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WORLD DEVELOPMENT AND WOMEN

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WORLD DEVELOPMENT AND WOMEN

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The alien culture at first appears to us as a mask,
enigmatic or repugnant.

On closer acquaintance we see it as a garment for the spirit;
we understand its harmonies and appreciate them.

Finally, as acquaintance goes deeper still,
we do not see, or for a time forget, the culture,

but look only to the common humanity
of the men and women beneath.

Robert Redfield

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and Development,
Virginia Tech

I. PREFACE

by

Larkin Dudley

Environmental and Urban Systems and
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PREFACE

Insights, issues, and inquiries concerning women and world development are presented in this volume of selected papers, sponsored by the Virginia Tech Title XII Committee. Themes of equity, revolution, women's invisibility, women's resourcefulness, and the need for future research are interspersed throughout the papers.

In the Overview, Mary Rojas describes issues in the Women in International Development (WID) movement at a global, national, and campus level, including the focus on the role of women by the Virginia Tech Title XII Committee. In the next paper, Former Ambassador Rita Delia Casco explains the goals and efforts of the Nicaraguan revolution from the viewpoint of one who took part in the struggle. In addition, she describes how, after the revolution, women's participation in society resulted in many successes, particularly increased literacy.

The lack of visibility of local women's work to local men, other women, and project developers is documented by Marilyn Hoskins in Paper IV. Her descriptions of the days of three women, one in Sierra Leone, one in Senegal, and one in Upper Volta, confirm not only the hard work and long hours of women in developing countries, but also how often projects are planned without awareness of the true conditions. Thus, she offers some suggestions for overcoming this lack of awareness.

Laura Jane Harper in Paper V also acknowledges the hard work of women in developing countries, particularly those women with

the least economic resources. Using Maslow's hierarchy of needs, Dean Harper organizes facts and personal experience around three basic themes: diminishing family food supply in many non-industrialized countries, the relationships between fuel shortages and food shortages in these countries, and the need for alternatives to reduce the time and hard work of fuel gathering and food preparation for women in many non-industrialized countries.

Documentation of why both human and mechanical energy is a women's issue is presented by Irene Tinker in Paper VI. She briefly reviews the development theories and practices that have emphasized trickle-down, community participation, measurement of physical quality of life, appropriate technology, and women in development. Additionally, she explores energy issue for women in modernizing countries with an emphasis on the human energy expenditures at the village level. In a look at the roles of women in industrializing countries, Tinker makes some comparisons between women's roles in industrialized and modernizing countries, examines briefly women as consumers, and speculates on the future of the women's movement. Finally, using background material from the UN Conference in Nairobi, she explores women's energy as an international issue.

Samuel Hale in paper VII emphasizes the need for better data for decision making in development projects. From his economics background and his experience in developing countries, Hale points out some of the technical and cultural problems and possibilities of international development work. Also he includes an

admonition of the necessity for addressing the incentives of local people--male and female.

Finally, Carol M. Cooper, in the last paper, indicates several directions for scholars and/or developers to pursue in the future. Her review of the literature indicates that consideration for the farm family, particularly the roles of women in the family, has been neglected in research and development planning. In order to correct this negligence, Cooper recommends areas of research and specific questions and activities that could prove fruitful. A bibliography of Title XII purchased materials on women and world development is included as the last contribution.

The time and ideas of the contributors noted above are greatly appreciated by the World Development and Women Committee. Others' efforts also need to be acknowledged. My personal thanks then to all the members of the World Development and Women Committee for their innovations and tenacity, to Howard Massey and the Title XII Committee for funding the projects and the printing, to Peggy Hall for budget assistance, to the Office of International Programs for much advice and aid, and to the Environmental and Urban Systems staff for support and professional expertise. Particularly, I appreciate the efforts of two graduate students in the Division of Environmental and Urban Systems, Dabney Weaver for her excellent editing help and Mike H. Jaskiewicz for his special design assistance. Of special note is the extra assistance, as well as typing, rendered by Amanda Shepherd in keeping track, Shirley Engelhardt in editing, and Dawn Abatemarco in decipher-

ing. As always, thanks to Len Simutis, Assistant Dean, College of Architecture and Urban Studies, for an environment where work can be accomplished.

Finally, as is indicated in the quote from the anthropologist, Robert Redfield, at the beginning of this collection, true understanding takes place on more than one level. At first glance, the papers in this volume are selected speeches from the visitors and projects which the World Development and Women Committee has sponsored throughout two years. On another level, these papers represent the dynamic growth of a group of Virginia Tech women from discussions in 1975 to an informal group in 1979 to a committee and a coordinator in 1981. This growth is, in itself, indicative of what can happen when women work together. Thus, the labeling of these papers, "Volume I", represents the optimism of the World Development and Women Committee that the issues, insights, and research questions presented here will continue to be important in the future.

Additional copies of this report are available from:

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II. Overview

by

Mary Hill Rojas
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Virginia Tech

OVERVIEW

The movement, Women in International Development (WID), focuses on the impact of development on women. It has emphasized women in the "third world," but easily speaks as well to women around the world, including women in the United States. Women worldwide traditionally are the child bearers, nurturers and keepers of the hearth. In most countries women are the food producers, preparers and preservers and, as such, the health and nutrition of their families depend on them. Yet in the public domain, outside of their private worlds, women worldwide hold the lowest paying jobs and their work is consistently undervalued. Women worldwide hold little political power and, worldwide, women have been kept from education. In countries where there is high illiteracy, women are the majority of the illiterates. Three-fourths of the malnourished are women and children. Worldwide, women have been viewed as a group with certain characteristics, without regard to individual capabilities. In recognition of these facts, the Women in International Development movement seeks to consciously include women as both agents and beneficiaries in development planning in order to improve their status.

Two global issues, education and population control, illustrate the importance of consciously focusing on women and girls in development plans. Two-thirds of all those in the world who are illiterate are women. Equity aside, this lack of emphasis on women's education results in low productivity, as well as adverse

consequences for the health of the family, both severe problems for national economies. Many factors contribute to girls and women not attending school, among them tradition and custom, the lack of female teachers, the need for girls at home to help with housework, the cost of attending school, the perceived value of school for girls and the fear a girl might be harmed and the consequent need to keep her at home for protection. Female education often centers around home and domestic instruction while male education centers on general studies or vocational training that leads to gainful employment. Yet, it has been recognized recently that one out of three households around the world are headed by women because of death, desertion, divorce or migration. It becomes essential to assure these women a means of supporting themselves and their families through education and training.

A second major issue illustrative of the vital role women play in successful development concerns population control. High birth rate, a major cause of world hunger, is due to many factors, many of which are cultural. Status is often related to the number of children, especially boys, a family has. There is often a need for many children to work on farms or provide old age security for their parents. High infant mortality also creates a demand for continual pregnancies. Yet many births are a drain on a woman's health, energy, and income as well as on scarce national resources. The positive correlations between women's education and low birth rates and the employment opportunities for wo-

men and low birth rates make the focus on women in development of major importance.

Women, however, have tended to be invisible in development plans and as a consequence much of development has not benefited them; it has, on the contrary, often inadvertently made things worse for them. In Bangladesh, a rural electrification project was planned without considering women's source of income, hand-hulling rice. With the new electricity, the hand-hulling was replaced by electrical mills and income for women was lost. In many developing countries, up to 70% of the food production is done by women. They select seed, plant, weed and harvest. Often, one of the women's jobs is vegetable production from kitchen gardens and the care of small animals such as goats, pigs, rabbits and chickens. It is this food production that sustains the rural family.

Nevertheless, development projects that promote cash crops and new techniques have been introduced for the most part to men. Farm cooperatives are set up which exclude women and credit often is not extended to women. The collateral needed for credit is often land and land titles are traditionally in the man's name. In many cultures it is unacceptable that women be taught by men, yet the great majority of extension technicians are men. Women are often responsible for the bearing of water and wood for fuel. As wood supplies and fresh water are depleted, women must walk further to get their daily needs, yet this work is often invisible. A Haitian village head man indicated to a development work-

er that water was not a problem, although the village women were walking daily some five miles to the nearest well. Another project, piping water into individual houses, seemed to be helping women. In actuality, however, women, who worked long hours, had little time for socializing except at the communal well. The new faucets isolated them by cutting off a primary source of communication.

Development planners, however, have been increasingly aware of the importance of considering the needs of women as have the agencies of the United States federal government concerned with international development. In the early 1970's, the United States promulgated a new focus for foreign aid by directing it at the poorest of the poor. This emphasis differed from the previous notion of aiding developing countries by the infusion of United States technology with the hope that the new wealth generated by industrialization would "trickle down" to the poor. This theory did not live up to its expectations. As concerned women, the United States has held for the most part to the "trickle over" theory. The United States tends to train and assist the men of a developing country with the assumption that they in turn would train their wives. This also proved to be a fallacy. The new philosophy focusing on assisting the poorest of the poor repudiated the "trickle down" theory and directly included women; the poorest of the poor primarily are female-headed households.

The new concern for women in international development mentioned above was recognized officially in 1974 in the Percy

Amendment to the United States Foreign Assistance Act. The Amendment mandates that United States foreign aid take into specific consideration the integration of women into development, both as agents and beneficiaries.

Title XII of the Foreign Assistance Act grants money to United States universities to strengthen the capabilities of faculties to be able to deal with world hunger and famine through development projects overseas. Because of the Percy Amendment, Title XII grants must emphasize the role and status of women in development. Virginia Polytechnic Institute and State University received a Title XII grant in 1978 and a part of that grant has focused on the role and status of women throughout the world. As a part of that focus, visiting scholars were brought to the Virginia Tech campus to speak on the issues of women in development. This booklet is a compendium of those speeches.

III. Nicaragua: After the Revolution, Women's
Equity and Literacy

by

Her Excellency
Rita Delia Casco,
Former Ambassador from
Nicaragua to the United States

Speech presented at
"International Innovations In Women's Equity"
A Title XII Symposium
November, 15, 1980
Virginia Tech, Blacksburg, Virginia

Nicaragua: After the Revolution, Women's Equity and Literacy

I want to thank you on behalf of the government of the national reconstruction of Nicaragua for having given me this opportunity to discuss the revolution and, within that context, the ever expanding role which women have played and continued to play in that revolution.

Let me say at the very outset that in Nicaragua one does not speak of a women's movement per se anymore than one speaks of a peasant's movement, or of a worker's movement. The struggle of all is taken to be an integral part of the revolution and all are taking part in that project. The struggle against Somoza would have never been successful if only the oppressed, even an oppressed majority, had been involved. Victory required the united effort of all the Nicaraguans, including business and the church; and the continuation of the revolution in the current phase of reconstruction requires continued unity. Moreover, because the struggle for a more just and egalitarian society has taken form in the revolution, all must be concerned with all aspects of the revolution. The effort to consolidate the revolution is the national task with which all Nicaraguans have concerned themselves. Thus, to speak of the challenges and successes of the women's movement in Nicaragua, one must speak of the challenges and accomplishments of the revolution. As a whole, one must be concerned not only with the domestic but also with the international aspects of the effort to achieve and maintain popular and nation-

al sovereignty. People who visit Nicaragua today are immediately struck by the many visible examples of the participation of women in the revolutionary process and by the changing role which that participation entails.

Women in military uniforms are seen everywhere and today women compose fully 25% of the popular Sandinista army as well as the militias, and half of the police force. They hold key positions of responsibility and, quite often, of leadership in every government office and ministry. While there are no women on the national directorate of the Sandinista Liberation Front, women head two of its five secretariats. On the grass roots level, women also play a leading role in the organization and functioning of the Sandinista defense committees, the vital national network of the neighborhood government.

The increased participation of women in all aspects of life was not simply granted through the largesse of the revolutionary leaders, but was earned through their broad contributions to the revolution. That is to say, women emancipated themselves through the revolutionary process itself. Nicaraguan women understood that their struggle was part of a larger struggle of the entire nation to overthrow an unjust, corrupt and violent system created and maintained by the dictatorship. The domination and exploitation of women was but one symptom of a general system of domination and exploitation; only through the elimination of that general system, only in the total destruction of the dictatorship, could the emancipation of women begin.

It is for this reason that Nicaraguan women will tend to look for their full integration into the social, political, and economic life of the nation in the consolidation of the revolution. Support for the revolution is seen as support for the movement towards full equality; and conversely, the women's movement must seek its fulfillment in the context of the revolution. It is primarily through their participation in the revolution that women are moving so rapidly toward full equality and integration.

Today, the Association of Nicaraguan Women insists that women combine the work of overcoming inequality with the work of national reconstruction. The consolidation and defense of the revolution is indeed a vast task in which women have made common cause with all sectors of Nicaraguan society. But at the same time, women, through the Association of Nicaraguan Women, are engaged in projects addressed to the specific and particular problems which women confront.

It is felt that the basis of the subjection of women lies in their enslavement to domestic labor, which is the material or economic obstacle to full integration. The association has pressed for the opening of popular laundries, restaurants, and day care centers in order to lessen the burden of domestic tasks. The education, health and nourishment of children are seen as a duty and task impinging upon the whole society, and not just upon single women without the necessary economic resources.

Still, even apart from these specific proposals, the most rapid strides are being made by women through their participation in the new institutions which the revolution has brought into being. Two of the most significant examples of this are provided in the working of the literacy crusade and of the Council of State.

The LITERACY CRUSADE is, to date, perhaps the most remarkable achievement of Nicaragua's revolution. The idea of a major campaign to concentrate national energy in order to greatly reduce illiteracy is as perhaps as old as the idea of the revolution itself. Plans for the crusade were drawn up even before the triumph of the revolution, and within fifteen days of the victory implementation began. In an economically exploitative and politically repressive system based upon agriculture labor, the rate of literacy was hardly a matter of concern for the masters of that system. But while literacy was low among economically active sectors of the society, it was lowest among the marginal sectors including, and especially, among women. Clearly then, from the very start, the effort to irradicate illiteracy was at the same time an effort to improve the status of women.

