behalf of Peter McPherson, I would like to discuss AID goals, motivations, and policies, especially in terms of agricultural production and Third World farmers.

First, the goal. Our goal is a free secure world in which growth and development are self-sustaining and the extremes of poverty and hunger are eliminated. Our job is to help poor people help themselves. We are motivated by our humanitarianism. We care about poor people. We've also motivated by our foreign policy requirements. We care about our security and that of others. And there is a third reason. Foreign aid is a good investment for America. To quote Secretary of State George Shultz: "There can be no enduring economic prosperity for the U.S. without sustained economic growth in the Third World. Security and peace for Americans are contingent on stability and peace in the developing world."

There are also the more immediate benefits, although we may not often realize it. Foreign assistance supports U.S. economic growth by providing jobs and benefits for millions of Americans while increasing the market for U.S. goods and services abroad. For example, in one of the programs that I'm responsible for, Food for Peace, exports to Third World countries from Iowa are over \$44 million a year; from Illinois, over \$68 million.

Nationwide, 120 million jobs are dependent on exports. Third World countries buy more of our exports than all of Western Europe put together, and four times as much as Japan. They also supplied 45% of our raw materials and commodities last year.

The prosperity, stability, and freedom of the people of developing nations are important to us, and I think that Mr. Gildehaus and many of the other speakers on your program have mentioned this. I think this is a point that is particularly close to home to those of you who live in the Quad-Cities area. We believe that the people of this country are entitled to good results that earn their continued support of foreign aid.

When this administration came into office we carefully assessed our programs at AID. We examined what was working and what was not working. We confirmed the use of development practices which have withstood the test of time. Others required adjustment and still others were found to be impractical and even counterproductive. As a result we have restructured our program on five basic beliefs.

First, we believe that sustained economic progress does not come as a result of the transfer of resources alone. Nor does it come solely as the result of windfall wealth from newfound oil revenues. We look at the problems of Mexico and Nigeria in recent times and can understand this. By contrast, countries such as Thailand and South Korea have combined some resources with wise internal policies. The result has been sustained and substantial growth. The policies of incentive are essential.

Second, we believe that a principal barrier to growth has been the general environment in which the chronically poor are obliged to live. The lack of skills, education, technology, a voice in the selection of leadership, are all barriers. Unmanageable population pressures and the lack of access to health services are also barriers to development. Perhaps the greatest barriers are government policies that work against sustainable growth and economic development.

Third, we believe that statism and central economic planning have not worked. The truth is that top-heavy government structures are inefficient. In many cases they do not extend their influence beyond the limits of the major urban centers, and even when they do, they tend to discourage incentives rather than promote them.

Fourth, we believe that poor people are good decision-makers. They will change long-standing behavioral patterns when presented with a real opportunity to improve their lives. When appropriate technology and the opportunity to benefit from it are present, positive results will readily occur. Certainly Peter McPherson and I both personally saw this happening when we were Peace Corps volunteers. (Peter McPherson was a Peace Corps volunteer in Peru.) The Green Revolution is only one example--whole areas of the world were introduced to those new strains of wheat and rice that dramatically improved yields. In northern India this technology, coupled with pricing policies that meant increased income from greater production, had dramatic results. India today is now virtually self-sufficient in grain production.

Fifth, we believe there has been substantial economic and social progress in the Third World. I've already mentioned the Green Revolution as an example. Infant and child death rates are down by half in many parts of the Third World. The number of children attending school, for instance, in Africa has dramatically increased in the years since independence.

With these beliefs or premises as a basis, AID, under the leadership of Peter McPherson, has established four policy cornerstones to guide our development efforts in this decade and beyond. These cornerstones address developing country internal policies, institutions, technologies, and a greater reliance on private sector and market forces. These are the fundamental tools for change without which we believe development cannot occur.

The first cornerstone concerns policy change in less developed countries. We work with the country's leaders to help fashion internal policies that will allow development to succeed. The second cornerstone deals with institution-building. Our approach during the past three and a half years has been to shift the emphasis from central government structures to those closer to the people affected. The third cornerstone addresses the need for private sector involvement and relies on market forces. We seek more reliance on these factors as the principal engines for economic growth. Our fourth cornerstone deals with the research/development and the transfer of appropriate technologies.

All four of these cornerstones are policy principles which must be applied in tandem if real development is to succeed. For example, the improvement of agricultural technologies and inputs such as fertilizers and seeds has been remarkable. There is a promise of more on the way in development of highyield, dryland rice varieties from research sponsored by AID. That should help sub-Saharan Africa. Still a large share of the world's farmers continue to follow low-production practices despite the worldwide availability of agricultural technology and improved seeds and fertilizers. Outwardly it would seem that these developing countries and these farmers are tradition-bound and not interested in opportunities to modernize production and improve their lives. However, our experience has shown that this is not the case. It has also shown that the availability of technology and resources is a necessary, but not sufficient, condition to increase farm productivity.

In addition to the proper resources and technical know-how, another factor is required. There must be the correct economic policy climate before agricultural development will take root. Farmers in many developing countries are held in check because of national economic policies which discourage increased production. Examples of economic incentive policies and how they help or hinder agricultural development are abundant.

Here are just a few cases that illustrate this fact. Food subsidies designed to benefit politically powerful urban consumers penalize farmers, depress the farmgate prices, and reduce production. AID is working with countries to reform such policies. We are encouraged by the success we are experiencing. In the past year and a half, 16 African countries have substantially increased producer prices. Six have decontrolled some or all consumer prices. In the early 1970's, Sri Lanka controlled rice prices to benefit urban consumers. It led to stagnant production and a need to import rice to meet domestic demand. Those policies have been changed to provide stable producer prices and a greater role for the private sector in rice milling and distribution. Since those policy reforms were implemented, rice production in Sri Lanka has increased at an average annual rate of 7.4%.

In another illustration of the effects of policies on production, government monopoly control of inputs such as fertilizer and marketing outlets has prevented farmers from obtaining their production needs and getting access to the best market. For example, in Bangladesh fertilizer distribution was entirely in the hands of a government monopoly until 1980. Despite a nearly 90% cost subsidy, less than 20% of the rice acreage received fertilizers. Because of the high subsidies, the government was unable to afford the cost of adequate purchases. Rationing became necessary. The scarcity, plus inefficient and high cost distribution, resulted in declining production. Recently policy reforms have been implemented. Subsidies have been reduced and distribution has been turned over to private dealers. The result is that fertilizer

prices have risen, but so has supply. Rationing is no longer necessary. Fertilizer use is up 15% in the past year. Crop production has increased from 12 million tons in 1977 to 16 million tons in the 1983-84 season.

There are other factors as well. Taxes, tariffs, quotas, and over-valued exchange rate policies penalize production of export crops. They make imports artificially cheap competitors to domestic items. The point is this, Third World farmers are essentially the same as you and I, and people all over the world. They are rational economic decision-makers. Given the technology, the know-how, and the right economic incentives, they will produce. Some people have looked down on farmers in the developing world because many of them are illiterate. But I can tell you that I have never met a farmer who could not count. Where there are incentives they will produce.

In closing, AID believes that hunger is a solvable problem. Because of the common sense policies we have designed and implemented to guide our AID programs, we are making significant headway in agricultural development. We recognize that policy reforms, however necessary, are often difficult for most country governments to implement. For example, the short-term impact of reducing artificial food subsidies to urban consumers can be an overwhelming barrier to policy correction.

Because of the critical need for reforms in Africa, President Reagan proposed the African Economic Policy Initiative. It was to be a five-year funding device to encourage policy reforms, to cushion the necessary, but difficult political reforms. While Congress did not approve the five-year program, as proposed, it did add \$75 million in additional African funding for fiscal year 1985. These funds will be used to encourage African countries to implement long-term growth-oriented policies, and I might add, growth-oriented policies based on equity. They should be especially helpful with respect to agricultural policies and production.

We can help in many ways, but we must recognize that the steps from food deficiency to feed sufficiency must ultimately be made by the nations of the Third World themselves. It begins with the policies of incentives. It continues with one farmer on one piece of land who sees a profit for himself and a better life for his family. It ends with food abundance on the tables of the world.

Thank you very much.

QUESTION-ANSWER SESSION

Q: I guess what I'd like to know is how to get started. It seems very difficult to get through agencies which are apparently isolated from each other. My business is to acquire machinery and equipment for developing countries. I'm currently active with some government projects in Liberia, the Ivory Coast, and a couple of other countries in that area. A few days ago, I had a call from a fellow who runs the Bank for Agricultural and Cooperative Development in Liberia. He doesn't really know how to make his bank a credit-worthy guarantor for local loans. I've called a couple of different agencies, and nobody really knows how to get started. In the process of interfacing with the existing international agencies and existing international aid programs, he would like very much to become self-sufficient and he doesn't really know what the requirements are to apply for existing funds from the World Bank,

or through your AID programs, or those kinds of things. There's such a maze that it's very nearly impossible for people to reach out for the resources that are sitting around already.

Bloch: I sympathize with your question. Anybody who doesn't work in the federal government can find it a very incomprehensible maze. Perhaps I can be helpful in this way. Your problem has to do with a Liberian request or proposal.

Q: This one does, yes. There are similar problems in the Ivory Coast, in Ghana, in Kenya, and so forth.

Bloch: Usually a good way to start is with the desk officer for that particular country. In all international affairs agencies, including AID, we have regional bureaus, and the regional bureaus are really the heart of international agencies. There are desk officers for every country where we might have an interest or a program, and there would be a Liberian desk officer and there would be an Ivory Coast desk officer. That would be a very good entry point. That desk officer should be able to give you advice, point you in the right direction, and certainly try to help and expedite whatever it is that your client has in mind.

Q: I guess part of the problem is that he has some idea of what the federal government is doing. He doesn't really have much idea of how to interface with programs that are concurrent which happen to be run by say the World Bank, or by some of the regional development banks, and so there is a problem of interfacing these projects. He feels that he has to reinvent the wheel every time he goes to talk to a different agency.

Bloch: That is a problem that I have heard before. Again in terms of interfacing with regional development agencies, with international agencies, and also with bilateral agencies like AID, I would say that if he wants to do that in terms of all three, then I guess the starting point must be from his own country, probably.

Q: I guess my question is, is there any move toward standardization of project approval so that if he gets something approved by the World Bank that it will also make sense to AID; that it would also make sense to the officials who administer PL 480; that it will also make sense to the Chemical Bank which will also have to write the check after it gets a guarantee from the Foreign Insurance Credit Association, and so forth?

Bloch: I'm smiling because we at AID have been trying to improve donor coordination on a more simple scale than what you have just described in terms of donor coordination in the food aid area, an area that I'm most familiar with. We are now only at the point of trying to agree on common terminology, let alone common standardized project approval processes.

We have a long way to go in terms of improving donor coordination. I'm afraid what you're talking about is not feasible in the foreseeable future, given my own personal experiences in working with international agencies or with other donors. We all have to respond to our respective legislatures. Our fiscal years are all different. Every government jealously guards its prerogatives in terms of its processes. We are hoping for greater enlightenment, and Peter McPherson has been working very, very hard with the World Bank, in particular, in terms of using the consultative group processes to improve donor coordination in selected countries so that we don't duplicate. But we're really far away from what you're describing, unfortunately.

Q: Mrs. Bloch, you mentioned the four cornerstones of the AID programs. The third one concerns private sector involvement and market forces. Could you give us some examples of private sector involvement, both in the host country and in the United States.

Bloch: I can give an answer generally. In terms of what we're doing specifically, I would have to refer your question to my counterpart in charge of the Private Enterprise Bureau. When AID established this bureau we sent out what they called reconnaissance teams to a selected number of countries. These reconnaissance teams were made up of American business leaders and were led by business people. They went into countries like Thailand and they engaged in consultations. They began to talk about specific projects where American investors could actually place their money. This process is continuing.

We also now have the authority for using revolving funds to fund private sector type programs. As I said, I am not expert on this. The underlying theme, however, is that we really do believe that American businesses have a lot to contribute to development in the Third World. I know that doing business in the Third World can sometimes be very difficult and sometimes incomprehensible to American businesses, particularly small businesses. AID hopes that through its Private Enterprise Bureau, it can begin to play more of an intermediary role, to make the cooperation of American businesses and Third World businesses easier, more comprehensible, and, of course, a more profitable enterprise.

Q: I have a question more in the area of long-term development. When you speak of fertilizers and new crop varieties, they have been very successful in one sense, such as in the United States. However, we have a tendency to be very dependent on a very narrow genetic base. I'm wondering if the United States is doing much to help preserve some of this genetic potential. Often new varieties will go in, and local varieties, which aren't as productive, will go out of vogue even though they have a lot of genetic potential. Some of them have been developed over thousands of years and I'm wondering if we're doing anything to encourage the establishment of seed banks and the like.

Bloch: I can tell you that we are working on it. I can't give you any details. This problem belongs in our Science and Technology Bureau. Hannan Ezekiel, who is going to be a panelist on your program tomorrow, and I attended a very fascinating discussion about this issue in Chicago, sponsored by the Medill School of Journalism at Northwestern University. I can tell you that we are very interested in this and in most of the genetic types that are found in the Third World. We need to work with the Third World to protect those very valuable resources.

Q: You mentioned that Mr. McPherson has just come back from Ethiopia from a fact-finding mission. My question to you is about the coordination of the hunger response community and its ability to get its message across. Although there has been a lot of publicity about Ethiopia in the last week to ten days, the fact is that the critical situation in that country and across Africa, particularly in sub-Saharan Africa, has been going on for more than a year. Yet it takes film on the BBC and NBC to generate sufficient political will in this country and abroad to get a response from the American public so that we can now begin to take effective action. I applaud the initiative taken by the President through Mr. McPherson. Given that we've known about Africa in the hunger response community and AID for more than a year, what is it going to take from private voluntary organizations to generate sufficient momentum in the public arena to develop the political will to deal with these problems on a more timely and effective basis?

Bloch: I think that's a very good question and I'm really glad you raised it, because it's not just Ethiopia. The Food and Agricultural Organization of the UN estimates that there are at least 24 sub-Saharan African countries suffering from drought and in need of emergency food relief. You are correct that this situation has been going on for over a year. I think the difference is that this year the situation has gotten worse in Ethiopia and in four other countries--Kenya, Sudan, Niger, and Mozambique. We consider these countries to be the most seriously affected. What we would like to do is to take advantage of the public outpouring of concern, mobilized since the October 23 NBC show on Ethiopia, and to try and translate that into a longer term commitment to ending hunger in Africa. It's not easy because unfortunately the media loses interest when there are no longer people dying in front of the cameras. I'm sorry to say this, but I think it is a fact of life.

I think that meetings like this are very important because you acquire deeper knowledge and you can help your community to build on what has been generated in terms of sympathy and concern. By the way, there are all kinds of contributions pouring in. AID has been trying to work with the private voluntary organizations to be able to take advantage of the thousands of calls that have been coming in. I think you've heard of Interaction, the newly-formed consortium of 121 private voluntary organizations, headquartered in New York and Washington. We have helped them set up an 800 number. Also, we are in the process of thinking through whether we can help Interaction fund a crisis response center so that the contributions that come in can be handled in a very organized rational way, and so that the funds can be channeled into organizations that are actually in need of whatever resources are being contributed.

There is a meeting today in New York sponsored by Interaction in order to discuss and plan how they want to move forward. But AID stands ready, as I said, to try to help fund whatever it is that the private voluntary organizations need to establish. We believe that a crisis center is needed because there are all kinds of contributions pouring in. Some of the contributions are not easily transported and we do not want to turn off those contributions.

We believe that there is a commitment and we want to build on that commitment and turn it into a more positive, longer term interest in the hunger issue, and when private voluntary organizations cannot handle contributions singly, they have to group together and we believe that it is fortunate that there is this consortium. So if you're interested you can contact Interaction

Q: We're already members of Interaction. I'll be going to a meeting of theirs next week on this whole field of development education. As a follow-up, I applaud your remarks about small farmers and their ability to be economic and rational decision-makers. From my point of view the ability to put out a positive message about the ability of poor people to help themselves is the kind of thing that is currently lacking in the mindset of the developed world. If provided, it would create a means by which this more positive and long-term message could be enunciated.

Bloch: Again let me add one more point. AID believes that the Biden-Pell, or the development education program, can serve the role that you just mentioned. We have to go beyond charity. We have to go beyond the pictures of starving people because in a way that also projects a very negative image, particularly of Africa. What we lose in the process is really the fact that Africa has enormous potential. It could be a very wealthy continent. They are making

progress and we've got to get that positive sense into the American consciousness because if the American people feel that all they have to do, in terms of ending hunger, is to give a hand-out, then we will never be able to solve the hunger problem. I think what we have to do is to give the Americans a sense that the problem is solvable and that Africans have the ability to solve the problems for themselves with a little help from us, and that we have to direct that help in the right way. Again, this kind of a program, funded with development education funds, can, I believe, be helpful, but it needs all of you to go back to your communities and work individually and together to spread the message.

Q: A number of us in the academy often receive questions from students and others who are interested in getting into developmental work. I wonder, based upon your experience in both the Peace Corps, and now with AID, if you could outline a scenario that students might consider as a means of entering the profession?

Bloch: I think the Peace Corps is a very very good beginning. To get into the development business, I think you need first and foremost some kind of a commitment. Without that you're going to get very frustrated, very quickly. The Peace Corps gives you the opportunity to work at the grassroots level and to work overseas. I don't think that you can learn about development by attending universities and classes. At the same time, development requires technical skills. I would recommend very highly, particularly if you are female, that you get into hard technical areas like agronomy, economics, and development economics. The primary thrust of AID right now, and for the foreseeable future, is on agricultural development. I think it's pretty obvious why that's necessary. So get your experience overseas and get a sense that helping the Third World is really important and necessary. Get your skills so that you can combine your commitment, your sensitivity, and some skills to be able to contribute something tangible to people in the Third World. That is the one thing that I felt very remiss about when I was a volunteer. I was a 21 year old generalist. I taught English in a secondary school. I really felt, as do most Peace Corps volunteers, that we gained a lot more than we gave.

Q: I'm with the Port of Milwaukee. My remarks are more in the form of congratulations and a commendation to AID and USDA for their recent enlightened evaluation of the letter of the law as PL 480 Title II programs relate to distribution. We heard today about the budgetary constraints that, obviously, you have to live under as far as the costs for transportation and the costs for commodities. Mr. McPherson's report that indicated reasonable cost and availability of U.S. tonnage in terms of the distribution of commodities was the more enlightened approach and I realize that there's tremendous pressure from the U.S. maritime lobbies to implement flag-of-preference for U.S. flagships. Getting beyond the compliment, I would like to ask you if there is any signal that the Midwest can send to their Congressional delegations that we would like as much of our tax dollar to go to commodity allocation for distribution purposes and not have as much of it eaten up in the transportation sector?

Bloch: I have a suggestion for you, and thank you for your commendations. It's a very difficult issue. Cargo preference is the law of the land, therefore, we support that law. We have to. We also see that there is a need for support of our maritime industries. However, the money, the extra money that we spend for cargo preference means about \$125 million less a year for buying commodities. Obviously there is a trade off. We would recommend, and this is the Administration's position, that cargo preference continue, but that it be made a line item of the Department of Transportation's budget, and that it not come out

of the Department of Agriculture's budget, or the foreign aid budget. It is essentially a subsidy for the maritime industry, and should come out of the DOT budget.

Q: I'm a student from Knox College. I would like to ask a question related to the question asked by the professor of the University of Illinois. You recommended the Peace Corps to students interested in development programs. Unfortunately the Peace Corps does require U.S. citizenship, and a lot of international students are interested in that program. Would you have any recommendations for them?

Bloch: Yes, the United Nations runs a volunteer program also, and you could apply to join that program.

Q: It doesn't matter if you are a student or if you graduate?

Bloch: I don't think any volunteer program takes students who have not yet graduated.

Q: I'm a graduate student in economics at Iowa State University, and I am also a returned Peace Corps volunteer. You have argued for appropriate incentives as a necessary step in promoting agricultural growth and in aiding Third World farmers, however, the ability of incentives to promote production is contingent upon producer participation in agricultural markets. What is to be done for farmers whose access to land and other resources is so limited that they consume all or nearly all of what they produce and therefore do not participate in markets?

Bloch: I think that is a very good question. In a country like Bangladesh, there is just no way that any farmer could get more land. I think, perhaps, the answer lies in increasing yields. That gets into research, into improving technology. It means finding a new miracle variety that's targeted at sub-Saharan African needs. The Green Revolution benefited South Asia a great deal, but unfortunately the varieties produced just did not take into consideration the dry land farming conditions of Africa. So I would say the road to take would be increasing yield.

Q: As a follow-up I would say that I tend to agree in many cases where the total land availability is such that there's nothing to be done; but what of the case of countries where there is sufficient land but it is inadequately distributed? For example, I was a Peace Corps volunteer in Guatemala where 60% of the land is in the hands of 2% of the farmers. Many others did not have enough land to produce even for their own needs.

Bloch: That is largely a Latin American phenomenon. What you're talking about is land reform, and I think it is a very sensitive and difficult issue. Obviously the solution has to be something that's worked into the policy reform equation. It can only succeed if the governments themselves make the commitment to do something about it. And I think that we need to be in dialogue with the governments about that, but we cannot enforce it or force it.

Q: I read recently that the United States and many European countries, as well as the Soviet Union, are cooperating in Ethiopia. Considering the fact that our present arms race in the world is consuming about a trillion dollars a year, do you see any way that we could turn part of this arms race into an "aid race"?

Bloch: Well, we'd like to turn what's happening in Ethiopia into an "aid race." In fact, Peter McPherson started talking about the fact that the Soviet Union provides \$3 billion worth of military aid to Ethiopia, and in all, they provided 30,000 metric tons of rice valued at about \$3 million for the Ethiopian emergency. That, until recently, has been the extent of Soviet aid to Ethiopia and I think we can all agree that Ethiopia is a client state of the Soviet Union. Most recently because of this international outpouring of concern for Ethiopia, the Soviet Union has sent in, I believe, a limited number of helicopters and trucks--equipment for moving the food which is very much needed. Perhaps that is a sign that we will have an "aid race" in Ethiopia. However, the Soviet Union is not in the business of economic assistance really.

Q: My question is about aquaculture. Is AID, or any other governmental agency, considering funding for aquaculture? As you know, it is a very efficient meat production method and can be conducted in very limited space.

Bloch: Yes. In fact, we're signing our first joint private voluntary organization/university project with the University of Georgia. It's a very excellent project in aquaculture. The University of Georgia is joining with a number of private voluntary organizations. We will be signing this grant in a few weeks. I know that the Peace Corps trains volunteers in aquaculture because you can take generalists and train them to do aquaculture. Some of the more successful projects of the Peace Corps are in this area.

Gildehaus: I had the privilege of introducing Mrs. Bloch and I now have the pleasure of thanking her. It was a very stimulating presentation and I think the questions from the group indicated a high degree of interest, ranging from a very intriguing concept of changing from an arms race to an "aid race" to growing catfish. There's any number of things that all of us can do. I think the suggestion that each and everyone of us try to build our own constituencies, that we take advantage of the immediate concern generated by the Ethiopian situation, and use that to build a basis for a longer, deeper, more abiding effort in this area is probably the best advice we got this evening.

PANEL A DISCUSSION: "Reducing Third World Dependency on Foreign Oil
by Introducing Integrated Food and Energy Systems"

Moderator: Lloyd E. Reeser
Farmer

Last evening during the question and answer session with Julia Chang Bloch, she made the comment that charity is not the solution to the hunger problem and that a longer term solution is required. We feel that our part of the program this morning fits into that category. I think it's time that we all recognize the fact that there are viable, effective, and sustainable humanitarian solutions to these hunger problems. We would like this morning to use this panel to acquaint you with an approach to resolving this food and energy problem and its economic challenges.

Our first speaker has had considerable exposure to the problems of the developing world. He has served over ten years with the Environmental Protection Agency and the U.S. Department of Energy in Washington, D.C. He now specializes in support services for small businesses and communities working on renewable energy conservation and environmental enhancement projects. He is retired Colonel William Holmberg of Washington, D.C. His topic is, "Integrated Farms: The Struggle for Independence."

William Holmberg
Renewable Energy Consultant

I really appreciate the opportunity to be here. One of the critical points that Lloyd didn't make is that I did spend quite a bit of time in the military and that was in the Marine Corp. You've got to know that the Marine's favorite number is 14, its shoe size and IQ. So you can see some of the problems I'm laboring under here.

We're going to be talking about integrated farms and the struggle for independence and I might just add for those of you who are farming in this particular part of the country, that we also need a touch of that independence right here in America. A basic source for that independence is that wonderful nuclear power plant in the sky that provides heat and beneficial radiation. And then when you add the carbon and nitrogen we get from the air and the oxygen and hydrogen we get from the water, we've got a pretty incredible set of resources provided by nature. From here on out we just have to apply our intelligence and our compassion and ingenuity to build these integrated systems.

A farmer in India having a power source could double crop, instead of single crop, and I think you can imagine what that would mean. Now we're not talking about the typical Midwest tractor as a power source. It certainly is not going to fit into that environment. We're talking about technologies that are appropriate to these developing nations, like wind, for small scale electric production; gasifiers, production of low BTU wood gas; and integrated farming and fish systems. In a feedlot operation in Panama, you take the crops to feed the animals; the manure goes to a digester to produce gas; burn the gas and an engine generator is set to produce electricity and process heat. Take the residue out of the digester and the fish ponds, add the waste from other animal operations, and you've got a repeated harvest of fish. You take

the water out of the ponds and use that for irrigation and fertilizer for your crop areas to grow trees, rapid growing trees. Use the light fraction from those trees as your animal feed and the heavy fraction to burn as fuel.

In an integrated farming system in Germany, which has been there for 80 years, a pond in the front is used for decorative purposes. It is a water holding pond. They have an alcohol plant in the back. They feed the mash to the cattle. They take the manure from the cattle and put it into a digester and use that for energy for district heating systems.

A more modern American plant uses fermenters and cookers, and there is a mash bucket off to the side feeding cattle. There's a greenhouse that fits right to the alcohol plant. You take the CO₂ and the waste heat off the alcohol plant to enrich the environment in the greenhouse and you get about a 25% increase in productivity--vegetables and fruits that can be marketed throughout the year.

On a much larger scale in Decatur, Illinois there's a five-acre greenhouse. It uses the waste heat and CO₂ off the alcohol plant to produce an incredible crop of lettuce. There's a crop every 28 days. They're shipping out of there on a daily basis to major cities all over the Midwest, and as far as Washington, D.C. I think that's probably for political purposes though.

We're also talking about a corn-stover situation where we're converting corn-stover into alcohol at a demonstration plant in the Tennessee Valley area, and about using animal wastes and human wastes for compost, which not only builds up the organic matter in the soil but also provides many of the nutrients required.

There is a food processing facility that's totally mobile. You set it up in the field. It uses a solar collector for part of its energy to dry. It has propane tanks on-board and an engine generator set that also cogenerates heat and electricity to drive the facility. It can handle fruits and vegetables that normally deteriorate in the field, a ton every four hours. You can train the people on it right from scratch in a few hours how to produce dried fruits and vegetables. This represents an enormous opportunity to feed people when you can do that right in the field.

In Nepal, you can see a solar collector on the roof of a primitive building. This is a fairly sophisticated portable tank and diesel generator set that produces electricity, hot water, space heating, and refrigeration. It is a totally compact and portable unit. This is America's greatest weapon.

In Metropolis, Illinois, a family built an integrated farm pretty much by hand. Two incredibly determined and creative people have proven to a lot of us that if you have the determination you can do it.

The real obstacles to implementing systems that will produce food, fiber, fuel, electricity, fertilizers, and chemicals are not technological or scientific. We have either overcome those obstacles, or we're certainly in the process of doing so. The real problems that preclude us from introducing these technologies in the developing nations are political, economic, and matters of regional security. We all know that when political forces are strong enough to maintain the status quo, forces seeking change don't have a chance regardless of the absolute necessity for change. We also know that developing countries do not have the economic resources to move forward into these areas. Even to buy a hammer or a hoe for some of these villagers is impossible without outside economic resources.

In many parts of the world we've found that you can't dig a well or plant crops because somebody's throwing hand grenades in on you. You've got to have political and military security in your communities. All of these are tough things to handle, but there are a few simple truths that we need to know to appreciate and to move forward. One is the absolute insanity of continuing the arms race between the USSR and the United States. Either we destroy the world through warfare, or one or both of the two countries goes into economic collapse. Either way the consequences would be serious. We've got to find a solution. It's an absolute necessity to find a way to reduce the arms race and start diverting those resources to where they are really needed in the Third World countries.

We also have competition between the USSR and the United States in the developing nations for critical land masses, for influence, and for natural resources. We've got to turn that competition into positive directions, rather than leading to arms races, local wars, and political catastrophes that cost the lives and fortunes of tens of millions of people. That simply has to stop.

We have to recognize fundamentally that Third World countries are primarily agricultural. They do not have big industrial facilities. We've got to start in the villages and vitalize those villages. Using the kinds of technologies that we're talking about here is certainly one avenue to pursue.

We also have to move forward in a cooperative way. Too often there is competition among the various factions that work in developing countries, and we have to bring this into some sort of a cooperative arrangement.

In the nations where I served, I tried to observe what was going on, and in many areas it's the church or the religious element, or the military, or the police, that maintain political stability and security in the villages and in the rural communities. I think it's imperative that we find ways to use our military forces and our own churches to interface effectively with the infrastructures in these villages so we can get on with the developmental process. The military does have a responsibility to support and defend, and the church does have a responsibility to succor the poor. If we can get them to do what they are supposed to do, and if we ourselves can use our military forces and our churches in a positive way to interface in these developing countries, then we've got a big leg up on moving forward.

I'd like to take just a minute to tell you about a little bit of Marine Corps history in this effort. In 1966, there was an incredible moment in history when the Commandant cancelled the Marine Corps birthday ceremony. It is something you don't do. It is the biggest event of the year, particularly in Washington, D.C., where tradition and pomp and ceremony drip off the walls. But he cancelled the ceremony and instead showed a movie called, "The Golden Fleece." It depicted the use of Marines and their equipment in Vietnam to help plant, harvest, transport, and store the rice. It was an incredible departure from our past performances, but it was really necessary in Vietnam. It was followed by a recommendation or a set of recommendations from the commanding general of the Marines in the South Pacific, including Vietnam, that he carried to the Secretary of Defense and the President of the United States.