The literacy crusade also opened up new avenues to women in more subtle, but also, perhaps, more profound ways. The literacy crusade is indeed remarkable in that in six short months from April to September of 1980, the rate of illiteracy was reduced from 52% to 12%. But perhaps just as important in the long run are the consequences of the process of the campaign. For those

six months, all of Nicaragua was converted into a huge school where not only did the so called "students" learn to read and write, but the teachers also having come from and gone to all corners of Nicaragua, received an even greater education concerning the social and cultural fabric of the nation. Imagine, if you will, the spectacle of the children of the middle class living with peasant families, sharing their lives, their chores, and their poverty. Then perhaps it becomes possible to appreciate the truly revolutionary impact which the literacy crusade has had and will continue to have. Not only did those two hundred volunteers gain a new understanding of their country and their fellow citizens, but a new generation of leaders, committed to social change was created. Only consider also that 70% of those volunteers were women, and it is obvious that women have been integrated into the vanguard of future social change.

Women benefited, then, not only directly as the immediate beneficiaries of the campaign, but also indirectly as women received a type of "leadership training" which can only be gained with actual experience. It is in this way that the advances made possible and brought into being are cumulative. In addition to the immediate gain which each achievement brings, the very process through which that gain is achieved prepares the way for greater future advances.

We Nicaraguans are genuinely and rightly proud of the democracy which is evolving in Nicaragua. The Council of State in which women are represented by a seat guaranteed to the National

Association of Women guarantees political pluralism even in the highest levels of government. In a nation without any truly democratic tradition, on a continent with a long tradition of brutal repression, coups, military dictatorship, torture, disappearances and massive violations of womens rights, Nicaragua's respect for human rights and democratic aspirations is exemplary.

For the first time in the political history of our nation, workers and peasants, slum dwellers, women, peasants and youths express with their own voice, and without intermediaries, points of view on problems which concern them. They make decisions and have the power to translate their solutions into law. The Council of State, composed of representatives democratically elected by their bases, is an experiment in democracy and in formation which will allow for the perfection of an authentically popular democracy.

The human and material cost of overthrowing Somoza were tremendous. By the time of the triumph of the revolution on July 19, 1979, Nicaragua had been decimated. 50,000 of our best citizens had been killed in the war. Our economy had been destroyed; our crops were burned or not planted. The banks had been plundered to the point that our gross reserves were sufficient to provide for only two days' imports. Still more, Nicaragua had been saddled with a foreign debt far beyond our capacity to pay, even with the most healthy economy.

In the months immediately following the revolution, the government moved quickly to restore economic production and at the

same time to lay the groundwork for the construction of a new society. In order to restore economic production and exploit all available human and material resources, the Government of National Reconstruction established the framework of the mixed economy. The properties of the Somozas, the banks, and international commerce were nationalized at once -- giving the government a vital stake in the economy and, at the same time, giving it the power to determine priorities, to channel resources in the process of reconstruction, and to stimulate our rapid development. At the same time, more than half of the national production remained in private hands in order to exploit the managerial and entrepreneurial skills of the private sector. The Somoza properties have provided the basis for an ambitious, though realistic program of agrarian reform. Just recently, as a surprise to many, Nicaragua came to terms with the private international banks renegotiating our debt on more just terms for its repayment - terms which would allow us to meet our responsibilities and yet not suffocate the process of reconstruction and development.

Needless to say, tensions remain, especially between the Government of National Reconstruction and its supporters, and those who, content to accept the dictatorship and its exploitative system until finally their own interests were threatened, joined the struggle late and are now claiming the right to divert the revolution along a course more favorable to their own narrow interests.

Still, while the costs and heroic sacrifices born by our people were tremendous, their accomplishment was far greater in creating the possibility of building a new Nicaragua, free both at home and abroad. Today I am speaking to you as a women representing Nicaragua which for the first time in its history is master of its own destiny.

IV. Women's Work in Developing Countries

by

Marilyn Hoskins
Title XII Visiting Professor
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Virginia Tech, Blacksburg, Virginia

Speech presented at
"International Innovations In Women's Equity,"
a Title XII symposium, November 15, 1980
Virginia Tech, Blacksburg, Virginia

Women's Work in Developing Countries

We all know that many activities women perform are invisible to those around them. Women themselves sometimes undervalue their work, and only with difficulty can remember all the "little household chores" they did during a day. This invisibility of women's work can cause a number of problems, especially when outsiders plan projects or activities which affect women.

I have worked with a number of projects which you, as Americans, help sponsor in less industrialized countries, especially in Africa. But before I talk about these, I want to share with you some pages from field notes which I took while participating in the life of various African families. These describe what some women do during a day. I have taken three specific days in the lives of women, *one* lives in a humid climate, one in a semi-arid savannah region, and one in the arid Sahel.

The first woman lives in a small village near the town of Bo, in Sierra Leone. At 4:00 a.m., she awoke and went fishing. At 6:00 a.m., she came back home with six small fish and some branches for the fire. She heated water for her family to bathe, cooked breakfast, fed the family, and cleaned the house. About 8:00 a.m., she, an infant fastened securely on her back and a four year old at her side, along with several other women, went to work in the fields. At around 11:00 a.m. she picked up some dead wood which was stacked around the field and brought it back to the house. At 12:00 noon she cooked lunch, fed the family, cleaned the dishes, carried clothing to the stream and washed it, picked some leaves and wild fruit from the forest area to add to her sauce for dinner, and carried water back to the house.

About 3:00 p.m., she went to weed her garden and bring home some leaves and vegetables for dinner. At 5:00 p.m., she returned to the pond to fish for an hour. She complained that silt was ruining the fishing. By 6:30 p.m. she had come home and started food preparation for the evening meal which was at 8:00. By 9:00 p.m., she was free to sit with friends and together they worked at food preparation (hulling peas, etc.) and repairing fish nets. The women all went home to wash and go to bed at 11:00 p.m.

The second example is a woman from an area of Senegal, where the grains are drier and hence take more time to prepare. The major dish there is millet, cooked as grits. Senegalese pound millet to dehull it, just as the Sierra Leonean woman did for rice, and use large wooden mortars and heavy long wooden pestles. Then they toss the grain in the air to get rid of the hulls. Unlike rice, the millet then must return to the mortar to be pounded into the consistency of fine corn meal. Cooking takes longer than the rice, often demanding an hour and a half of constant stirring and fire tending, adding water and meal little by little as it cooks.

This Senegalese woman had awakened about 5:00 a.m. and started food preparation for the day. She fed her family millet mush left over from the night before and set aside the millet she was preparing for later in the day. She went to the field to weed until about noon. During the planting or harvesting season she would work all day long and return home only in the evening. But in this particular season she came home at noon, fetching water from a distant well on her way. She returned to the well carrying her clothes to wash, and came home to spread them to dry on bushes and the thatch roof of the house. She did not cook lunch because fuel was scarce, so everyone in the family of eight drank water with some of the millet meal added. Formerly there had been

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more wood for fuel and she had served hot millet mush more frequently. This Senegalese woman went to work in her garden at about 4:00 p.m. She returned and started preparing food at 5:00 and the family ate dinner at 9:00 p.m. It took four hours to chop, pound, trade a few herbs with neighbors and to cook the meal. Afterwards she sat with other women spinning cotton until she went to bed about 11:00 p.m.

The third woman who was from the Sahelian region of Upper Volta was more involved in animal care than the first two. Here, in the drier climate the populations rely more on animals which can digest the dry grasses and less on gardens and planted crops. In this region of sparse food, cows give but little milk. She let the calf start nursing, pulled it to the front of the cow, and tied it to its mother. She could get several cups of milk before letting the calf finish nursing. She then went to the well, brought home water, washed the baby, rolled up the sleeping mats and swept the packed earthen courtyard. The family ate curded milk and a grain called fonio which grows both wild and in fields. The grains are about the size of grass seed, which women prepare into firm balls--looking much like a baseball. Residents pinch off pieces to dip in the thickened milk.

About 9:00 a.m., she left for the garden and with some friends went to collect wild grains, leaves, roots, and fodder for the milk cows. She returned to process food until about 1:00 p.m., when she and the family had lunch. Afterwards she went out to collect wood and water, returning to start preparing food. At 5:00 p.m., she milked again. The family finished dinner around 9:00 p.m., after which she sat preparing grass for weaving into mats until about midnight.

Women of all these regions make their own soap, their oils (palm oil in

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Sierra Leone, peanut or shea nut oil in Senegal, and sesame oil etc., in the Sahel). Women collect the fuel (wood, dung, weed or other stalks); they collect medical herbs and items for crafts. They process food seasonally, smoking, drying and storing foods, when they are readily available, to save for times of scarcity, and make many of their household items (mats, baskets, pottery, etc.). Once a week or more frequently, they go to the market to sell, to trade, and to catch up on the news of family and friends.

Thus, these three women have a great deal in common. First, they all have both nurturing and economic roles. If development programs overlook either one of these two responsibilities they will either be ineffective, or they will cause women hardships. Another thing these women have in common is that since they are limited to the resources near enough their households to still allow them to care for the children and the household, they have great pressure when ponds near their homes silt or when wood or fodder is no longer available near the house. All these women find they are working harder and longer hours than they used to work. In this whole region, as in many other areas of the world, more men are finding it impossible to support their families with the growing population and pressure on local resources, thus, they are leaving to go to the urban areas. More women are left in charge of the entire farmwork.

But even with all the above tasks, women's work remains invisible, not only to outsiders but to the local men as well. An example of this came from the cited village in Sierra Leone where most women work from 4:00 a.m. to 11:00 p.m. One day a man who had been watching me for several days came up and said, "We are glad you have come. We hope you will civilize our women. You should teach them something--something of value to both the women and the men. Perhaps you could teach them to embroider flowers on our pillowcases." When

could my hostess have sat down to embroider? I am sure that what the women there did during the day was invisible even to him.

Let us look again at the responsibilities women and men have to their families in West Africa. Although all tasks differ by region and ethnic group, in most of this area there is a family field where men, women, and children all work together. Generally, the man is responsible to see there is enough grain for family meals. Any surplus grain is his to sell for his own personal needs. On the other hand, the women usually have small fields of their own on which they raise vegetables so important to the nutrition of their families. They sometimes raise some extra grain which is theirs for use in making beer or other small food items to sell. Wives are free to make extra crafts items or sell surplus vegetables or food stuffs for spending money. In many ethnic groups of this region, men may have more than one wife. It is common, therefore, for the wives to be responsible for their own children's clothing, and school expenses, as well as for their own needs. Lack of understanding of just this one aspect of the division of men's and women's work and responsibilities has caused problems in many projects.

For example, a rice raising project in Upper Volta gave some families enough land for all adults in the family to work growing rice. The income per family has risen and the project is considered a great success by many observers. However, the nutritional standards have lowered; the quality of clothing children and wives wear has diminished; and social life for women is much less. Women no longer go as frequently to social events or to their native villages to visit as they do not have the traditionally expected gifts to take to weddings, etc., and feel they do not have the proper clothing to wear. If project planners think that the money paid to the men for the grain raised by the family will trickle-over

to

adequately, they do not realize the social organization of the local family or the traditional economic contributions and independence of the Voltaic woman. In this project area, women were given neither land for their vegetable gardens nor opportunity to raise surpluses or to develop crafts to sell.

We women and men need to insist that information about women be disaggregated from that of men. We need to insist that women are involved in the project design teams, and that evaluations focus not only on output of projects (how many trees were planted, how much rice was raised, etc.), but also include an examination of the impact of the projects on all the people in the community, whether they are men, women, children, the poor, or those belonging to any other separate group.

There are, however, projects in which women's roles have been considered and I want to give you a good example. For instance, in Niger there is an excellent cattle fattening program in which women participate. The activity was well planned, being located near water, near a market, and in an area with agricultural byproducts and river grasses with which to fatten the animals. It was established as a loan program in which participants were to select their own animals from the market using strict criteria for the condition of the animal. Participants learned animal selection and health care with the support of the local government veterinary service. When the project started, a number of people participated, they lost very few cattle, and they made a good profit on all animals sold. It was judged a success by all but the project coordinator, who discovered that none of the really poor and none of the local women were participating. He discovered that women and more men wanted to participate, but when they had no land or other wealth the risk of losing the animal (for which they must still pay) was just too great. The programmer then built in an obligatory insurance fund after which women and landless or land-poor men became the majority of the participants. This

was a project which helped the disadvantaged mainly because someone was not happy with only a superficial evaluation. Someone looked at its differential impacts on the various groups in the community. Someone identified and overcame constraints to participation of those most in need of the activity.

We not only pay taxes which support development activities, but most of us also belong to organizations which direct specific development activities. The YWCA, the League of Women Voters, most churches, and many voluntary groups such as the Red Cross, CARE, Foster Parents, etc., all have activities which affect women. Many of these efforts help women in a positive way; some of them do not. But it is up to us to find out about our programs and to look at their impacts. It is up to us to insist that women programmers help talk to these local women during the project design phase and that women are involved in establishing criteria for on-going evaluation. It is up to us to help see that programs with which we are involved, whether we stay here in Blacksburg or work overseas, recognize the woman and what she contributes to her family and society. It is up to us to help her become visible.

V. Food and Fuel: Issues and Observations

by

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FOOD AND FUEL: ISSUES AND OBSERVATIONS

You are to be congratulated on scheduling this conference on food and fuel. Since it is being sponsored as part of VPI's involvement in the Title XII program which deals in part with Women in Development, I am assuming that most of your deliberations will center around the implications and relationships of food and fuel in non-industrialized countries, and on ways to improve the conditions in regard to these two commodities, ways compatible with the culture and goals for development in those areas of the world.

In any culture and in almost all situations, if women are to achieve they must be ingenious as well as capable hard-working individuals. The need for woman's accomplishments through creative endeavors is magnified in those cultures where a large percentage of the population is still involved in subsistence agriculture or cash cropping on very limited acreage (especially so for landless farm families). Together these two classifications of farm families (the landless ones and those engaged in subsistence farming, even if the land is their own) constitute an overwhelming majority of the total population in most non-industrialized countries. The acquisition of family food and fuel in these cultures is usually considered to be women's work and both tasks are extremely laborious, time consuming, and a constant test of wits.