These are the four recommendations: (1) that we stop the oppression in the rural communities, not only by the Viet Cong and the North Vietnamese, but also by the South Vietnamese Army; (2) that we stop the flow of war materiel into South Vietnam from the North; (3) that we move massive amounts of nation-building materials to start the vitalization and revitalization of the rural communities; and (4) that we insist on land reform so that people could own their own land and get on with the building of the nation.

Many of us believe that we lost the war in Vietnam simply because we couldn't start the nation-building process. There wasn't a nation there to defend. We recognized that we had to start in the rural communities. We also put together something called combined-action platoons, which were a squad of Marines (13), one Navy corpsman, and 40 Popular Forces people that were basically the residuals in the communities. Their mission was very simple. They were going to live and die in those villages and start the building process. They were going to get the well to function, the marketplace to work, the schools to work, the medical system to provide services, the farms operating again, and some light cottage industry moving. We set up a program with CARE International so that money contributed to "Marines' Care" was available for purchasing nation-building materiel in Vietnam. We cranked it up and we literally raised millions of dollars for this nation-building effort in Vietnam. It took all sorts of forms including handing out something as simple as shoes.

This panel believes that if we apply these technologies and use these resources in rural communities, we can then find ourselves in the position where we're encouraging private ownership, increased productivity in the rural areas so people will want to stay in their communities, and not migrate to the urban areas where they run into all kinds of problems. The free market forces will prevail, and you can have community self-reliance, and what we are really talking about is using these technologies to give a community self-reliance in terms of food, fiber, fuel, electricity, fertilizers, and chemicals. If the educational process is started, religious freedom and political stability will follow.

Clearly these are the things we want and we think we can use modern science and technologies and the vast resources that we have available to us to accomplish these things.

What are some of the next steps. Well, clearly, I've led us into an area that a lot of people are very uncomfortable with, i.e., using a coalition of United States military, the church, and a wide variety of organizations to effectively interface with the infrastructure in the rural communities of developing nations. These represent a lot of problems for a lot of minds. I can understand that, but the resources are there. The commitment is absolutely necessary and we need to get on with an open discussion of the opportunities. We need to review our own history and the history of the military forces and the churches of other nations so we can pick from that history the good, and reject the bad.

There was a recent amendment by Senator Denton that authorized the use of military transport to move humanitarian supplies into Central America. We need to look at the possibility of expanding that. There's precedence for that during the Vietnam War where we used every kind of transport to move humanitarian materiel into Vietnam. Many people didn't like that because they felt we were interfering with military operations. The humanitarians, or the more liberal people, felt that the military shouldn't be involved in any way whatsoever, but our point was that we were there, and why not do some good work.

As a matter of fact, we established about 110 of those combined-action platoons, and there were some minor miracles that occurred in those villages. We need to explore the CAP concept again to see if it can be brought into play. For example, in the Mediterranean, in the Caribbean, and in the South Pacific, we have a special battalion landing team which consists of 1,600 Marines and many sailors stationed on several ships. There is an incredible amount of resources there. There are helicopters, bulldozers, trucks, and a communication capability. They just float around out there for six months and go kind of crazy. There are real opportunities to tap into some of these peoples who have been specifically trained and go into countries where they are welcome and set up a partnership with rural communities and get on with infusing this technology into those communities.

The army also has vast resources and capabilities in this area. The whole special forces concept was designed to provide a capability to go into rural communities and work with the local people.

I think we need to reinforce some of the churches that have taken the lead by going in as missionaries, or setting up small colonies to bring in advanced farming technologies such as some of these integrated systems that we've talked about. We have these great opportunities in front of us and I think we can use them. The blessings have been provided by the sun, air, water, and modern science and technology. The real advances in science and technology do not take us down the path toward the big industrial complex. The computers, word processors, fiber optics, and all those new technologies give us an opportunity to decentralize and get self-reliance back into communities. We can get people involved again, one with another in building a level of independence. So the opportunities are certainly there. It just depends on whether we have the courage and the wisdom to take advantage of them. Thank you very much.

Lloyd E. Reeser: Thank you, Bill, for giving us a very broad outline in a very few minutes of the basic technology that can be applied to solving these problems. We're now going to enter into a more technical phase of this panel's presentation. Next on our panel is Professor Donald L. Day, who has worked extensively with integrated food and fuel systems. His recent efforts have been concentrated on designing and constructing a livestock waste digester system at the University of Illinois. His topic is, "Integrated Alcohol-Methane Production Systems."

Donald L. Day
Professor of Agricultural Engineering
University of Illinois at Urbana-Champaign

I want to tell you about a research project at the University of Illinois. It's a multi-disciplinary approach to our charge, which was to devise a system for Illinois farmers to help them become self-sufficient in fuel used in farming in case there was an interruption of fuel and petroleum from imported supplies. This project was supported in part by the Illinois Department of Energy and Natural Resources, and the University of Illinois Agriculture Experiment Station, and other groups.

There is a growing concern in farming communities for a dependable supply of fuels for tractors, combines, and trucks used in farming operations. Gasoline and diesel fuel have historically played that role. As world oil resources dwindle or become interrupted, however, interest in the development of alternative energy resources increases.

Alcohol is a proven fuel (USDA, 1980). It can be burned in spark ignition engines either as a mixture with gasoline, or by itself. It must be highly distilled and free of water to be used as a mixture with gasoline, but if it has water in it (less than 200 proof), it can be used alone. Ethanol production is therefore appropriate since both fermentation technology and renewable biomass are readily available in the corn belt region of the USA.

The issue of alcohol production for fuel is not trouble free. The energy balance of ethanol production and the use of the residues are the most controversial subjects. Table 1 shows an example energy input to the production of fuel alcohol (Rodda, 1980). It can be seen that drying stillage for feed recovery is a major component of the energy budget for alcohol production. This indicates that a significant saving of process energy can be realized when stillage is consumed directly by livestock without dehydration. Naturally, a nearby livestock industry with an adequate number of animals is necessary in this case since wet stillage spoils in about a day in hot weather if not consumed. Further, a significant amount of nutrients can be lost through decomposition.

A further reduction in the energy requirement of fuel alcohol production is possible by making lower proof alcohol which can be used in farm machines (USDA, 1980). It takes about two-thirds of the distillation heat to make 190 proof alcohol as compared to 200 proof alcohol. It takes even less energy to make 160 proof alcohol. It is therefore advisable to have a small scale lower grade alcohol production unit on the farm where labor is scarce and capital for high technology equipment is not usually available.

Although substantial economies-of-scale are generally realized with higher plant capacities, it is advantageous to have a small scale alcohol production unit on the farm to cut down transportation costs, while at the same time, a nearby livestock industry serves as a convenient market for the stillage. This integrated system has the further advantage that the process heat required for conversion of biomass into alcohol can be derived from methane through anaerobic digestion of animal manure. Therefore, if methane from manure is used, fuel alcohol production can be viewed as a means of converting renewable and relatively plentiful resources--corn and animal manure--into liquid fuel that is compatible with mobile engine requirements. Additionally, anaerobic digestion is considered a waste management approach that contributes to solving waste disposal problems.

The sludge from anaerobic digestion retains most of its fertilizer value if it is not taken out in the process of methane formation. The sludge can be spread on land to partially fulfill the nutrient requirements of crops. Consequently this total system not only contributes to an ecological and energy cycle for the farm, but also helps provide a clean environment.

There is a definite size relationship among the different components --lower proof alcohol production, methane generation, livestock and crop land-- of this integrated system. However, due to the lack of actual operating data for the sizes and types of ethanol production facilities considered, assumptions based on existing, demonstrated technology are made in this paper.

Because corn is the most popular crop in the Midwest region of the United States of America, it is used in this discussion of alcohol production. A diagram of an integrated farm fuel system is shown in Figure 1. Beef cattle are chosen in the following discussion for consuming the wet stillage although the stillage can also be fed to swine and poultry. Chen and Day (1983) studied the numbers of beef cattle or swine required to consume the stillage and to provide manure for methane production for various sized farms in Illinois. They found that it takes considerably more livestock to produce enough manure for the digester to provide fuel for the alcohol plant than it takes to have enough livestock to consume the stillage at normal protein contents of livestock rations. The livestock numbers required would agree more closely if the efficiencies in the alcohol plant and in the digester could be improved and if more stillage were fed than is necessary for protein requirements. Estimates for the integrated farm fuel system are summarized in Table 2 based on the corn yield from 1 hectare (1 acre) converted into 160-proof alcohol.

Table 3 gives the typical production potential of different proof alcohols from different land areas and yields assuming that all the corn yield is converted to alcohol. The amount of whole stillage available after fermentation is also included in the table. Different volumetric values as shown in Table 4 appear as the result of different energy contents and thermal efficiencies relative to gasoline. Table 5 presents the equivalents of gasoline or diesel used on farms that can be replaced by fuel alcohol based on 160 proof alcohol produced on the farm. According to Torgerson and Cooper (1980), Illinois crop farms averaged using fuel at the rate of 89.4 liters/hectare (9.55 gallons/acre) of gasoline and 59.7 liters/hectare (6.38 gallons/acre) of diesel fuel in 1978. This includes fuel used for the cropping operations, including a truck, but does not include fuel for miscellaneous use in pickup trucks. With conversion coefficients of 1.5 and 1.8 for gasoline and diesel (USDA, 1980) respectively, this is equivalent to 241.5 liters/hectare of 200 proof alcohol (25.8 gallons/acre), a total of 26,580 liters (7,020 gallons) of 200 proof alcohol for an average Illinois farm of 110 hectares (272 acres). This in turn is equivalent to 335.7 liters/hectare (35.9 gallons/acre) of 160 proof alcohol, for a total of 36,800 liters (9,700 gallons), considering energy content and thermal efficiencies as given in Table 3 ($[89.4 \text{ liters} \div (.67) \div (.45/.67) + 59.7 \text{ liters} \div (.55) \div (.44/.55)] \times 110 = 36,800 \text{ liters}$). This indicates that about 9.1% of the corn crop yield can provide enough ethanol for field operations on the farm. Thus an individual can determine his requirement for fuel ethanol to size his own ethanol production.

It is necessary to know the energy requirement of alcohol production in order to estimate the number of animals needed to produce enough manure for the biogas plant. However, as was stated earlier, there is limited information on small-scale lower-proof alcohol production. The closest estimate found in the literature appears to be for a batch fermenter that operates eight hours per day, six days per week at the rate of 95 liters (25 gallons) of 190 proof ethanol per hour (USDA, 1980). For the discussion, it is assumed that 160 proof is obtained by diluting 190 proof alcohol and the energy requirement as given for the latter is used as the basis for further calculations. The requirement includes cooking, distillation to 190 proof and miscellaneous and comes to a total of 2,859 Kcal per liter (43,000 Btu per gallon) of 190 proof ethanol. This is 2,408 Kcal per liter (36,210 Btu per gallon) of 160 proof ethanol.

EXAMPLE FARM

An integrated biomass energy system for Midwest agriculture can be illustrated with the following example. With reference to Figure 1, assume a farm with 162 hectares (400 ac) of corn that produces $9 \text{ m}^3/\text{ha}$ (120 bu/ac). It would require 54,380 l (14,360 gal) of 160-proof alcohol for use in a tractor, combine, and truck to accomplish the farming operations.

The corn produced is
 $120 \text{ bu/ac} \times 400 \text{ ac} = 48,000 \text{ bu}$

The amount of 160-proof alcohol required as fuel to produce the corn crop is
 $35.9 \text{ gal/ac} \times 400 \text{ ac} = 14,360 \text{ gal of 160-proof alcohol}$

Assume the alcohol plant produces the equivalent of 2.4 gal/bu of 200-proof as 160-proof alcohol. This will be
 $2.4 \times 200/100 = 3 \text{ gal/bu}$

of 160-proof.

Amount of corn required is
 $14,360 \text{ gal} \div 3 \text{ gal/bu} = 4,790 \text{ bu corn}$

This is 10% of the corn crop.

Assume the alcohol plant runs 24 hr/day for 300 days/yr. Then capacity of the alcohol plant is

$$\frac{14,360 \text{ gal}}{300 \text{ days}} \times \frac{\text{day}}{24 \text{ hr}} = 1.99 \text{ gal/hr,}$$

say 2 gal/hr of 160-proof.

Process heat required to operate the alcohol plant is
 $\frac{36,210 \text{ Btu}}{\text{gal of 160-proof}} \times \frac{14,360 \text{ gal}}{\text{yr}} = 520 \times 10^6 \text{ Btu/yr}$

To operate 300 days/yr, this is $1.73 \times 10^6 \text{ Btu/day}$ or 72,000 Btu/hr.

There will be a by-product of surplus whole stillage, assuming 50% stillage set back for succeeding fermentations, of 14 gal/bu at 88% moisture content, wet basis.

Surplus stillage for our example farm will be
 $\frac{14 \text{ gal}}{\text{bu}} \times \frac{4,790 \text{ bu}}{\text{yr}} = 67,060 \text{ gal/yr.}$

This will be 224 gal/day for the 300 day/year operation.

To supply supplemental protein in beef cattle rations, the cattle can utilize whole stillage at the rate of about 10 gal/hd-day (Berger, 1980). This would require

$$\frac{224 \text{ gal}}{\text{day}} \times \frac{\text{hd-day}}{10 \text{ gal}} = 22 \text{ animals.}$$

However at 5,342.8 kcal/m³ (600 Btu/cu ft) of biogas, a total of 865,000 cu ft of biogas or 2,880 cu ft/day will be needed. With reference to Table 5 for a biogas plant, beef cattle required to produce enough manure for the biogas are

$$\frac{1.73 \times 10^6 \text{ Btu}}{\text{day}} \times \frac{\text{hd-day}}{11,443 \text{ Btu}} = 150 \text{ animals.}$$

This is considerably more animals than the 22 needed to consume the stillage.

Sludge from the biogas plant that utilizes manure from 150 feedlot beef cattle at 364 kg (800 lb) average weight for 300 days/yr will have annual fertilizer values of 5,129 kg (11,284 lb) nitrogen (N), 1,969 kg (4,331 lb) phosphorus (P) and 4,303 kg (9,466 lb) potassium (K), Table 7. This assumes no losses of fertilizer in the digester and normal losses due to handling and storage thereafter (MWPS 1976). Based on needing 166 kg/ha (148 lb/ac) of N 32 kg/ha (29 lb/ac) of P and 160 kg/ha (142 lb/ac) of K for an annual corn yield of 9.01 m³/ha (120 bu/ac), the sludge can be used to fertilize 30 (76), 62 (154) or 27 hectares (66 acres), respectively, depending upon the decision to satisfy nitrogen, potassium or phosphorous requirements of the corn crop.

There are various alternatives for the system. For instance, many feedlot operators prefer to feed only stillage solids from a liquids/solids separator instead of whole stillage. If only stillage solids go to the feedlot the thin stillage (raw wastewater) can go to the biogas plant to help produce process fuel for alcohol production, thus reducing the number of livestock needed.

Table 8 gives the characteristics of thin stillage (Stover and Gomathinayagam, 1982). A conservative estimate of methane production from thin stillage is 0.5 l CH₄/g VS added (Doller, 1980). This is about 1,200 Btu/gal of thin stillage fed into the digester.

The energy content of biogas from thin stillage would be

$$\frac{1200 \text{ Btu}}{\text{gal}} \times \frac{200 \text{ gal}}{\text{day}} = \frac{240,000 \text{ Btu}}{\text{day}}$$

This is 14% of that required to operate the alcohol plant. Thus the number of animals could be reduced by this amount or more if there were less than 50% set back of the stillage.

BIOGAS PLANT

The anaerobic digester on the University of Illinois swine research farm is a component of the integrated farm energy system even though it is located on a swine farm. The farm has a capacity equivalent to a farrow-to-finish operation marketing 3,000 pigs per year. The swine farm is a totally enclosed, modern confinement unit with partially slotted floors. The manure produced from the animals is scraped from under the slats several times each day to a central sump before being pumped to the anaerobic digester.

This system was built to provide an operational biogas production unit, as well as a research unit that can be used to demonstrate the technology of methane generation and utilization. Since the unit is readily accessible, it will also provide a unique opportunity for demonstrating the concept of methane generation from a biomass to students, agricultural extension workers, consultants, and farmers. A description of the plant was described by Fedler (1983), a summary follows.

The anaerobic digester unit is a horizontal tank 16 ft. diameter and 90 ft. long (14.9 m x 27.4 m) is composed of four compartments: the main reactor, gas storage, gas processing, and sludge storage (see Figure 2). The four compartments are divided by 12-inch-thick concrete walls. A separate tank is also provided for mixing, processing, and preheating the incoming manure. The tanks were fabricated on-site from rolled 0.040-inch-thick galvanized steel. The interiors and exteriors of the tanks were insulated with spray-on polyurethane and then sealed on the inside with a spray-on rubber lining. The remainder of the unit not buried in the ground was mounded over with earth to provide additional insulation except that part of the south side has a solar collector to help in preheating incoming manure (see Figure 3).

The manure from the buildings' sump is pumped to the mixing and processing tank adjacent to the main tank. As the manure enters the mix tank, it passes through a classifier, which removes grit and any other heavy materials as well as any scum produced. When the classifier section fills with grit and other solids, the material can be removed by using a vacuum slurry wagon. Also within the mix tank, the manure slurry can be diluted to approximately 8 to 10 solids when necessary. The manure is heated to the proper temperature, either 35 C (mesophilic) or 55 C (thermophilic), through the use of a hot water jacket at the perimeter of the mix tank.

As soon as the influent slurry reaches the preset temperature, it is agitated and then transferred to the reactor tank. When operating in the mesophilic mode, the hydraulic retention time of the slurry in the reactor is approximately 20 days. When operating in the thermophilic mode, the retention time will be approximately 10 days. Some mixing of the reactor contents is required to maintain the highest efficiencies. The slurry in the reactor is mixed by gas agitation using the biogas that is stored in the gas storage tank. Since the stored gas is under pressure, a 3-way electric valve is used to provide alternate mixing of the reactor and sludge storage tanks.

After the slurry goes through its fermentation in the reactor, it flows by gravity to the sludge storage tank that has a 5-day capacity. The added time for fermentation will allow for more methane production at a minimum of expense. The contents of the sludge storage tank is not heated but is agitated with the gas from the gas storage tank, as in the reactor tank. At present, the digested slurry will be stored in an anaerobic lagoon located next to the digester. Provisions have been made to connect a vacuum slurry wagon to the effluent pipe so that field application studies can be conducted with the effluent.

The biogas produced from the fermentation process is collected simultaneously at the top of the reactor and sludge storage tanks. It then goes through a scrubbing process that strips the biogas of the carbon dioxide (CO₂) and hydrogen sulfide (H₂S), leaving behind primarily methane (CH₄) gas. Various methods of scrubbing will be tested. After the biogas has been stripped of

the CO_2 , it is stored in the gas storage tank. This tank has the storage capacity of approximately 3 days of gas production at full loading in the mesophilic mode of operation. A gas flare-off is provided to prevent any problems of a pressure buildup in the gas storage tank if more gas is produced than is being used.

Construction of the digester was completed in November, 1983. Loading with manure and monitoring of performance began in the winter of 1983-84. The digester is expected to produce about 100m^3 ($3,300\text{ft}^3$) of methane per day under present conditions.

ALCOHOL PLANT

A farm-scale alcohol plant was designed and is being tested at the University of Illinois Agricultural Engineering laboratory. The unit employs three unique features: an efficient cooking method, triple distillation and micro-processor controls. Corn is fed into an extruder which cooks with mechanical friction, rather than conventional heat, and emerges in the form of corn chips. The corn chips, used as feedstock, increase yields in the saccharification and fermentation stages and they can be stockpiled for use in the fermentation stage.

A three-phase distillation unit, intermediate between the classic ideal system and a pot still, has been developed and is undergoing operational testing and refinements. The unit has three pot stills with packed columns in series. Alcohol is distilled and removed in each of the three phases as beer is transferred between the distillation vessels, figure 4. Distillation energy is provided by steam traveling counterflow to the beer. The unit is sized to produce 95 liters of alcohol per day (25 gal/day). Plans of an alternate design are given by Hall and Andrew (1981) for a farm alcohol fuel plant.

The distillation research at the University of Illinois was described by Steinberg et al. (1983) and is summarized as follows. Heat and mass balances were used to calculate a theoretical distillation energy requirement under various operating conditions of feed rate, product rate, and alcohol concentration. Actual energy input was measured as the power input to the electric resistance heater used to produce low pressure steam in a separate vessel.

The distillation unit performed as desired; it was operated continuously on actual beer made from extruded corn for several days at a time with no problems. The remaining question was energy efficiency under varying operating conditions. Theoretical energy increased linearly with feed concentration between 110 Kcal/kg feed at 6.5% alcohol to 135 at 10.5%; it also increased linearly with the ratio of feed to product alcohol concentrations. When the stillage concentration was reduced to 0.5% alcohol, the energy efficiency increased linearly from 45% at a feed-to-product concentration ratio of 7 to 55% at a ratio of 12. Higher energy efficiencies were obtained when the stillage concentration was allowed to go higher, e.g. 70% efficiency at 1% alcohol.

The distillation system primary water flow control is currently under study for microprocessor control. The microprocessor will adjust the water flow according to temperature received from the system. Once this is achieved, other controls will be put into the microprocessor program.

Now what does all this have to do with developing countries? I'll ask before you do. It's just in recent years we have a new project through the College of Agriculture's Office of International Agriculture in what's called the USAID Title XII Strengthening Project. Our part of that is an element called "Engineering Technology." There are several other elements, including rural development and many other things, but ours is energy technology development. The same laboratory, and many of the same people, are working on both projects. There is a natural technological transfer.

The title of our project is, "Microbuilt Conversion of Biomass in the Fuel, Feed, and Fertilizer for Developing Countries." We're presently working with two countries, Egypt and Kenya. In Egypt we are working with the fermentation of crop residues. That's the fibrous material of the crops, not the grain. For Illinois, that would be the sharp corn cobs and corn stalks. In Egypt it would be sugar, grass, but mostly the residue from sugarcane. That project is intended to break down the legume to make the cellulose that's available for an animal feed using special fungi. It's a form of mushroom.

In Kenya we have a biogas-from-biomass effort with Kenya Farm Service Centers Project. The Farm Service Center is a training and development community like the International Farming Services Inc. where you have a network of farm service centers that has the training, financing, and the ability to construct and repair things. The Centers also have the structure to produce feed, fuel, and food at the local level using locally trained people to do the repairs and financing in the local community.

Next Tuesday I'm leaving on a fact-finding mission to Egypt and Kenya in conjunction with this project. Thank you.

TABLE 1. Energy Inputs For Ethanol Production From Corn.
(Rodda, 1980)

Operation	Commercial		Farm	
	kcal/m ³	Btu/bushel	kcal/m ³	Btu/bushel
Corn Production	1,007,631	130,000	1,007,631	130,000 ^a
Cook and Convert	298,421	36,000	b	b
Germ Recovery	41,447	5,000	-	-
Distilling	588,553	71,000	b	b
Gluten Recovery	54,711	6,600	-	-
Feed Recovery (drying)	875,368	105,600	c	c
Electrical	78,750	9,500	78,750	9,500 ^d
Total	2,688,276	324,300	1,156,381	139,500

- a) Computed from Ludley et al. (1977).
 b) Methane produced from animal wastes.
 c) Residual grains fed without drying.

TABLE 2. Estimates Based On 1 Hectare (1 Acre) Of Corn
Yield Converted To Ethanol.
(Day and Chen, 1983)

Energy required for ethanol production	8.8 x 10 ⁶ kcal	14.1 x 10 ⁶ Btu
Volume of biogas required	1,646 m ³	23,537 cu. ft.
Number of animals required for biogas ^a	10.9 head @ 364 kg	4.4 head @ 800 lb.
Number of cattle required for wet stillage ^b	0.69 head	0.28 head
Fertilizer value of sludge		
N	371 kg	331 lb
P	143 kg	127 lb
K	312 kg	278 lb
Land area that can be fertilized with sludge		
N requirement	2.2 hectares	2.2 acres
P "	4.5 hectares	4.5 acres
K "	2 hectares	2 acres

- a) Calculated according to assumptions in Table 6.
 b) 50% stillage set back for succeeding fermentation.

TABLE 3. Potential Ethanol And Wet Stillage Production From Corn, Entire Crop Converted.
(Day and Chen, 1983)

Farm Size		Annual Yield		Alcohol Production						Wet Stillage ^d	
ha	acre	m ³ /ha	bu./acre	200 Proof		190 Proof ^b		160 Proof ^c		m ³	gallon
				liter	gallon ^a	liter	gallon	liter	gallon		
121	300	6.01	80	236,496	62,400	237,193	62,584	295,620	78,000	1,276.8	336,000
		7.51	100	295,620	78,000	311,178	82,105	369,525	97,500	1,596	420,000
		9.01	120	354,744	93,600	373,414	98,526	443,430	117,000	1,915.2	504,000
162	400	6.01	80	315,328	83,200	331,924	87,579	394,160	104,000	1,702.4	448,000
		7.51	100	394,160	104,000	414,906	109,474	492,700	130,000	2,128	560,000
		9.01	120	472,992	124,800	518,631	136,842	591,240	156,000	2,553.6	672,000
202	500	6.01	80	394,160	104,000	414,906	109,474	492,700	130,000	2,128	560,000
		7.51	100	492,700	130,000	518,631	136,842	615,875	162,500	2,660	700,000
		9.01	120	591,240	156,000	622,356	164,210	739,050	195,000	3,192	840,000

a) Based on 327.4 liters of anhydrous alcohol per m³ of corn (2.6 gallons/bu.)

b) & c) Calculated from 200 proof as if water is added. For example: vol. (190 proof) = 20/19 vol. (200 proof)

d) Total stillage, based on 1,745.4 liters per m³ of corn (14 gallons/bu.) at 12% solid.

TABLE 4. Volumetric Values of Fuel Alcohols.
(USDA, 1980)

Proof	Energy Content		Thermal efficiency relative to		Volumetric value relative to	
	kcal/liter	Btu/gal.	gasoline	No. 2 diesel	gasoline	No. 2 diesel
200	5,063	76,152	103	100	.67	.55
190	4,810	72,344	94	100	.58	.52
160	4,051	60,921	86	100	.45	.44

TABLE 5. Ethanol Production Expressed In Terms Of
Equivalents of Gasoline Or Diesel.
(Day and Chen, 1983)

Farm Size (ha)	Annual Yield (m ³ /ha)	Gasoline		Diesel	
		liter	gallon	liter	gallon
121	6.01	133,029	35,100	130,073	34,320
	7.51	166,286	43,875	162,591	42,900
	9.01	199,543	52,650	195,109	51,480
162	6.01	177,372	46,800	173,430	45,760
	7.51	221,715	58,500	216,788	57,200
	9.01	266,058	70,200	260,146	68,640
202	6.01	221,715	58,500	216,788	57,200
	7.51	277,144	73,125	270,985	71,500
	9.01	332,573	87,750	325,182	85,800

TABLE 6. Assumptions Used For Biogas Plant.
(NCCR-99, 1975)

Animal	Cattle	Swine
Animal weight	364 kg beef	27.3 kg
Dilution *(Manure: manure + water)	1:1.32	1:2.9
Hydraulic retention time*	12.5 days	12.5 days
Loading rate*	5.9 kg VS/day m ³	2 kg VS/day m ³
Fraction of VS destroyed*	.45	.5
Estimated biogas production*	1.86 m ³ /1,000 kg animal	1.79 m ³ /day 1,000 kg
Heat content of biogas	5,340 kcal/m ³	
Period	300 days/year	300 days/year
Heat requirement to operate plant	1/4 of biogas produced	1/4 of biogas

TABLE 7. Land Area To Be Fertilized By Digester Sludge,
Conversion To Enough Alcohol For Farming Operations.
(Day and Chen, 1983)

	Farm Size (ha)	Fertilizer Value (kg)			Land to be Fertilized (ha)		
		N	P	K	N	P	K
Cattle	121	3,076	1,181	2,581	18.5	37.3	16.1
	162	4,102	1,574	3,441	24.7	49.8	21.5
	202	5,161	1,981	4,330	31	62.6	27
Swine	121	4,248	1,673	3,383	25.6	52.9	21.1
	162	5,661	2,230	4,509	34.1	70.5	28.1
	202	7,075	2,787	5,635	42.6	88.1	35.1

TABLE 8. Raw Wastewater (Thin Stillage) Characteristics.
(Stover and Gomathinayagm, 1982)

Parameter*	Corn Feedstock		Milo Feedstock	
	Mean	Standard Deviation	Mean	Standard Deviation
TS	32,200	9,300	42,800	2,150
TDS	18,600	7,100	20,400	6,800
SS	11,800	3,700	22,500	5,100
VSS	11,300	3,500	19,500	2,600
Total COD	64,500	12,600	75,700	12,100
Soluble COD	30,800	6,200	40,700	9,100
Total BOD ₅	26,900	300	34,900	2,000
Soluble BOD ₅	19,000	2,100	21,700	1,360
Soluble TOC	9,850	2,200	14,900	2,600
Total P	1,170	100	1,280	100
Soluble P	1,065	75	1,075	150
Total TKN	755	115	--	--
Soluble TKN	480	95	--	--
Soluble NH ₃ -N	130	60	--	--
Total Protein	4,590	650	--	--
Soluble Protein	2,230	780	--	--
Total Carbohydrate	8,250	750	--	--
Soluble Carbohydrate	2,250	550	--	--
Soluble Glucose	< 750	--	--	--
pH (range)	3.3-4.0	--	3.5-4.0	--

*All units in mg/l except pH.