Estimates related to total food and fuel availability and consumption in non-industrialized countries, effects of not having enough of either or both combined, and amounts of time spent in collecting and preparing food and fuel vary due in large part to how and where the data have been collected, analyzed, and interpreted. There are three conclusions, however, with which all agencies involved in reporting the data related to domestic food and fuel in non-industrialized countries agree. They are:

1. In spite of increasing food production in the non-industrialized world (30 percent in the past 10 years)(1), diminishing family food supply and availability have reached crisis proportions and the situation worsens yearly.(2, 3, 4)
2. Conventional sources of fuel used in these countries for home consumption and acceptable alternative sources need to be increased rapidly if a large part of the world population is going to escape the consequences of future fuel shortage (5, 6, 7) of equal magnitude to the present shortage of food. In turn, such a condition would aggravate even further the increasing world-wide problems related to undernutrition since the causes and effects of these two shortages are linked together and compound each other exponentially.
3. The inordinate amount of time and extremely hard work spent by the world's poor women in fuel gathering and food preparation are increasing. Much of this time could ad-

vantageously be redirected to income generation projects, projects which would immeasurably benefit poor families in the non-industrialized world.

Diminishing Family Food Supply

Concerning the first statement that in spite of the fact that food production has increased by 30 percent in the past 10 years, family food supplies have diminished and undernutrition around the world has accelerated by approximately 40 percent in this same period of time (2, 3, 4) and continues to increase at an alarming rate:

There is a great difference in total food production and available family food supplies, (1, 4, 8) /ts farmers in non-industrialized countries move from subsistence farming to cash cropping, the extra income earned does not mean that sufficient money will be spent to replace the family food formerly grown on that acreage. Neither does it signify that food is available for purchase at the village level, nor that the families living there would know how to balance family meals and individual nutritional requirements from purchased food even if it were available. The inability of non-industrialized countries to increase and equitably distribute food supplies to the point that enough food is available where it is needed to prevent hunger of all the population is one of the saddest human conditions of our time. Equally tragic is the fact that undernutrition of those groups of the population who have traditionally been the most vulnerable continues to increase at a higher rate of incidence than is true for malnutrition generally.(4) These groups are of course:

Infants and young children of preschool age;
Pregnant and lactating women;
The sick, convalescent, handicapped, and elderly; and
Especially these groups among the rural landless poor.*

As for solutions, policy makers in FAO, WHO, UNICEF, UNESCO and many other international and national organizations are making an all-out effort to conquer in this century prevalent inadequate food production patterns around the world, inequitable distribution of the food produced, and resulting continuous escalation of undernutrition. All agencies agree that if these three goals are not met by the year 2,000, there is very little hope of such achievement later.

Fuel Shortage

Relating to the second statement that if the conventional sources of fuel used for home consumption in the non-industrialized world are not increased rapidly and acceptable alternative fuel sources effectively introduced, the food crisis already plaguing much of these areas will be aggravated still further:

In the second generalized statement you may wonder why I have referred to the term "conventional fuels" rather than speaking of new and sometimes controversial ways to cook

* Referring to the deteriorating nutritional status of pregnant and lactating women in non-industrialized countries, this period in the life of a rural poor woman usually amounts to a significant portion of her adult child-bearing-ability years and not just 2-5 years, the average span of time devoted to pregnancy and lactation in the life of a women in the industrialized world.

foods. One reason is that firewood is by far the most commonly used source of fuel in most of the rural areas of non-industrialized countries, charcoal in the urban areas of these countries. Families in the Western World in the past century and a half of industrialization have shifted almost entirely to the use of gas (both natural and bottled), coal, oil (including kerosene), and electricity. However, almost all investigators in the area of fuel conservation, production, and consumption agree that in non-industrialized countries the transition to alternative domestic-food-production fuels will be slow. For the foreseeable future, firewood, or its charcoal derivative (where it is available), will continue as the fuel used by 90-95 percent of the poor. (5, 7)

Firewood scarcity is intimately linked in at least two ways to the current and continuing food crisis that faces many parts of the world:

1. When deforestation occurs (as in the case when there is a continuing firewood shortage), the land quickly erodes and the ability to produce abundant crops is drastically reduced;
2. When firewood is not available for home consumption, usually the only alternative left to families is to divert to fuel consumption the manures previously applied to the land as organic fertilizer.

Eckholm writing for Worldwatch (7) has posed this question:

"Even if by some miracle, we somehow grow enough food for our people by the year 2,000, how in the

world will they cook it with the growing scarcity of firewood?"

Solving the fuel problem may be as difficult - or even more so - than the problem of undernutrition around the world. Both are inter-linked and in addition are intermeshed with population growth (of which this conference is not about). However, Food, Fuel, and Fewer Children is an appropriate topic for discussion and action. If population growth is not decelerated quickly, then the two other situations - food and fuel - appear hopeless.

In addition to family planning, prevention of undernutrition presupposes adequate food production, improved food distribution systems, universal food and nutrition education, and increased family incomes so that those who do not grow the foodstuffs needed for a balanced diet can and will purchase, prepare, serve, and eat wisely as well. Preparing, serving, and eating wisely and well presupposes appropriate and adequate storage and cooking methods and facilities.

Redirection of Projects

In regard to the third conclusion presented earlier that the inordinate amount of time and extremely hard work spent by the world's poor women on fuel gathering and food preparation could in large part advantageously be redirected to income generation projects which would immeasurably benefit the poor families of non-industrialized world:

The old adage that, "Men work from sun to sun but women's work is never done" describes perfectly the lives of the world's poor women. Although the amount and kinds of labor of poor rural women will vary slightly from country to country and even between various locations in a particular country, most labor surveys of household and women's labor in non-industrialized countries indicate that poor women in rural areas (which account for a large proportion of the women living in these countries) are engaged in hard physical work for approximately 60 to 75 hours each week or at least 9 hours daily. These hours are in addition to child care and other forms of family nurturance and support and are usually broken down as follows:

20-25 hours weekly in farming and marketing farm products;

24-30 hours in securing food, cooking it, and in other housework;

6-8 hours in securing the water needed for family use; and

8-12 hours in firewood collection and preparing it for use as fuel for cooking and heating.

Those rural women who are not so dreadfully poor may spend as many hours at work, but usually their labors are not as heavy and more of it is spent in income generation projects which assist their families greatly in many ways.

As I was getting ready for this presentation today, I asked myself several questions, such as:

Is this acquisition of food more limiting than lack of fuel to nutritional well-being of family members in developing countries or are they mutually dependent on each other?

What motivates the poor women of these countries to improve their lots in life and provide more adequately for their families?

Why do they even continue to try?

Why don't they just give up?

Why would a woman work the fields day after day and year after year and still see her children die from malnutrition before they are five years of age?

Why walk 10 miles a day to get a back-breaking load of firewood or a jug of water?

Some of the most creative combinations of food, some of the most ingenious cooking methods and uses of fuel I have ever seen have been improvised by these women. What is the secret of their continued creativity in the face of ever-present failure?

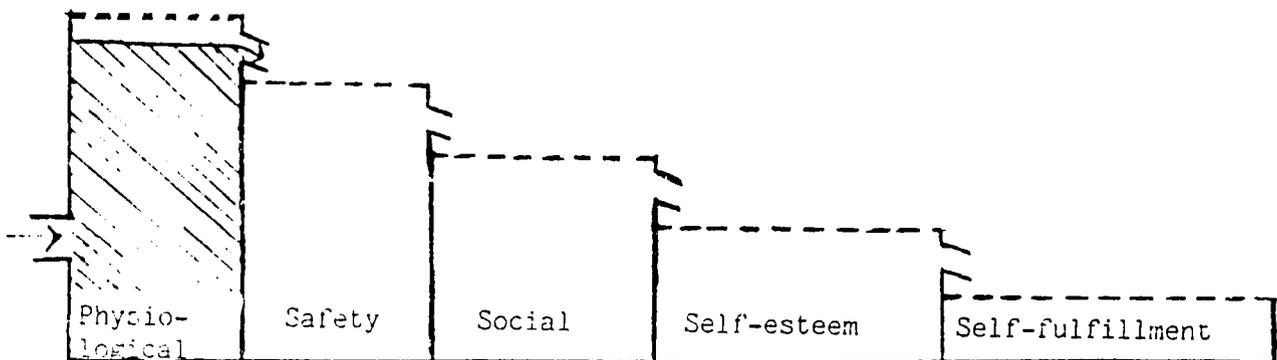
As I used this process to tidy up my thinking, I recalled a few concepts from Maslow's theory of human motivation, which he termed the hierarchy of basic human needs and the preconditions for basic-needs satisfaction. I took myself to the library to re-read this theory.(9) Briefly, these are the hierarchical stages of Maslow's theory of motivation and achievement:

1. The most basic and elemental component, meeting physiological and physical needs;
2. Safety and security

3. The sense of belonging and love and the need for social interaction;
4. The need for esteem and respect, both by self and from others; and
5. The opportunity for self-actualization or self-fulfillment.

The following graphic presentation of Maslow's hierarchy-of-human-needs theory shows the need categories and their fulfillment in sequential order:

NEED CATEGORIES IN SEQUENCE



A CONCEPTUAL MODEL OF MASLOW'S HIERARCHY-OF-NEEDS THEORY (10)

Need categories are filled sequentially and the most elemental one, meeting one's physiological needs, must be largely complete before the threshold of the next stage is apparent. The cycle of beginning, devoting one's energies to diligent and creative accomplishment, and subsequent satisfactory achievement must be fairly well completed before the next set of needs becomes evident, emerging as the new center of one's activities.

According to Maslow, in the primitive first stage of the hierarchy when an individual must do what he has to do to survive, if the tools, environment, and opportunities are available, he/she will move through the accomplishments of each state of the hierarchy to the place where he must be what he can be.

Physiological needs are the universal needs common to all humans regardless of culture, education, occupation, stage of national development, economic status, geographical location, etc. One's physical survival depends on being able to eat, breathe, sleep, be protected from the elements, and other physiological needs to a degree adequate to maintain normal body processes and energy. Physical needs are the most prepotent of all human needs and until satisfied all others become non-existent or pushed into the background. All one's energy, ingenuity and creativity are focused on filling this need. At this stage, little else matters. Using Maslow's hierarchy concepts, freedom from hunger is one of the components of this basic human need. Modern day nutritionists and international developers have added to the concept by stating that freedom from hunger is not only a basic human need; it is a basic human right.

All of the creative and management skills of families living in areas of the world where there is not enough available food to eat are directed toward getting it, conserving it, preparing it, and using it to meet basic needs. Thus, food preparation would take precedence over saving the forests for future use. But even the use of wood is very ingenious.

I have heard it said that the "poor are poor" because they lack energy, management skills, and creative approaches to problem solving. Nobody can stretch food further, prepare it as quickly and creatively to preserve available food content, and apply better management practices to the use of food and fuel than those who have little of both. If one really wants to study the art of management and creativity in an uncomplicated setting, one should study how the poor manage and improvise. Only the affluent can disregard cost and afford waste. Where we would, for example, prepare an elaborate oven meal or use a micro-wave to prepare for a well-balanced food pattern, a southeast Asian woman would serve her family fried rice. How simple and efficient!

When and if physiological needs are relatively well gratified, then there emerges the new set of needs categorized as safety and security. Sanitation and elemental cleanliness are included in this set of needs as is freedom from fear and anxiety. In category 1, as long as one's stomach is empty and the level of sugar or other nutrients in the blood and cells is below the minimum required for homeostatic equilibrium, one is not nearly as apprehensive about freshness or sanitation of food as when there is enough food to go around. Only when there is enough food is one able to think about order, plan for the future, and conserve the extra food and fuel for another time and need.

The use of food and fuel relate also to meeting:

Social needs;

Self esteem and the respect of others; and

Self-actualization;

but in more complex, sophisticated ways than is true for human survival.

We tend to think of creativity in terms of artistic pursuits and management in terms of economic outputs. Before people can direct their inventive abilities to self-actualization and money matters, they have developed the qualities of ingenuity and management on self-survival. Actually, some of the evolution of utensils, equipment, and use of fuel in family food production came to us from the creative inventions and discoveries of the women and families of cultures very different from our own.

Why then do we encourage these women and cultures to alter their styles of life?

1. Because under present conditions and continued population growth in the non-industrialized world, there is and will not be enough food available to alleviate undernutrition nor the amount of traditional fuel necessary to make the food edible; and
2. Because some of the energies of the world's poor women could now be better used in other ways advantageous to their own self-fulfilment and their families' benefit.

When I was working at FAO Headquarters a little over a year ago I read reports of several research studies which showed that of all the factors influencing and controlling food intake, the most influential are:

The amount and variety of food produced;

Nutrition knowledge; and

Income levels.

As I later worked in four southeast Asian countries and in Egypt I observed experimental community projects aimed at:
increasing food production and potable water supply;
nutrition education;
improving family, maternity, and child development centers involved in basic education, feeding, health evaluation, and family planning; and
the introduction of income generation projects for women.

Not all of these experimental programs included all four of these components. However, without any doubt, those centers providing assistance in income generation for women were the most successful in all the areas involved, including

Amounts and varieties of food available and increased supply of potable water;

Knowledge and education related to nutrition, sanitation, food preparation, storage, etc.;

Better health and feeding practices, especially during pregnancy, lactation, infancy and early childhood, and during heavy work periods such as planting and harvesting time;

Acceptance of different ways to limited family resources in meeting family needs; and

Stabilizing population growth.

How I wish the designs of these experiments had been planned to look at the results from a statistical standpoint.

If countries of the non-industrialized world move forward to the place where they can feed their own in a healthy manner and meet fuel needs for doing so, women at local levels must be given the opportunities and assistance needed to become equal partners in this endeavor, not just women-of-burden. Local women, too, must be allowed the joys and benefits of self-actualization and fulfillment.

Even though I have observed how the rural poor (men, women, and children) live and work in several areas of the world, have read even more about the rural poor and their living conditions in many other regions, and have always sought the reasons behind their actions, in this paper I have attempted to re-evaluate my conceptions (or misconceptions as the case may be) in relation to the need for and use of food and fuel by the poor. As a result, some of my ideas regarding these relationships have changed.