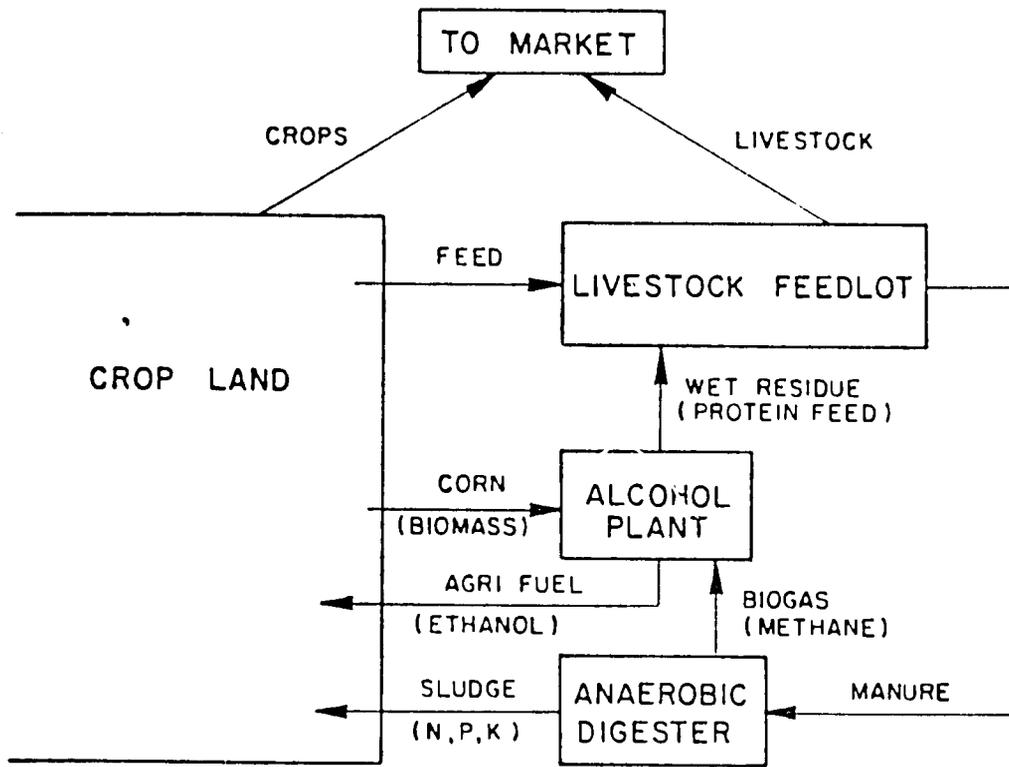


FIGURE 1. Flow scheme of integrated farm fuel system.

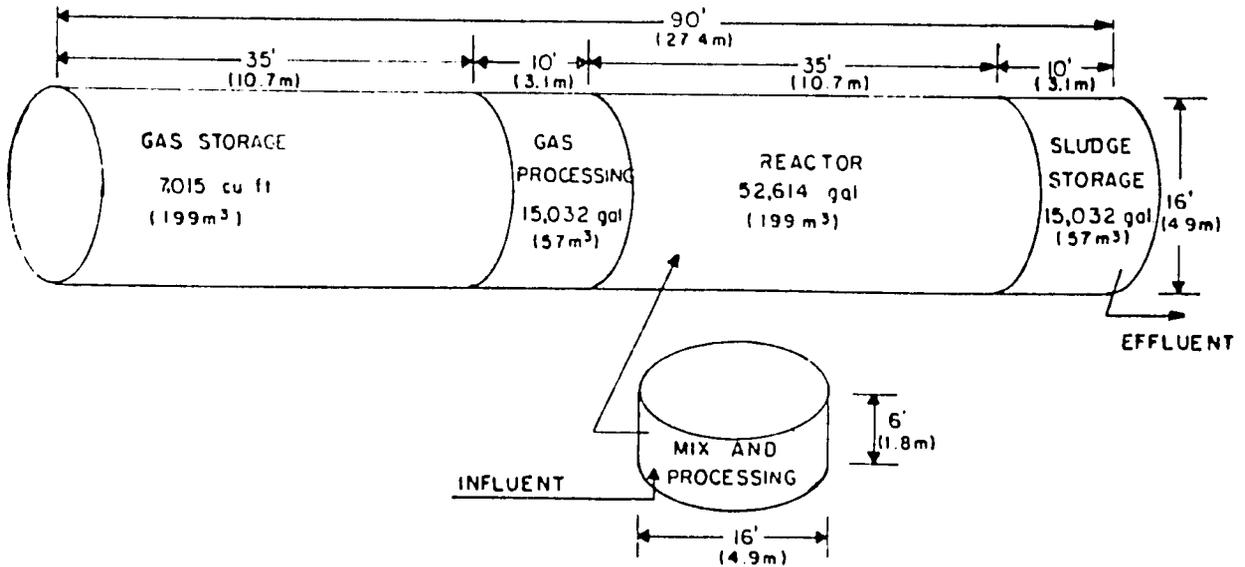


FIGURE 2. Schematic diagram of the anaerobic digester constructed by Energy Resource Systems. (Fedler, 1983)

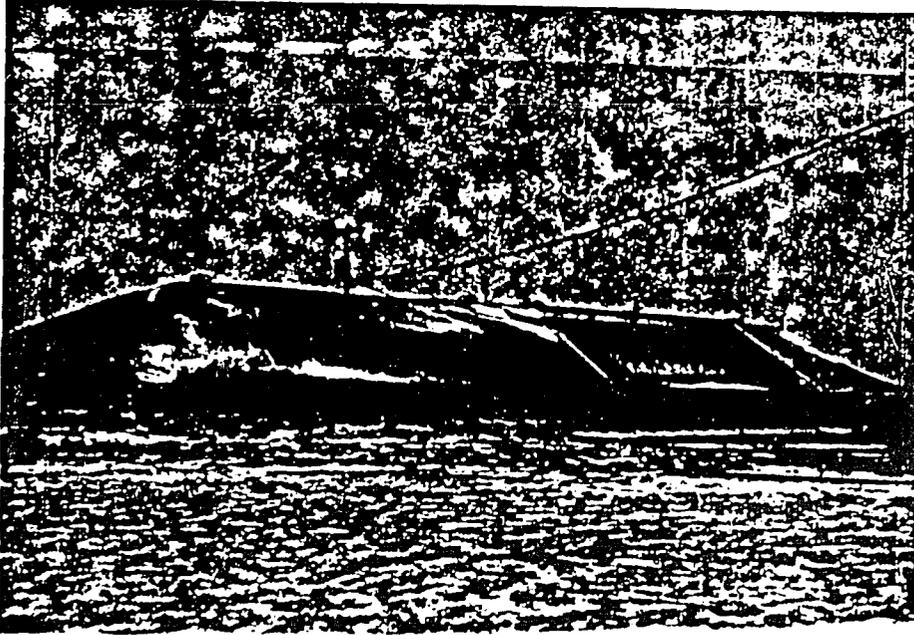


FIGURE 3. Photograph of anaerobic digester.

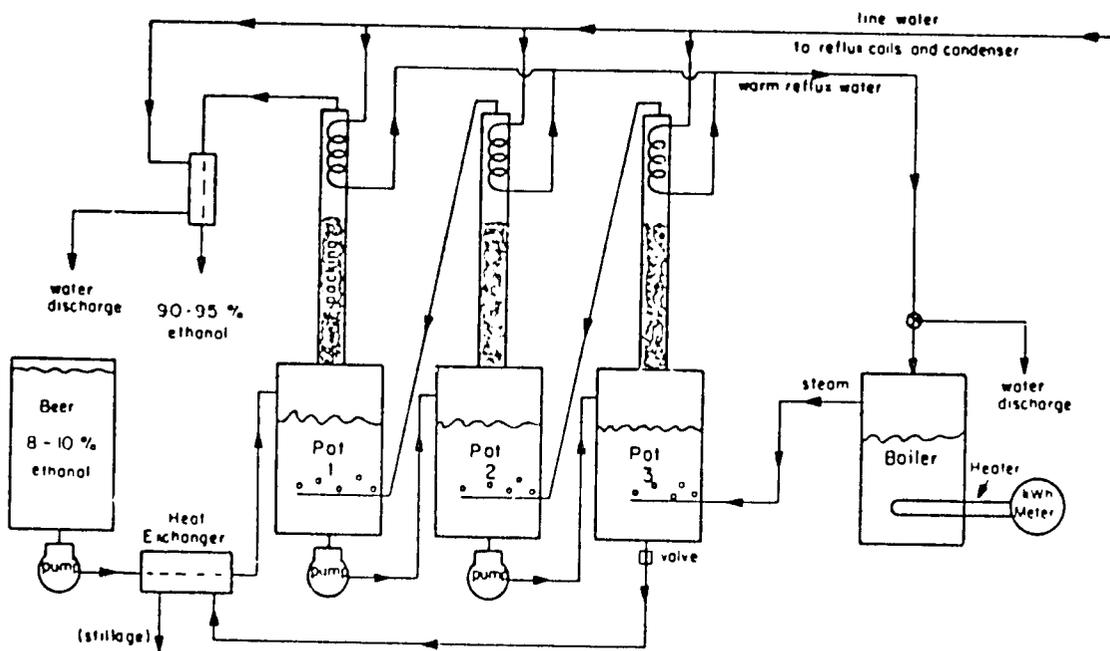


FIGURE 4. Schematic of triple effect alcohol still.

ACKNOWLEDGMENTS

This paper is based on a study conducted under project No. 1-5-39064 of the Illinois Agricultural Experiment Station, College of Agriculture, University of Illinois at Urbana-Champaign entitled, "An Integrated Biomass Energy System for Illinois Agriculture." It is supported in part by a grant from the Illinois Department of Energy and Natural Resources.

REFERENCES

1. Berger, Larry L. 1980. Nutritional value of distillers feeds for livestock. Paper presented at Alcohol Day Symposium, Animal Science Department, Univ. of Illinois, Urbana, Illinois.
2. Day, D. L., and T. H. Chen. 1983. Feedlot biogas as process fuel for farm alcohol plants. Proc., International Symp. on Biogas, Microalgae and Livestock Wastes, Sept. 15-17, 1980, Taipei, Taiwan. In: Animal Waste Treatment and Utilization, Ed. by Chung Po. Council for Agri. Planning and Development, R.O.C., p. 249-258.
3. Doller, J. D. 1982. The biological conversion of corn distillery wastewater to methane. M.S. Degree Thesis, Sanitary Engr., Univ. Ill., Urbana, IL.
4. Faidley, et al. 1977. ASAE Paper No. 77-5528. American Society of Agricultural Engineers, St. Joseph, Michigan.
5. Fedler, C. B. 1983. The anaerobic digester on the swine research farm at the University of Illinois. Proc., Livestock Waste Management Conf., Mar. 22-23, Champaign, IL. Agri. Engr. Dept., Univ. of Ill., Urbana, IL. p. 42-47.
6. Hall, M. D. and F. W. Andrew. 1981. Farm alcohol fuel plant. Proc., Alcohol and Vegetable Oil as Alternative Fuels. USDA-SEA Extension, Washington D.C. p. 209-215.
7. MWPS. 1976. Livestock waste facilities handbook. Midwest Plan Service, MWPS-18. Univ. of Illinois, Urbana, Illinois.
8. NCCR-93. 1975. Livestock waste management with pollution control. North Central Regional Research Publication 222, MWPS-19. Iowa State University, Ames, Iowa.
9. Rodda, Errol D. 1980. An integrated alcohol energy system. Paper presented at the 73rd meeting of the Amer. Institute of Chemical Engineers, Nov. 1980, Chicago. Agricultural Engineering Department, University of Illinois, Urbana, Illinois.
10. Rodda, E. D., and M. P. Steinberg. 1981. Energy analysis of an agricultural alcohol fuel system. Proc., Third International Conf. on Energy Use Management, Oct. 26-30, W. Berlin, Germany. In: Beyond the Energy Crisis, Ed. by Fazzolare, R. A. and C. B. Smith, Pergamon Press. p. 1807-1814.
11. Steinberg, M. P., I. Bilgory, and E. D. Rodda. 1983. Triple effect distillation of beer containing particulates. Paper 83-3569, Amer. Soc. Agri. Engr., Winter Meeting, Dec. 13-16, Chicago, IL. Agri. Engr. Dept., Univ. Ill., Urbana, IL.

12. Stover, E. L., and G. Gomathinayagam. 1982. Biological treatment of synthetic fuel (alcohol production) wastewater. Paper, Water Pollution Control in Synfuels Production Session, 55th Annual Water Pollution Control Federation Conf., Oct. 3-8, St. Louis, MO. Civil Engr., Okla. State Univ., Stillwater, OK.
13. Torgerson, David, and Harold Cooper. 1980. Energy and U.S. Agriculture: 1974 and 1978. USDA Statistical Bulletin NO. 632.
14. USDA. 1980. Small-scale fuel alcohol production. United States Department of Agriculture, Washington, D.C. March.

Lloyd E. Reeser: Our third panel member, Professor Everett Hatfield, is president of Creative Agricultural Management, Inc. that provides nutritional, procurement, and managerial services to the livestock industry with special emphasis on the use of renewable resources and environmental enhancement. His topic is, "Viable Options to the Energy and Food Dilemma."

Everett Hatfield
Professor of Animal Science Emeritus
University of Illinois at Urbana-Champaign

Thank you, Lloyd. I'll probably be repeating several things that were mentioned earlier yesterday and that were mentioned this morning also. This presentation was prepared before I attended the conference, but it will provide a different approach and will come to some conclusions that I think might be useful. In order to save time I'll cover the summaries.

While many of the affluent countries are adjusting to inconveniences caused by the recent energy crisis, the current population explosion is placing the world on the brink of a potentially serious food crisis of a major magnitude. Famine already threatens millions of people in many nations. It is unfortunate that the countries with the greatest population increases also have the greatest technology and food deficits.

A recent article in Time magazine (August 6, 1984) reports some sobering news from the International Conference on Population held in Mexico City. Although the world population annual growth rate has declined to 1.7%, by the year 2025 the world population will be 8.3 billion, doubling the present population. "Of that total, 7 billion (over 80%) will be residents of the undercapitalized, undernourished Third World." Former World Bank President, Robert McNamara, points out that, with the exception of China which established a birth control program with financial rewards and penalties to encourage one-child families, many of the problem areas have high fertility rates. Examples include Kenya where the average number of children born to a woman is now 8; some of the highest over 6.5; many with over 4 children per family. By comparison, Soviet women have an average of 2.4 children, American women have 2.8, and Western European have 1.6.

To prevent a catastrophic collapse of the world's political, social, and economic structure, food supplies must keep pace with population growth.

Most of the world's desirable agricultural land is now being used for food production. However, this land resource is being gradually diminished by expansion of dwellings, cities, roads, and industrial centers.

Table 1 shows the distribution of the world's population and concentration of persons per land area. The USA and Canada represent only about 6% of the world's population.

Table 2 illustrates the ratio of land to population. The width of the bar represents a proportional part of the world's population. Asia, which has over one-half the world's population, has only about 2 hectares or less than one-half acre per person. This is similar to an earlier table which showed that if we use renewable energy resources we can get, based on a hundred bushels of corn per acre, 88 million BTUs from a total crop of corn, compared with about 5 million BTUs from a barrel of oil.

The energy dilemma haunting us at the present time was caused, in part, by permitting our addicted energy-wasting lifestyle to let us become entrapped by OPEC. It is absolutely imperative that we establish national policies for developing alternate energy sources to escape the stranglehold of OPEC. A few days ago the OPEC nations agreed to reduce oil production in order to maintain a gouging price level that threatens the world economy.

Fortunately we do have the necessary technology and the engineering resources to develop a self-reliant, independent, energy-sufficient world posture. Such a national policy is not an option--but an essential course of action.

The food/population problem has precipitated some anxiety about the use of grain for the production of fuel. These concerns, based on traditional evaluation of resource uses, have raised some legitimate questions. We cannot promote and sustain a program to produce a fuel which is a negative energy system. Even if the tax credits and tax incentives make it appear to be profitable--it cannot survive. However, as Dr. Day indicated, with modern technology and processes, ethanol production from grain substrates has a positive energy balance.

A large energy cost in a traditional system is the energy cost of drying the residue as pointed out by Dr. Day. Most engineering data show that 40-60% of the total energy costs are used for drying the residue. This expensive process can be effectively eliminated by an integrated livestock system in which the wet residue is used to feed livestock. Convincing evidence is available to demonstrate that the wet residue is as nutritious as the dried residue.

We can effectively meet the challenge of using grain for fuel, if we accept three premises:

Premise One: We must become energy independent for national survival. Although the energy balances from some obsolete gas/oil fueled distilleries are negative and unacceptable, we have developed positive energy balance systems to produce fuel from renewable resources.

Premise Two: Grain can be used for fuel and food (feed). We can have our cake and eat it too. Essentially all of the protein equivalents in the grain substrate residue remains after ethanol production. Furthermore, the quality of the protein is greatly enhanced by combining the amino acids of the substrate with the amino acids of the yeast. In addition, the residue contains liberal amounts of B-vitamins that are essential for metabolism.

The world population/ food problem is largely a protein problem. The starving countries, as reviewed yesterday, survive on grains such as rice, corn, sorghum grain, wheat, and so forth, with insufficient protein. Corn and other grains are deficient in the amino acids, lysine, tryptophan, and threonine. The protein quality-evaluating techniques demonstrate that the qualities of proteins can be greatly enhanced by supplementation of grain proteins with animal source protein or amino acids. In addition to improving the protein utilization by improving the balance of the essential amino acids, energy utilization is improved.

Premise Three: The use of grain substrates now will permit us to develop facilities to get into fuel production immediately while technology is being developed and refined for the use of crop residues and other renewable organic materials for future ethanol production--thus permitting grain to become available for feed or fuel. Significant progress is being made in selecting and isolating specific enzymes and choice of degrading chemicals which will reduce cellulose and other organic materials to monosacchrides for subsequent ethanol production. Present ethanol facilities are being constructed in modular units, which will permit the addition of presubstrate units for the physical, chemical, and/or enzymatic treatment of crop residues and other organic materials with minimum time and capital investment.

Extrapolation of the forecast of population growth patterns, particularly in areas with meager resources, predicts alarming consequences unless remedial programs are initiated soon. Although some countries have proclaimed national policies counseling reduced birth rates, which appear to be more rhetoric than fact, the burden of correcting the population/food dilemma appears to rest on the countries with the developed sciences and technical skills for mass production, processing, and distribution of food. The industrialized nations must provide leadership and technology. To stimulate and initiate successful programs in different societies (some of which have groups stagnated by tradition, biases and/or habit) will require critical masses of ideas, technology and financing in addition to political consensus in support of these programs.

Whenever the competition for grains between man and animal reaches a high level of intensity, grains will be used as human food, not animal feed. The animals which will survive this competitive environment will be those which do not compete directly with man and can use non-feed energy and protein sources and that's the ruminants--cattle, sheep, and other ruminants.

The sleeping giant which can be used to improve food availability to the human population is the Biological System of the Ruminant. This biological system has the ability to utilize solar energy trapped in the forage part of plants which has little or no food value to man but can convert it into meat, milk, fiber, and draft energy. In the USA alone this year, 40 million metric tons of grain will be used to feed cattle. Most of this grain could be diverted to food sources, and the forage part of the grain plant could be used to feed the cattle. This shift from grain to forage utilization can be accelerated by technical assistance. Chemical treatment of forages to improve their energy availability has been demonstrated. Although some technology is known, new techniques and methods for application need development.

For every unit of solar energy trapped in grains, there are many more units trapped in the forage or crop residue which produced the grain. The ruminant animal has historically enabled civilizations to survive in areas with harsh and adverse environments.

Our National Goals should include:

1. Conservation of finite resources.
2. More use of renewable energy resources.
3. Conversion of recoverable crop resources to food--directly by chemical treatments or by utilizing the biological system of animals.

Table 4 shows the distribution of products from a bushel of Number 2 corn. You can produce about 2½ gallons of ethanol. But about one half of the total mass is left as residue which contains all of the protein equivalents and, as I mentioned earlier, the protein is enhanced by the combination of the amino acids in residue with the amino acids of the yeast used in fermentation. In addition it is fortified with B-vitamins.

Table 6 shows how the nutrients are concentrated in residue which is DGS (distillers, grains, and solubles). It's about 3 times as concentrated as in the corn substrate.

Table 7 shows plants which can capture solar energy from different crops. The energy is expressed in million calories per acre, and it's expressed also in metabolizable energy, which is energy available to the animal, not gross energy. You see that the corn crop contains over 500% more energy than the soybean crop. The bar on the extreme left and the second bar show the breakdown of the energy in the grain and forage of the two crops. In addition, the corn crop will produce as much protein per acre if you consider the protein in the forage as the soybean crop including the crop residue.

Table 8: However, if you take the grain of corn, use it to produce liquid fuel, you have the DGS left showing the remaining energy per acre of DGS compared with the energy from the soybean. You lose a little of the energy compared with the soybean energy, however, as the third bar shows, if you take the crop residue energy and add back the DGS energy, you will have about 3 times as much energy as you do from the total soybean crop. Look at the protein from DGS. It's about 2/3 as much as in the soybean crop, however, if you add the protein from the residue back, you have as much protein from the DGS after the ethanol production as you do in the total crop of soybeans. This means you could take a couple of acres, an acre of corn to produce 350 gallons of ethanol, which if you put it in fuel at a 10% level would be 3500 gallons of premium gasoline and have as much energy and protein left per acre of corn to replace an acre of soybeans, it could be put into corn and you would have an acre of corn in addition.

Using the target animal to utilize these residues--it needs to be a ruminant. This is not contrary to our eating habits. The per capita consumption of different meats is indicated there and beef is at the top of the list.

One of the directors at the University of Wisconsin, Harold J. Hobson, is an agronomist and I was pleased to see what he had to say about the ruminant:

"What gives man food, fuel, leather, fertilizer, hair wool, fiber, security and recreation; does work; can live on the land on which crops cannot be grown; is a highly efficient user of solar energy; is a measure of family and tribal wealth; and has even been known to docilely stand in for man through religious sacrifice? The ruminants."

He also said, "A dog may well be man's best friend, but the ruminant must certainly be his greatest benefactor."

Table 13 is a repeat of a table that Dr. Day was using, an integrated system in which the feed processing is used for alcohol production. The residue goes to the feedlot. Some of the byproducts can be used for hydroponics and aquaculture, thus providing a total integrated system that can utilize all of the produce produced.

Although the energy/food crisis demands an urgent response there are many opportunities for solving the problems.

We need to strengthen our efforts in conserving our natural finite resources. The Soil Conservation Service has indicated that you lose about 25-30 more topsoil from soybean production than you lose in corn production. In addition, we can use available and future technology to develop techniques for capturing more direct solar energy and to maximize our use of renewable resources.

We can increase our food supply in many ways through the utilization of crop residues, selection of varieties of plants that can capture more solar energy, practice of crop-producing methods that will reduce losses from water and wind erosion, minimum tillage practices, and crop rotation. It is likely that genetic engineering by using recombinant DNA techniques will have new varieties that can produce crops that will yield many folds more than our present popular varieties.

Nature has provided man with a valuable tool to convert so many recoverable resources to food--the biological system of the ruminant. Thank you.

Lloyd E. Reeser: Thank you, Dr. Hatfield, for a very informative presentation, possibly new concepts to many of you as far as the food versus fuel issue is concerned. Dr. Hatfield has long been an advocate of nutritional improvement through alcohol produce and these kinds of integrated systems.

TABLE 1. WORLD POPULATION AND LAND AREA

WORLD'S POPULATION AND PERSONS PER HECTARE

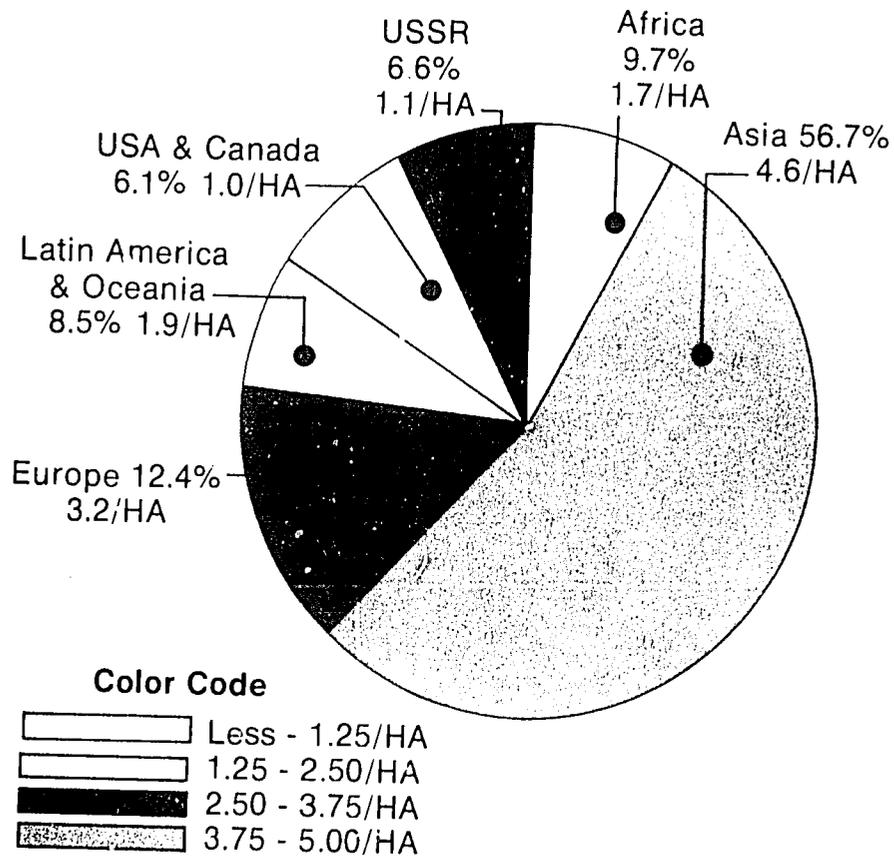


TABLE 2. LAND RATIOS

RATIOS LAND/POPULATION (Hectare/Person)

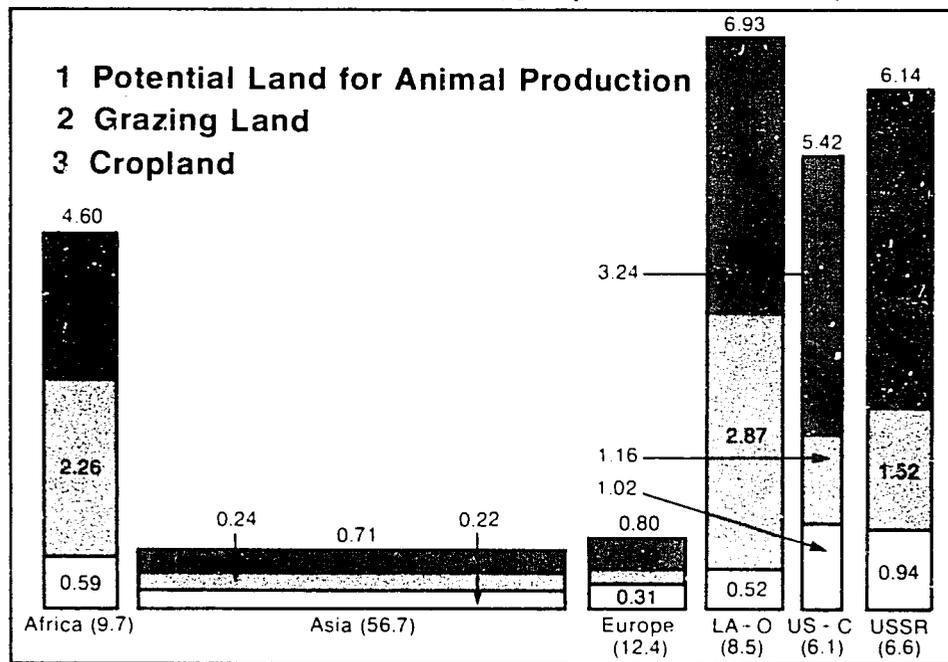
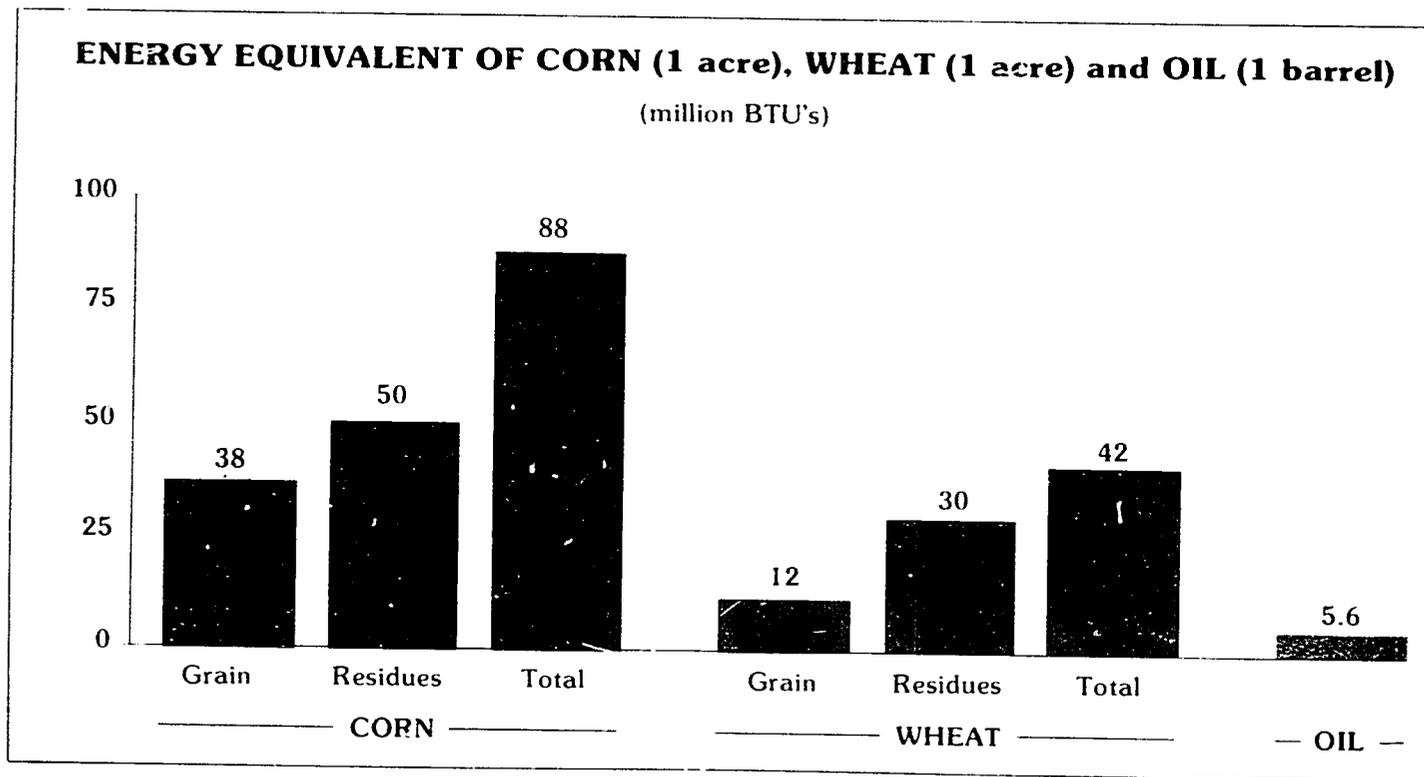