In order for you to understand the basis from which the thoughts I have given here today have evolved, I must emphasize that I believe they are relative to the subject, but they are also tentative. Although I have truly struggled with the concepts and statements presented in the paper, I have an idea that reconsideration of the relationship between food and fuel will lead me to change them again from time to time.

Thank you for providing me the opportunity to test my knowledge and beliefs in this regard. I hope you will test yours also.

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VI. Energy: An Issue for Women and Development

by

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Energy: An Issue for Women and International Development

Energy is a woman's issue. It is an issue at the subsistence level where women supply that bulk of human energy for survival tasks and is an issue in modernizing societies where energy-saving technologies too often undercut women's productive pursuits without replacement in kind. Energy also is an issue in industrial societies where women influence consumption patterns, since development is largely the substitution of more efficient energy for human energy. Although different development paths affect women diversely, the focus on energy in most cases has been on the national level. This national focus has resulted in the obliteration of the differential impact of countries' policies on different household members.

Historically, energy policies often have added to the daily burden of women rather than relieving the toil. However, the end of the era of cheap oil has required governments to reconsider their priorities and goals and to adopt new energy alternatives. It is imperative that the implications of governmental macro choices on the micro-level be made explicit before policies are changed. Thus, to begin to understand how current development policies affect women world-wide, it is necessary to examine first Energy as a Development Issue (Part I of this paper), to review Energy Issues for Women in Modernizing Societies (Part II), to speculate on Energy Issues for Women in Industrial Societies (Part III), and briefly to conclude with Energy as a Woman's Issue Internationally (Part IV).

I. Energy As A Development Issue

Current development theory is planned modernization which uses industrialized countries, particularly the United States, as the model.* This model was based on cheap energy for industry and transportation, utilizing nationwide delivery systems for both fossil fuels and electricity. Investment was made in capital-intensive industry and in national infra-structure on the assumption that the benefits and money associated with modernization would trickle down to the poor, and spread into the rural areas. Given the focus on the modern sector, activities in the informal sector were considered attributes of underdevelopment destined to wither away with modernization. Thus, most of women's economic activities were unrecorded and household production was completely ignored. As a result, women in developing countries were assumed to have the same type of leisure time as housewives in the industrialized countries, and development projects planned accordingly. In other words, the human energy used in subsistence activities was seldom acknowledged and so often national energy planning did not take into account effects of technology on human energy.

Recognizing that maldistribution of income tended to accompany capital-intensive development, three theory refinements have appeared during the last decade. One refinement was a people-ori-

*Only theories underlying development policy of the major donors as they have been refined or revised by the development community are considered.

ented approach, a focus on the micro-level. This approach required, at least in theory, community participation of both men and women. In addition, alternative methods for measuring development were put forward, such as the Physical Quality of Life Index, which includes life expectancy, infant mortality and literacy as some of its variables (Overseas Development Council, 1977). The move to "appropriate technology," emphasizing that technology should be energy conscious and available at the village level, also was a refinement. Thus, all three refinements reflect an acknowledgement that development had not helped, but had often hurt the poor, and a recognition that donor agencies had increased and should continue to increase their efforts to design programs to provide basic needs for the poor. It remained, however, for a fourth approach -- the women-in-development approach -- to emphasize that women, especially women-headed households, were the poorest of the poor (Irene Tinker and Bo Bramsen, 1976).

Along with the people orientation, the village-focused (appropriate) technology refinement was in part a response to the growing wood shortage in the developing countries. Since the growing energy crisis called into question earlier paths, energy intensive development no longer made sense at the village-level. Rising prices of kerosene increased the demand for firewood and charcoal, especially in cities. Alternatives proposed in energy technologies had characteristics associated with micro-level planning. The technologies are small, can be decentralized, and

are relatively easy to use and repair, even though many of the solar technologies are extremely sophisticated. FAO took the lead in designing new programs for social forestry: the growing of trees as a village-level agricultural crop, often with mixed uses. Also, technology groups around the world have become captivated by the challenge of producing a more efficient cookstove.

In the first rush to incorporate solar energy into rural development, there was a tendency to overestimate its immediate utility. By the time of the U.N. Conference on New and Renewable Sources of Energy in Nairobi, August 1981, the contribution as well as the limitation of solar technologies to the energy mix had become better understood. Because the proponents of new and renewable sources of energy had as their antecedents the people-oriented development approach, both preparatory documents and the Nairobi Programme of Action accepted the imperative of adjusting technology to the people. At a Bellagio workshop held in May 1981, sponsored by the U.N. Educational, Scientific, and Cultural Organizations and others, a group of experts emphasized that:

Social and cultural constraints are liable to be misunderstood or misinterpreted, being intimately linked with problems of poverty and fear of risk-taking. Special care must be taken to select and adapt new technologies in line with development objectives and the needs of the people who will use them (Bellagio, 1981).

As a result of this confluence of development and energy approaches the U.N. Conference on New and Renewable Sources of Energy was, from a substantive point of view, the most successful

of the recent series of U.N. conferences on global issues. Reports from the series of technical panels and issue groups ranged from good to excellent; a synthesis report put the various recommendations into a single document. Most of this accumulated wisdom was incorporated into the final Programme of Action. Thus, the result is a solid document providing guidelines for research and projects on the following energy sources: hydropower, fuelwood and charcoal, biomass, solar, geothermal, wind, oil shale, and tar sands, ocean, draught animal power, and peat. Representatives of non-governmental organizations concerned with women, environment, and fuelwood found delegates most receptive to additional clauses delineating these issues.

The conference was successful because of its limited objective: consideration of fossil fuels and nuclear energy were specifically excluded. By the conference's own estimate, at present new and renewable sources of energy (excluding human energy) account for only about 15% of the global energy requirements, although their role is expected to increase during the energy transition (National Programme of Action, 1981). These sources are much more important in the developing countries, composing between 50 to 70% of total non-animate energy use in many developing countries (Brown and Smith, 1980; Brown, 1980; Tinker, 1981(b); Tinker, 1980(a)).

However great the use of these energy sources are in developing countries, the modern sectors of these countries are tied to energy-intensive industries and transportation networks. Thus

there is not only a problem of energy and fuel development, but the debate at the macro-level is part of the controversy surrounding questions on the new international economic order. How will the energy-poor developing countries find money to pay their fuel bills? Overall about 40 percent of export earnings of oil-importing less-developed countries is spent on oil (IBRD, 1981). Countries such as Turkey, Brazil, and India now pay over 50% of their export earnings on imported oil.

The above figures indicate clearly how few resources are likely to be available within country budgets for people-oriented development programs. Both the International Development Strategy and the Nairobi Programme of Action call for greater financial support for energy. The International Development Strategy also requests the developed countries "to facilitate the fullest possible access by developing countries to scientific and technological processes to enable them to develop energy sources including nuclear technology for the production of energy..."(IDS, 1981).

Therefore, the transfer of funds and technologies from the North to the South are at the heart of the New International Economic Order debate. But rather than force a split at Nairobi, the conference agreed in essence to send the question of finances back to the General Assembly. Perhaps one reason for this willingness to avoid confrontation on North-South issues at the U.N. Conference on New and Renewable Sources of Energy was the feeling held by some delegates that monies for alternative energies could

well be financed by the oil-exporting countries that have gained so much from the rise in the price of energy (Rake, 1980).

However quickly or slowly the reordering of national power progresses, equality between countries does not guarantee equity within countries or between women and men. Therefore, programs at the micro-level which will help reduce the human energy expenditure of women must be strongly championed so that the donor communities and national governments do not again forget them.

II. Energy Issues for Women in Modernizing Societies

Turning from the international to national, it is recognized that national energy policies obviously affect women of all countries in their capacity as citizens. Two issue areas particularly pertain to women more than men. First is the human energy expenditure differences in modernizing societies. Second is the consumer advocacy role identified with consumption in the women's spheres. This section will basically be a brief review of issues affecting women in the subsistence economy, particularly the relationship between women's energy and appropriate technology. In the next section, the focus will be on woman as a consumer in the industrialized nations.

To get out of the poverty trap which is characteristic of subsistence economies, more efficient cheap energy must be introduced at the village-level creating an economic surplus or providing amenities which reduce human energy expenditure (Ashworth,

1980; IFIAS, 1981). Here we want to draw on the literature from the appropriate technology community to illustrate the types of policy concerns which new energy technologies are beginning to raise. These include:

- attitudes of technologists toward social constraints, especially in the woman's sphere;
- trade-offs between efficiency and employment, or "who benefits;"
- technology as a man's sphere; and
- technology for amenities, or "who pays?"

Proponents of appropriate technology argue that early development planners favored a capital-intensive high technology approach to industrialization and modernization. Capital enterprise development has often increased unemployment as evidenced by the displacement of indigenous handicrafts industry and the adoption of new agricultural techniques (Tinker and Bo Bramsen, 1976). Also, the environmental degradation that often accompanies capital-intensive development was seldom considered. Further, choices already made now lock most developing countries into energy-intensive industries and programs which are putting ever increasing strains on their national budget.

Appropriate technology is usually defined as technology that is human scale, labor-intensive and made from local materials to allow for easy repair. For a time, appropriate technology utilized fossil fuels, but now its advocates are experimenting with renewable energy. Despite their emphasis on human scale technology, appropriate technology proponents still tend to approach

village-level technology with programs that overlook social constraints to usage and with attitudes that if the technology works efficiently in the laboratory, then people should and will adopt it. Debates at both the U.N. Conference on Science and Technology for Development and the U.N. Conference on New and Renewable Sources of Energy frequently cautioned that the social, economic, cultural, and climatic issues would play a dominant role in the utilization of any technology.

It is difficult for most scientists and engineers to adapt their technology to people; it has been even more difficult for them to include women either in the adaptation or training. The result has been that many technical innovations at the village-level are quickly abandoned, from latrines to water pumps, from solar ovens to canning factories (Tinker, 1980(a); Elmendorf, 1980). Sometimes, innovations turn out to be less efficient than traditional technology. Corbett argues that a new peanut oil-press is heavy, hard to clean, and takes longer to produce oil than the traditional method (Corbett, 1981). On the other hand, efficient and appropriate technology may well be rapidly adopted, but it may also have devastating effects on employment. Rice hullers with a rubber roller were introduced into Indonesia in 1970; within four years some 7.7 million women lost their income from hand-pounding (Tinker, 1980 (a); Tinker, 1980 (b)).

The Indonesian case cited above represents the dilemma of who benefits. The poor Indonesian women work hard to survive; hand-pounding of rice was done both as a job for others and as a house-

hold activity for one's own family. For those rich enough to pay for processing, the new huskers are more economical both in terms of cost and in the amount of usable rice, and will remain so as long as fuel to power the engines is subsidized. Nevertheless, the poorest women still pound their own rice because they cannot afford the cost of milling; indeed, many have even less money now than before. Yet we have argued that the scarcity of human energy is a major constraint on development at the subsistence level, and here is a technology which reduces the drudgery of food-processing, a technology certainly appropriate for all but the poorest. However, the introduction of appropriate technology in this case did result in a labor surplus, an ill effect according to some.

Economic historians would argue that such a labor surplus as was present in the Indonesian case is necessary to provide labor for new industries. It is true that young women are particularly welcome in the electronics and textile factories in Asia and Latin America (Tinker, 1980 (b); Lim, 1978; D'Onofrio, 1979), but in countries without new industry, alternative employment opportunities must accompany the introduction of new technologies. In Indonesia, as in Bangladesh, the poorest women are now vying with men for jobs in road construction in the food-for-work program. The income of poor women is essential among the poorest stratum of society, whether the household is headed by a man or a woman. Thus, non-discriminatory access to such jobs and equal pay for women become ever more important as a country modernizes.

What these illustrations underscore is the difficulty in reaching the poorest with any technological innovation. Money, as well as time, is in short supply at the subsistence level. It is the slightly better-off who can adopt new technologies; in doing so they increase the gap between themselves and their poorer neighbors. We have noted that as family income increases, women in the more affluent families tend to return to household tasks. Their increasing dependency on the male head of household makes it unlikely that these women will work with other women for non-household benefit. It would seem, therefore, that the only way to reach poor women with technologies is to work through groups of poor women and indeed, many such projects are currently underway (Hoskins, 1980; Piepmeier, 1980).

However, the tendency of better-off women to retreat to the household can be reversed when alternate priorities to the status of housewife become accepted in society. Educated women may wish to use their education or to contribute their talents to national development (Blumberg and Dwaraki, 1980). A call to women to participate in the Saemaul Undong, the new community movement, allowed Korean women, for the first time, to participate in non-lineage organizations. The fact that Mother's Clubs, and later the Saemaul Undong Women's Clubs, added income-producing activities to their agendas empowered women to control their own income. As modernization proceeds, the anxiety of Korean women to send their children to school has kept up the pressure on rural Korean women to continue to work (Tinker and Cho, 1981). Such

alternative status goals may be necessary to tap the underutilized talents of the better-off women in the developing countries. On the other hand, Papanek maintains that middle class non-working women contribute to family advancement and societal needs through a variety of social networks and voluntary associations (Papanek, 1979).

Whatever the situation country by country, it appears that women at all socio-economic levels need training in technology. Cultural assumptions about women's attributes often become self-fulfilling prophecies as has been illustrated by the infliction of "math anxiety" upon many American women (Tobias, 1978). Repairs are much more likely to be done on technologies women use if they themselves are trained to do it. In Nepal, the spigots attached to gravity-fed water pipes were largely out of use before village women were trained (Tinker, 1980 (c)). Women are also more likely than men to successfully adapt technology for work in women's spheres. This issue will be elaborated in the discussion of cookstoves.

Finally, it is important to ask who will pay for improved technologies which bring human energy benefits without immediate and apparent economic benefits? For many years, women writers have riled against the drudgery inflicted upon poor women in the developing countries. Our statistics show that food-processing and preparation take the greatest amount of human energy, followed by fetching water and collecting firewood. Because these activities are in the women's sphere, relatively little attention

has been given to them directly. Arguments for improving water supply and sanitation during the U.N. International Drinking Water Supply and Sanitation Decade emphasize the necessity for health for the entire community, rather than focusing on the widespread drudgery entailed in carrying water. This is undoubtedly a realistic strategy which reflects the way development planners set priorities.

At the village-level, too, men usually make decisions about expenditures. Thus, new technologies designed to benefit women such as improved grain mills or solar ovens are not likely to be high priority. As so clearly articulated by Harrison Brown and Kirk Smith: "To the extent that men make the investment decisions, energy system changes may have a low priority than they might appear to warrant in the eyes of an outsider concerned with overall technical or labor efficiency" (Brown and Smith, 1980).

A new rationale for spending on technologies at the village-level has recently been put forward by the ASTRA group. Utilizing the work of A. K. N. Reddy, et al. (Reddy, 1980), Batliwala (1981) has produced data which substantiates the caloric deficit of women caused by their higher expenditure of human energy and their lower food intake as compared to men. Batliwala (1981) estimates that gathering firewood, fetching water, and processing and preparing the food account for an energy use of about 700 calories daily. She points out that these domestic tasks must be done almost every day and that women spend 1010 calories on them as compared to 711 for men.

Men, on the other hand, do expend more energy on agricultural activities. However, food intake greatly increases for all families during periods of heavy agricultural work, compensating for the extra energy used. Day in day out, women work harder. Batliwala finds that while men expend only 70 percent of the calories that women do, they eat twice as much (Batliwala, 1981). Careful nutritional measures done in Upper Volta find a similar deficit between women's work and their intake of food (Bleiberg, et al., 1980).

These figures underscore a well-known fact that poor women in India and Africa are often undernourished. What is new in the ASTRA approach is the solution. The usual responses to hunger are to provide more food and try to reduce illness. Reddy (1980) and Batliwala (1981) suggest that appropriate technology may be the fastest means of reducing this calorie gap. Reddy feels that the piped water and free gas which ASTRA brought to a test village near Bangalore have already reduced women's energy expenditure by the 700 calorie gap (Reddy, 1981). (Oral presentation at the August 1981 women and Energy Panel of the Non-Governmental Organization Forum during the U.N. Conference on New and Renewable Sources of Energy in Nairobi.)

Also, pricing policies clearly affect village-level technologies. Given the poverty of the women in greatest need, subsidized intervention may be necessary. If governments pay for health or for food supplements, why should they not help pay for clean water or other technologies that would then reduce the need

for the food or the health services? These are unresolved issues that still affect women in modernizing societies.

III. Energy Issues for Women in Industrializing Countries

After this brief review of women and human energy in the developing countries, it seems useful to add a table comparing the time women allocate to activities in developing countries with the amount of time allocated by women from the more industrialized countries. Table I is based on Evenson's summary of time-use information drawn from 17 countries. The mean averages of time per typical work day spent in market work, home production, and leisure for women in developing, planned industrialized, and market industrialized countries are included. Averages are presented for all women, employed females, and housewives. Women in developing countries have, on the average, slightly more leisure time than women in market industrialized countries and on the average about two hours more than women in industrialized planned economies. This finding may be partially explained by the rapid movement of better-off women to the housewife status in developing countries. Even so, housewives in the developing countries have less leisure than men (Evenson, 1980). Only in Western industrialized countries do housewives have more leisure than men. The figures emphasize an observation often made about planned economies: that these countries require women's participation in the modernizing labor force, but have done little to alleviate

the energy required for activities in the women's spheres, which are not as modern.

Table I

Work and Leisure for Women: An International Comparison*

	<u>Developing</u>		<u>Industrialized</u>			
	1**	2***	Planned		Market	
			1	2	1	2
Market Work employed female housewives	2.80	8.08 .05	6.12	8.11 .25	3.53	7.60 .13
Household Work employed housewives	6.64	2.97 8.16	5.45	3.99 9.14	6.02	3.36 8.19
Leisure and Sleep employed housewives	14.55	12.95 15.78	12.44	11.89 14.59	14.45	13.03 15.67

* Derived by Evenson from 32 studies done in 17 countries

** all women

*** by predominate category

Although surveys at this level of aggregation are useful to show general trends, details are often distorted. What this table clearly states is that working women everywhere work long hours, partially because they continue to bear the primary responsibility for energy expenditures in the women's spheres. While this double day phenomenon is frequently discussed, the argument presented in the Western countries by the women's movement has emphasized the importance of job access and pay for women. The easy assumption that under pressure, men would share work in the women's spheres

has happened in reality only to a limited degree, primarily among affluent and well-educated couples without children. Divorce is also common among this group. Similarly, no or one-child families and divorce are so pervasive among women in planned economies that the resultant low birth rate is of great concern to their governments (Tinker, 1980 (c)). In the United States, also, there is a growing recognition that feminism has exacerbated the tension between men and women. Betty Friedan is calling for a "second stage" of the movement to grapple with the issues. She writes: "...in our reaction against the feminine mystique, which defined women solely in terms of their relation to men as wives, mothers and homemakers, we sometimes seemed to fall into a feminist mystique which denied that more of a women's personhood is fulfilled through love, nurture, home (Friedan, 1981)".

Elsewhere, I have argued that the American women's movement is rooted in the extreme individualism which characterizes American culture (Tinker, 1981 (a)). Yet this phenomenon is worldwide. For the family woman the most prevalent alternative to the double day with its extreme expenditure of human energy is the dissolution of the family. Yet, if the woman becomes the head of the household, she must still perform the double day without a second income. Reducing human expenditure in household drudgery as has been done in the U.S. clearly helps; but in the long term there is a need to evaluate, honor and share the activities described as the women's sphere in some totally new way.

Household consumption patterns often remain within the woman's sphere, whether she is working or not. Yet, women's choices are largely framed by men who design the houses, suburbs, and household appliances, or popularize inappropriate clothing styles for winter. Women lead the consumer demands for more energy efficiency for refrigerators, irons, vacuum cleaners. One step made to meet that demand is comparative details of consumption must now be furnished to the consumer in many countries. Energy-extravagant housing patterns will take years to replace, however, for the same reasons that industrial energy saving will be slow; current investments cannot be quickly replaced and retrofitting is only partially a solution.

If the renewed emphasis on "woman's personhood" has any validity, then women will always be more concerned with the interpersonal relationships within the household, and so with the services and supports rendered there. Hence, it is essential that women in industrialized societies demand a role in decision-making, particularly in those areas where women's spheres are concerned. Yet the dangers of this focus are apparent: with rising affluence will all women retreat, or be pushed back into the traditional housewifery role? So fundamental is this issue that no sector analysis of women's special concerns is complete without reference to it. So profound is the problem, that however elusive, women around the world must address it directly.

IV. Energy As A Woman's Issue Internationally

Finally, the recognition of the social dimensions of the problems of energy in a holistic context and the investigation of the differential impact energy has on women and men in developing and industrialized societies is a step in the right direction. The recognition that energy is a women's issue at the U.N. Conference in Nairobi is also positive. Due to the nature of this issue and the fact that discussion of fossil fuels and nuclear energy had been excluded from the debate, much of the conference time was spent exploring energy alternatives at the micro-level. The focus was on the energy transition: how to alter the fuel of development without unduly retarding either national modernization or rural development. The earlier romance with solar energy as the panacea for energy needs had given way to more realistic notions of an energy mix in which fossil fuels will continue to play a dominant role at least until the end of the century (Strong and Ul Haq, 1981). Current applications for new and renewable sources of energy were generally seen as appropriate for small-scale decentralized use. Once the human level becomes the point of reference, the next logical step is to disaggregate women's and men's roles and needs. Thus, women's concerns are both recognized by and inserted into the Nairobi Programme of Action in a more positive and integrated manner than in most previous U.N. documents.

An example of this approach may be seen in paragraph thirteen of the Nairobi Programme of Action.

The ultimate aim of socio-economic development is the constant improvement of the living conditions of the entire

population. The successful achievement of the energy transition has direct implications for shelter, physical infrastructure, health, sanitation, nutrition and general well-being in rural and urban communities...it should include, where appropriate, provisions to ensure adequate supplies of energy in case of acute shortage of energy for subsistence. The energy transition must include consideration of the social dimensions, including the role of women as agents in and beneficiaries of the process of development, in view of their special burdens as producers and users of energy, particularly in the rural areas.¹

This reference to women as the producers of energy is the closest that the conference came to dealing with human energy. The meaning is ambiguous: it could refer to women growing trees or making charcoal. Draught animal power is one of the ten energy sources listed in the Programme of Action, but not human power. Yet, when all else fails, human energy is the energy of last resort. More often than not, it is women's energy.

¹ The wording was drafted by the Department of International Economic and Social Affairs with input from the Bureau of Social and Humanitarian Affairs. This, and other amendments, were supported or drafted by a womar's caucus called by NGOs but including government delegates, and encouraged by the secretariat for the conference including Secretary-General Enrique Iglesias.

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VII. An Economist's Approach to Fuelwood
Production and Use

by

Samuel A. Hale, President
Energy/Development International, Washington, DC,

Speech presented at
"Food and Fuel: Changes in Family Behavior"
Title XII Conference
November 5, 1981
Virginia Tech

An Economist's Approach to Fuelwood Production and Use

I appreciate having the opportunity to participate with you today. Exclusively, our company, Energy/Development International, does energy work in developing countries. In such places as the Sudan, Kenya, Somalia, Indonesia, West Africa, and the Caribbean, we have projects which started out as energy projects and have become cooking projects, local tree planting projects, and other kinds of projects. I think Marilyn Hoskins felt that as a male-dominated company, it was time that we received a little education. Thus, the primary reason I am here is to listen rather than to speak.

The title of the talk is supposed to be, "An Economist Looks at Fuelwood Production and Use." However, before addressing fuelwood production and use, I would like to make a few points about economics. My first thesis is that, in the kinds of areas which we've been discussing today, you cannot separate economics from the rest of the social sciences, particularly those that concern individual and social behavior. At too many times in project designs concerning fuelwood production and cook stoves, economists don't include adequate concern for how people actually behave. Donors and governments too often try to reduce everything to numbers that are inappropriate and misleading. They imply that somehow if you can achieve those numbers, you have achieved your goals, when in fact what is required is individual actions of a lot of people at the local level -- actions over

which donor or government have little influence. The other point, though, is that if you look at economic parameters, which I'll spend a few minutes doing, it may give you some clues as to what is likely to work or not work and why. In particular, when one looks at various participants' economic incentives, one finds a major difference between how the individual at the local level views things, and how donors, governments and the people designing big projects tend to think that local people are going to behave.

Before summarizing some overall fuelwood trends as we see them, I would add at the outset that there is very inadequate data on many of the factors that are needed to make decisions. For example, we may not have information about production of fuelwood, the consumption of energy, the ownership of land and who has rights to the land. In fact, despite the work of the FAO and others, there has been little work on even measuring rates of deforestation. From people who have been in Africa or Asia for years, there comes much anecdotal evidence and many impressions which lead us to believe that the problem is getting worse. However, when it comes to really being able to quantify what is happening, we are not very well off at all. Then, when you get to the operational aspects you need to know, such as land tenure, quantification is even more difficult.

As to the problem of fuelwood production and use, a particular thing that I would like to stress along with the other speakers, is that I believe that deforestation is not just, or even

primarily, a fuelwood problem, but a loss of Africa's and Asia's agricultural base. Yet, again, we're only beginning to have any kind of information that deals with the chain of cause and effect related to deforestation. That does not mean it's not a problem. I think it is very obvious for people who have been in Africa, or parts of Asia or Latin America, that the soil erosion problem is very serious. However, the information has not caught up with our perception of the problem. (Chart I)

One of the problems with the information we have is that the nature of the problem varies widely even within a relatively small region. For example, Dr. Tinker stated that the consensus at the U.N. Nairobi conference was that the major cause for deforestation is clearing land for agriculture because of the pressure from landless peasants to move on to ever more marginal lands. That is generally true. On the other hand, in Kenya we find many areas where that does not seem to be the problem. Rather, as soon as a rural road is put in, people come in to produce charcoal for sale in Nairobi and do not use the land for agriculture at all. In short, generalizations are risky.

A second problem, from an economic point of view, is that the individuals being asked to act often do not reap many of the benefits of such action. The classic case is the World Bank's major program in reforestation of the foothills of the Himalayas, the major purpose of which is to avoid long term flooding in the Ganges Delta. There, the major benefits of the program occur in regions far removed from the people that are being asked to plant

CHART I

FUELWOOD/BIOMASS: SOME PLANNING CONSIDERATIONS

- Poor Data on Production, Consumption, Land Tenure, Etc.
- Lack of Information on Impacts of Deforestation or Diversion of Crop/Animal Wastes
 - o Soil Erosion
 - o Siltation -- Water, Power Impacts
 - o Wildlife, Tourism
- Local/Regional Nature of Problems and Solutions (Production, Processing, Use) -- Largely Individual Decisions, Limited Government Leverage
- Individual Cannot Capture Many Benefits of Afforestation or Efficiency Improvement
- Income/Employment Impacts of Many Policy Options
 - o Subsistence Agriculture/Shifting Cultivation
 - o Charcoal, Cookstove Employment
- Temptation to View as Less Immediate than Two Major Commercial Energy Problems:
 - o Oil Import Bill
 - o Reliability of Electricity Supply

the trees, to maintain the trees, and to give up time from other pursuits.

Third, policy options related to deforestation obviously have income and employment impacts. Governments' first instinct seems to be to protect government forests. Aside from the fact that this has not worked very well, it also has implications for subsistence agriculture and the landless peasants that put the pressure on so-called endangered forests in the first place. Another example: many government officials in Kenya want to move into large industrial scale charcoal production, despite the fact that traditional charcoal production -- which admittedly is very inefficient -- is the largest source of non-agricultural employment in most rural areas of Kenya where there is wood. These are but a few examples of obvious impacts.

Also, we find almost universally that the governments, unlike most donors and us, do not look at fuelwood and deforestation as being such a major problem. Although they think it is a serious problem, they tend to devote much more time to the commercial energy problems for a number of reasons. Commercial problems are where governments get political pressure. Doing something about fuelwood tends to be more postponable. Also, it is inherently more difficult to have an impact on deforestation because instead of reaching a few places in the system, you have to reach down virtually to every individual. Just from an organizational standpoint, many more people are involved in wood than are involved in other types of energy, and few governments in de-

veloping countries have been very successful at mobilizing great numbers of local people. So, for a lot of reasons we find that rhetoric and general concern about the problem notwithstanding, the president and the chief ministers tend to be concerned about commercial energy, not cooking energy or wood. Unfortunately, there seem to be few exceptions to this pattern.