TABLE 3. ENERGY EQUIVALENTS



DWIGHT L. MILLER (NRRC) CORN ANNUAL, 1979 EDITION

TABLE 4. ETHANOL FROM CORN

Bushel of Corn	56.0 lbs	
Water	8.7	
Dry Matter	47.3	
Oil	1.5	
ETHANOL	16.5	
CO ₂	15.8	
Residue (DGS)	13.5 (4.73 lbs Protein)	35.0%
Residue with Oil	15.0 (4.73 lbs Protein)	31.5%

TABLE 5
NUTRITIONAL CONTENT

	<u>CORN</u>	<u>DGS</u>
ASH, %	2.2	5.0
FIBER, %	2.3	9.8
FAT, %	3.6	11.2
PROTEIN, %	10.0	29.2
ENERGY (MCAL/KG)	3.29	3.14
LYSINE, %	.23	.83
METHIONINE, %	0.11	.54
NIACIN, PPM	17.2	79.8
RIBOFLAVIN, PPM	1.5	10.9

71
TABLE 6. COMPARING TWO MAJOR FOOD CROPS

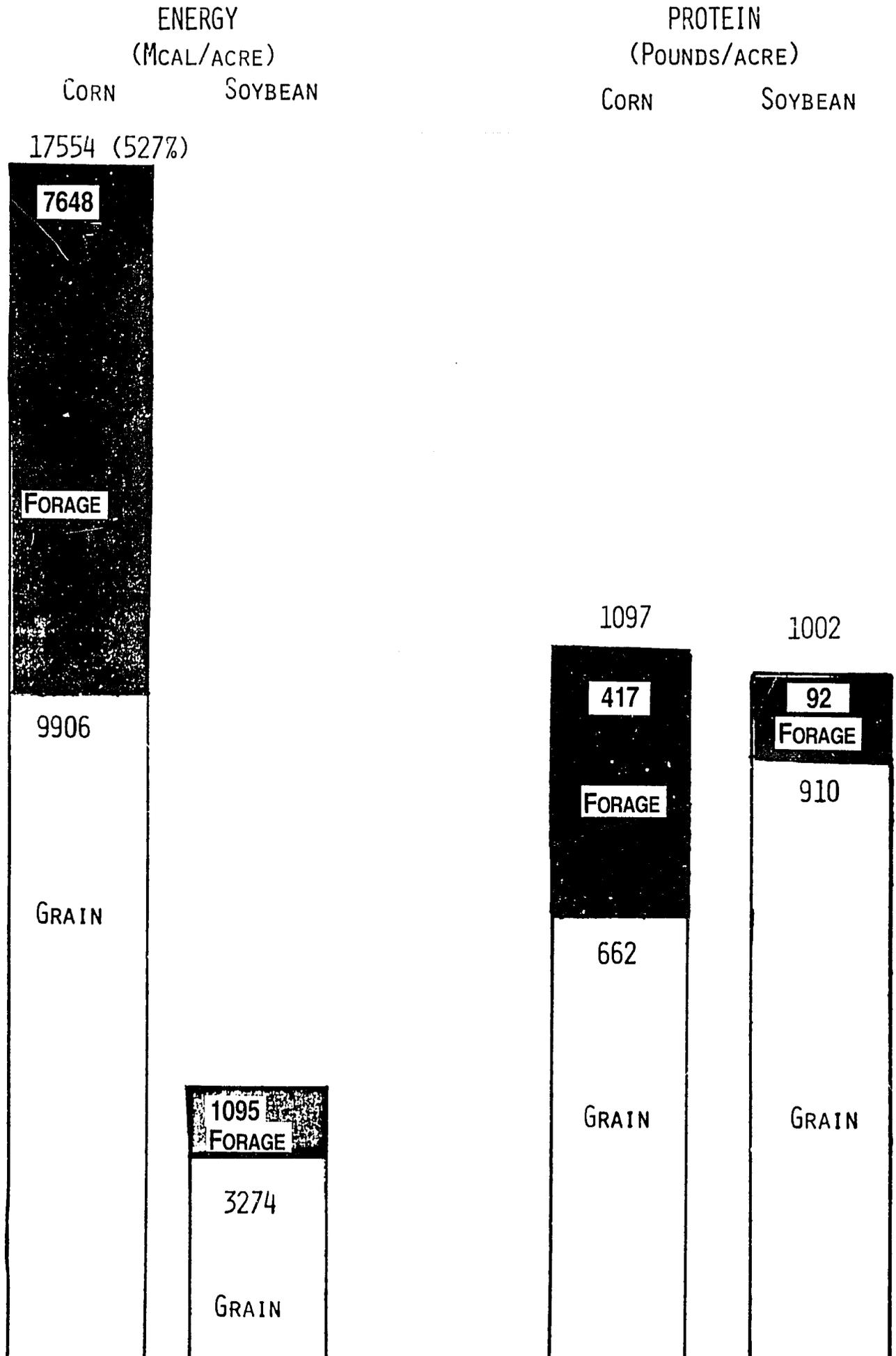


TABLE 7. ENERGY CONTENTS OF FEEDS

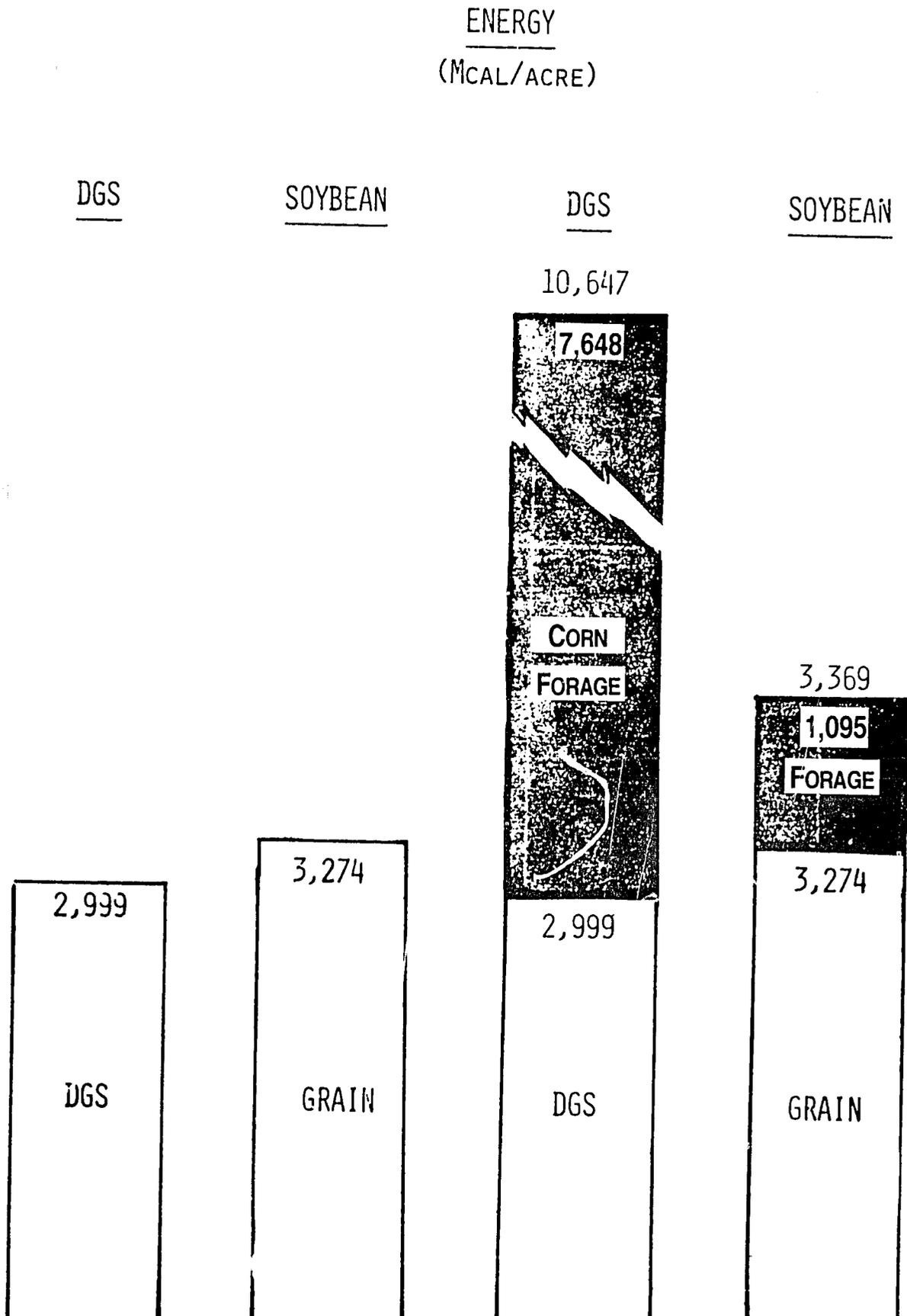


TABLE 8. PROTEIN CONTENT OF FEEDS

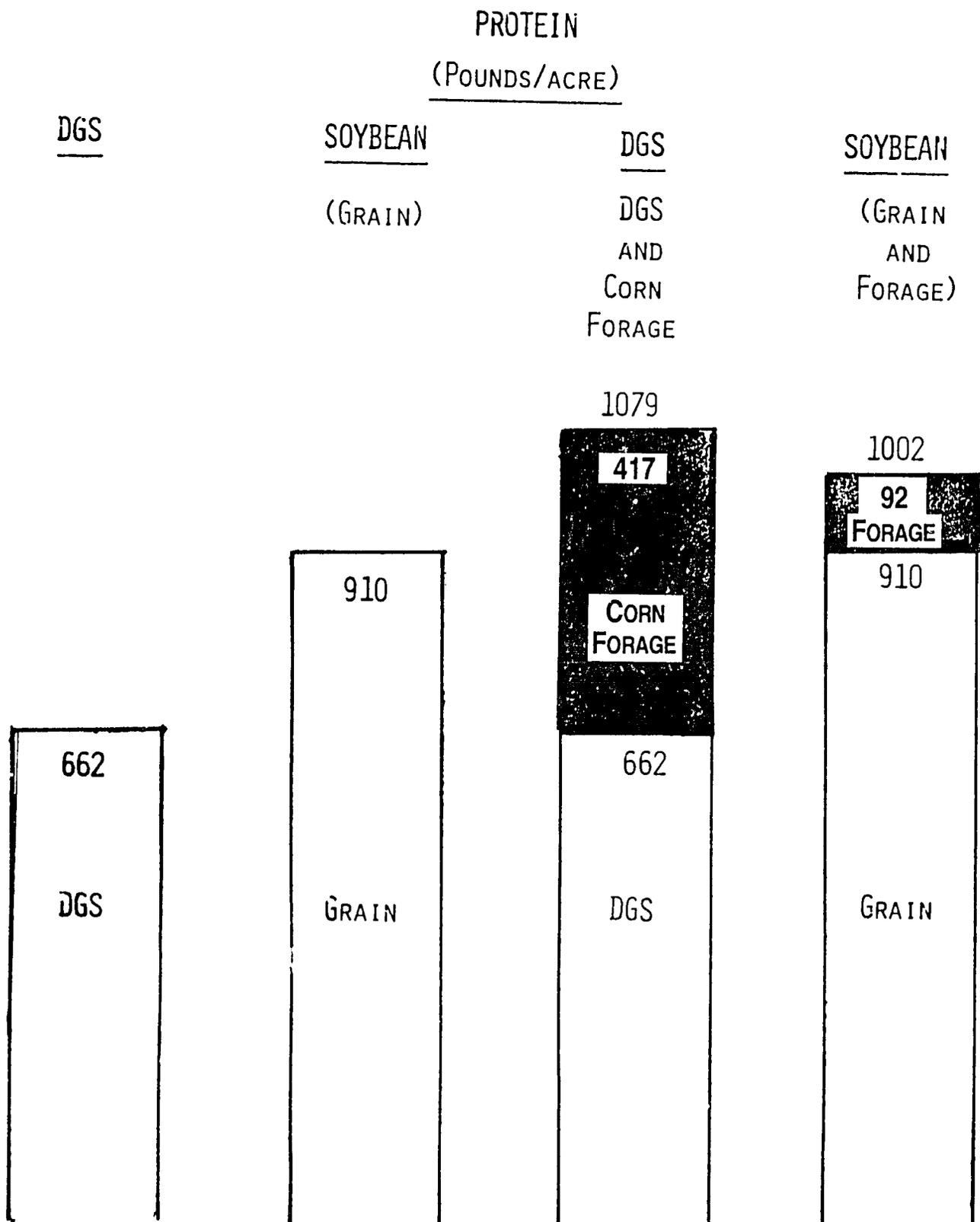
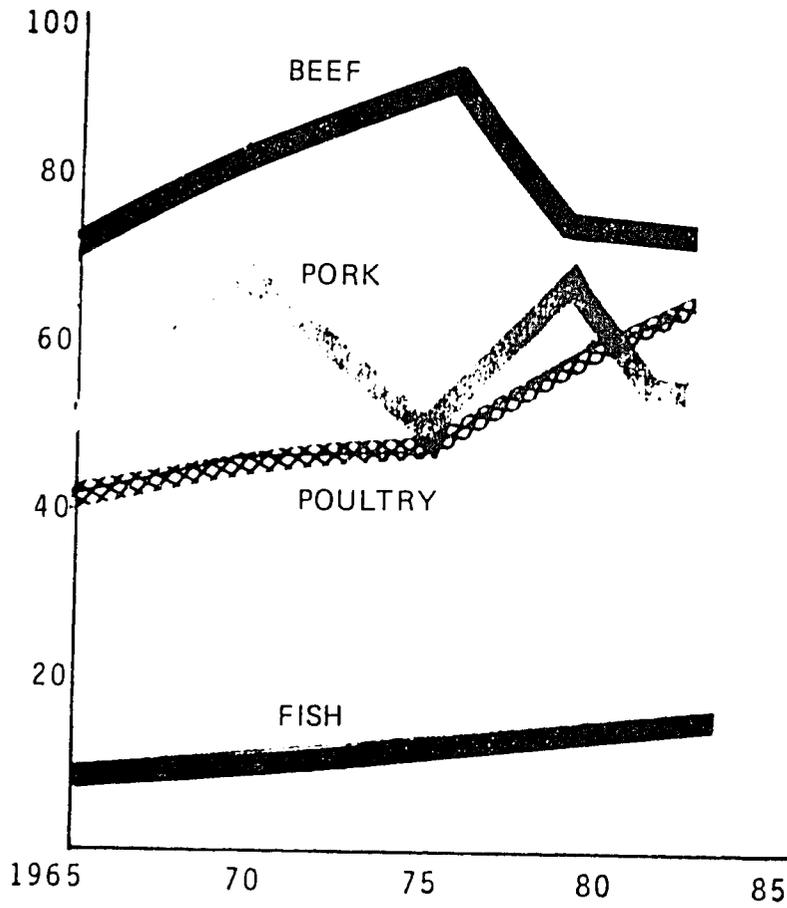


TABLE 9

PER CAPITA CONSUMPTION
POUNDS



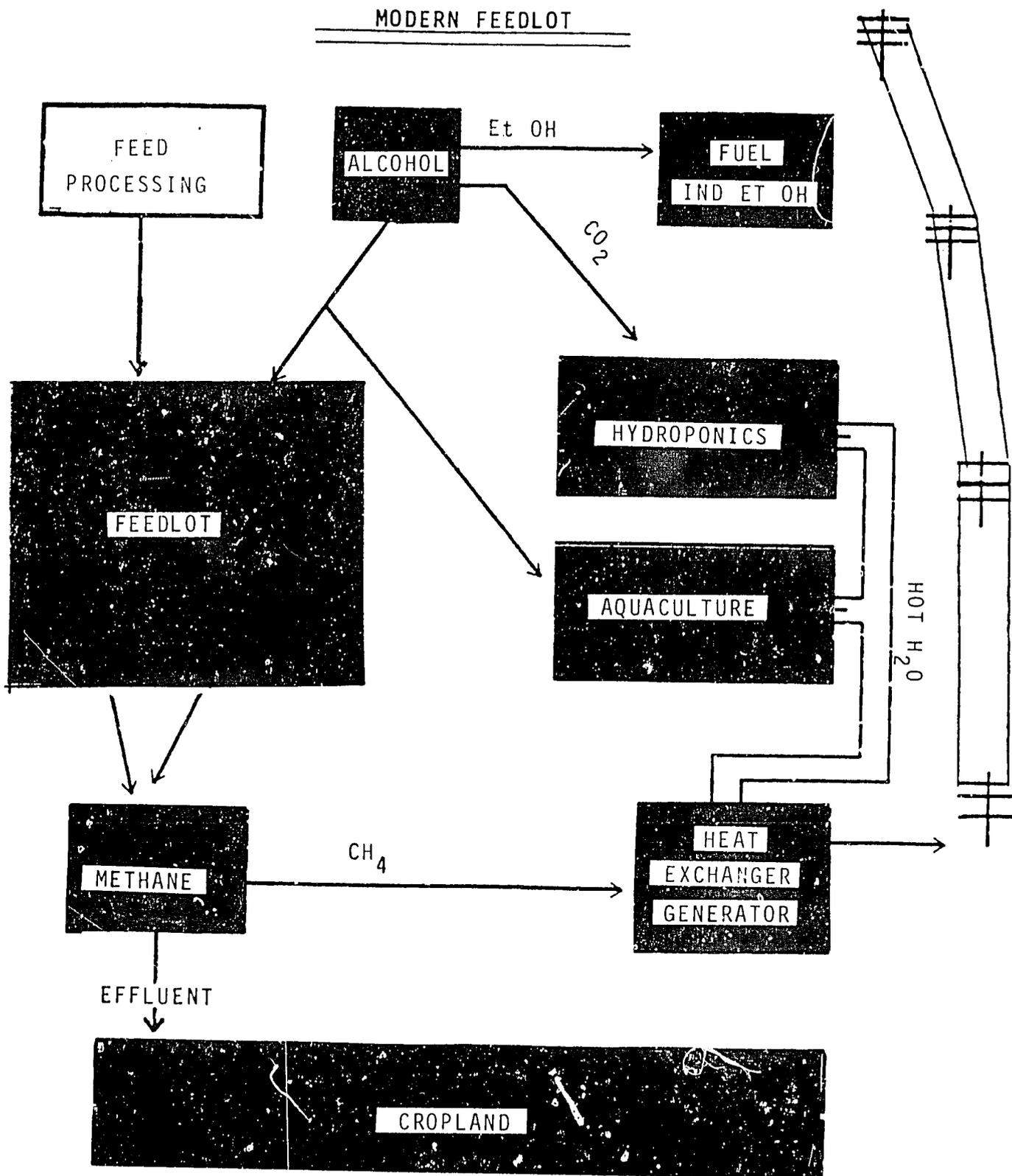
Source: USDA

TABLE 10

WHAT GIVES MAN FOOD, FUEL, LEATHER, FERTILIZER, HAIR WOOL, FIBER, SECURITY, AND RECREATION; DOES WORK; CAN LIVE ON THE LAND ON WHICH CROPS CANNOT BE GROWN; IS A HIGHLY EFFICIENT USER OF SOLAR ENERGY; IS A MEASURE OF FAMILY OR TRIBAL WEALTH; AND HAS EVEN BEEN KNOWN TO DOCILELY STAND IN FOR MAN THROUGH RELIGIOUS SACRIFICE? THE RUMINANTS, CATTLE, SHEEP, GOATS, YAKS, BUFFALOES, CAMELS, AND OTHERS, BOTH DOMESTICATED AND WILD, DO ALL THESE THINGS. THEIR ABILITY TO PRODUCE FOOD IS THEIR GREATEST CONTRIBUTION.

.....HARLOW J. HODGSON, PH.D.

TABLE 1.1.



QUESTION-ANSWER SESSION

Reeser: I think that after these presentations it becomes quite evident that if we are to work in harmony with our natural resources, our economic resources, our human resources, and technical resources, we can go a long way in resolving these hunger and energy problems that are facing not just the Third World, but the entire world.

Q: Yesterday afternoon we heard Dr. Christensen talk about the situation in Africa where a country grew enough products of its own in surplus but the government didn't have enough money to buy them, therefore, the total price eroded and the agricultural economy went to pot. Is that a situation where this technology of ethanol production and conversion of fuel into proteins would have any application?

Holmberg: Well, I don't think there's any question about the fact that we can use these energy systems, and, as Everett Hatfield pointed out, if we use them wisely and with natural processes, we don't throw anything away. We make a net gain.

In the United States in 1983, we used about 200 million bushels of corn for the production of ethanol, which was more corn than we shipped to the Soviet Union.

Q: While these integrated systems may be very efficient in the long run, there is still a certain amount of initial capital investment. How can one be sure that investments in this program will be equally available to the more wealthy and the poorer members of these developing societies?

Holmberg: Well, there's no question about the fact that there is a capital investment, but just let me give you a number I thought about while I was going to sleep last night. There's a nuclear power plant being constructed near Clinton, Illinois. It's been under construction for a long period of time. It's already cost over \$3 billion, and it will probably take another one or two before it goes on line. It's raised the cost of electricity in this general area. It hasn't produced any yet. If we took the money that went into one nuclear power plant in the United States, that is Clinton, we could put up 30,000 of these integrated farming systems throughout the developing countries and I think you could see the miracle of that impact. It takes capital, and when you talk about the poorest countries, capital has to come from the United States or other developed nations.

Q: Aren't you assuming by setting up technology of this size then that the landholdings in developing countries would be large enough to support such a plant? Shouldn't the farm be big enough to have a barn full of cattle to produce the biogas that you need to run the tractor?

Day: Yes, there definitely is economy in size. It's just a principle of industrialization. Like I tried to say, we can think small instead of just thinking big. Farmers are some of the most qualified entrepreneurs. You give them an idea and they can make it work where industry might fail on a small scale. So no, I can't tell you just what size it has to be. But yes, there should be a combining, a concentration of these byproducts to make the most available and to make the best use of them due to this economy of scale.

Reeser: In other words, a community or cooperative system could be worked out to accommodate these smaller acreages.

Holmberg: Well, even on a small scale just using the wastes from a human family and two or three pigs and chickens and so forth, you can set up a small digester to give you enough energy to take care of your own basic needs. There's literally millions of these small digesters throughout Asia. So it just doesn't require the large-scale digesters we're talking about for industrial purposes. They can also be quite small in scale.

Day: Along the line of what Bill just referred to, I'm assuming that those small digesters also get human wastes. In the health of a community this is a big factor. Digestion, this anaerobic process, kills some of the disease-causing pathogens. It's just a natural disease control method and less odor, less disease, and a more healthful situation than having these wastes exposed to the community.

Q: I was wondering how much the auto industry or the farm equipment industry are doing to develop tractors and farm equipment that will run on this type of fuel.

Day: I think some of the foreign countries are doing more than we are really. Brazil is an example. However, some of our companies are doing it in foreign countries, Ford Motor Company, for instance. It's a matter of supply and demand. As long as gasoline and diesel are available at reasonable prices, we're not going to see a push for converting engines on a large scale in our communities. But we should know how and have the technology immediately available if fuel supply is interrupted and fuel prices do increase. Prices are bound to increase because of fuel being a nonrenewable source.

Holmberg: In Brazil in 1983, 80% of the new cars manufactured run 100% on ethanol. They have made a basic decision that they're going to go that way; that they're going to shift to a renewable energy system, and they're also honest in recognizing the true cost of oil. We are a debtor nation. We have to understand that. We import more than we export. We pay \$30 for a barrel of oil and that's not the real cost. You've got to service that debt. That runs the cost up to about \$54 a barrel. If we would just be honest with ourselves, we could see that it is essential to reduce our dependence on imported oil if just for economic reasons.

Q: Bill, your illustration of making alcohol from corn was extremely good. It's good for many countries of the world, including Brazil, which has been doing it for decades on a national basis. It appears to me that we need some legislation in the United States because many U.S. farmers who live on a family farm have been trying to convert corn into alcohol and ended up in jail and the farm is taken away from them because the Bureau of Alcohol Control comes over and closes the still down. This needs some action and more than just words. If we're going to save this country, we should also be aware of the problems the government is now forcing on the farmer. He can't make alcohol.

Holmberg: Well, we've got people who are in jail because of the alcohol business, but it's not because of the Bureau of Alcohol, Tobacco, and Firearms (BATF). It's because we had a lot of shysters out there selling bad equipment. They just went down the drain financially. By and large the government, and I don't like to defend the government at all, but in this case I will, has been extremely

helpful in a variety of ways. They've cleaned up the regulations for BATF. Initially we had some problems, but they have been set aside. There's a 6¢ a gallon tax exemption at the federal level and in the State of Illinois it's 4¢. It's been very supportive. We've got to continue that support. That's the problem. But by and large the real problems we've had in the ethanol industry have been our own. We just haven't been honest enough with ourselves in developing this technology.

Day: Getting a license for a farmer to produce alcohol on his farm for fuel use has become greatly streamlined in the last few years. It is possible. There is not as much red tape as there used to be. Obviously you can't sell it. It must be used by you in engines or for fuel.

Q: Have there been any experiments on other kinds of biogas? Can we use some of the leads from other experiments?

Day: Yes, biogas largely started from the treatment of municipal sewerages, but any organic matter that can be degraded microbiologically will work. Fibrous material is very slow to degrade, such as cannery wastes, food processing wastes of that sort, and municipal wastes of that sort. However, the anaerobic digestion process is a liquid process, so it doesn't make sense to take a biomass already in a solid form and make a slurry out of it. It would be better to burn it more directly, or use gasification. Biogas is best suited for something that is already a diluted material.

Q: Is there any work being done, or are there any figures, on the recuperation period for capital investment in the development of an alcohol plant?

Holmberg: It depends on what the financial recovery period is for the development of an alcohol plant in one of these integrated systems. It's all over the map. It depends upon the location, the cost of money, the cost of the feedstock, the price of the alcohol, the marketability of the mash or the DVG. It's such a wide range that you have to be very specific in determining what site you're looking at.

Hatfield: The capital investment of that system is very low.

Q: There's been no comment made in this session about the use of vegetable oil as a fuel. Since there are so many diesels, and diesels run on oil, a lot of people say why not vegetable oil. I understand also that it's possible to combine alcohol with vegetable oil and make an even better fuel than just vegetable oil. Any comments on that?

Holmberg: Yes, that's entirely doable. The South Africans and Venezuelans have done it. They take vegetable oil and combine that with the alcohol and it turns into splendid diesel fuel. It's just a matter of the technology and the determination to do it. It's doable and it could be cost-effective under right conditions.

Day: Even in Illinois, at the Illinois Agricultural Experiment Station, there are projects using soybean oil. In my opinion that's kind of a horrible thought to take a good product like soybean oil and use it for fuel, but it certainly is possible. There was an international conference about a year ago in North Dakota on the use of sunflower oil for diesel fuel.

Q: A follow-up question to that. I recognize your point, Dr. Day, about the use of soybean oil for fuel. And, of course, in the case of alcohol we aren't really burning up a good food product for fuel, but a good question again is with the surpluses we have in this country, what percent of the products on the farm would be required for this to make the farmer effectively self-sufficient as far as fuel in his diesel tractors? I have not seen any figures on this.

Day: We did not study that in our project, although Dr. Carroll Goering at the University of Illinois is involved in that type of research. I guess Lyle Reeser could give us some input on that issue.

Lyle Reeser: What I would like to add to this question about the vegetable oils is that in the developing world there are tremendous land areas that are not really adaptable to grain or even pasture use, and they are very adaptable to palm oil. We see countries in the developing world that are importing vegetable oils and cooking oils from the developed world, and they could produce all of their needs for their cooking and vegetable oils and some of their fuel needs from palm oil on marginal land. So I don't think we need to worry about using our soybean oil and our corn oil for fuel when we have these tremendous opportunities in the developing countries for them to use their own resources.

Now, back to the other question. I think you've answered that, Donald Day, on the work that's being done at the University of Illinois. In fact, Dr. Goering is in South Africa right now on sabbatical, and I think that when he comes back he'll have a lot to add to the work he's already done on mixing vegetable oils with alcohol. Caterpillar Tractor Co. has operated their construction equipment in Brazil on 100% vegetable oil. They've also operated on 100% alcohol or ethanol. So we know what can be done, but what we need to do now is to work more toward the economics of making these fuels feasible in the developing world.

Q: I just want to add one sentence to what the last speaker said about palm oil. In developing nations palm oil is really very easy to get. For instance, in Nigeria, palm trees grow wild without anyone actually planting them. You have made a very good point.

Q: I think that you should explain to the crowd about what Ford is doing to import its tractors into the U.S. market this next year, and what the Illinois Department of Technological Services is doing to support them. You should also tell them about the alcohol plant in Rockford that will be powered by biogas.

Participant: There's been a real effort on the part of Illinois Farm Growers to help Ford bring their tractors into America. Ford has a total ethanol operating tractor in Brazil. They want to bring that tractor into America this fall and they needed some general support. The Illinois Farm Growers ran a survey of Illinois hog farmers and anyone else who might help assure them of a basic market to sell this product. The State of Illinois will buy several for the highway department. I hope that individuals will also consider buying this tractor. The tractor's fuel efficiency is about 25% better on an average than diesel which is currently used.

This next month, in Rockford, Illinois, a 3 million gallon ethanol plant will go on line whose total energy source will be biogas from the dumps in Rockford and Milford, Illinois. It's absolutely a sensational breakthrough. They will operate 200 horsepower boilers on methane.

Q: Is there any single publication to which we could subscribe that would keep us up-to-date on these technologies?

Holmberg: Not really, because you're talking about a whole range of technologies here. I really can't think of one that will do the trick for you. Acres USA would help.

I'd just like to make one comment here. One of the really important points that was made today, that sometimes slips away from us if we don't pay attention, is the blessing of the ruminant animal. We talk about digesters in various sizes. The ruminant, as far as I know, is probably the most efficient digester going. That has enormous potential if we just learn how to work cooperatively using some things as simple and as ancient as a ruminant animal. All of this modern technology we've been describing will then work in harmony with nature, instead of trying to overpower nature. That process is a basic political decision. We've got all kinds of people jumping up and down ready to give you the technology and ready to give you the science. We don't have enough people like yourselves who will get into the political process and really make this actually happen.

Day: I think from this discussion you can observe that if we want success in this area, all we have to do is reach in the right direction, and make the right commitment.

PANEL B DISCUSSION: "The Role of Women in Development:
From Agricultural Production to Family Nutrition"

Moderator: Mary Keith
Assistant Professor of Foods and Nutrition
University of Illinois at Urbana-Champaign

Our topic this morning is how do women fit into the world food problem, but we're not looking just at women. Actually, after the title for this panel came out I wanted to change "women in agriculture," and instead use, "the ignored factor in food," or something that would reflect the situation more accurately. But by then it was too late. At any rate, we have two very valuable, very informed panelists here with us today. They'll both be giving brief presentations and then we hope that there will be a lot of discussion and questions and answers from all of you.