Other trends also are evident. Prices of both fuelwood and charcoal appear to be going up dramatically in most areas, although price levels themselves vary widely from region to region. Distances involved in collecting firewood seem to be increasing in many areas; but again, as we discussed this morning, it is hard to generalize. In an increasing number of regions, firewood seems to be moving from a traditional free good to a marketable, sellable good. On the one hand, this trend is producing rural income; but, on the other hand, unlike before, it is costing money. In many areas, including rural areas, there is evidence of a quickening shift from wood to charcoal. At the same time we are also finding that the distance you can go before it pays to convert to charcoal rather than transport wood may be much greater than we thought it was. Finally, in a few areas, notably the Caribbean, there is some movement from charcoal to commercial fuel, though one would expect such shifting to be substantially less than it was before 1974. (Charts II & III)

Escalating rates of deforestation are things that all of us notice visibly in many areas. Although deforestation trends have not really been well documented, there are at least two particu-

CHART II

FIREWOOD TRENDS

(Caveat: Highly Site-Specific)

Increasing distance of firewood from consumers,
decreasing ability to be selective

Trend in some areas to monetization

Where wood over 10-15 kilometers away,
consumption decreases

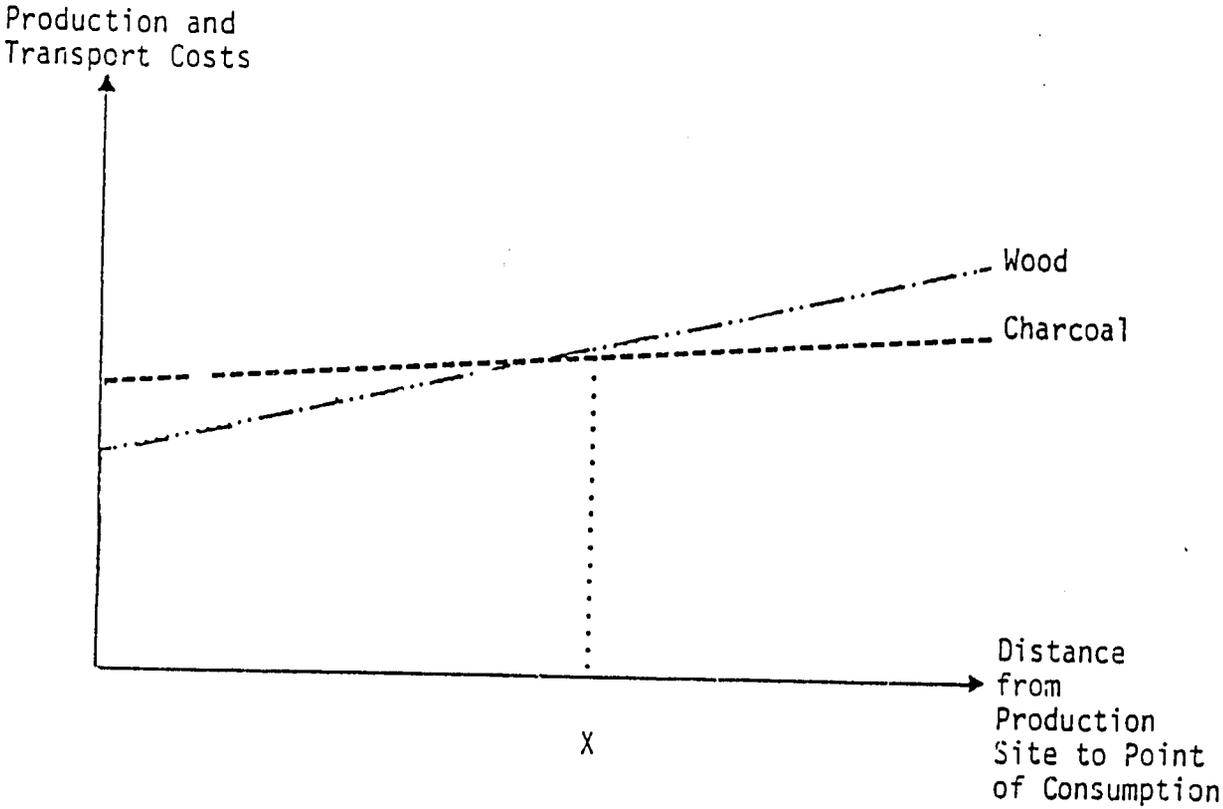
- Switch to crop residues, dung, etc.
(households and industries)
- Fewer hot meals
- Switch to food requiring less cooking

Isolated efforts:

- Plant trees (not necessarily maintain them)
- Improve cooking efficiency in other than
traditional ways

CHART III

FIREWOOD VS. CHARCOAL COSTS
AS FUNCTION OF TRANSPORT DISTANCE



lar areas where deforestation is very clear. One is the increasing sign of deforestation around cities, towns and villages. The second, which has been discussed less, is deforestation on marginal land, that is, the process where because of increased population on agriculture land, the poorer and less powerful rural groups are pushed to clear even more marginal lands. Examples include steep slopes and fragile semi-arid land which should not be used for agriculture because it is difficult to get anything to grow. The result of these movements will be more serious environmentally than if those lands were left in natural forest. In addition, the consequences may include accelerated watershed degradation, loss of agricultural production, accelerated siltation of waterways, and so forth. On the other hand, the political and social pressures to continue such land clearing are substantial. (Chart IV)

And finally we believe, although we cannot prove, that heightened competition for limited fuelwood sources is likely - not only competition from urban household purchases of wood and charcoal, but also from commercial and industrial fuelwood users -- tea and tobacco plantations, brick kilns, and the like -- which we have found to be increasing at a rapid rate. Although this is pure conjecture, our suspicion is that the money making users are likely to squeeze out the nonmoney making users. Thus, it appears that for a variety of reasons, there is going to be more pressure for what was previously free firewood collection. Because most of the money making users tend to be male and the

CHART IV

TYPICAL FUTURE "NO-ACTION" SCENARIOS

- Continued increase in:
 - o Charcoal prices
 - o Firewood collection distances

- Gradual shift from:
 - o "Free" to monetized firewood
 - o Firewood to charcoal
 - o Charcoal to commercial fuels

- Escalating rates of deforestation:
 - o Around cities/towns/villages
 - o On marginal lands (slopes, arid lands, etc.)

- Accelerated watershed degradation, loss of agricultural production base

- Urban-rural competition for limited fuelwood sources

nonmoney making users are female, this has implications for the role of and the burden on women, especially poor rural women.

There is some evidence that industrial reaction to prospective fuelwood shortages may be more pronounced. The Beijer Institute, which has been doing a detailed fuelwood survey in Kenya, is finding that most so-called cottage industry, blacksmithing, tinsmithing, local brewing and a few others, use little or no inanimate energy. Thus, most so-called cottage industry is purely artisan and thus uses little or no fuelwood. At least in Kenya, most industrial fuelwood use is by larger-scale industry. Those industries may involve local small holders - for example, as much tea and tobacco production does in Kenya - but they still involve organizations which are large and sophisticated enough to both worry about and do something about problems of fuelwood supply. Thus, for example, a number of Kenyan tea and tobacco plantations or cooperatives are either growing their own fuelwood or fostering an active small farmer network from which they purchase wood. Some of the biggest plantation managers will now no longer take tea or tobacco from a small farmer unless that small farmer also brings the wood that is necessary to cure the product. This is a vast change from even two years ago. (Charts V & VI)

Another viewpoint can be gained from looking at household reactions to problems of higher fuelwood prices and lengthened collection distances. Reactions have included using dung or agricultural residues and having fewer hot meals and meals that require less cooking. There have been some efforts to either plant

CHART V

HOUSEHOLD VERSUS NON-HOUSEHOLD USES
AS PERCENTAGE OF TOTAL FUELWOOD CONSUMPTION

<u>Country</u>	<u>Households</u>	<u>Cottage Industry</u>	<u>Industrial and Service Sectors</u>
N. Nigeria	75		25
Gambia	85	7	8
rural	(85)	(9)	(6)
urban	(83)	(-)	(17)
Sudan		98	2
Tanzania		93	7
Thailand	84	7	9
rural	(89)	(7)	(4)
urban	(74)	(8)	(18)

CHART VI

FIREWOOD PURCHASES
AS PERCENT OF TOTAL INCOME

	<u>Up to:</u>
Ouagadougou, Upper Volta	30%
Niamey, Niger	25%
Highlands of Korea	15%
Andean plateau	25%

Source: Openshaw, "Woodfuel -- A Time for Reassessment,"
Natural Resources Forum 3 (1978), p. 41

trees or to improve cooking efficiency with the traditional three-stone stove. There also have been extensive efforts to introduce Lorena or other improved stoves, most of which require both learning a new stove construction/maintenance technology and changing cooking habits. Improvements to traditional cooking methods largely have been unexplored. We are seeing where the introduced stoves are doing poorly, that people are returning to and investigating other approaches. So far, AID and other donors have concentrated on high-mass owner-built mud or clay stoves, such as the Lorena stove. However, there is increasing attention to improvement in designs for low-mass charcoal stoves. Interestingly, the charcoal stoves now used in most of Africa originally came from Asia, and some of the stoves being investigated as possible replacements also come from Asia. Particularly, there has been a very active movement to take improved Thailand stoves and introduce them to Tanzania, Kenya, and elsewhere in East Africa, rather than trying to implement with a vast extension network and get people, one-by-one, to build their stoves.¹ These efforts to distribute improved charcoal stoves tend to concentrate on people who make stoves now, sell those stoves, and presumably have a stake in making and selling a stove which would achieve better acceptance in the market. (Charts VII & VIII)

¹ This network requires not only getting them to change their cooking practices, but also requires them to learn a new artisan skill.

CHART VII

COOKSTOVE ISSUES

- INCENTIVES TO ADOPT IMPROVED COOKSTOVES
 - o Owner-Built Stove: 20-50 Hours to Construct
Perceived Risks (Inconvenience
vs. Time Savings, 100-300 HRS/YR)
 - o Purchased Stove: 50¢-\$5 (More for Lorena)
Payback Less than One Month
 - o Invest Money to Save Time?
 - MALE-FEMALE ROLES
 - INSTITUTIONAL ABILITY TO REACH COOKSTOVE USERS
 - o Marketed Stoves: Network Already Exists,
at Least for Charcoal
 - o Owner-Built Stoves: Extension-Intensive
(West Africa)
 - EMPLOYMENT AND OTHER ASPECTS
- 

CHART VIII

COOKSTOVES

- TRADITIONAL STOVES (THREE-STONE, CHULA, JIKO, ETC.):
 - o Wide Variation in Efficiency Estimates
(3-5% vs. 18% in Lab)
 - o Highly Dependent Upon Cooking Practices

- BROAD ALTERNATIVES:
 - (1) MARKETED STOVES (LOW-MASS)
 - o Improved Metal Charcoal Stoves (Kenya)
 - o Pottery or Pottery-Metal Stoves
(Asia, Tanzania)
 - o Metal/Pottery Stoves for Firewood (Ethiopia)

 - (2) OWNER-BUILT STOVES (HIGH-MASS)
 - o Lorena-Type Stoves (Central America, Africa)
 - o Improved Chulas, Other Designs

 - (3) SIMPLE MODIFICATIONS
 - o Sealing/Saving Charcoal
 - o Sealing Pot Holes
 - o Horseshoe Alcove
 - o Dampers, Air Vents, Baffles (Chula)
 - o Pre-Drying Wood

As I mentioned, the other option that has been given little consideration is simple modifications to existing stoves. Examples include saving partially burned charcoal in a sealed tin can, sealing up the pot holes, simple alcoves around a three-stone fire, dampers perhaps, pre-dried wood, and probably most important, processing the food first, whether it's soaking beans overnight, or simple grinding. Thus, rather than just concentrating on the stove, we are beginning to perceive that we should broaden our thinking to the whole area of cooking practices.

There is one other thing I would like to mention about stoves. When you go out to survey how people use stoves, you find that they use them for a lot of things. Sometimes they want a pot to boil fast, other times they want it to simmer slowly. They use three-stone stoves for heat, for light, for drying the thatch on the roof, for drying or curing food and for keeping insects away. In short, the traditional stove has a broad range of purposes, as well as some bad side effects, particularly smoke burning your eyes over time. Almost all the work on more efficient stoves is concentrated on only one of the first two parameters -- either to boil faster or to simmer more slowly and more efficiently -- and even those two tend to be mutually exclusive. If you do one, it is very difficult to do the other. Most "improved" stoves involve giving up at least some of the other benefits. From this point of view, it is fairly obvious why such stoves have not been adopted.

Another example of improved stoves not meeting user's basic design criteria is the very heavily insulated charcoal stove, a number of which were demonstrated at the U.N. Conference in Nairobi. Tests indicate that such a stove does consume less charcoal per meal. However, early designs were so heavy that they could barely be lifted. Also, costs of these designs were about ten times that of the traditional charcoal stove. Now gradually, with more design work and greater interaction between users and stovemakers, much more appropriate stoves are evolving.

Since the title is "An Economist Looks...", I feel obligated to again add something related to economics. So...what are the incentives to adopt and improve cookstoves? If you look at the owner-built Lorena-type stove from a purely economic point of view as a prospective user, it looks like a terrific thing. It does not take terribly long to learn how to build one, and projected time savings in the first year are much higher than construction time. Yet, despite substantial demonstration and extension effort, virtually nobody has picked them up. Similarly, one could pay more than ten times present prices for a charcoal stove and the charcoal cost savings would be so great that this investment could pay for itself in a few months. Again, however, there has hardly been a mad rush for improved artisan-made stoves. Consider, for instance, if in order to save time collecting fuelwood, are people willing to pay now for a stove that was free before? That is, at what rate are the rural poor willing to trade time for money or vice versa? Nobody really

knows. Neither do they know enough about male/female roles. There has been little experience to indicate that a male household member is willing to build an improved stove so that the female (who collects the firewood) can save time.

Finally, a very important issue is the institutional ability to reach cookstove users. Even if we had an owner-built stove that we felt was terrific and knew people would use, fostering use for the owner-built stove is highly extension-intensive. In fact, it may take more hours of extension work per stove than it takes to build a stove. At a time when most people feel that the extension networks in most of Africa already are overburdened, could the extension network really manage under the kind of strain that it would take to get owner-built stoves adopted on a large scale? Where would the money for such an extension effort come from?

Now I'd like to turn to alternative fuelwood production systems. First of all, there are a lot of ways to approach the problem of imbalance of fuelwood production and consumption. Most plantations in Africa produce only saw timber or pulp wood and use perhaps only 25-30 percent of each harvested tree. More efficient management would arise if charcoal or fuelwood were produced with other products. Countries that have done this are able to use 75-85 percent of the tree. This can have an immediate impact with what appears to be minimal environmental costs, assuming some leaf litter and other biomass is left on the land. (Chart IX)

CHART IX

ALTERNATIVE FUELWOOD PRODUCTION SYSTEMS

- MULTIPLE-PRODUCT PLANTATION MANAGEMENT (MALAWI, KENYA)
- FUELWOOD PLANTATIONS (INDIA, PHILIPPINES)
- INTEGRATED WATERSHED MANAGEMENT PROJECTS (SRI LANKA; KANDI WATERSHED, INDIA; PANJABANGAN AND MAGAT WATERSHEDS, PHILIPPINES)
- VILLAGE/COMMUNAL WOODLOTS (SOUTH KOREA, CHINA, INDONESIA, ETHIOPIA)
- PRIVATE FUELWOOD PRODUCTION (ETHIOPIA)
- AGROFORESTRY APPROACHES
 - o Taungya Systems (Asia, E. Africa)
 - o Traditional Integration of Trees into Agriculture or Animal Husbandry
 - o Introduced Agroforestry:
 - Tree-fodder crops (India)
 - Mixed tree-fodder and field crops (IITA, Rwanda)

Fuelwood plantations are another option. The World Bank is investing in very large-scale integrated watershed management projects which produce major fuelwood components. Village wood lots have been tried with mixed success. In a few areas, fuelwood is grown by small farmers as a cash crop. In Ethiopia, for example, eucalyptus has long been a cash crop for sale to Addis Ababa urban fuelwood users. Trees have been grown on a sustained yield basis much the way an agriculture crop is. Finally, there are many agroforestry approaches. One example is the taungya system in East Africa, the so-called three-tier system where, for example, you have tall trees, like date palms, then perhaps small fruit trees or cocoa, and then group crops. The traditional use of fodder tree pods for livestock is another example.

The point I want to make is that most of these approaches require individual initiative at the local level. The government, the World Bank, or AID can propose and fund all of the projects they want. But, if somebody does not plant the tree and maintain the tree at the local level, development is not going to happen. That is obviously true with agroforestry, individual farmers' fuelwood production, village or communal woodlots, and also in virtually all of the World Bank watershed management projects. Even at government fuelwood plantations, experience around the world suggests that extra incentives get the people in the plantations to care for the trees. (Chart X)

CHART X

AFFORESTATION: NECESSARY CONDITIONS

- LAND AND WATER
- GERMPLASM OF APPROPRIATE SPECIES
- SEEDLINGS DELIVERED AT APPROPRIATE TIMES
 - o Nursery Network or Backyard Nurseries
 - o Delivery System
- TIMELY LAND PREPARATION, PLANTING
- POST-PLANTING MAINTENANCE
 - o Technical Information/Assistance
- INCENTIVES
 - o Who Benefits from Establishment and Maintenance
 - o Time Distribution of Costs vs. Benefits
 - o Where Monetized, Confidence in Marketing and Distribution System

AFFORESTATION CONSTRAINTS

- VILLAGE/FARMER INCENTIVES TO ACT
- INSTITUTIONAL CAPABILITY
 - o Species Selection
 - o Nurseries/Direct Seeding
 - o Extension Services
 - o Marketing/Distribution
- CAPITAL AVAILABILITY
- LAND AVAILABILITY/SUITABILITY

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The FAO and others (such as CILSS), who have conducted country-by-country surveys in Africa assume that, in order to get wood supply and demand in balance, you have to increase the planting rate by somewhere between 20 and 50 times the present level in most countries. Again, I would caution that since adequate data on neither production nor consumption exist, these numbers are a little suspect. Nonetheless, the point is that whatever the real number is, most countries are far below where they need to be. I would argue that it is not primarily because there's not enough money for forestry, although it is true that there's got to be more money. On the contrary, if you assume organizations will continue to use the dissemination models they are now using, many people feel that there is so much World Bank, AID, and other funding now going into forestry, that you simply could not move much faster.

So what is stopping it? First of all, villagers and farmers lack incentives to act. Most of the economic analysis that we've done -- and I am not going into numbers, because they are very site specific -- is concerned with very traditional economic measures, that is, what is the internal rate of return, how sensitive is the return to various assumptions, what are the scarce resources? We try to estimate these measures on the various levels of decision making to differentiate how an individual villager or farmer perceives the situation from how the government or donors perceive it. It becomes very obvious that these actors' perception and incentives are quite different.

Also, you really have to differentiate between actors at the local level, particularly if you are talking about village woodlots. For example, the village male elders typically make the decision about whether there is going to be a local woodlot, who's going to get the benefits, etc. The women in the village, who bear most of the burden of collecting firewood, may have no say whatsoever. You really need to get down to that kind of level.

Let me just take a couple of interesting cases, based on work that Asif Shaikh of our company did in Mali. AID had a number of small fuelwood projects and rural reforestation projects in Mali. They wanted to somehow jump from those to a major nationwide effort. There was a suspicion that the projects they had were not working very well. Nobody had looked in any detail at what they were costing per hectare or how much money or other scarce resources (such as forestry extension staff) would be required to apply the project model on a significant national scale. What we did was to go in, take various kinds of models -- particularly in village wood lots and agroforestry systems -- and we tried to analyze all of the inputs: the person's labor (peak or off-peak), the land and so forth. Examples of questions we asked were: if they spent their labor on something else, what were they displacing, and if they took land away from agriculture, how much would they have made if they had produced a cash crop. We assigned a value to the outputs. We did this from two or three different perspectives: the investors at the village

level (that is, a micro-social perspective), the national government's perspective, and, where significantly different, the donors' perspective. We also addressed issues of project efficiency, use of scarce resources, and other large-scale implementation issues.

Our findings are both obvious and important. First of all, from the local investor's point of view, virtually everything we examined did not pay each farmer. Lack of financial benefit was particularly true of village woodlots, even if you assume they worked (which, as Marilyn Hoskins has shown time and time again, is an issue itself). Even if you very clearly work out who is going to get the benefits and who is going to incur the costs and even if you assume there is only one person in that community who bears all the costs and reaps all the benefits, it does not pay him or her to do it. The benefits are less than what he or she gives up in terms of peak labor effort and other inputs.

Agroforestry potentially could pay for the individual farmer -- in fact, could have a nice return. The problem is that the cost is extremely certain and the benefits uncertain. You ask the farmer to give up 5 percent of his or her land, a certain amount of labor, and other inputs for benefits about which farmers are skeptical. That is, if you took 5 percent of the land and planted trees to stop soil erosion, would it really stop soil erosion? Is anything going to happen differently? What are going to be the outputs of these trees?

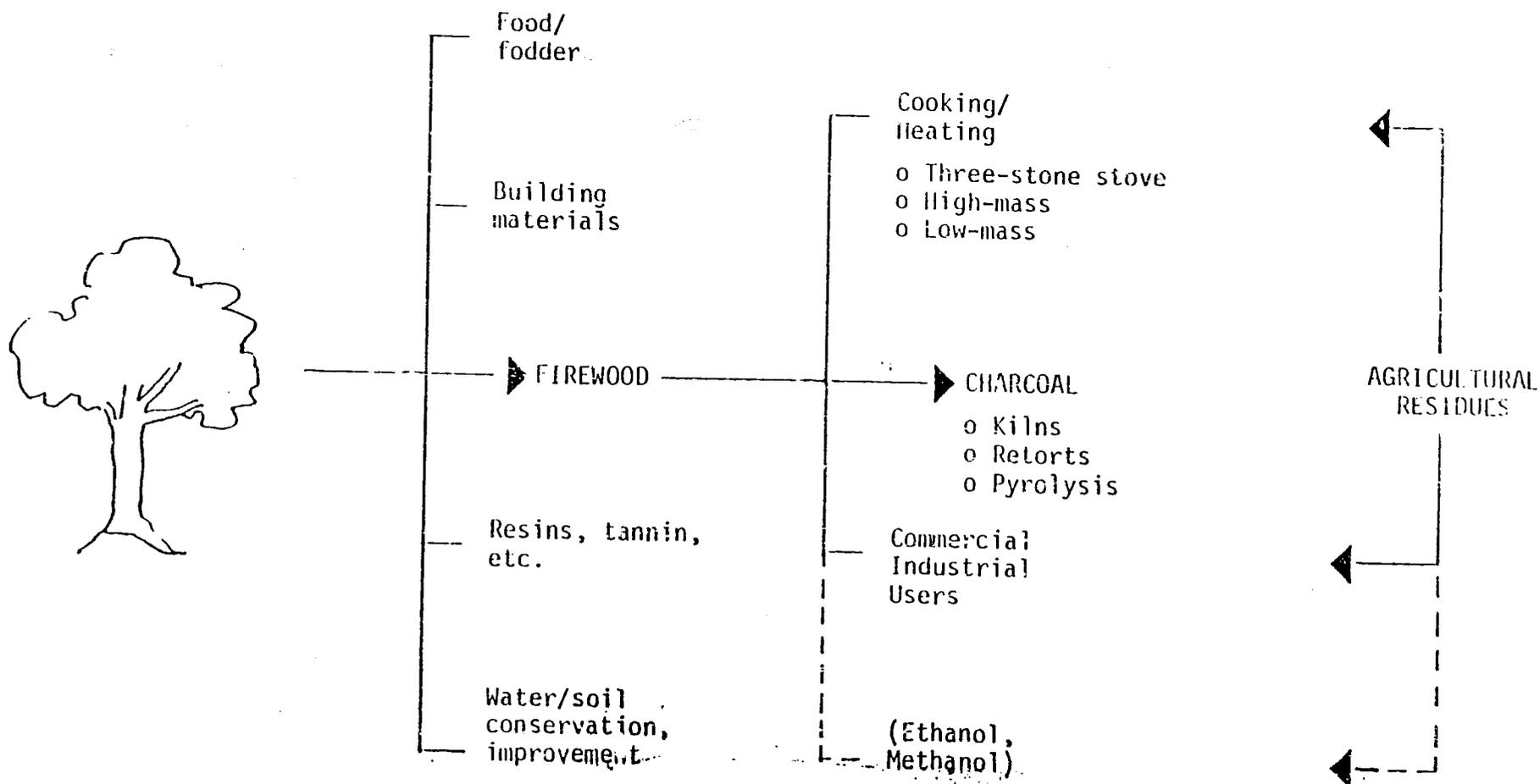
From our and others' surveys of farmers, it is clear that the thing on which they economize the most is peak season labor. Farmers generally are unwilling to take virtually any labor -- male, female, or child -- out of the agricultural cycle during the peak season. Since a tree requires nurturing at the same time as agricultural projects do, the farmers therefore are hesitant. Also, one must address the whole question about who the beneficiaries are and who bears the cost. For example, in most cases at the local level, if the problem is soil erosion on slopes, the farmers that are planting the trees are not going to get most of the benefits because a lot of the benefits are going to those farther down the slopes or in the valley. Within the village, the people that make decisions about land -- mostly male -- are not usually the ones to benefit from the fuelwood -- mostly female. Those are some of the issues at which you have to look in the future.

We in the West tend to think of a tree as producing fuelwood. However, this is only one product from the tree. The people in Africa or Asia tend to think of a tree as producing a whole range of outputs, of which firewood perhaps is the most important to the male, who in most cultures has the most influence over how land is to be used. Food and fodder from fruit trees, particularly as a potential cash crop, are much more highly valued by the males, at least in those cultures where the men are likely to get the income of whatever is sold. Building materials, firewood, rosins, tannin, medicinal herbs, leaves, and

so forth are also valued products. In Mali and elsewhere, a benefit that the country and our consultants may value highly, but which farmers were very skeptical about, is the water and soil conservation effect of planting trees. These kinds of findings lead us toward trees that can accomplish multiple purposes. If you look not at exotic (introduced) species, but at trees that are used locally, you find that most of them produce a number of outputs and that the tree itself is used very efficiently. Local people will use everything from the leaves to the bark, and in some cases even the roots. Certainly, the internal parts of the trees are used. Most such trees produce some kind of food or fodder in addition to other products. (Chart XI)

A notable thing about these indigenous species is that you seldom find them in government nurseries. For example, we went to one of the largest and best-run government nurseries in one African country and found basically highland plantation trees. Meanwhile, a prolific indigenous tree with big seed balls surrounded the nursery. The nursery staff complained about this tree because it drops its seeds all over the nursery. Well, it turns out that when you visit the farmers throughout the region, this tree is used by virtually all of them. It is very tall and straight with a crown that lets in a lot of light so that they can grow crops directly under it. It also produces fodder for their animals and other products used for cooking. Meanwhile, the nurseries were essentially clearing away the seeds and considering them a nuisance. This is perhaps an extreme example of ignoring local resources, but certainly not an isolated one.