The first speaker is Nadia Youssef. She is a Senior Policy Specialist with UNICEF in New York. I met her some years back when I was a lowly graduate student and she was talking to a group of people from several different universities trying to get us more actively involved in women's problems in international development. She impressed me very highly then, and meeting her and talking to her again now has certainly increased the respect and admiration that I felt at the time. Nadia Youssef holds a PhD from the University of California at Berkeley, has taught at the University of Southern California and at California State University. Her list of publications is longer than both of my arms so I'm not going to go into all of that, but just let Nadia speak on her topic this morning.

Nadia H. Youssef
Senior Policy Specialist, Women's Economic Activities/Basic Services
UNICEF

Thank you, Mary, for your kind introduction. I would like to discuss the problem of the hunger crisis beyond Ethiopia, yet concentrating on Africa. I would like to take as a point of departure that famine is a social fact, not a natural one, and is the result of human arrangements, not an act of God. I'm quoting here from Frances Moore Lappe and Joseph Collins in Food First. Lastly, I would like to place women within the context of agricultural production and the famine and hunger in Africa in a way that alerts us to the fact that we can no longer afford to program for women alone without addressing the total problem.

Despite rapid urbanization, agriculture continues to employ 70% of Africa's people, yet during the period 1960-80, per capita food production dropped 20%. We heard last night that FAO has identified 24 countries in Africa as facing an emergency crisis. Cereal production in sub-Saharan Africa has declined from 17 million tons in 1981 to 13.8 million tons in 1983. In the Sahel countries alone in 1983, cereal production, including maize, sorghum, millet, and wheat was 1.5 million tons below the 1982 harvest, which itself had been 3.5 million tons below the '81 harvest. Total cereal import needs for 1984 in the Sahel countries has been estimated at 1.9 million tons. Droughts are not a novelty to Africa. This recent drought-induced food crisis is, however, significantly different and more ominous than the others. Why?

First of all, food shortages of great magnitude are for the first time simultaneously affecting countries in all subregions so that we now have 24 countries in a state of emergency. The combination of production decline in export crops and the lowest real prices for Africa's exports in 30 years, except for oil, has made it more difficult for most countries to pay for acutely needed food imports.

Another serious problem is the African public debt which has grown from only \$5 billion in 1970 to \$65 billion in 1983. The deficit between export revenue and import expenditures rose from \$1.8 billion in 1973 to \$11 billion in 1980 and is still rising. In addition, Africa, south of the Sahara, has the fastest population growth of any region, the highest illiteracy rate, and the lowest life expectancy.

The degree to which the food shortages have affected the malnutrition levels is very difficult to document. I tried very, very hard before coming here to get some reliable data which I would like to read to you now. In terms of percentages of population for Africa, there is a record of chronic protein-energy malnutrition for children under 5 affecting 35% of that age group. Acute protein-energy malnutrition is affecting 7%. Low weight for children under 5 is reported for 30% of that age group population. The annual number of infants with a low birth weight of 2500 grams or less, is 20%, and 40% of the women in Africa suffer from nutritional anemia. These are some of the indicators of the degree to which one can translate the current food crisis into actual levels of malnutrition.

Now I want to come to what I have been given as a subtitle: "the politics of hunger." The statistics on food shortages and on malnutrition are deceiving at the aggregate level if they convey to us the impression of a homogeneous Africa, suffering equally and across the board from hunger, famine, and death. Whole countries are not collapsing. Entire populations are not starving. It is the poorest, the weakest, and the least powerful, including a majority of women and children, who are becoming the most vulnerable to setbacks such as drought. For the crisis confronting Africa is not the drought, but the social, political, and economic circumstances which now more than ever before prevent the poor from withstanding the rigors of nature. Ironically, it is the food producers, most of whom are women, who go hungry.

Agricultural development skewed in favor of cash crops is in large part responsible for the small farmer's difficulty. To illustrate: between 1967 and 1972, while food production was faltering during drought, Mali increased its cotton production four fold and peanut production grew 70%; Burkina Faso's (Upper Volta) cotton harvest has increased from 2000 tons yearly in 1960 to 75,000 tons in 1984; Zimbabwe cotton producers expect to harvest a record of 241,000 ton crops this year while the country is importing basic grains. It is true that cotton is more drought-resistant than many food crops, but producer prices for cotton have risen by 10% yearly in recent times, encouraging farmers to turn away from sorghum and millet, staple food crops, to cultivate cotton instead.

In Kenya, coffee production has soared, 30,000 tons in 1984 compared to 21,000 in 1983 at the time when the country is threatened with maize short-fall for the first time in four years. Increased cash cropping and the growth of towns and roads have pushed subsistence farmers, who are mostly women, onto soil so delicate that the land becomes suitable only for grazing. Marginal

land is producing less and less and so will be exhausted. Where more production is possible there is very little incentive for small farmers to grow surplus food. Because farmers in African countries receive such a low price for their surplus produce, they will leave maize fields fallow. This is happening in Kenya. Or, they exact payment-in-kind, as in the case of Mozambique, where the money has no value. And so it is because producer prices are kept so low, in order to keep down the price of food in the cities, that you have an answer to part of the crisis that is occurring today. Yet the irony is that it is the pictures of starving children from rural areas that you get to see on TV and not the people in urban areas who can afford to buy food. And so while production figures at the aggregate level are declining, the growing urban middle class is eating more than ever.

Just before coming here, we had reports from Angola, which is not one of the countries usually mentioned as part of the crisis situation, that already famine is affecting that country and we were told that in certain areas of Angola infant mortality rates are reading 430 per 1000. In some villages that were reported about, you can hardly see children under one. The unevenness and inequity in the food distribution is striking. As I said before, Kenya, which is usually self-sufficient in maize now finds itself in some parts of the country with malnutrition levels as high as those in much poorer and less productive countries. Again, this is because the surplus grown in the fertile soil goes to the urban population which can afford it. When food distribution is left to commercial traders, the food may reach the hungry, but there is no guarantee that they will be able to afford to buy it.

Now how do women fit into this picture since the panel, after all, is on women. The rural dwellers suffers triply. They suffer because they are poor. They suffer because they are the producers. And they suffer because they are less and less able to cultivate food on fertile soils as a result of the emphasis on cash production. It is the most marginal lands that are being designated to women to grow subsistence crops. This is not entirely a government decision. Indirectly, however, it is because, to a certain extent, farmers, in order to produce some income, are forced to go into cash crops; and therefore relegate the most marginal lands to the subsistence grower. Independent of and yet interrelated with drought conditions, I would say that there are three processes intrinsic to the rural transformation affecting Africa which make it particularly difficult for rural African women to survive.

The first of these is that the rural economy is changing from one dominated by a subsistence mode of production to one which is more characterized by money as a medium for exchange. The implications of this I have mentioned before. Prioritization is being given to cash crops.

The second major change going on in the African countryside is the accelerated effort to increase food production. The processes by which increasing agricultural production is encouraged in the smallholder sector, often is placing insuperable loads on women, and reducing the time they have for their own subsistence cultivation and for their children and family. Because it is a fact that women, although they do not derive direct profits from the cash crops that are grown in small holdings, still are required to do a great deal of work for the cash cropping. This takes away both their energy and their time from subsistence cultivation, so that the extra hoeing, weeding, crop protection, and crop management fall disproportionately on the already overburdened women. Her health and child care must suffer inevitably.

A third change which I think is very important and not often brought out in a great deal of the literature, is that there is a shift in control over household resources as a result of the dichotomy between cash cropping and subsistence cropping. Women traditionally have controlled household food production, stocks, and at least to some extent the manner in which food was distributed to family members. Men control money income and the way it is allocated between food and non-food expenditures, and between essentials and consumer durables. There is mounting evidence, however, in many parts of Africa that now women are losing the power of control over household resources. What this has meant, of course, is a poorer diet, and definitely less health care, and in general the bidding power of the greatest advocate of child and family welfare, the mother, is declining.

As I said before, one of the most important crises to be faced is the fact that the move toward cash cropping has left women with smaller and less fertile plots for family food. UNICEF recently funded five village studies in Tanzania. The dramatic results showed that average farm households are now only able to produce 40% of their nutritional needs. The rest of those basic needs have to be purchased from the market. This then raises the whole question of the need for women to have access to cash income since the nutritional needs of households can no longer be met through crop production. Subsistence cultivation is less and less able to meet those needs. I think that the greatest burden that most rural women feel is that they are no longer only responsible for producing food, but must also purchase additional food. This brings in the matter of access to cash income. Now, what is the solution?

One of my first reactions to being invited to participate in this seminar was that the subject under discussion did not belong in a women and development panel and Mary has obviously sided with me on this issue. The food crisis is not a women's issue just because women are the major food producers. It is a political issue and it has to be addressed as such. From the point of view of donor and assistance agencies, we can no longer conveniently confine ourselves in the food crisis to designing women's projects which do not also address the political realities of Africa. At this point let me state that some governments are trying to resolve the food imbalances through credit screens, through donations from food surplus districts to the worst affected areas, and other forms of reorganization of food distribution and marketing. However, from the point of view of development assistance certain definite considerations have to be taken into account.

At the policy level I would suggest the following: the growing problem of desertification is the major element in Africa's food crisis. The classical approach is to address it as a technical problem: terrace the fields, plant more trees, conserve the soil. The gut issue, however, is that technical solutions will not solve social and economic problems.

John Tinker, director of the environmental news service, Earthscan, blames the type of agriculture that foreign assistance programs and foreign experts have forced Africans to adopt. I do not know enough about agriculture to see whether his claim can be supported, but what he is trying to say is that the techniques introduced by foreign expertise cannot cope with drought. In many cases they have reduced the soil to such a poor state that when rains do not come, the soil cannot produce food. The point Tinker makes, and it is up to the agricultural experts to take this up, is that unless a change in agricultural policy is brought about, anti-desertification projects will fail.

Where farmers produce a large portion of food consumed, attempts to increase food production may have to be carried out in parallel with government subsidies and transfers so that the food purchasing power of poor urban families and rural laborers is made possible. That is the only way that producer prices will not be lowered. Unless this is done increased production may continue to affect food prices adversely, increase rural poverty, and lead to future decreases in food production. I was very pleased to note from the presentation by Julia Chang Bloch yesterday that the Reagan Administration is concerned about this fact. I think it is very important to remember, also, that, from a program point of view, if and when nutritional programs are introduced, that they be targeted to those groups that are the most needy. For example, one of the UNICEF programs that we are supporting in Zimbabwe is designed to give priority to households headed by women. This is just one way of targeting the neediest groups which include pregnant mothers and children.

With respect to what we can advocate to help women specifically, again, I repeat that whatever we do along those lines and we have to continue supporting such programs, constitutes piecemeal solutions to a larger issue. Given that caveat, let me just throw out some of the interventions that are possible.

First, I think it is crucial to realize that not all rural women in Africa who are farm producers have access to plots. Even those who do have access to plots, as I have said before, need cash income. So one of the major thrusts should be to increase women's income and the control that they have over that income by expanding rural work opportunities outside of the farm and at the same time improving crops so that they can be marketed.

The next recommendation is almost embarrassing because we've been advocating it since 1974. It originally came out as an FAO resolution but not much has been done about it. That is, to have women gain access to agricultural extension techniques as opposed to home economists' lessons on how to cook better and more nutritious food. When women go home they do not find any food to cook. At present, I think only 5% of the women in many of the African countries are having that access.

Another important change that I think needs to be promoted is to have women gain entry into agricultural cooperatives. In most of the rural areas that I'm familiar with it is only a widow who can enter into an agricultural cooperative and only if her husband was previously a member. These cooperatives are essential because they are the focal point for learning about agricultural techniques and for gaining access to credit.

The third important recommendation is to provide rural women with labor-saving devices and with productivity-oriented technologies.

A fourth recommendation is, where appropriate, to promote livestock projects and training in small-scale animal production. In dry areas livestock provides food during periods of grain shortages, is a source of income during a food crisis, is an efficient converter of crop residues, and can be a major supplier of organic matter for home gardening.

A last recommendation which I think is essential and which needs a lot of grassroots work is to foster and strengthen women's productive and marketing groups. The only way small farmers can survive is to be productive by becoming organized. Collective productive investments and profits enable women to take advantage of skill economies rather than using food resources for individualized projects. It is also very important to explore the needs and the possibilities for the horizontal and vertical integration of these cooperatives. Thank you very much.

Mary Keith: Our next speaker is Elsa Chaney. She is a visiting scholar at The Caribbean Food and Nutrition Institute in Jamaica. She is not a food and nutrition specialist, but is actually a political scientist. She has been working mainly on the roles of women in economics, social development, and in agriculture, and how all of these fit together. I think that her presentation is going to be a welcome contrast to what Nadia has been talking about. Elsa's major area of expertise has been the Caribbean area and South America. She has been working on several projects in Jamaica and in the Caribbean area. She will focus on Jamaica and will compare what is going on in the Caribbean versus Africa.

Elsa M. Chaney
Visiting Scholar
Caribbean Food and Nutrition Institute

Thank you. This morning I would like to make four points. First, I want to talk about events in rural areas of the Caribbean: the heavy out-migration, the decline in the smallholder agricultural sector, the increasing "feminization" of farming, and how these and other events are affecting household nutrition. In many world regions, and not only in tropical America or the Caribbean, as Alan Berg, the World Bank's nutrition economist, has pointed out, much of the food of the poor is grown on the hillsides. So I want to talk about what's going on in the small farm sector, the whole panorama of rural change and how that affects hillside agriculture. Second, even though the nutrition situation in the Caribbean is not really acute at the moment, there are spot crises and shortages; generally the experts consider the situation as marginal and precarious. The third point I want to make is that there is no necessary conflict, in the Caribbean at least, between the export sector, that is lowland agriculture, and the hillside sector in which many of the domestic food crops are grown. I want to develop that theme because it seems to me that both agricultures could coexist if there were the political will to bring that about.

It's very important that hillside agriculture be supported because income from export crops does not necessarily translate into food imports to make up for deficits. Economically, the hillside areas produce most of the food crops. Politically, they are important because a large segment of the population still lives in these areas. Socially, the hillside rural areas are the focal point of the greatest poverty in the Caribbean.

Fourth and finally, where do women fit into this? Women, by and large, if they are employed in the rural areas, either are farm operators or work in smallholder agriculture. Just as Dr. Youssef found it difficult to talk about women outside the context of everything that's going on in agriculture in Africa, so I find it difficult to separate women from what's going on in the smallholder sector. I want to weave the two together.

Let me just quickly say a word about the nutritional situation as a background. The Caribbean, in general, has a good nutritional profile in comparison to other world areas. Of course, there are pockets of malnutrition, but in general the situation has been good, and, until recently, has been improving. In 1982, for example, in Jamaica, children attending health clinics were weighed and categorized according to the famous Gomez classifications: 74 were considered normal according to these classifications. Only 1 or 2 fell within the severely-malnourished category. Then there is that gray area between severely malnourished and normal. For adults, there are some other problems such as anemia, obesity, and obesity-related diseases caused by eating the wrong kinds of food. Obesity, diabetes, hypertension, and anemia affect women in particular.

Food balance sheets for the Caribbean show that until recent times the area has had about 130% of its food requirement available. One might ask, what's the problem? The problem, of course, is skewed income. If you're looking at a food balance sheet you have to subtract what the affluent eat and waste and what the tourist sector consumes. You can sum up the situation by saying that, for example, in Jamaica about 70% of the population does have a dietary-energy supply shortage on the order of 27% spread over the 70% of the people, and 14% protein shortage spread over 70% of the people. Now this is not a truly acute situation. However, I had a chance, in 1982, to interview about 60 people who deal with the food and nutrition, and agricultural sectors. They found the nutritional situation worrisome because of the high dependency on imported food, and because of the situation in hillside agriculture.

I would like now to look at the connection between nutrition and development, and at the other side of the issue, development and nutrition. First, donor agencies involved in food and agricultural assistance commonly justify a wide range of food and nutritional programs by pointing out their assumed developmental effects. For example, the objectives of U.S. food and agricultural assistance are defined in terms of "enabling countries to become self-reliant in food...and thus contribute to broadly-based self-sustaining economic growth." We think we see pretty clearly a connection between nutrition and development. This appears to be self evident, even though the connections are complex when you look at them closely. What we generally ignore are the nutritional effects of development, because we're used to measuring development in terms of such things as per capita income and the growth of the gross national product--and not in terms of what nutritionists might consider important, infant mortality and malnutrition rates.

Kenneth Leslie, an agricultural economist working with CFNI, points out that in the Caribbean region, as indeed elsewhere, in spite of remarkably high rates of growth of gross domestic product achieved in the 1960s, the anticipated impact on nutrition and the general welfare was not realized. Instead, enclaves of affluence tended to rise in a sea of poverty as the income gap between social groups in the countries widened, while the nutritional status of large population groups remained either unchanged or in some cases worsened. Nutritionists, I think, were the first to note that rural modernization and agricultural development may not lead automatically to improved nutrition, and in fact, may have unintended negative effects on nutrition.

Beginning in 1970 with Ester Boserup's classic treatment on women's role in economic development, the women and development literature began to pick up on this theme and "cautionary literature" evolved dealing with the gamut of effects of development, some of which have very negative consequences. Certainly there are studies now to show that development can have negative consequences on nutrition. Economists, too, have begun to examine how food consumption patterns can change, often to the nutritional detriment of household members, as rural communities make the transition from small-scale subsistence or semi-subsistence production to market production.

Wortman and Cummings, in one of the most recent complete analyses, outline what they believe is the only viable strategy to feed the world: to "lift productivity and profitability on large numbers of small farms." Indeed, these authors go so far as to argue against large-scale mechanized farming whether by corporations or by individual estates or state farms because such an approach, while it "may increase productivity, usually will not expand employment or raise incomes of rural people." Widespread changes, of course, are already taking place in the countryside that have already altered the nutritional status of large segments of the population in many world areas.

In the Caribbean the question is a bit different, as some experts are noting now. I know that when I first went to Jamaica some years ago I expected to see the kind of classic situation in which there would be many people competing for the land, and in which a lot of the people would have to migrate because there just wasn't room for them to farm on the hillsides. To my surprise, I found that a lot of farmland is lying fallow, since people are discouraged about farming: there's not a price for the local domestic products, and there is not a great deal of extension support. In short, there is not much support for doing the kinds of things necessary to get higher productivity such as stemming the terrible erosion.

In Jamaica, for example, currently it's estimated there are 185,000 acres of agricultural land that are either unused or under-utilized. But prescriptions for change haven't caught up with the reality, and we're still hearing about the pressures of population on land. In fact, one study (Omawale and McLeod) points out that the countryside in the whole Caribbean region is dominated by what they call "denuded households," households inhabited by the old or by older women who sometimes raise crops for their own sustenance, and for their grandchildren as well.

Goossen writing about Guadeloupe points to the ramifications of this for children's and women's nutritional status. She says the fostering of grandchildren, nieces, nephews, and godchildren is indeed universal among older women. The woman usually has her own small landholding and earned income, and she uses these to fulfill her responsibilities as mother, foster mother, grandmother, godmother, etc. Women in many world areas, of course, have been involved in cultivation for a very long time, but in the Caribbean, contemporary trends in international migration by the male population are greatly affecting the sexual division of labor in the rural household.

Now, it is true that women, at least since the early 1950s, have been predominating in migratory streams. Nevertheless, it's often the younger women who migrate. If you look at the age-specific rates of migration you realize that a number of older females and also the females in

their working years are being left behind. If you look at sex ratios of working people, you find there are many more women left behind in the population than men. What are they doing? Many of them are trying to keep the little farm plot going. According to the 1970 population census the female-share throughout the Caribbean in agriculture adds up to about 24 to each 100 men in agriculture. In Barbados it is 59 women per 100 men, and in Grenada 57 per 100 men.

Some of Dixon's recalculations of the underestimation of female participation in agriculture would put Jamaica at 31% of all agricultural workers rather than 11% as the census tells us. For the English-speaking Caribbean as a whole about 1/3 of the smallholdings are operated by women. The latest Jamaica agricultural census showed that about 20% of all farms in Jamaica are operated by women. In some areas, women are involved in agriculture even if they are not listed in the census as the operator of the farm. A survey in central Jamaica where I worked showed that 47% of the women assisted in most farm operations while another 20% helped out at least at harvest and planting time. It's interesting that women do seem to operate at the smaller size end of the continuum. For example, in Jamaica 19% of farms under 5 acres are operated by women, 10% of farms from 5 to 500 acres, and only 6% of those farms of 500 acres or more are operated by women. Women are involved in vegetable growing and in small animal raising, which are very important activities for the whole food picture as these items complement starchy crops such as the yam, cassava, banana, etc.

What happens though is that women are left behind because their companeros are choosing some off-farm employment even though they may still reside in the household. This is not so different from the situations in Africa, where women also continue to raise the subsistence crops and keep the family going, even though they may find it hard to carry on the farming operation alone. If they don't have title to land, sometimes it's hard to participate in government programs or get credit. In addition to carrying on farming operations, they have the burden of caring for the children. They may also find it difficult to hire laborers. They are overlooked, as Nadia pointed out, by extension officers. As a consequence they may fall back into just doing a very little agriculture to get by. They become discouraged farmers or give up farming altogether.

So land is taken out of agriculture. If that happens, to return to farming may be very, very difficult. Soil erosion accelerates, terraces collapse, irrigation ditches silt up, farm animals are sold off, the farm buildings, no matter how rudimentary, may fall down. When migrants return they may be discouraged and may not go back to farming. In fact, the few studies that we have, a couple in the Dominican Republic and one in Jamaica, show that when people come back they tend to go to the nearest town. They do not return and invest their savings in agriculturally-productive ways. In some countries, the smallholder sector has completely disappeared. Some of the small eastern Caribbean islands are now dependent on imported food and are being supplied from neighboring islands for their fresh fruits and vegetables. In countries like Jamaica, and there are others as well, there is still a chance to save the smallholder sector. It's not completely gone, but it's in a very precarious state.

That leads me then to the final point that I want to discuss, and that is the fact that there seems to be two agricultures in much of the Caribbean. I think this is also true in a lot of Latin America. These two agricultures don't necessarily compete, except politically. The "modern system" uses advanced and largely imported technology and capital-intensive methods to produce food, fiber, and other commodities principally for export. In countries like Jamaica most cash crops destined for overseas markets tend to be grown on the flat plains, using hired labor, or in the intermountain valleys. In other words the colonial system of the past in the Caribbean put the plantation export agriculture in the lowlands. In the other or "traditional sector," and I think that we're all beginning to see that traditional doesn't necessarily mean backward, many of the farmers use technologies which are good and proven, such as mixed cropping, crop rotation, and rudimentary soil conservation techniques. They use manure. These are all technologies and we certainly don't want to say that modern is "scientific," and traditional means "backward." I want to be careful how I use these words.

At the time of the abolition of slavery in 1834, people headed for the hills because that was the only land available to them. They began to produce subsistence crops and essentially they're doing the same time today, although not, of course, to the same extent. The small farm sector, however, still is very important. For example, in Jamaica, 55% of landholders living on farms smaller than 5 acres, farm as their principal means of livelihood, compared to 70% of landholders who have farming as their principal livelihood on more than five acres. 40% of landholders on farms less than one acre, farm as their principal means of livelihood. Of course, this does show how many still need some off-farm wage employment, or "occupational multiplicity." Jamaicans call it "hustling." In order to get a full family income you do a little farming, the women do some marketing, baking, and sewing to make ends meet.

However, as we know, the "modern system" always has been favored over the traditional for credit, inputs, extension, and research, because commercial agriculture earns foreign exchange and because we thought it more efficient and more productive. Now there is a change, and as Hills and Iton point out, time has never been more propitious for an identification, description, explanation, and acknowledgement of the ecologically-sound attributes of traditional agronomic practices, and of the contribution that Caribbean small farmers make to food and nutrition.

In the past, according to the law of comparative advantage, it was argued that the Caribbean with its good lowland soils and its sunshine should forget about this backward hillside agriculture and to concentrate on growing export crops in the lowlands. The latest thing in Jamaica is winter vegetables for the U.S. market. This could conceivably offer a lot of employment, but as Mills points out, even if plantation earnings were sufficient to allow imported food supplies commensurate with the increasing demand, nowhere in the Caribbean or the rest of the underdeveloped world has it happened that there's a one-to-one tradeoff between what is earned from export crops and domestic food needs.

As one observer put it, cash crops produced with cheap labor do not convert into cheap food from foreign markets, but into expensive meat, milk, and processed foods that are priced above the means of most people. Sugar and coffee earn foreign exchange which in turn buys high quality beef, poultry, airplane tickets, and automobiles which never trickle down to those who produce the

sugar or coffee. It's interesting that in Jamaica in 1977-78, when political difficulties and a lack of foreign exchange to buy food forced the Jamaican government to cut back on imports, the smallholder sector was able to respond. There was a tremendous increase in locally-produced foods because there wasn't the competition of the imports.

Farmers do respond to the possibility of a market. When there are no alternatives, people got back to eating locally-produced food. There were even all kinds of campaigns on remembering how to fix yam and sweet potato and those good things that urban Jamaicans tend to relegate to festivals and Sundays when they can get imported food.

In conclusion, then, it does seem worthwhile to take another look at the smallholder sector, not only because we find most women in the rural areas, but because this sector can make a great contribution, and is absolutely essential to good nutrition.

There is too great a dependency on imported cereals at the moment. Too many energy and protein requirements are being met chiefly by importing cereal grains. There could be much more substitution if the smallholder sector and the women who work in it were given more support. It would mean a lot in terms of nutrition, in terms of saving foreign exchange, and in terms of saving a way of life that has been a very healthy one. I certainly don't think that development is going to stem migration, but development of the smallholder sector might make it at least a better life for those who remain. It's a very valuable part of the whole Caribbean social structure that still is visible in some countries.

BIBLIOGRAPHY

- Boserup, Ester. Women's Role in Economic Development. New York: St. Martin's Press, 1970.
- Dixon, Ruth. Land, labour and sex composition of the agricultural labour force: an international comparison. *Development and Change* 14 (1983): 347-72.
- Goossen, Jean. The migration of French West Indian women to metropolitan France. In Judith-Maria Hess Buechler, editor. *Women in Migration*. Special issue of Anthropological Quarterly 49 (January, 1976): 45-52.
- Hills, Theo L. and Stanley Iton. The "food forest," a type of intensive tropical mixed garden agriculture--its contemporary ecological significance. Montreal: McGill University, 1982. Typewritten.
- Leslie, Kenneth A. *The CARICOM Regional Food and Nutrition Strategy: An Overview*. Kingston: Caribbean Food and Nutrition Institute, 1982.
- Omawale and Joan C. McLeod. Food consumption and poverty in rural Jamaica. *Ecology of Food and Nutrition* 14 (1984): 297-306.
- Wortman, Sterling and Ralph W. Cummings, Jr. *To Food This World: The Challenge and the Strategy*. Baltimore: The Johns Hopkins Press, 1978.

QUESTION-ANSWER SESSION

Q I'm from Western Illinois University. Miss Chaney, you seem to imply that it is either a situation for cash cropping or for subsistence cropping. I would tend to believe that maybe it isn't an either-or situation. What has happened is that much of the cash cropping has been done that way because of land tenure situations, and a disparity in income which keeps poor farmers out of the fertile lowland area. I wonder if you would like to comment on land tenure problems in Latin America and the difficulty of implementing land reform because of the political power of certain groups. If there were land reform then some of this subsistence hillside farming could actually be done in the lowlands.

Chaney: I think I must be suffering from jet lag because I was really trying to make the opposite case: that choosing between the two agricultures is a false problem. Since (at least in the Caribbean) each uses a separate labor force, a separate set of inputs, and is in a separate area, there is no necessary competition. In fact, if Caribbean governments had the will to bolster up the smallholders where they are, a lot more production could take place on the hillsides. I don't for a minute advocate that export agriculture should somehow be done away with because for many of these countries it's the only source of foreign exchange.

In the case of Jamaica, with the price of bauxite being way down and lacking any other real asset except tourism, export agriculture is the only source of foreign exchange. When I said the two agricultures, I was trying indeed to show that both could coexist, if there were the political will, since each grows a different type of crop. The smallholder sector also traditionally does grow some export crops such as bananas and coffee, sometimes as much as 25% of the total crop. It is even a separate labor force, because although some of the people in the smallholder sector do go down to work on the plantations, they still can work around and farm their own plots at the same time, if it's profitable to do so.

The whole question of the hillsides, however, does lead us to something that I didn't touch upon. Are the hillsides necessarily the best place to continue farming because erosion is such a bad problem and a lot of the land is exhausted after so many years? It's not the ideal place for growing anything. Some of the farms have more than 30 degrees of slope and you therefore have a problem that is very hard to address. That leads into the whole political difficulty of getting some of the better land for the small farmer and that's, of course, a whole other thorny issue.

Based on my own limited experience in the smallholder sector when I worked on a rural development project, I still think that a lot more could be done on the hillsides without enormous expenditure. There is the whole idea of the food forest which Hills and Iton, agricultural geographers, have been putting forward. We need to take another look at how the smallholder really arranges his or her plot. At first glance when we see a small farm we're tempted to think that it's a big mess of weeds. However, there is a very complex arrangement of intercropping, of planting one crop in the shade of another, of cycling, of planting certain crops because they put back into the soil what the last crop took out. The food forest, as defined by Hills and Iton, has trees, bushes, and finally ground crops, all on different levels.

This kind of agriculture is also very good for stemming erosion. A lot of erosion occurs because people from Wisconsin have gone out and taught vegetable gardening based on a Wisconsin pattern. We even found that people were gardening as if there were seasons, although things will grow in Jamaica anytime. They would put in a whole big plot of tomatoes and all the neighbors would also plant tomatoes, with the result that there would be a big glut. There was no reason for this since you could have a year-round garden of small amounts of different vegetables cycled over 12 months. As someone remarked, it's Caribbean farming that is complex and it's Iowa farming that is simple.

We should study a little more what people are doing and doing successfully locally because they have survived at it. We could probably get quite a lot more production out of the hillsides without having to go to the thorny question of taking over some of the good plantation land for smallholders, even though that could certainly also be done.

Q: I'm a graduate student in Extension Education at the University of Illinois. Both of you mentioned the role of extension and how that needs to be improved. What do you see as the strategy for improving extension's role in aiding women in agriculture?

Youssef: I think it has to be done at two levels. There seems to be, I have to say it, a terrific resistance within different departments of agriculture in Third World countries to programming extension workers to reach women. UNICEF has tried in several African countries to promote this notion and the resistance has just been formidable. They insist that women should only be reached by home economists. I think from the point of view of donors and of development agencies the African crisis now is at a point in history where certain leverage has to be used to get governments to address this issue. There are, it is true, certain areas where cultural proscriptions come into play and the argument is being used that women farmers cannot be contacted by male extension workers. Nevertheless, it is important to start getting women into extension. I don't mean women of university graduate level. I think that one can very well arrange middle level training courses for extension workers by taking rural women who have a certain primary education background and giving them some initial training. I think this can increase the cadre of women in the extension ranks. I don't know how to really work with local governments to open up the extension services to women. Even FAO has not been able to break through that.

Q: My question is for Nadia. Could you explain again the different kinds of households in developing countries?

Youssef: My favorite topic. What I was referring to is the woman-headed household which now in most Third World countries reaches about 1/3 of households. These include de facto and de jure types of households. De jure refers to households headed by divorced and widowed women who are not being absorbed back into their families. In traditional areas customs called for widowed and divorced women to go back into their families and to be absorbed back into their kinship group. This is not happening anymore because of financial and economic difficulties.

The second group which is particularly prominent in Africa, is the de facto household, which includes single mothers. This group is also extremely prominent in Latin America. The de facto household is the result of male labor migrancy.

Women are, in fact, in charge of the farm. We have good data from Botswana and other countries bordering South Africa that these households are the poorest of all, for several reasons. First of all they do not, in most cases, have available male labor within the household to do the farming, so they have to hire labor and pay cash for tasks they cannot do. Also, they do not have access to plowing or to tractors, as male heads of households do. From an economic point of view, whether urban or rural, de facto households are the poorest of all.

Q: I'm on the staff of the University of Illinois. You've made references to levels of development and class variation within a country. Do you have a preference as to how you like to measure that, particularly class and the lack of SES measures?

Chaney: That's a very, very difficult problem, one that, of course, social scientists grapple with all the time. How do you really measure class, particularly in the Caribbean, where you have the added racial and ethnic factor? Income data is very hard to get hold of and very suspect because people don't want to really tell you what their income is. In a study that I'm going to do I suspect that I'll probably do it by multiple means, by looking at the size of the farm, and by looking at the assets in terms of both the household and the farm assets. Do they have any tools? How many animals do they have? How big is the house? What sorts of amenities? I will also try to include off-farm income.

Youssef: In Africa it's a bit different. I'm speaking now of trying to stratify the rural population. Obviously the urban you can always stratify by your usual variables. Some of us have been developing the whole concept of access of means of production as one of the ways of trying to stratify rural women in particular, and their access to livestock, access to water, and access to labor.

PANEL DISCUSSION: "The Challenge of the '80's:
The Blending of Development and Humanitarian Goals"

Moderator: Jack M. Smith
Senior Associate Director, The Stanley Foundation

Our function this afternoon is next to impossible. It's a very ambitious charge that we are given. We're to examine the challenge of the 1980's, and that is a blending of humanitarian and development goals. Fortunately for us we have two gentlemen with impeccable credentials to lead us through the maze. What's the maze? What's been done? What can be done? Or what should be done regarding U.S. overseas development policy? What's the relationship of trade and development? How can the international food system be strengthened? And, no doubt other related issues will emerge.

I would first like to introduce Dr. Ezekiel, who will speak on, "From Food Aid to Trade: A Quarter Century of Progress." Hannan Ezekiel is coordinator for Food Aid Research with the International Food Policy Research Institute in Washington, D.C. Prior to that he was editor of The Economic Times in Bombay, Delhi and Calcutta, India. A citizen of India, Ezekiel obtained his MA and PhD degrees and law degree from the University of Bombay. He also attended MIT under a Rockefeller Foundation fellowship. He was division chief in the International Monetary Fund, and chief economic consultant and head of Tata Economic Consultancy Services in Bombay. He has published extensively in academic journals and futuristic books on the Indian economy in the year 2000. So, it is a great privilege to have this expertise with us today.

"From Food Aid to Trade: A Quarter Century of Progress"

Hannan Ezekiel
Coordinator for Food Aid Research
International Food Policy Research Institute

Mr. Chairman, Ladies and Gentlemen, a quarter of a century ago the United States mounted a massive program of food aid to South Asia and other developing countries. One of these countries was India which received billions of dollars worth of food, millions of tons of food, mostly as program aid that is provided to the country for the purpose of sale to meet existing demand. There was acute criticism of such aid at that time. The debate on the disincentive effects of food aid about which we have heard a great deal since then, began at that time with a presentation by George Schultz at the American Agricultural Economics Conference. There was a view that food aid would have the effect of reducing the domestic production in the country assisted. Many articles were written, a number of them supporting this thesis. Econometric studies were carried out. Computations were presented showing how much output would fall in India as the result of each ton of PL 480 wheat imports to India.

Over a period of time, the results of these studies varied. Different econometric studies came to different results. One study said that one ton of imports would cause a reduction in domestic production of 1/3 of a ton. Another study later on pointed out that there was a misspecification of the equations used, that one of the relationships had not been properly taken into

account, and that when recalculated the results would be 1/33 of a ton. But the general impression was that food aid has a disincentive effect, and ultimately, therefore, it slows down the growth of the country that is being assisted. This in fact remains a part of the debate even today.

Apart from the specific criticism about the disincentive effects of food aid on domestic food production, there was the more important general criticism of food aid, and aid in general, not merely food aid to India. Aid was criticized on the grounds that it was creating a dependent society and that as a result India would develop a dependent relationship. It would not become a self-reliant society. It was argued that aid was encouraging bad economic policies in these countries, and that the withdrawal of aid, although it might cause a few million people to starve, would be beneficial to that country because then that country would perhaps adopt more sensible, reasonable economic policies. It was contended that aid was being poured into a bottomless pit and would produce no results at the end of the period, and that the United States would have nothing to show for all the sacrifices that it had made in providing food, even though it came from surplus stocks. The argument continued that as a stagnant, inefficient, and corrupt society, India would never be able to develop, that it was the classic example of a stagnant economy where nothing would ever be done. It was a hopeless case in the 1960's.

In 1984, India produced a harvest of 153 million tons, approximately triple the output of the years during which aid was provided to it. Indian economic growth continued over this period of time and as a result of that, India is today, apart from recent political events, a stable society about whose economic development little question is raised. The dramatic changes were caused by the Green Revolution. New varieties were adopted. A new Mexican short-stemmed wheat was modified to suit Indian conditions as the result of research carried out in Indian research institutions, and output from the use of this wheat tripled and quadrupled per hectare.

The strange phenomenon was then found that peasants who had been variously described as illiterate, backward, superstitious, traditional, and unchanging, instead of being induced and persuaded at great effort and cost to adopt the new seed, went out of their way to buy the new seed at black market prices. Because the seed was available only in small quantities in earlier years, they bought the seed at a cost of a rupee per seed, which even today would be an extremely high price and I am talking about the 1960's. As soon as they saw that you had developed for them a technology that would increase their productivity and their income, they did not need to be persuaded to use the new seed. They fought to get a share of the limited supplies. As a result of this, production shot up and the massive PL 480 aid came to an end.

Since that time, massive food aid to prevent starvation as a systematic feature of the Indian economy has ceased to exist, even though food aid is provided to India today for specific projects and programs.

Now, in the debate that was going on in the 1960's about PL 480 aid and India, a sober voice was that of India's eminent agricultural economist, Professor Dhantwalla, who pointed out that food production would not be adversely affected by PL 480 imports because of a highly inflationary situation in India at that time, caused by an acute short supply of food with a high demand. Therefore, at most, this food would act as a restraint on the continuous rise of prices and make sure that the people of India, at least those who had an

income and could afford to buy, would be able to buy the food they needed. Because of that acute shortage in food supply in relation to demand, the additional food supplies could not possibly induce any farmer to think that he should not produce more food. Whatever additional food he could possibly produce, he would be able to sell at a profit, thereby raising his income. This fact was confirmed by subsequent developments because as soon as technological change came to the farmer and brought him new seed which could increase his productivity, he responded to it very powerfully. Professor Dhantwalla argued that food production would increase in India as soon as there was technological change and a strengthening of extension services that would take the technology and technological changes to the farmers. They would need adequate provisions of necessary inputs, which were in short supply, i.e. water, fertilizer, power, credit, and a proper framework of agricultural support policies, including support of farm prices. Over a period of time he pushed for these things to be done.

The government of India's expenditure and development plans provided increasing support for all these types of agricultural policies. As a result of these policies implemented by the government of India, many farmers were ready to accept the technological change when it came and as a result production shot up.

Although the revolution was called a "Green Revolution" we must, of course, admit that it was only a wheat revolution. Rice did not show the same kind of revolution. It was not because the rice producers of India were unwilling to produce more rice, but because the technological problems of research in rice are more complex than the technological problems of research in wheat. The number of varieties of rice that are used in India are immense. The rice that produces a very high crop yield in one area completely fails in another because climatic and agronomic conditions are different. Therefore, a number of new varieties of rice were to be introduced over a long period of time so that you did not get the kind of revolutionary impact as with wheat.

As a result of all of this, however, India began to feed itself. Supply caught up with demand. Of course, from time to time because of fluctuations in production, commercial imports were undertaken. But by this time, as the country developed and had to some extent dealt with the problems that had arisen as a result of its partition which coincided with the achievement of its independence, its resources in general had also increased. Imports, in general, were commercial rather than aid. When individual emergencies did occur in one part of the country, because of drought, floods, hurricanes, etc., they were dealt with internally. So it is quite some time since India has made a demand on the world for assistance to deal with acute emergencies faced in particular parts of the country. These are handled with the country's own resources.

This year, as I said, India has achieved a harvest of 153 million tons. It was 133 million tons last year. This has created official stocks of 24 million tons of food grains when needs at the maximum are assessed at around 15 to 17 million tons. The storage capacity does not exceed 17 to 19 million tons. This is a variable figure because it is different in various parts of the country.

Now, I've spoken about India's success in this particular sphere at some length, because it must be recognized that when there are basic weaknesses in a developing country's economy, then any assessment of the effect of various programs and policies during a given short period fails to recognize how long it takes to bring about changes. If you wait a reasonable period of time, you can get results which are completely at variance with what you thought was likely to happen. There are, of course, weaknesses in India. I don't want to say that everything is fine. It isn't. What I am trying to say is that it has substantial achievements to its credit.

However, the picture of poverty continues. Emphasis on heavy industry instead of light industry has made growth of employment opportunities in India, and therefore income, relatively slow. And if it has achieved a sort of self-sufficiency just now with supply matching demand domestically, it is because income has not grown sufficiently and a relatively large proportion of India's population still suffers from chronic poverty, and therefore, chronic starvation. But anybody who has the money to buy food is able to get it. There are many who are unable to buy food or buy enough of it. So that problem has to be dealt with. I am emphasizing this because we use the word sufficiency. Later on I will raise the question of what exactly do we mean by sufficiency. Is India now a case of sufficiency? Yes, if it is in relation to demand. No, if it is in relation to need.

What are the lessons then to be drawn from the Indian experience. I think that it is critical to an understanding of the problems of the '80's. The lessons are that aid and the domestic effort being made to solve a developing country's problems, take time to have an impact.

Policies to promote food production and programs for increases in the provisions of inputs together with technological changes are important and will bring about change in the country's economy. This is particularly important in the African context because all the technological research that has gone on so far is not directly applicable to Africa. So, we now have a situation in agriculture in Africa in which there is not sufficient technological work being conducted. There is no technology to offer to the farmer and say, "You must change because this will bring about a dramatic change in your output." We don't have that. There is a need to bring about technological change, if you want to bring about development, take it to the people, and make it profitable, of course. Another conclusion is that income growth is as important for food sufficiency in the widest sense of the term as food production growth. This is a point to which I shall come later when I examine this concept of sufficiency.

I will now turn to three asides that I want to present to you that take me off the mainstream of my discussion, but are really relevant to it. The first is that we must understand the concept of sufficiency which is in the title of our conference. The concept of sufficiency is ambiguous. On the supply side there is the question of whether you mean that domestic production must be sufficient, or do you mean that domestic production plus commercial imports which the country is able to finance commercially provide a supply that is sufficient to meet the domestic demand. If you are saying that it should be domestic production then, you have many of the richest of the developing countries which are not sufficient at all. In fact, the oil-producing countries which have no problem in feeding their populations do not produce enough food for themselves. Their domestic production is quite insufficient to meet their demands. But nobody would tell them that they are poverty stricken. Nobody would be in his right mind to suggest to them that they should try to produce all the food that they need to consume. Please understand that very carefully.

A second aspect of sufficiency is on the demand side. The concept is ambiguous because it does not explain whether you are talking of effective demand or of total need. Because effective demand is where a desire to obtain food grains is backed by effective purchasing power, and need is in some sense a measurement of what a person needs in order to survive. The large number of people who are unable to buy food in a poor country, nevertheless have a need for it and even a country which satisfies its total demand fully does not satisfy its total need. That has to be very clearly understood in any discussion because we get ambiguities in any logical statements that are made which do not clarify whether you are talking about the demand, or whether you are talking about need, or whether you are talking about some combination of the two. Why do I say some combination of the two? Because the concept of need itself is ambiguous. What do we mean by need? Do you mean the population of a country multiplied by, let us say, some measure of minimum requirement for all? And surely, in each country there will be some proportion of the population that has an income sufficient to buy more than its minimum consumption requirements. How do you take that into account. It has, for example, been sometimes suggested that 153 million tons could feed India's population today on a bare minimum basis. And yet approximately 40% of the population is below the minimum levels of consumption.

So what do you do? Do you tell each person, who has income enough to buy more food, not to buy it but to give it to the poor in his own country and abstain from consuming more than his absolute minimum requirements? That does not happen. So there could be the concept of the consumption patterns of the well-fed, plus the minimum requirements of the others, as a measure of the total need of the country at any given time. But if you so measure it, then this measure changes in two directions. As people shift from not being well-fed to being well-fed and consuming more than the minimum requirements, the numbers change and the number of people who are not fed has then to be multiplied by how much they are not fed to get their minimum requirements. This total will change over time. In this context there are still many questions. I think I should mention them here because it is important to an understanding of food in the context of economic development.

How does one see shifts in consumption from non-cereals to cereals, because generally speaking, most analysis is done in terms of cereals. In many of the developing countries a part of the present consumption comes from non-cereal items such as cassava. Then there are shifts away from these as cereals become available or as incomes rise. A similar but not exactly identical statement can be made about the shift from the traditional or so-called inferior grains to non-traditional or "superior" grains.

Then there is still, however, the shift from the lower or inferior to higher or superior sources of calories as understood by the nutritionists. There is the further movement or transition from a calorie sufficient to a protein sufficient diet, and here we come to the critical question of the role of meat, poultry, and eggs which need inputs of food in order to produce food. It is true that sometimes you need inputs of feed which are not foods. But even so the production of feeds, whether they are directly foods or not, compete for the inputs of land, labor, capital, power, fertilizer, credit. Therefore, as a country develops and as proportions of the population of that country increase their consumption of meat, poultry, and eggs, their demand for cereals, in terms of the cereals that they consume directly and the cereals that are consumed by the cattle and poultry, increases very dramatically per capita. Then the demand for food rises very sharply, and it is in that kind of context

that you have to talk about development because you ought to recognize that development will mean a rise in incomes and changes in consumption patterns of those who benefit from the income rise. You can't prevent that as you couldn't prevent it in the United States or Europe.

Now let me talk about a second point in this context which I have mentioned before but will just cover again because I think it is important. There are the dangers of drawing conclusions about the effects of change in too short a period of time. This applies not merely to research projects, as I will illustrate. You could draw a very negative conclusion about the impact of PL 480 in the early '60's and a very positive conclusion by the mid-70's, after there had been time enough for it to have an impact on the economy of a country. Similarly, you could talk about the impact of the Green Revolution. Very early assessments in the Punjab and Haryana where the Green Revolution occurred in India pointed out that it had reduced employment, reduced the incomes of the poor and made them poorer. Therefore, what was being argued was that it was unfortunate that India should have had a Green Revolution. Ten years later, the situation was one in which there was so much growth in employment in the Punjab and Haryana that labor moved to these areas seasonally and in some cases, but to a limited extent, the moves became permanent. It is this movement of labor that has kept wages within reasonable limits, otherwise they would have shot through the roof, because the growth in the demand for labor in the Punjab was great. So, the Green Revolution has not had the unfortunate effects that were claimed, except during the period of transition.

The point I'm trying to make here is that whenever we are talking about developing countries and development and try to look at the evidence in those developing countries, what we are seeing is data related to the process of change. Data in the process of change is extremely difficult to evaluate unless you have a very clear understanding of all the factors that are in operation and keep in mind the fact that some factors take time to develop. Some factors act quickly. Some factors operate in only one part of the country. Others are operating in another part of the country. Development may take place rapidly in a part of the country and not move at all in another part. Whatever adverse conclusions have been drawn generally are found not to hold ten to twenty years later.

I would want to question any adverse conclusions because the experience is that too many of them are on the basis of too short a view of what is happening in the economy.

Now let me make a third point, and this is about food aid and dependency. This question also comes up again and again. It is suggested that food aid or aid in general encourages dependency, encourages weakness, encourages the choice of soft options in the country concerned, and that it fosters continuation of faulty policies, and increased waste and corruption. However, in many developing countries, and it is certainly true of India, there is a fierce sense of patriotism and a fierce pride in one's own country. People become angry when they have to take assistance from somebody else. This is balanced by a recognition that if you take it now, you will get out of that situation soon. You want to get out of it as fast as possible. If that is so, then soft options are not easily being taken. They could be described as soft by a person looking at it from afar. But when you are close enough and see what it means in terms of human suffering and you see it in terms of what it might mean in terms of political and social changes, upsets, breakdown of law and order, then those options may well be the right ones.

I'm reminded of a story. When I was with the International Monetary Fund, one of the mission leaders to a South American country told me about this. When he was talking to the finance minister of that country, the finance minister said, "You are proposing a certain set of policies. A few years ago, just two or three years ago, a mission from the Fund proposed such a set of policies." He said, "come here," and took the mission leader to the window, "Look at that tree. That is where my predecessor was hanged for adopting the policies that you recommended to him. You remained in Washington, but that is where he was."

So you've got to keep in mind that we are talking of very difficult areas when we talk about domestic policies. The developments in India, and other examples are Taiwan and South Korea, show that food aid may help a country over the transitional period so that it can deal with problems on a longer term basis. But what is the basic cause of the food problem which requires dealing with it on a longer term basis. Unless you understand that, you do not understand development. The nature of the problem arises from population growth. Why is there population growth? There is population growth because as soon as a country comes within the sphere of a modern system, it becomes free and starts looking at its own problems. Technological changes that have taken place on the health front, have caused death rates to plunge. That is a technological fact. Birth rates do not plunge immediately because that is a social fact. Social changes don't take place quickly whereas technological change can bring about very rapid changes.

Let me illustrate this point to you. The World Health Organization carried out a program for wiping out malaria in Sri Lanka, then called Ceylon. In two years they wiped out malaria. The growth rate of the population shot up from 1.1 per annum to 2.2 per annum in just two years. Would you have expected a fall in the birth rate that would compensate for it and keep the growth rate of the population at 1.1 in two years? Now 25 years later the birth rate in Sri Lanka has fallen because of a variety of factors including a program designed to bring down the birth rate. But it took 25 years. That's not surprising. In Europe where death rates fell first, it took 60-80 years before birth rates fell. During that period outmigration to North America, for example, helped to solve the population problems of Europe.

You have population growth, urbanization, and a limited scope for migration. In addition you have existing poverty, illiteracy, and a defensive social organization that has built up over the centuries to enable you to survive in the worst of circumstances. Its purpose has not been to enable you to bring about changes to improve your position because history has shown that you could not improve yourself no matter what you did. All the social organizations were thus of a defensive kind.

The infrastructure is worse in Africa than it is in India. That is why India achieved much after this period and why Africa will take more time.

How do you blend development and humanitarian goals against this background. I want to discuss the steps to prevent disasters, and not merely to deal with them when they occur. Even merely to prepare to deal with them in advance so that you can deal with them better is an improvement. What is being done now is to give aid when it is needed in the face of a disaster. Occasionally, we discuss the need to build up the organization, the logistics,

the ports, and the distributary mechanism through which the food can go when it is needed. However, the discussions do not include how to prevent that emergency from recurring. For example, if an emergency arises because of a drought, the drought could have been prevented by measures that were aimed at generating supplies of water. An irrigation system was proposed in one of the group discussions by an African student here. He spoke about his country and said that a proposal for a dam was made 15 years ago, but that it was not supported. As a result, the area that would have been provided with water from that dam may suffer from a drought. If this happens you have to provide food to those who would not have needed it if you had assisted them in building the dam at the right time.

The lesson of blending humanitarian and development goals is to see that whatever other assistance you give is aimed at preventing disasters and that you do so by building infrastructure in the form of roads, irrigation systems, research, information, technology, administration and extension services, institutional arrangements such as cooperatives and private marketing systems, and education and training. These are the instruments through which you change the environment in which development takes place. Projects and programs must be integrated so that you don't build a road in one place and have a program for generating milk production in another; so that when the milk production increases it cannot be transported, and the road does not carry anything because nothing is being produced. A simple matter but even that has happened. The classic is the case of a road ten miles long built at the cost of millions of dollars from nowhere to nowhere.

Now I'll quickly wind up by saying a few words on the subject of aid to trade. Developing countries with rapid income growth during the last 15 years have increased their imports substantially and with a very small proportion of that in the form of aid. This rapid income growth might be due to oil income, to rapid industrial growth, to rapid growth in agricultural export crops, or through rapid growth in food production. There are examples of all of these, but income has grown. Their needs are met because whatever is not produced domestically they import and, for the most part, pay for. But developing countries with slow income growth also have had relatively large cereal imports with a high proportion of food aid and still face continuing starvation for a portion of the population that cannot buy the food even when it is imported. Only some developing countries, like India, have had slow growth of income and relatively large growth of food production so that for the present it appears as if they have become self-sufficient. The conclusion would be that if you want your aid to turn into trade, then you have to promote rapid growth in the countries receiving that aid as well as in other countries in the developing world. To achieve that, a set of integrated policies is required.

While we are discussing food, trade and food will grow only if industrial development takes place in those countries alongside of agricultural development. That can take place only if the policies of the industrial countries on industrial imports are not protectionist. In this connection, the role of income growth, industrial development, and the policies of industrial countries are as important as food aid for the development of food trade.

I have tried to put the subject, "from food aid to trade," in the wider context of the theme of this session which is the blending of development and humanitarian goals, and the subject of the conference, which is, "Third World Development: From Food Deficiency to Food Sufficiency." The future depends on how we are able to respond to the challenges implicit in the titles we have in these subjects, and how we respond to these challenges in an inter-dependent world.

Jack M. Smith: Martin McLaughlin received his PhD at the University of Notre Dame. He is a man who has devoted much of his career to the international food situation and to some terribly difficult problems of development. Martin is now an independent consultant on food and development policies back in Washington, D.C. He was a federal executive for 25 years and was associated with the Department of State and AID. I met him some years ago while he was Senior Fellow and later, Vice President of the Overseas Development Council. He has published and lectured widely on food and development issues. He's taught at the University of Portland, DePauw, George Washington, Maryland, and Catholic University of America. That is the professional side of Martin McLaughlin. On the personal side, he is a scholar. Marty is a pragmatist, but a man with compassion and vision.

"Improving the International Food System: The Role of the United States"

Martin M. McLaughlin
Private Consultant on Food and Development Policy

I am very pleased to have been invited to participate in this Iowa-Illinois World Food Conference and this session on Third World development, and specifically to provide some thoughts and suggestions on how the United States, which is, I believe, in a key position to help improve the international food system. I'm also happy to have been able to meet some old friends and acquaintances, to hear some of the other addresses and panels, and to get a feel for how the conference has been going along until now. Too often, I find that we sort of "semi-finalists" come in very late in the game and therefore risk irrelevancy and redundancy in discussing policy matters. Policy matters is what the U.S. Catholic Conference, for which I am a consultant, and the Interfaith Action for Economic Justice, for which I agitate in Washington, concentrate on.

Since it is the 30th anniversary of the Food for Peace program, I was particularly happy to hear Julia Bloch last night emphasize the essentially short-term character of food aid programs and how their urgency for meeting immediate needs must not lead to ignoring the longer-term development considerations. I was also interested in her listing of the goals, objectives, and principles of the foreign aid program, with which I used to work, and with which I'm sure we would all generally agree. I could only wish that AID, my old agency, had a little more clout in establishing our policy priorities with respect to the Third World. That's a kind of a Washington comment. In any case, it seems clear that one part of the U.S. role in the international food system for the foreseeable future will be to provide substantial and probably increasing amounts of food aid. I hope that that food aid, as Mr. Ezekiel has already indicated with respect to India, can lead to an improved trading system and to increased food self-reliance and not to subsistence, in the developing countries.

What I would like to do in the time we have this afternoon, even at the risk of carrying a lot of coals to Newcastle, is: (1) describe the international food system, its limitations, and the position the United States holds in it; (2) suggest some reasons why the United States should favor and foster increased food security as the goal of that system; and (3) make some specific, although macro-suggestions about what the United States should do, in both the short and long run, to move toward that goal. In doing this I'm very conscious that there isn't really much new in what I have to say. Many of you have your own experiences, your own analyses, and your own beliefs. Maybe some of this will confirm it. It's a question sometimes of how often we have to hear the same thing before we do something about it.

There is an international food system in which all countries in the world participate in some measure. It includes suppliers, processors, producers, marketers (transportation, advertising, retailing, and so forth), consumers, and, of course, regulators--the government. These elements of the system interact upon one another within countries and among countries. When the final figures are in for the current crop year, this system will be found to have produced more than 1.7 billion metric tons of grain worldwide. Grain is the basic food-stuff which accounts roughly for 85% of what human beings eat directly or indirectly, more than enough to provide an adequate diet for the 4.5 billion people in the world, if they had access to it. That is the key point. Yet it is estimated that around half a billion people will not have access to the food they need. They will be undernourished and millions of them will probably starve in 1985, especially in sub-Saharan Africa. In a nutshell, that is what is meant by the world food problem. In Mr. Ezekiel's concept, demand is met, but need is not.

The causes of that problem are manifold and almost obvious to any student of the subject and I don't need to repeat the analysis you've just heard. Arable land worldwide is limited, it is costly to increase the amount, mismanagement depletes it by may 25 billion metric tons of topsoil per year worldwide. Water supply is limited; rain is unevenly distributed and it's unpredictable; irrigation is expensive; water tables are declining everywhere, including right here. Other inputs are also beyond the means of many poor people and poor countries--fertilizers derived from petroleum, machinery, seeds, research, training. Investment is discouraged in some countries by pricing policies that favor cheap food for the urban market rather than incentives for small producers for cash crops for exports to earn foreign exchange in preference to food crops for local consumption. And on the demand side there are the inexorable quantitative pressures of population growth and the differential consumption patterns that result, ironically, from economic growth and exert ever growing pressure on food supply. And there are finally, the social, political, and economic structures, national and international, which impoverish and disenfranchise the poor and the disadvantaged.

It does not seem unreasonable to suggest that an international food system that permits more than a tenth of the human race to remain malnourished, or face starvation, is not functioning as well as it should. Nor is this suggestion a new one. Ten years ago, right at this time, a World Food Conference, the first of its kind, was convened in Rome under UN auspices to deal with precisely this question. 134 government ministers, mainly of agriculture, participated; and a score of resolutions aimed at achieving food security for everyone were adopted. But despite ample supplies worldwide, there are still food shortages in Asia, in parts of Latin America, famine in sub-Saharan Africa, and that's nearly a half billion hungry people, a total that increases every year.

In this international food system, the power of the United States is enormous and dominant in both production and trade. Although nearly 90% of all food is consumed in the country in which it is produced, the 10 or 11% that moves from country to country in trade or aid, mainly trade, represents most of the margin between adequate diet and malnutrition. Half of that food, half of that 10 or 11%, starts in the United States. In addition to that, the international trading system is dominated by U.S. corporations that operate in this relatively little-regulated market. Many observers say, with some exaggeration no doubt, that world grain prices are set at The Chicago Board of Trade. Even with an overvalued dollar and relatively low prices, the grain trade will probably net the United States about \$18 billion in 1984 and thus hold down the trade deficit, which was \$33 billion in the third quarter only, by that amount. So it's a significant contribution. U.S. grain reserves, including those held by individual farmers and those in the commercial pipeline, are greater than the known reserves of any other country. In fact, they constitute more than a quarter of all reserves in the world that we know about. Significant numbers of people outside the United States literally depend upon U.S. food for their survival, at least in the short run.

Now with that kind of power and dominance there comes a commensurate responsibility for the international food system to achieve its goal of food security for everyone. The reasons why the United States should care about this problem were, in my view, very well stated by the Presidential Commission on World Hunger, which issued its report in April 1980. The Commission said there were three reasons why the United States should play a major role in improving the international food system and helping to attain world food security: first, to do so is a moral imperative; second, it is in the strategic and political interest of the United States; and third, it is in the U.S. economic interest.

The moral and humanitarian reasons for helping to attain world food security seem to me to be self-evident; it is hard to conceive of a human need more basic than food. Malnourished people live miserable lives, produce sickly children, cannot work or enjoy leisure, and are susceptible to diseases rarely seen in the industrialized world. The persistence of hunger at a time of abundant food supplies confounds rhetoric and threatens human values. It seems to me that as a nation founded on the principles of human freedom and human dignity, the United States should make its appropriate contribution to the fundamental welfare of the worldwide human family. I don't see this as a guilt question; I see it as a responsibility question.

On a geopolitical level, the United States, by helping food-deficit countries develop and achieve significant increases in their own food production in a self-reliant and sustainable fashion, can foster peaceful change and thus enhance global security and its own security as well. I think it's a vast oversimplification to perceive our security interests only, or even primarily, in terms of military superiority over the Soviet Union. World peace, in my view, offers much greater security than weapons. A world without hunger, or with the hope of eliminating hunger, is more apt than now to be peaceful and stable. The frustration and misery of increasing masses of poor and hungry people constitute at least as dangerous a threat as the military rivalry of superpowers. The poor have little to lose by turning to violence. There are in addition many very real threats to national and personal security like drought, environmental degradation, disease, pollution, and explosive population growth that show very little respect for national borders and are undeterred by armed, tanks, planes, or missiles.

But it is the third of the Presidential Commission's reasons for caring, i.e. economic self-interest, that is sometimes the most persuasive and is also the most actionable. To explain this rationale involves us in the consideration of two major and related subjects--interdependence and development. The latter topic, development, it seems to me, is essentially a responsibility question which I will get to in a moment. The former, interdependence (which is not a word very much in favor in the country that declared its independence), is a vulnerability question.

It has become almost a cliché these days to talk about economic interdependence. We regularly trot out the figures: 40% of U.S. manufactured products are exported to developing countries; one out of eight U.S. jobs depends on exports; one out of three farm acres produces for the export market (one out of five for the developing countries); and we depend on developing countries for a large share of several strategic materials. As poor nations rise from poverty and hunger they are better able to buy what we grow and make; and, if we help them develop, they are more likely to share with us those commodities that we need for our own economic growth. All of these statements are true, but both independence and vulnerability apply with particular force to the U.S. food system.

For most of the twentieth century the main concerns of U.S. agriculture were overproduction and the depressing economic impact on the farmer of recurring surpluses. In fact, in the mid-1950's it was mainly those considerations that led to the Food for Peace program, which you discussed yesterday. But during the 1970's a significant change took place in U.S. agriculture, mainly under the pressure of sharply rising export demand.

At the beginning of the 1970's U.S. agricultural exports amounted to about \$10 billion gross. Ten years or so later, in 1981, they had peaked at \$44 billion. At the same time that trade increased in volume and in importance, the dependence of U.S. farmers on the export market and their consequent vulnerability to the constant changes in that market also grew. Farm size increased; farm numbers shrank. Farm debt rose almost threefold to about \$200 billion in 1981, and to nearly \$300 billion now. Farm foreclosures increased markedly. All of this has resulted, as you know already, in something like a revolution in the structure of U.S. agriculture.

Hearings conducted all across the country in 1979 by the U.S. Secretary of Agriculture delineated the major outline of this revolution that continues to this day: the decreasing number and increasing size of farms, the trend away from widespread ownership and diffused control of food production and distribution, the greater difficulty of entry into farming, and lately, an increased shakiness in land tenure. There are some people who say that we need land reform in the United States. Along with this goes a decline in employment in industrial sectors related to agriculture and in rural nonfarm employment. The past quarter century has witnessed a clear movement away from the Jeffersonian tradition, which some people say is romantic or nostalgic, of the medium-sized, owner-operated family farm and toward larger farm units. The trend, which many people feel reduces the quality of rural life and the viability of rural communities and would, if export demand were not also down, exert strong upward pressure on consumer food prices. Federal programs seem to have accentuated this movement, but not deliberately, one hopes: price-related commodity programs reward quantity and therefore tend to benefit large producers; credit programs have "resulted in growing exploitation of them by

the well-to-do"; tax rules benefit the largest farms and have encouraged non-agricultural investors to enter the farm land market for tax shelter purposes and further bid up the price of land. Farmer-to-consumer costs have escalated, but the farmer still receives only about 35¢ of the supermarket dollar; the system gets the rest.

A more technological aspect of this "revolution" has to do with depletion of the resource base and an accompanying decline in technique. Both the global and the national resource bases are seriously at risk, the former for reasons over which the United States has to share influence with other countries, but the latter because of factors almost entirely within our own control. The National Agricultural Land Study, submitted to the President in February 1981, shows that we're losing about one million acres of prime farm land annually to noncrop uses, and the equivalent of about another 3 million acres to soil erosion. Farm-related programs have promoted, in many cases, abuse of land use once again, although not on purpose. In recent years federal farm subsidies have been identified by the Department of Agriculture as a major incentive for using fragile land for intensive crop production. The four million acre loss represents 1% of what is now in production, perhaps tolerable for our national food system, but a serious threat if the United States should have to continue to provide half of a steadily increasing volume of imports into the developing countries.

Decline of technique is the result, in some measure, of the drastic underfunding of research. Now the relatively small proportion of it that goes into such practices as minimum tillage, which is catching on in the Midwest, intercropping, and the basic research priorities identified by the National Academy of Sciences in 1975, i.e. more efficient photosynthesis, biological nitrogen fixation, and genetic engineering. What research money is spent tends to go for temperate zone agriculture and thus is of little help to the food-deficit developing countries which are located in the humid or arid tropics.

The systemic goal of world food security to which the United States should be a major contributor, in short, will not be easy to achieve in the face of policy constraints and the supply and demand considerations that we were noting earlier. In the end, though, what's needed is not so much a food policy as a development policy. While the immediate problem may be hunger, the underlying problem is poverty behind which lurks the comparative political powerlessness of the poor. Unless the food-deficit countries develop, that is unless they improve the quality of life of their poor, they will never achieve food security or food self-reliance, or development for that matter. As we have heard, food-reliance is the ability to have access to food either by growing it or buying it. Therefore the policy choices, to which I now want to turn, will have to be broader than simply food policy.

In 1974, the UN World Food Conference, whose tenth anniversary we are in the process of celebrating, concluded that action to reduce hunger and achieve food security must take place simultaneously on three fronts in three time frames: (1) the immediate problem of imminent starvation required sharply increased food aid; (2) the intermediate period during which food-deficit countries would work toward improving their food systems called for some kind of scheme for international reserve accumulation and management; and (3) the ultimate requirement was for those countries to increase their own production and improve distribution internally. While there was general recognition that food self-sufficiency was not necessary and probably not possible for all countries, food self-reliance, that is the ability to grow or buy food, was thought a desirable and achievable goal.

To monitor and coordinate the implementation of its recommendation, the Conference created a 36-nation World Food Council. During the ten years of its existence the Council has become the internal goad of the UN system, prodding the various agencies to carry out the tasks assigned to them by the Conference.

None of the three targets I have listed has been achieved in the ensuing decade, and those objectives remain pertinent today. I believe the United States could and should make its appropriate contribution to all three; but our input, like all outside contributions, has to consider the needs of the hungry first and pay careful attention to the difficulties poor countries face in making significant structural changes.

What to do? I am going to list a series of macro-proposals. I hope your eyes will not glaze over too much. Mainly, they are in the area that Dr. Ezekiel mentioned as preventive medicine.

Taking the first priority in time, it seems clear that U.S. food aid must be increased, probably even more than it has already been, especially for sub-Saharan Africa and especially the food-donation program, Title II of PL 480. At the same time, care must be taken to (1) establish humanitarian relief and development as the top priorities, (2) ensure a commodity mix appropriate to the circumstances of the recipients and not simply dump surpluses, (3) improve the predictability of supply under all market conditions (in other words make it countercyclical), (4) make every effort to ensure that the donated food gets to the people who need it, and (5) ensure that it contributes to development and does not disrupt the domestic market (does not act as a disincentive or create or perpetuate a dependency). Those are all caveats and we all know them. Unfortunately it's very difficult to carry them all out.

In the area of trade, I think the United States should resist the temptation to push exports at any cost instead of revamping domestic farm policy, and should refuse to engage in trade wars or export subsidy competition. It should under no circumstances, in my view, use food aid or trade as a political weapon, for example through embargoes. We should also, I think, take steps to liberalize the imports of labor-intensive processed foods, as well as of nonagricultural products, so that developing countries can increase their export earnings and their ability to resume development, meet their growing external debt obligations (\$800 billion this year), and purchase our products. This kind of action could be an advantage to food-deficit countries as well as to exporters like the United States. It will be necessary, however, to avoid restraints on trade and to make sure that when liberalizing trade and when it hurts workers, those workers are compensated in some way.

I think the United States should encourage and provide support in both its bilateral and its multilateral development programs to the work of private, non-profit organizations that are engaged in development activities in many food-deficit countries through programs focusing on rural development, nutrition improvements, and small-farm assistance. Many of these organizations have been working in developing countries, as many of you know, for several decades. They have built up an experienced dedicated staff. They've established an excellent rapport with (indigenous) counterpart organizations, and have undertaken successful projects.

Although the major market for food-related U.S. private business is, and will continue to be, the United States and the other industrialized countries, those businesses are nonetheless significant factors in the international food system as a whole and in the food systems of many food-deficit countries. Since the investment decisions of many of these corporations affect food production, the diffusion of technology, dietary and nutritional practices, and so forth, the corporate sector should be drawn into the food policy area more than it is now. At the very least, the government should help ensure that U.S.-based corporations active in the food systems of developing countries fulfill their potential for helping to develop effective food systems there and avoid possibly counter-developmental impacts.

Next, the United States should continue, and preferably increase, the support of multilateral institutions attempting to improve the prospect for food security in food-deficit countries. This gets us a bigger bang for our buck since every dollar contributed leverages three more from other donor countries. In particular, the United States should pledge and make its full contribution to the second replenishment of the International Fund for Agricultural Development (IFAD). This organization makes loans for agricultural development to the poorest countries. It's one of the most promising ways, I believe, for helping to increase food production there. The United States should also increase its contribution to the regional banks and to the World Bank's International Development Association, a large share of whose loan funds go to the food sector.

The United States should also give special priority to working with other countries and with multilateral institutions to help interested food-deficit countries develop and implement national food strategies along the lines of the World Food Council's initiative. The Council devised a national food strategy concept to integrate programs involving production, distribution, consumption, and nutrition. This was a big breakthrough since most programs before that concentrated only on production. Most of the major policy decisions about food production and distribution, and access to land are needed in the food-short developing countries. Only their leaders can decide to adjust land tenure patterns so that more farmers will have access to land to broaden the availability of seeds, fertilizer, irrigation, water, power, credit, training, extension services, and so forth; and to restructure pricing systems that discriminate against domestic agriculture. Only they can modify foreign exchange regulations that favor industry and urban dwellers, and reverse development priorities that in many cases have systematically held down the agricultural sector. These are politically difficult decisions. The man hanging on the tree is a good picture to think about. But those decisions are necessary in order to bring about a sustainable, self-reliant food system. Third World leaders willing to take these risks should be rewarded by more forthcoming policies on the part of the United States, regardless of their ideology.

The United States should put its own research and technical assistance capacities to work on major food-related problems of the developing countries to help ensure an adequate supply of personnel with the motivation to deal with key food problems of developing countries.

In view of the particularly threatening food situation in sub-Saharan Africa, the United States, in cooperation with multilateral and bilateral agencies, in addition to increasing food aid, should help mount an immediate massive and coordinated effort of technical assistance, training, and research designed to increase food production and improve food distribution in that region of greatest need and least immediate potential for self-reliant development.

There is one other suggestion. I believe that special attention needs to be paid to the role of women. In my view this is not a "women's problem." It's a development problem. It's the quality of life of women that is most at risk in developing countries, and it is that quality that gets left behind, or even worsens, when something that we call "development" takes place. When we talk about the disenfranchised poor, we're talking in a very explicit way about women. I think that in focusing on the role of women we have the best entree to all of the demand-side distributional political issues that are so much more difficult and urgent to resolve than the production problems which are more susceptible to technological solutions.

In all of this discussion I'm acutely aware that it's focused primarily on what may appear to be an international food policy. Partly this emphasis comes from my own orientation, partly from the topic assigned, and partly because so many groups, including some I am involved with, are trying to load so much specific detail onto the 1985 farm bill. But mainly it stems from a deliberate intention to stress the linkage of domestic and foreign policy in this area as in others.

We all have but one world. Interdependence is a fact, not a wish and not a threat. We all help or hurt one another by the decisions we make publicly and privately. We all participate in an international as well as in a national food system. What we lack as a nation is a national, much less international, food policy. I'm not even talking about nutrition, food stamps, and things like that in this country.

It has become increasingly difficult over the years to develop a U.S. food policy, or to identify a place in the Executive Branch or the Congress where it could be developed and/or implemented. More than 40 elements of the bureaucracy have something to say about food policy--State Department, Agriculture, Commerce, Treasury--plus a score of congressional committees and subcommittees that have jealously guarded bits of jurisdiction. Interested groups from the country zero in on the governmental unit they believe can influence the decision in their favor. In these circumstances the narrowest interests often prevail because their goals are precisely defined and their communication channel is tight. As a result, farm legislation is basically a network of single-interest provisions.

The past few months have witnessed an unprecedented proliferation of groups concerned with the 1985 farm bill, including traditional commodity and industry groups, general farm groups, public interest groups, churches, and, of course, the major political parties. I won't attempt to summarize the kinds of viewpoints being expressed by these various groups, but there are two basic and general questions being raised in connection with upcoming farm legislation that I would like to underscore.

The first is that several groups are insisting that for the first time the farm bill contain at the beginning a statement of policy rather than plunge immediately into some kind of specific commodity legislation. Such a policy would have to adopt goals for the food system that would include an adequate diet for all Americans at reasonable prices, a fair return to the farmer for his investment and his effort including fair wages for farm workers, prudent and efficient use of productive resources to ensure their sustainability, equitable government support programs for farmers and consumers, and ensuring U.S. ability to meet its food needs here and abroad.

The second is a growing concern that farmers should be rewarded for their stewardship, that is for adopting and continuing farming practices that preserve or even enhance or regenerate the resource base.

It will no doubt be noted that given the world's present economic disarray and the political climate in the United States, these recommendations, as a group and perhaps individually, are unrealistic. I would submit that we, therefore, need to change the political climate and help the American people on farms and in cities bridge the gap between the humanitarian impulse they have displayed toward fair play here and abroad, and the public policies and practices required to make that impulse effective.

I would have to disagree, respectfully, with those who say that we really don't know what the problem is, or how to solve it. It's certainly true that we don't know everything, that new and perhaps even miraculous technologies will be found, and that we surely have not reached the limits of the human intellect. But, there is a sense in which it can be said that we, the world, the international community know what the problem is. People are hungry because they are poor. They are poor because they are powerless to choose otherwise, particularly women. If they could choose otherwise they would choose not to be poor.

We, therefore, know the solution too. The poor have to be empowered; they have to develop; they have to improve the quality of their lives. This is not a matter of charity in the popular sense of that term. It is a question of justice. It's a question of rights--the right to food, the right to a human life beginning now. To acknowledge this and to act on it presents an enormous and urgent educational challenge. As Julia Bloch said last night, we have to go beyond the poignant, visible human tragedy of Ethiopia, geographically and philosophically, and deal with the problem of changing those underlying structures.

Nearly everyone agrees that hunger should be eliminated from the human experience and that it can be done by the end of this century, if the necessary political will can be generated. We can eliminate hunger if we (the world) want to. People like you, and meetings like this, I think, can be a very big help in this effort. Thank you very much.

QUESTION-ANSWER SESSION

Q: I wanted really to wait until the discussion got going a little bit before posing this because it's always terrible for someone to get up and ask you about what you didn't say. In any case, I'd like for both speakers to comment on that part of the world food system that is already in gear and that has the potential of producing a lot of food, and that's the complementary food system of the smallholder agriculturalist. To paraphrase scripture: "Men and women do not live by cereal alone." How does food, that is the yam, the cassava, the vegetables, and the small animal products that the women produce, fit into your vision of a food system? How can we give more attention to the smallholder sector, which involves a lot of women, so that it is not neglected or completely forgotten but receives part of the research and the support, as well as the inputs of government and private groups so that what is already a productive part of the system won't be lost? The problem today is that the smallholder sector is being abandoned as discouraged farmers migrate out. And the question is not one of pressure on this part of the land, but the abandonment of something that still has a great potential.

McLaughlin: I would make two comments to that. One is that the International Fund for Agricultural Development which was created with great commotion and difficulty over a three-year period after the World Food Conference, is engaged very much in smallholder support programs. It's concerned particularly about women and smallholders. Unfortunately, IFAD has had a very difficult time getting itself financed. It is located in Rome. It is a very small organization that started out 6 years ago with a budget of \$1 billion for 3 years. It was replenished for \$1.2 billion for the following 3 years, ending in 1984. The U.S. has only recently contributed its share of that.

The negotiating budget for second replenishment, which should have started at the beginning of 1984, is down to \$700 million and may be reduced further. There's a lot of blame to be shared on this. Some of it should be borne by the United States, but not all of it. Secondly, what happens to smallholder agriculture in country X is largely determined by what the government of country X wants to happen to smallholder agriculture. I think what we have to do is examine all of the economic policy interactions between the United States and country X to figure out just how much our foreign private investment in that country is affecting decisions of people who leave their local produce farms for the cities, or the extent to which the better farmland is taken over for export crops without real compensation, and things of that sort.

I think that we have to consider our commercial lending policies. This is getting to be a very popular subject because when you consider that the Third World debt is \$800 billion of which a third is owed to U.S. commercial banks, that gets us into an interesting set of issues.

My point is simply that smallholder agriculture is very much a domestic problem, but it is influenced in many ways by external forces that are indirect. What we can do about those external forces depends upon our relationship with those forces in the United States, and that means public policy. It also means, perhaps, some rethinking of corporate practices in some cases.

Ezekiel: Let me express a few views on this question by asking the questioner, when you say that the smallholder as a rule is disappearing, are you making an economic assessment, or is this merely an emotional, or nostalgic statement? This is very important because one often gets into this kind of social phenomenon where you are unhappy that something which looks interesting, nice, strange, peculiar, and attractive is disappearing even though it may be good for those who are in it. It may be good or it may be bad. Therefore, one has first to make sure that in any country that smallholder has really a role to play and that his continued existence is good for him and for the society in which he lives. Must we keep them because they have some primitive habits and ways of functioning which look very interesting, and we want to be able to go over there and study them from time to time? As a result, they remain in poverty and live in the 15th or 17th century, or even earlier, while the rest of the world is moving on. The answer may well be, yes, they have a role to play. If so, then why are they then disappearing? Is it because there are certain forces at work? Can those forces be overcome? What policies and forces do you need to deal with them provided the cost involved in the implementation of those policies and programs is worth the result? If so, those policies and programs will have to be devised, their costs estimated, and the benefits of implementing them calculated.

Assuming that we come to the conclusion that they are worthwhile, that policies and programs with relatively small costs can be devised to protect the smallholders, then what needs to be done is a great deal of socio-economic research as well as research of a technological nature which will look at the problems of smallholder production in terms of how that productivity can be increased so that income can rise and the output justified. Very little research is being conducted on vegetables, for example, and one would want to do more of that if the smallholder is what you want to protect. That kind of thing would be one way of trying to protect the smallholder. Maybe, however, the economic system is one in which the smallholder will not ultimately have a place. Does the smallholder, similar to those in Jamaica, have a place in the United States? If there was such a place, it disappeared long ago, because the economy changed.

Q: I have a question that you alluded to, Mr. McLaughlin, when you mentioned this whole business of the debt. It's a rather difficult question, but it's been with me ever since I got here. I think I really have three questions. One, of course, relates to the debt that the Third World countries have run up, and continue to run up, and how servicing that debt affects the whole process of development. Another concerns the United States trade deficit, which we also mentioned this afternoon. And finally, having just come through the U.S. elections and having heard a great deal about the budget deficit, I'm wondering if those things are all related and if we also should be considering them as we discuss how we are going to deal with this problem of hunger.

McLaughlin: Well, I don't think we have time to answer all of those questions, but I will say a couple of things and take the risk of being ridden out on a rail. Everything is connected with everything. So yes, they are related questions. Debt service for the Third World countries is a very, very serious problem because the only way they service the debt is to earn foreign exchange. If trade is down, commodity prices are down, manufacturer's prices are down, and their export prices are down, they are not going to earn very much foreign exchange.

Will they survive all this? I don't want to be placid about it, but my feeling is that a debt in the magnitude of \$800 billion never gets paid, it just gets managed. It gets rolled over and rescheduled so that the problem is not the debt. The problem is the relationship between what it costs to manage the debt, and what it costs to keep the country and the people alive. Will they survive? I think so. Because there is what I used to call the Conrad Hilton syndrome. If you owe the bank \$80 million, the bank is in your hands, not the other way around, unless the bank wants to run a lot of hotels. In other words, the more you owe the less likely you are to have to pay it. When you think of an \$800 billion debt, think of it as one half the U.S. national debt which is also not going to be paid. We'd be in trouble if we printed enough money to pay that debt.

As a footnote, I did a little research in connection with something else the other day, and I came to the conclusion that all of the sub-Saharan African countries owe collectively to the United States government, that is a public, not a private debt, roughly \$1.9 billion. That is roughly \$100 million less than it costs us to build one Trident submarine. Now the question is, do you trade a submarine for forgiving that debt. I doubt that this policy issue will be raised in the current Administration, but I raise it as a kind of theoretical exercise.

On the subject of deficits, we have a trade deficit because we buy more than they buy, and we buy more than they buy partly because the dollar is so strong. I don't know how to answer that one. If we buy less, they're in trouble. So, we have a problem. Now we're not buying from the developing countries primarily, except, of course, from the OPEC countries.

On the budget deficit, that's entirely in the hands of the United States. It is a budget which is a collective allocation of resources. We can decide how many resources we want to allocate in toto, and how we want to allocate those internally. My answer to you is that if you don't agree either with the total or with the mix in the budget, you ought to let the people who define the total and the mix know. Very specifically, how would you do it if you had the option. There are 535 people in Congress to whom you can write. In fact, there are 537 people in Washington you can write to about this.

Ezekiel: The question to ask, and it can be answered in two ways, is how did this Third World debt arise? One answer is from the supply side. The banks were flush with funds arising out of the rise in oil prices, the substantial liquid resources at the disposal of the oil-producing countries which they put into the banks to earn interest. The banks invested these funds all over the world, including the developing countries. Therefore, the banks did what they needed to do in order to conduct their business. They made bad judgments. What many countries are saying now is that they should not pay for these bad decisions. However, the U.S. government, the governments of the industrialized countries, and the international lending institutions will try to make sure that the banks are paid. Why? The banks didn't consult anybody before they made the loans. If you go back into history, when banks made bad loans in the interwar period they suffered the consequences. I suppose you are well aware of the fact that there are innumerable bonds of a small municipality in the Austro-Hungarian Empire which have never been paid, and nobody has forced anybody to pay them. No government has been involved in insuring their payment.

A good question to ask is, why should the U.S. government be interested in insuring that the Third World debt be paid now. Should it use its political power for this purpose?

The other way the question can be answered is from the demand side. Why did the developing countries want these loans on terms that were very difficult, and interest rates that were very high? Because as a result of the rise in oil prices, they were put into a position where they had to pay substantially more for the oil they imported, point one; and point two, they had to pay substantially more for the industrial goods that they had to buy from the industrialized countries.

So, the developing countries got hit at both ends--in the oil they bought and in the industrial goods they imported from the industrialized countries. Therefore they had to survive this period by borrowing. They had two options. One was to cut back on oil imports and, therefore, their immediate development and growth, or to borrow and postpone the day when they would have to deal with the problem. Some countries, like India, did not postpone the problem. They took the brunt of the oil price in terms of slowing down economic growth and adopting policies aimed at promoting exports at a great sacrifice in order to generate foreign exchange. Other countries took out loans and said that they would deal with the problem when it came up. Those are the ones that are in trouble. Now are you going to give them assistance in order to repay the banks when those who fought the situation are not being assisted? That's a good way to look at it. Please think of the problem in these terms.

McLaughlin: I think there's one other historic question that you could raise and that is why didn't the OPEC countries which were so flush with money invest it in Third World countries instead of the Chase Manhattan Bank?

Ezekiel: That's right, they didn't.

Q: Mr. McLaughlin, when presenting your recommendations on how we can go about improving the international food system you listed several organizations that presently could be playing a more active role, such as the private sector and the agribusiness industry in particular. I wonder if you could elaborate on that further and explain exactly the kind of roles that you see these actors playing in the international food system.

McLaughlin: First of all there is a tendency in many quarters of the United States to bash the corporations. Transnational corporation is kind of a swear word. The fact of the matter is that however you look at it, international corporations, whether they are based in the United States, or in some other developed or developing country, are major actors on the international economic scene. If the purpose of our concern is to have development take place, then it seems to me that these actors who obviously can contribute to development should be asked or even required to do that.

Now how that takes place varies very much from country to country and from corporation to corporation. I think it's fairly obvious that a large corporation which is producing and manufacturing farm equipment can be very helpful in a Third World country trying to develop its agriculture, provided the equipment that is being devised is somehow relevant to the circumstances of that country and is not based on the American model. It may be that they don't need an 18-foot combine. They may need something much smaller, or we might say, more primitive or less well developed. The problem is that, in my view, the purpose of a corporation is to produce something for profit, and there is nothing morally wrong about producing something for profit. But, if another purpose is to be injected into the corporate decision, it may have to be injected from a noneconomic, i.e. political or social-political point of view. It's been rather difficult to get the majority of corporate executives to see this longer term value when they're making shorter-term economic decisions. But in the long run it is probably, I think, in the interest of the corporation to have development take place so that the corporation's product can be purchased when development has reached the point at which its product is relevant. I think it's a very difficult problem.

There is a Presidential commission on international free enterprise development, I believe. It's chaired by Duane Andreas, of ADM (Archer Daniels Midland). It's been working for about 2½ years to make some recommendations about what the United States should do to foster free market development around the world. Its report will be issued next week in Washington. I want to see what the commission recommends about the entry of private enterprise into economic development on a consistent basis.

Q: It's a question for Dr. Ezekiel. You discussed the hypothesis that food aid is a disincentive to domestic agricultural production. Almost all of the evidence you cited to refute that hypothesis was from a single country, India. When I took statistics in graduate school I was taught that you cannot refute a hypothesis by using a sample size of one.

In the 1960's there were a number of other countries where the United States provided a lot of food aid, such as Colombia, Pakistan, and Egypt. Were the records of these countries worse than that of India, or were they also fortuitously aided by the Green Revolution?

Ezekiel: There was no attempt in this particular case to write an academic thesis to make a point. It's just to illustrate the point that I gave the case of India. To answer your question, I would argue that in Pakistan as well the response of food aid was favorable. There has been a substantial expansion in output in Pakistan. In fact, it is, like India, a potential exporter of wheat. In Egypt production has also increased, although consumption has increased more so that in Egypt the situation has not reached a balance between demand and supply. Subsidies have created complex problems in that country which are not the same as those faced in India and Pakistan.

About Colombia I do not know enough right now, but I would like to say that in Colombia the problem arose because the quantity of food aid in the form of wheat was so large that it constituted more than 33% of the total domestic production. The gap between the consumption of wheat and the production of wheat was not that great. Consequently it did produce a very sharp and very definite fall in the prices of wheat, and therefore produced a disincentive for the wheat production during that period. The government kept on accepting the wheat because when it was sold it was converted into local currency and provided some underpinnings for the Colombian budget. But even this does not show that food aid produced a disincentive effect on food production. What it does show is that wheat aid in excessive quantities produces a disincentive for the production of wheat. In fact, other crops expanded in their output. Some of these were food crops; some of these were nonfood crops. It is not true that when the price of wheat fell that the land went out of cultivation. What happened was a shift from the cultivation of wheat to the cultivation of other crops because wheat production was not profitable during that particular period of time. So a somewhat greater examination of the Colombian question is required, and I have not had an occasion to study it.

McLaughlin: I would like to make a slightly different, but related point. I think that U.S. food aid has the potential of being a disincentive. There are a lot of people who are giving a lot of anecdotal examples of this and it is probably wise for the community that is concerned about food aid to study some of those questions and answer them. On a more general level, I would say that the potential is far greater for Title I to be a disincentive than it is for Title II. Title I is a government-to-government program through which in effect we lend them the money to buy our food. Once they have bought the food, it's theirs. There are no further restrictions. There may be restrictions in the contract, but the only sanction we have is not to do it again. We cannot control the internal handling of food that is sold for money. Money is fungible. It goes into the budget for whatever purposes the country wants to use it for.

We have tried to offer an incentive in Title III of PL 480 for countries to use the money for development purposes in which case they don't have to pay it back. Title II, on the other hand, does not go to governments, or at least 90% of it doesn't. It goes to either private voluntary agencies in the United States, or to the UN World Food Programme for distribution in micro-level projects. That doesn't mean that they're irrelevant for development, or unreplicable. It just means that they are small. Unfortunately, over the years the ratio between Title I and Title II has been roughly 2½ or 3 to 1, and the transfer authority in the statutes has been used almost entirely to transfer Title II surplus funds into Title I accounts.

I'm getting into too much detail I'm sure, but I simply want to say that if the food is going from government to government it is less subject to our control and therefore more likely to be a disincentive than if it goes through private organizations.

Q: During the political campaign, President Reagan said that he would not touch the defense budget and social security. Just before I left Cedar Rapids yesterday, I heard that the Administration was looking at agriculture as an area to cut. So, I'm wondering what's going to get cut in agriculture. Is there waste and fraud in the agriculture spending? What's going to happen in that area?

McLaughlin: Well the quickest answer for me to give is that I don't know, but that's not really fair. I think, first of all, foreign aid is only agriculture in terms of food aid, and that's only PL 480. I don't think that PL 480 is going to be reduced. I think it's going to be increased, partly because of the surplus question, partly because of commodity mix, and partly because of the emphasis on Ethiopia right now which is important in the short term. Well, it's not short term, but it's a consideration that lends itself to being looked at as short term.

What's going to be cut? I would say that that depends very much on the commodity lobbies. You can talk and talk to the commodity lobbies if you want to about that.

Waste and fraud? I don't see much waste and fraud in the farm area. It seems to me that there may be some misallocations that stem not from one of those, but maybe from greed or ignorance or something else, but waste and fraud would not be the things I see. I think that in terms of the discussion you are going to have later on, it's probably wise to look for advocacy groups that you resonate to best, in order to decide what you want to do about farm legislation. It certainly has to be done in 1985, or the authorities will run back to 1939 which nobody I know of wants to happen. Of course, one answer might be that we won't do anything but just extend current authority and avoid all debate. But I think the debate on the 1985 farm bill will fall partly along the lines I was suggesting and partly along other lines. It will take place with considerable vigor and will start fairly soon, early in the 99th Congress.

Q: I have a question as to mechanisms that are available to try to get the government out of the direct foreign aid business. One of the problems that I run into is that whenever I find somebody, for example in West Africa, who wants to undergo a certain kind of project, I talk to government agencies who claim that they're in the business of insuring American businesses against political and economic risk. In those cases the response is generally that either we aren't doing business with that country, or that there are direct aid programs in place with which private enterprise would conflict, so we can't discuss it. What it boils down to is that you can't get there from here. At some point we need to make a decision to actually begin international trade as an environment in which private enterprise can be active. So what I am looking for is some way to get around this age-old political problem. They pass a bill to build a bridge, but they never appropriate funds for it. Does that make sense?

McLaughlin: Well, you're confusing me just a little bit. Are you saying that we should get the government out of the foreign aid business?

Q: Yes. What I'm saying is that the government agencies claim that their role is one of advocacy of private enterprise and that their role is an umbrella for the development of private enterprise channels, but what they actually do is to establish direct aid programs with which competition is very difficult. I don't know how to get around that.

McLaughlin: I'm a little bemused, but let me comment from my bemusement. First of all, I think that the emphasis on involving the private sector more in foreign aid is a very recent one. It developed during the past four years. Basically the difficulty with that emphasis is that the United States is a unique country. There isn't any free market in any other country that's even remotely like this one. All other governments have something to say about most aspects of economic activity. It is, therefore, very difficult to get the U.S. government out of a foreign aid process as long as it is dealing with what happens in another country because the other country is going to insist on its being a government operation, because many countries don't trust foreign private investors. They see them as interested only in the profit of foreign private investment and not in the development interests of the Third World country.

On the question of the insurance you were talking about, I think that is really a function of OPIC (Overseas Private Investment Corporation) which really does not provide money. It does insure, or attempt to insure, U.S. corporations against losses on the basis of political difficulties in developing countries. That is a program whose authorization line has been increasing regularly. I don't think they've had to pay out much as a matter of fact to compensate companies for losses. It's been a fairly low-cost program.

I'm not sure that it makes sense in a policy relationship to try to get the government out of foreign aid. There is one clear way to do it and that is don't appropriate any money for it. Now I could go into the Congressional ins and outs of that, but you have a much more expert person coming up in the next session who can tell you all about that.

Q: This question is for Dr. McLaughlin. As you said, early next year the Congress will begin debating the 1985 farm bill. This legislation will be in force for the next four years. You also indicated that we do not have a food policy in this country. I would like to have you elaborate a little bit on what a food policy for this country could and should be, and how groups like this one can influence public policy.

McLaughlin: Well rather than prolong the discussion with a long list of what a food policy ought to be, I can give you general aspects of what I said earlier in my talk. First, an organization to which I belong, as do many of you, has produced a paper on what the farm bill ought to include as a general policy. That paper is available from Bread for the World, either from a local chapter, and there's one in every Congressional District, or from the headquarters in Washington, D.C. at 806 Rhode Island Avenue, N.E.

Second, there is a group of organizations, once again in Washington, which has produced a much more detailed publication on the farm bill which will be out in about one or two weeks. That can be obtained (there may be a charge) from Interfaith Action for Economic Justice, at 110 Maryland Avenue, N.E., an organization that I know well. Just ask for the paper described. Neither of these organizations is very big. They're all underfunded, but would be happy to have you write and ask for their position paper.

WORKSHOP: "How to Influence Your Government
on Third World Developmental Issues"

Moderator: Dennis L. Thompson
University of Illinois Cooperative Extension Service

Our workshop leader today was a member of Congress from the 20th District in the State of Illinois from 1961 to 1982. He is currently a member of the Board for International Food and Agricultural Development (BIFAD) and serves as an adjunct professor at Western Illinois University in Macomb, Illinois. He was the author of Title XII which is commonly called the Famine Prevention Program of the Foreign Assistance Act, and has also been involved with legislation concerning government payments to individual farmers, various trade expansion programs, and the reduction of government control in agricultural commodity programs. In 1974, he served and participated in the World Food Conference in Rome about which we have heard so much at this conference. Also he was a delegate to most of the North Atlantic Assembly Conferences from 1965 to 1981. It gives me great pleasure to introduce and present to you the Honorable Paul Findley. Mr. Findley.

The Honorable Paul Findley
Member, Board for International Food and Agricultural Development
Former U.S. Congressman from Illinois

Thank you, Mr. Thompson. I would like to get acquainted with this group a little better than I am. Would those who are affiliated with a land-grant institution stand up. Thank you. Now would those who are affiliated with an institution that is identified under the Title XII program stand up. There are several.

I enjoyed Dr. McLaughlin's comments. When he was giving a brief outline of what the 1985 farm bill should contain, I felt right at home. It's been a little bit difficult for me, since my involuntary retirement back in 1982, to realize that a major farm bill is going to be adopted without Findley taking a role in it. Well, here I am taking a role in it this afternoon, anyway, and I thank you very much for this opportunity.

Davenport, Iowa, I think, has a population of about 100,000 people. The U.S. Agency for International Development has estimated that in every 24-hour period, about 20,000 people worldwide die of malnutrition. This is another way of saying that every five days a population equivalent to that residing here in Davenport is wiped out as the result of malnutrition. That's the best way I can dramatize the urgency of the business that calls us together today. Back in the dreadful days of the Vietnam War, I recall vividly Jim Symington, a young Congressman from the St. Louis area, taking the House floor and speaking very briefly. The message he had for us was essentially this: There are 435 people gathered in this chamber. (He was exaggerating because the entire membership of the House never is present in the chamber at one time.) But he cited the total membership of the House of Representatives and then he noted that during the previous week 500 American citizens, serving in military uniform, had died in Vietnam. He said, "Just imagine how we would react to this struggle if we were certain that in the coming week all of us would be wiped out as a result," suggesting that our attitude towards the policy in Vietnam might be quite different.

I'm well fed. You can tell that readily, and I suspect that most of you are too. We have difficulty, therefore, understanding what malnutrition and famine are all about. The assigned topic to which I'm speaking is how to influence your government on Third World development issues. I must say modestly that I think it is the most important topic on the agenda of the Conference. We can readily agree that a massive problem in world food supply distribution does exist. We can even agree generally on the measures the United States can best undertake in order to meet this problem. But all of this will be to no avail if our government fails to move accordingly. The magnitude of the problem I just tried to illustrate is seen in the agony of the famine in Ethiopia. Certainly many people are dying in great numbers worldwide of malnutrition and starvation.

Just two years ago the federal budget outlay for farm programs whose main object was to curb food production was over \$15 billion. Now that was for one 12-month period. I used the figure, \$15 billion, on the conservative side because a case could be made to support the contention that \$21 billion was actually spent during this 12-month period for the purpose of reducing the production of food in this country. Well, whatever the exact figure it is enormous beyond my comprehension, and I suspect, the comprehension of most citizens. Those who die each day from malnutrition are likely to be unaware of this ugly and absurd anomaly. I was about to add the word, "fortunately" unaware, because we cannot conceive of the mental state of a person dying of starvation who had the knowledge, for example, that the government of the United States was spending billions of dollars during the past year compensating farmers for reducing the production of wheat and feed grains on their cropland. I dare say that there really are relatively few of our own fellow citizens who are aware of this absurd and ugly anomaly.

Well, the proper role for the U.S. government is to feed the hungry, directly through donated foodstuffs which hungry people will receive without cost, and indirectly through government-to-government food aid which enables the host government to provide food to needy people, theoretically at least, at reduced cost.

The problems involved in this type of endeavor can be found in Ethiopia. Part of the problem, as Mr. McPherson graphically stated in news reports yesterday, is inadequate port facilities. It's one thing to have the grain to feed the starving, and it's another thing to get that needed grain into the country itself. But an even larger problem in Ethiopia, as well as in many other countries, is the task of actually getting the grain to the malnourished and starving people. Most governments in that part of the world are, to say the least, inefficient and I think it's even generous to call them corrupt. Donated grain loaded on a truck may never reach the intended people.

Most starving people have no money to pay for grain, so when we actually provide grain to a host government on attractive terms, as we do under Title I of PL 480, there really isn't much likelihood that that donated grain is actually going to reach any of these starving people because they simply don't have any money with which to buy it.

From the standpoint of the general economy, the cut-rate offerings, as Mr. McLaughlin pointed out just a moment ago, are often a disincentive to production and one wonders whether these grain gifts advance the cause of meeting the world hunger problem as we are so eager to do.

The most important role for our government and our people, I think, is to help train the hungry to feed themselves. This is easier said than done even when all parties are fully committed to the goal. Success requires a long-term commitment by the host government to undertake a fundamental program of mass education. The United States has been endeavoring to accomplish this goal, which I view as the most practical and the most promising. Ever since December of 1975, when President Gerald Ford signed Title XII into law, the Famine Prevention Act of the Foreign Assistance Act, we've been undertaking this task through a partnership arrangement between the great teaching institutions of the United States, many of them represented here today, and the government of the United States. Not all citizens endorse this role for our government. Many of them equate these programs with that unpopular term, foreign aid. I'll never forget H. R. Gross, that valiant legislator from Waterloo, Iowa, always describing foreign aid as that "foreign give-away program." Well, foreign aid is often used as an expletive, as H. R. Gross used it. It's caustically translated as a give-away scheme to pass out money and food to foreigners when we have unmet needs here at home. Whenever the public is asked to identify the programs that should be reduced or eliminated, foreign aid always tops the list. You can be sure of that. Erroneous perceptions by the public, together with just plain ignorance about the facts of life worldwide are the greatest stumbling blocks to eradicating hunger from the planet. The people of the United States very clearly have the capacity to feed the world's hungry to a far greater extent than they do today, and more importantly, they have the resources through which the hungry can feed themselves tomorrow and have a better life and be able to buy things from countries like the United States. But frankly, our country is not doing an adequate job on either front, and that's where you come in. You can make a difference.

Your presence today means that you are a very select group. The decisions you make and efforts you undertake will affect the food and agricultural situation abroad. Your endeavors may be largely unnoticed and insufficiently appreciated, but they can be vitally important in solving the growing problem of famine and malnutrition in the developing world. Your work probably won't make the evening news, or even the inside pages of the local newspaper.

Many people in our government know the right path to take, but they need to be prodded down that right path. The great teaching institutions, the land grant universities that have contributed so much to the development of food production in this country, know what they should be doing. But they, too, need prodding. It's human nature for a university, a government, or an individual to take the line of least resistance to seek out the activities that involve the least pain, strain, and torment. Universities are no different than the others.

Well, our legislators ought to know what to do and how to do it, but often they do not. One exception is Paul Simon, a person who has had a longstanding interest and commitment to world food problems, who was just this week elected to the U.S. Senate. Frankly, I regretted very deeply the loss of the services of Charles H. Percy. He, too, was valiant on the world food front, just as Paul Simon is; but I must note particularly the splendid work that Paul Simon carried out during his tenure in the House of Representatives. But Paul Simon is a rarity. Few others on Capitol Hill have demonstrated a similar interest. Many people have given up on the world hunger problem. They think it's hopeless. They feel that there isn't anything really that can be done to solve this problem. They see no practical way to get our food

abundance to hungry people around the world. They see no likelihood that the trend in Africa, a very distressing trend in which per capita food production is actually declining, can be reversed. They may be cynical about the ability of U.S. universities to make a difference, and the record of U.S. universities is not without blemish.

But on the brighter side, Title XII is in position to do good things. It is functioning. It's about to enter its second decade, and while I am deeply distressed that it has not accomplished more than it has during these past ten years, it is in good hands. AID is headed by a graduate of the Title XII program. Peter McPherson was a charter member of the Board for International Food and Agricultural Development (BIFAD) on which I now serve, and so was his special assistant of today, James O'Connor. They want Title XII to succeed as do the present members of BIFAD. Also promising is the degree to which universities have participated in meeting the eligibility standards by utilizing grants to strengthen their campus activity for international work. There is a better spirit today between AID, as an institution, and the university community than I have seen in about 25 years. That is vitally important, and I think it holds a bright promise for tomorrow.

Still, great problems remain and most of them can be reduced by action that you yourselves individually undertake. These problems come under the category of ignorance and lethargy. There is great need for good public relations. Seek out and do your best to influence your Congressman and your Senators. How many of you have had a direct face-to-face conversation, even the exchange of a few words with your Congressman in the last year. Would you raise your hand. I am delighted to see that many hands. How about one of your U.S. Senators. Have as many had that contact? Fewer hands. Well, you are missing an opportunity and so are they. And I speak from a lot of experience in this field. They all need prodding. They need prompting. They need education. And they, frankly, know of this need.

I have a few suggestions about dealing with Congressmen and Senators --a few do's and don'ts. First of all, don't start with the defeatest notion that these people are inaccessible. They each have a big staff and one of the functions of that staff is to protect the leader from intrusions. But they all inevitably look to the next election day. Now, election day is only a week in the past, but already everyone of the 435 House members and all of the Senators who will be up for election in two years are looking toward the next election day. They can never wisely or safely put the next election day completely out of mind. They are busy people. That's certainly true. They handle a lot of tough assignments every day. I think you'd be impressed if you could see the schedule cards that they have to carry around every day indicating the various challenges they must confront in a 24-hour period. They almost all keep a frantic pace and tend to be harried at the time you might encounter them. But most of them vote for foreign aid. Otherwise the legislation would never come into being. But when they do vote for foreign aid they hope that nobody will notice because it is so unpopular back home. Well, you have the frequent opportunity, if you'll just seek it out and utilize it, to put foreign aid in a positive light, and thus make your Congressmen and Senators feel better about supporting it. They almost never get a note or a telephone call thanking them for voting for foreign aid. I think Mr. McLaughlin's Bread for the World group occasionally sent me a note patting me on the back for something I did to boost foreign aid. Those were rarities, but we knew that a note from Bread for the World was from Washington, D.C., and not a note from, let's say, the 20th Congressional District in Illinois.

A call from a constituent or a telegram or mail from a constituent expressing appreciation for a foreign aid vote is bound to get attention because it is a message which almost never arrives on Capitol Hill. If your Congressman or one of your Senators has been particularly diligent about supporting foreign aid, or a particular part of it dealing with world hunger, why not try to arrange a public function in their home constituency to pat them on the back for having done so.

Another way that you can help create a positive attitude on the part of these legislators towards foreign aid is to encourage the chancellors, presidents, or whoever heads up universities and colleges to seek out these legislators with a word of praise now and then. The best time for you and the university administrators to do it is when you are next on Capitol Hill. Nothing astonishes a Congressman or a Senator more than to have a constituent come in and thank him or thank her for supporting a particular legislative initiative on foreign aid, and not ask for something, or not complain about anything. It truly is an astonishing experience for legislators to have that happen. Make yourself a one-person committee to keep your legislators informed on good things that are being done in the realm of foreign aid and encourage your Congressman or Congresswoman to go abroad at government expense and visit the site of a university project from his home constituency. It won't be too hard to identify such work because many universities are now engaged worldwide in such activities. Now, I know from personal experience that these trips are often called junkets. That means that a Congressman or a Senator will be frankly thrilled to have the opportunity to put an aspect of such a trip in a positive light with his constituency. He can explain that he's gone to Ecuador, for example, to check into the work of the University of Florida on the improvement of food production for the peasants of Ecuador.

As you approach your legislators, keep their frantic schedule in mind. If you plan to visit them, and I hope you will, craft the visit carefully so that when it's over they will look back on it as a worthwhile investment of their time. This means handling the opportunity so the legislators will clearly see something in it for them. This could mean knowledge which will be helpful perhaps in their committee work or in a vote on the House floor, favorable publicity back home (and don't neglect that, because that's the grist that keeps the political wheels going), or a feeling of satisfaction in the work that they have done as legislators. So often the day is filled with complaints. Try to impart to them a feeling of satisfaction over what they have done. Above all, be prompt and brief. Congressmen are busy human beings who almost always feel harried and probably look harried. Don't miss opportunities to be with them. The actions they can take can have momentous importance to your life and to mine. Approach them with this in mind.

Now, if you have a memo pad on which you jot down the things to be done tomorrow, and I recommend that practice, start each with a notation like this: Action on World Hunger. Put it at the top of your list every day. You'll be astonished at how many things come to mind that you can do for this cause. Maybe it will involve clipping something out of the media and going in to see the news director for the local radio or TV station, or going to the editorial writer for the local newspaper and calling to his attention a development that he might have, perhaps, overlooked but that is important to him.

When an event like this conference comes up give it high priority and tell the world about it, especially the world nearby. I don't know if there are any media here today, but I hope so. Be as imaginative about finding ways to get the press to cover events like this as you are in insuring the quality of the conference itself. We tend to talk to each other. The converted tend to talk to each other, and that's good. We need to reassure ourselves occasionally, but we need to get the word beyond just the group in this room.

Title XII, as I mentioned, was signed into law by President Gerald Ford ten years ago. President Jimmy Carter signed a letter about Title XII which was read by Vice President Walter Mondale at a famine prevention symposium in 1979, four years later. President Ronald Reagan signed a similar letter which I had the privilege of carrying to Ecuador about three years ago. But frankly, I doubt that Ford, Carter, or Reagan, even to this day, realize that Title XII exists, or have any real understanding of how the world food problem can be met. I'm not suggesting that you can often get into the Oval Office to visit personally for any length at all with the President of the United States, but every day you have opportunities to enhance the knowledge and influence of people who can help shape public policy. You should seize those opportunities and act on them. The most important thing is your own determination to succeed in this. You are the missionaries, in my view, of a cause that can fill hungry bellies, quicken the minds of depressed people, bring bright hope to millions who now live in darkness, and at the same time serve your own country by helping to eradicate one of the principal causes of international strife. Our great teaching institutions which work through Title XII have the capacity to eradicate famine and malnutrition worldwide within a generation. I don't have any doubt about that. I'm absolutely convinced that if the enormous educational resources of the great teaching institutions in this country were harnessed to the needs of developing countries, the transformation and public education and utilization of resources by the peasants worldwide would be so swift and broadscale that by the year 2000 famine would be just something for the history books.

But the experiment that we are all engaged in may fail. And if it does, a black cloud will descend over the hungry world. The best hope on earth, as I see it, will fade and the nation known worldwide for its capacity to eradicate famine will have stumbled, dashing the dreams of all. Teaching institutions which invested heavily in these dreams will be demoralized. Congress and the other institutions of government will be turned off. Cynicism and despair will sweep the hungry nations and years could pass before the black cloud would be dispelled enough to inspire new action.

If Congress falls down in its responsibility to provide needed funding; if the agencies of the executive branch fail aggressively to enlist the cooperation of the governments of the hungry nations; if the great universities fail to take seriously and utilize fully the opportunity before them; if you, the individuals, fail to inspire action, the greatest hope for solving the world's hunger problem will become only a bitter memory and will likely remain so for many years to come. So much hands on your success. Thank you.

QUESTION-ANSWER SESSION

Q: I am originally from Belize, Central America. It has been the policy of the U.S. government to introduce technology in the Third World to promote agrarian reform. They are also trying to institute population reform, telling

people to stop producing so many children. But what they fail to realize is that in a lot of these countries the people thrive on large families. They depend on large families to produce their food. My point is that instead of implementing technology, and become technologically intensive, maybe the U.S. government policy should be to encourage these countries to become labor intensive, and use this population. Don't encourage these people to stop producing. Indeed a lot of developing countries (I am now speaking from a personal perspective) do not see population as a problem. Only the U.S. does. We think the U.S. and other industrialized countries are trying to deprive us of our chance to become developed countries also.

Findley: You said it better than I did. I believe that much of our foreign aid in the past has been geared toward the transfer of rather advanced technology.

I want to tell you about a little experience I had with a Congressional delegation which visited Ecuador in 1979. It was the first time a Congressional group had been in Ecuador for many years, and they still had the trimvirate of military leaders running the country. But the leaders took seriously this opportunity to sell the wares of Ecuador, and during the afternoon the leadership of the entire government lined up on one side of a great long table. These included the head of the bank, the head of the military establishment, the head of the agricultural department, and so on. On the other side was the Congressional delegation.

One after another these leaders of the government of Ecuador told of the glories of accomplishment under their stewardship. The final event was a slideshow presentation of the great things done in agriculture. The heart of it was the showing of a vast field of grain. I guess it was wheat. You couldn't see the limits of that field. Then the camera swept over, and showed a vast concrete irrigation ditch at the edge of the field and other shots showed enormous machines for planting and harvesting this grain. There wasn't a peasant in sight. It made me realize what enormous obstacles we face in trying to whip the problems of a hungry world. If the host government believes its success is equated with the transfer of high technology, bypassing the poor peasant, then very little is going to be accomplished. Nothing is going to be accomplished to uplift the peasant. That's why I view Title XII is so hopeful, because it is involved in mass education inspired by the Land Grant Act in this country more than a hundred years ago which set out to provide education to the masses of the population who were then farmers. The masses of the population of most of the hungry nations are farmers. They have limited resources. They could each probably do a lot better with the resources at hand but they don't know how. They aren't consistently spurred down the right path to improve food production. That's where a land-grant-like system could do wonders, I think, in almost any country where there is a food deficit. It doesn't bypass the peasant. It concentrates on his needs, providing him with general education which is, I think, the best hope for reducing his dependency on large families, for bringing about agrarian reform and other changes in the political structure of his country. It's an investment in general education. That's why I think it is so promising and so worthy of our best efforts.

: Congressman, you mentioned the unpopularity of foreign aid with the general public and the trepidation with which members of Congress vote for it. It seems to me one of the problems in that whole domain is that we haven't yet done a good enough job of transforming the mindset in this country that foreign aid is not simply a handout; that it is actually an investment in the future.

We've not done a very good job of getting over to the American public the real gains to be made from fostering development in the Third World and that it's not simply charity. Do you have any suggestions about how we can go about more effectively getting out that message?

Findley: You obviously grasp the need. I don't know where you live, but you have opportunities in your home area to make sure that the local media, the leadership, the community, the leadership of the churches and the school systems understand that money put into foreign aid does bring back returns to the citizens of the United States. You ought to seize all such opportunities. We're meeting here in Davenport, Iowa. Isn't Jim Leach the representative for Davenport, Iowa? He has an excellent record on foreign aid. Jim Leach serves on the House Foreign Affairs Committee. I was his colleague there for a number of years. People of Davenport ought to seek out a way to really salute the great work that Jim Leach has done in this field and congratulate him for voting for things that benefit the United States by supporting foreign aid.

Q: I believe that one of the most important things that can happen for foreign aid assistance is the 1985 farm bill. I believe we should include in this bill a long-range program for maybe ten years, and not from election to election. We need a long-range bill, and I think the League of Women Voters should really research this and let the public know what their stand would be on it. What are your comments on this type of approach?

Findley: Well, it's a noble idea, but frankly, it doesn't have a chance. First of all, the people who serve on the Committee on Agriculture in both the House and Senate tend to represent very specialized commodities. Most of them see their responsibility as serving the rather narrow interests of those commodities. Also one must recognize that people in Congress like to do good things for the farmers and they like to do those good things periodically. So they are unlikely to vote a program that would deny them the opportunity to make a befriending vote every year or so to advance the interests of farmers. I don't want to seem cynical about it, but the truth is the legislation is fashioned for the most part by people who respond to the narrow interest of particular commodities.

The main problems I have with farm programs is that they tend to be expensive and they tend to yield financial benefit more to large operators than to small ones. That's why I proposed the payment limitation. I'd like to see it much lower than \$20,000. It provides a social dimension to the payments that are made under farm programs, and if there is no limitation there, frankly, is no social dimension to it, and there should be.

In all candor, the League of Women Voters is not one of the groups that has influence in the Committee on Agriculture. That's not to say that it cannot. The League needs to start working in the districts of the members of the Agriculture Committees, and make their voices heard there. They should attend the town meetings that these Congressmen conduct, and make them realize that there are votes at stake in the next election. That's the way to get their attention. Coming to the Agriculture Committee with a prepared statement of 18 different reforms that ought to be written into the next farm bill just won't have any effect at all. It really is pretty much a waste of time. There has to be a home district constituency for those messages to have effect. Do I sound cynical? I'm not cynical. I think we have the greatest system of government in the world, but we have to be realistic about how it functions.

I think another thing you could do is encourage Congressmen who don't represent a particular commodity interest to get on the House Agriculture Committee.

Q: I don't have a question, but I think maybe the audience here should know that you're the first United States Congressman who drove alcohol fuels in his own car. That was back in 1977 when we first started the program that this year has seen 100 million bushels of Illinois corn converted and 200 million bushels of American corn converted into fuel. So you people are talking to a gentleman who understands that if we can take the technology of alcohol production to these developing countries, we're in a position not only to supply fuel, but to supply food. The gentleman who led the fight is in front of you tonight. Thank you, Paul.

Q: I want to make a comment regarding your suggestion that people write letters supporting their Congressman and Senators when they voted for foreign aid. There are at least some cases when you give foreign aid to a country in which you're giving foreign aid to a government that has a lot of human rights violations. I'm thinking specifically of a country like Guatemala. When you give money to a government like that, I don't know if you're necessarily helping the people. So I think that before somebody writes a letter saying, "Good job, Congressman, you supported foreign aid," you've got to look at where that foreign aid is going, because you may be doing more harm than good.

Findley: You make a very good point that a lot of foreign aid is misdirected and wasted and is, frankly, counterproductive. What I would prefer, of course, is that a group that wants to salute Jim Leach or someone else single out something that is very specific and has a broad appeal, and salute them for that support. Title XII meets those standards, because it is rooted in this country's land-grant university experience in which many millions of our citizens have shared. Therefore, saluting Congressmen for trying to bring the genius of the land-grant teaching system to hungry people elsewhere, I think, would find a good response. For example, the American Farm Bureau Federation, historically, has been very critical of foreign aid and a lot of other programs. But in recent years they have become much more trade-oriented and eager to expand markets. I've found when talking to farm bureau audiences that when I relate Title XII and the BIFAD program, i.e. the use of universities abroad, they respond. They're pleased with it. They like the idea of investing a few of their bucks in helping the peasants of Ecuador or India or elsewhere to a better life, realizing that that's the only way that those countries can become customers for whatever the U.S. people have to sell. So I think there is a message that will receive a good positive response that should be told. Thanks for your logical point.

Q: I'm a researcher working in developing countries and some people like myself feel that one of the ways we might have impact on government is by providing research results to inform policy-makers. Yet our professional associations remind us now and then that probably the majority of research results never come to the attention of policy-makers. I wonder if you could comment on the problem of research utilization.

Findley: An enormous problem. We have research piled sky high almost all over the world. And we have so many millions of people who have need for such information. One of the shortcomings of our foreign aid activities of the past is that there hasn't been enough emphasis on information distribution.

That's why I'm so enamored with the Title XII idea because it involves necessarily an extension type system in the host country through which a farmer will receive information on a regular basis, month after month and year after year.

I mentioned my experience in Ecuador. Three years later when I went down there after Ecuador had signed up as the first full-scale Title XII contractor, I talked with a man who sells fertilizer. He told about traveling each day past a small farmstead. He saw this farmer's need for some fertilizer, and he decided, well, I'll just give him some. So he did for one season. The farmer used it with good results. The next season he didn't use it. The farmer hadn't learned by the experience. He needed that extra prod of a specialist who would go to him season after season and make sure that he did the right things to improve his own food production. So there is enormous need for the utilization of research.

One of the things I have been trying to do as a member of BIFAD, is to make sure that universities that engage in contracts abroad have a central place for the preservation and the filing of information they've gained from the experience. Frankly, a lot of them don't. A lot of them have no central place for this vital information. So you've touched on a very important problem. It's more important in my judgment for us to develop a good information delivery system in the developing countries than to engage in contracts in research. I don't suggest that we drop the research, but let's not neglect the need for information distribution.

Q: We have been talking about the problem of hunger. It seems to me that is not only a problem of distribution, but the ability of countries to raise the level of productivity of the soil. Water is basic. Let's start with one step at a time and look at the availability of water worldwide and how we can help each developing country make water available in order to grow plants.

Findley: A very sound statement. And every country is different, and the last thing I'd want you to assume is that I believe the U.S. system of land-grant-type education can be transferred intact to any developing country. Every country has different needs, different traditions, different cultures, different rainfall, and different soil types. But there are many countries that have adequate rainfall, adequate climatic characteristics, and sufficient nutrients in the soil to produce a lot more food than they do today. So we shouldn't jump to the conclusion that we have even a few hopeless cases. I don't believe we do. I think every nation that is a food-deficit nation has a capacity for doing better, and I think Title XII provides that opportunity.

APPENDIX

SOME FACTS ABOUT WORLD HUNGER*How many people suffer from hunger and malnutrition?

The current estimate of the world's population is 4.762 billion. Of this population, estimates of the hungry range from 100 million to 1 billion. According to the Food and Agriculture Organization of the UN (FAO), 500 million suffer from severe malnutrition. Other agencies indicate that the number is higher. Another calculation places one-quarter of the population in developing countries in a category where the food intake is below the critical minimum limit.

Where are the hungry located?

Hunger and malnutrition can be found in every country, including the U.S. and other highly developed nations. The most severely affected areas of the world in terms of protein and caloric deprivation are Africa and South and East Asia. FAO reports that three-quarters of the malnourished are located in South Asia and the Pacific.

Who are the hungry?

The majority of the hungry fall into three categories: (1) those who are destitute, (2) those who are victims of disasters such as flood, fire or drought, and (3) the chronically underemployed and unemployed and their dependents.

Who suffers most from hunger?

Children and pregnant and lactating women have the highest incidence of malnutrition because their nutritional needs are greater than other population groups.

What causes hunger?

Hunger is caused by a complex set of events and circumstances that differ from place to place and time to time throughout the world. Natural disasters, lack of rural infrastructure, such as good roads, that prevent the movement of food throughout a country, and political upheaval all contribute to hunger. Many believe that poverty is the primary cause of hunger.

What are the effects of malnutrition?

Malnutrition is responsible for low birth rates, slower body growth, later maturing, shorter stature, restricted physical activity, and retardation. Children are affected by serious diseases such as kwashiorkor and marasmus which are sometimes fatal. Adults are also severely debilitated because of malnutrition and more prone to disease.

*Taken from "Study/Action Packet, Prepared for World Food Day, October 16, 1984." Sigman, V.A., Sands, C.M., & Kellogg, E.D., (1: 4). Urbana: University of Illinois at Urbana-Champaign, Office of International Agriculture.

What is the status of the current food supply?

The real question here is, "Is there enough food to feed the world?" If the food supply is examined from the standpoint of calories available per person there is some indication that, based on total world food production, every person could be adequately fed. However, this assumes even food distribution. At the present time, unequal distribution of resources throughout the world prevents this from happening. Poor countries and poor families cannot compete for available food supplies because of poverty.

What is the future outlook?

Over the past 25 years there has been a steady increase in world food production, about 2.5% each year. During the last 10 years, however, the increase has slowed to 1.7% annually. Anticipated future demand is placed at about 3-4% annually, as population and incomes increase. However, it is not likely that an equal increase in food production will occur.

Have developing countries addressed the problem?

Yes. Since the middle of the 1970's, the developing countries have increased food production more rapidly than the more developed countries, 3% compared to 1.7% annually.

What area is the most seriously affected by future food deficits?

Africa is the area with the greatest need. Over the last decade, Africa's per capita food production has declined while the rest of the world's has increased. At the same time, Africa's population growth rate is the highest in the world, 2.9% in 1984 as compared to 1.7% for the world as a whole and 2.4% in Latin America. Africa is now the primary food aid recipient.

How much assistance is the U.S. government providing?

At the present time 1.7% of the U.S. annual budget is devoted to foreign assistance. The U.S. is the largest food donor in the world.