CHART XI
MULTIPLE USES OF TREES



Now let me turn quickly to charcoal, as we talked some about charcoal this morning. I think it is clear that, in many developing countries, charcoal production and consumption are on the increase because wood around the major urban consuming areas has been stripped. People are continuing to come into the urban areas, yet have to go further for fuelwood. This begins to create essentially a cash crop opportunity. The distribution system varies widely by country, but a typical case is described below. Rural men or women, depending on the region, go in to harvest fuelwood from public forests, largely using hand tools, although the use of handtools could begin to change. They are, then, harvesting wood off land that they do not own, which is an important point to which I shall return. Most of the actual coking -- that is, charcoal production -- tends to be very small, dispersed, and low cost. People spend virtually no money making earthy or pit kilns. Thus, it is a heavily undercapitalized and very traditional production. On the other hand, what happens after the coking often is highly organized and, coincidentally, often well connected with high government officials. Often there are a few highly organized, generally politically powerful people or companies which control the distribution channels. Then after delivery to the main distribution points, the marketing system spreads out again. In some cases, as for example, in the Sudan, these distributors actually subcontract with the producers and provide them the capital and equipment to produce charcoal in slightly more efficient kilns. In most cases, however, there is

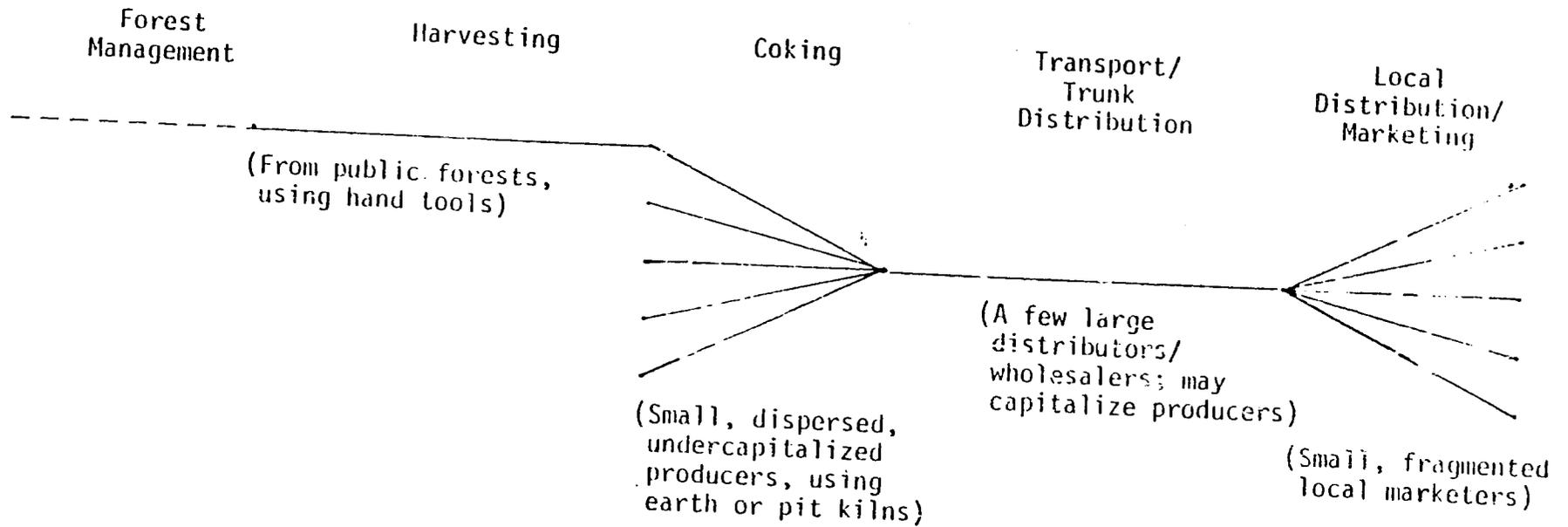
not such a formal link between producers and distributors. For example, in Kenya, producers typically go to the nearest road, sit out with their bags of charcoal (which they dare not leave) for two or three days until a truck comes by and purchases the charcoal. These producers are obviously in a very bad bargaining situation. (Chart XII)

The UN and others have projected very rapid growth in the demand for industrial charcoal, particularly in a number of developing countries. For example, in some countries the UNDP has projected that industrial demand for charcoal will exceed household demand by the end of this decade. We are finding in Kenya a similar phenomenon, where a lot of industries are becoming, if they have not already become, major industrial users of wood or charcoal. Part of the reason that statistics show this dramatic jump is not because demand is growing that fast, but because the demand that was always there has never been counted before. This trend, plus continued urbanization, suggest that charcoal demand will continue to increase dramatically. Also high-volume industrial users may begin to force nationalization of the charcoal industry.

Various things could be done to improve the efficiency of charcoal production. An attempt has been made by various donor projects which have spent a lot of money on metal kilns, starting at about \$3,500 a piece. However, industrial charcoal producers in developing countries typically use much higher volume masonry or brick kilns. Also, there is some interest in very high-volume

CHART XII

TYPICAL CHARCOAL DISTRIBUTION SYSTEM



retorts or pyrolysis units to recover by-products as well as produce charcoal. Except for the Casamance kiln in Senegal, there has been virtually no donor effort to improve the traditional kiln, yet you will find, for example, a few foresters who have found very low cost ways of improving traditional kiln designs while working with the traditional makers. For example, in one region of Kenya, improvements in traditional earth kilns at a cost of under \$10 per kiln appear to be achieving the same charcoal yields as a \$3,500 portable metal kiln. (Chart XIII)

An economist can quickly demonstrate that, for those who have their own plantations, buying an expensive metal or brick kiln would pay if the plantations have sufficient volume to keep the kiln operating. What that says is that managing your own forests better with the assistance of your own kiln will pay for the higher cost of kiln operation. Even if producers had money (and most traditional producers do not), if he or she does not own the wood and does not capture the benefits of better management of the forest, there is absolutely no way to justify spending more than maybe \$10 or \$12 on a more efficient kiln. For someone in this position, the only benefits to more efficient charcoal production is the saving in labor and time and perhaps a slightly higher profit because the charcoal quality is improved. Neither of these benefits is significant compared to the benefit accruing to the plantation manager who can produce more charcoal per hectare on a sustainable basis. Virtually the only people, therefore, that you can find buying the other kinds of kilns are

CHART XIII

COMPARATIVE TABLE OF ILLUSTRATIVE KILNS AND RETORTS

<u>TYPE</u>	<u>INVESTMENT COSTS</u>	<u>USEFUL LIFE</u>	<u>ANNUAL OUTPUT (TONS)</u>	<u>MAN-WEEKS PER TON</u>	<u>YIELD BY WEIGHT</u>
Mark V Kiln (Portable Metal) ¹	\$3,500	3 years	50-55	2	12-15
Small Lambiotte Continuous Retort ¹	\$250,000	20 years	2,000	.15	23-25
Katugo (Missouri) Masonry Kiln ¹	\$2,000	5 years	100-110	.5	21-23
Traditional Earth/Pit Kiln	0	1 charge	10-50 ²	3-5	8-12
Modified Traditional Kiln	\$10	1/2 year	10-50 ²	3-5	12-15

¹ Adapted from E. Uhart, "ECA/FAO Forest Industries Advisory Group Data on Charcoal Kilns and Retorts," January 1976.

² Assumes multiple kilns operating in sequence.

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either donors who put them in to see how they work, or large plantations that have a continuing interest in managing a piece of land that they own.

Assuming that there is very little incentive to any other process than traditional charcoal production, the problem in trying to get people that are producing charcoal traditionally to make marginal improvements is very extension-intensive. In many countries, going out to give the producers assistance implies government recognition, a recognition some governments are not willing to bestow. In addition, most forestry extension officers come from forest services that traditionally view their role as protecting the forest from the charcoal producers, perhaps winking at the charcoal producers, perhaps being bribed by the charcoal producers, but not as assisting the producers. Also, and this gets a little further afield, our experience in many countries is that the way you move up in the forestry department is by making a mark on the government plantations. Thus, from the point of view of the extension agents themselves, they may have little incentive to help the people at the local level.

I realize that this has been a disjointed presentation, but I would like to end with a couple of even more disjointed points. The first is that we know very little about land tenure, yet it is clear that this could be a major obstacle to large-scale afforestation. Many of the projects that are being financed now do not even address the land tenure question. Second, a major

cause of the deforestation problem is that landless peasants are being forced into even more marginal land. How about the land ownership pattern in the first place that forced them onto that land? Third, and jumping back to a more narrowly forest-related issue, there is a real need to organize the selection and production of seeds of appropriate species. Virtually throughout Africa at least, you cannot obtain reliable seed of the right kind of species and selections. This is particularly true of the fast-growing, multi-purpose leguminous species used in agroforestry. Finally, the things the farmers need to do -- land preparation, planting, postplanting maintenance -- in most cases interfere with the agricultural cycles at the same time extension agents must have active participation. This means that they have to see the benefits of participation, and in too many cases they do not. Every profession looks at things from its own perspective. We would say that you are unlikely to have fuelwood production, improved cookstove and charcoal production, other measures or anything approaching the scale needed to turn around the critical problems of deforestation in developing countries until you really address the farmers' and the households' incentives -- the incentives of men and women both.

VIII. Incorporating Women Into Farming Systems Research
Programs:
Research Questions

by

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Incorporating Women Into Farming Systems Research Programs: Research Questions

Farming systems research (FSR) has been developed as an approach to agricultural projects which incorporates the rural household into planning as well as implementation. This method evolved out of the experience of agriculturalists after discovering that the traditional or "top-down" approach does not take into account the wishes and needs of farmers and thus is unsuccessful in most instances. FSR involves the researcher and the farm family jointly in the design and implementation of improved agricultural practices, such that the farm family will feel "ownership" in the project and commitment to it.

Although FSR advocates inclusion of the farm family in all project stages, the literature does not reflect such a focus; women's roles in particular having been neglected. The omission of women poses serious threats to the intent of farming systems research, since (1) women and family members are named as integral elements of the method, and (2) women in particular are responsible for a large degree of agricultural work in developing nations.

Time allocation studies in various societies have shown that women invest equal, if not more, labor in agricultural production than men (Staudt, 1979b). Additional research states that women perform 60 to 80 percent of the agricultural work in rural areas of most African countries (Carr, 1978).

As agriculture modernizes, a division of labor occurs in which men are generally in charge of commercial crops to which women often contribute a great deal of labor, and women are more involved in production of food crops which are eaten by the family or sold occasionally. It is estimated that 60% of the world's farmers market less than one-half of what they produce, as the bulk is produced for consumption (Harwood, 1979).

Subject to cultural variation, those crops which are marketed tend to be men's, and those meant for family consumption are designated as women's (Chaney and Lewis, 1980; Staudt, 1979b).

Although women contribute significantly to agricultural production, they do not have the same access to technological innovations as men. This has slowed down food production and has often been a major factor in the failure of projects (Newland, 1980). Men's disproportionate access to agricultural technology also excludes approximately one-third of the world's rural households which are headed by females (Staudt, 1979a).

Given that appropriate technology dissemination is an implicit goal of farming systems research, it should be responsive to the needs of potential users, regardless of their gender. It is the intent of this paper to provide a sense of some of the issues which multidisciplinary farming systems research teams must bear in mind in attempting to integrate women and other family members into projects. Such efforts will succeed in adhering to the spirit of FSR as a truly collaborative approach to international agricultural development.

The considerations necessary for involving women and other family members in the research process take the form of a series of questions emanating from a description of their present lifestyle and responsibilities, as well as their wishes and goals for the future. (Also see Appendix, attached.) The data gathering process must take into account both external, often societal, factors beyond the women's control, and internal factors within her sphere of influence.

External Factors

External factors to be considered include land tenure policies and

inheritance rights. Although women usually cultivate land which is controlled by their husbands, there are societies in which women have rights to land due to an inheritance, lineage allocation, or gifts from their husbands (Spring and Hansen, 1979). Traditionally, African land rights belonged to whoever worked the land. However, land "reforms" tend to deprive women of their rights in favor of men who, ideally, will give their wives land. Such dependence on men handicaps women's efforts further when men migrate or are involved in off-farm activities which place total responsibility for farm management on the women.

Farming systems research must examine traditional patterns of access to land as well as those promoted by the modern legal code, which affect women's lives. For example:

Do women have the right to own and inherit land as individuals?

Do patterns of land tenure impact on women's commitment to agricultural activities? Do they affect the way women plant and/or maintain their land from season to season?

Do proposed land reforms take into account both traditional and modern policies?

Would land and water rights for women encourage them to work toward long-range goals? Would the provision of such rights be threatening to men?

Do women's domestic and other time demands bar them from access to land and water use or ownership (given that land registration requires time to complete)? (Chaney, Simmons and Staudt, 1979.)

Access to markets and credit is another external factor to be considered when assessing women's roles in FSR. Women in many developing countries have been characterized as being economically invisible, in the sense that their domestic, child rearing, and subsistence agriculture activities are not valued for national income accounting. They are thus classified as "economically inactive" and their contributions as unpaid

family workers are not separately accounted for (World Bank, 1979). In addition, credit is usually extended to men as heads of households and landowners. These patterns are particularly detrimental to de facto (female) household heads, who may have taken on full responsibility for the family's agricultural activities, without also having the benefits of market and credit access. Given these circumstances, farming systems researchers must ask farm families how these issues impact on their decision-making.

Are women allowed to market the goods they produce? If so, who cares for the farm when they are at the market? If not, what are the restrictions, and are women satisfied with those conditions?

Are women entitled to keep or save cash income from marketing efforts, and if so, may they spend it as they see fit, or must it be used for family needs?

Are women permitted to invest income or use it in obtaining credit for future economic activities?

Is legal title to land or collateral in the form of property required to obtain credit, and if so, does this eliminate women from that realm?

Do husbands have a claim on women's market income and/or access to their investments or credit accounts? If so, how much control do men have, and are the women satisfied that this does not infringe upon them (i.e., do they feel that they are adequately provided for with community or private goods instead of money)?

Do credit cooperatives exist and if so, are they legally accessible to women?

Does social custom affect women's participation in sexually mixed groups, such as credit or marketing cooperatives?

Do literacy requirements restrict membership in such organizations?

Do informal mechanisms for credit extension exist (i.e., relatives, money lenders; self-initiated rotating associations)? (Buvinic, Sebstad, and Zeidenstein, 1979.)

Do group lending schemes offer a reasonable solution to the problem of obtaining credit?

Do women have ideas on how they might market their goods and/or obtain credit?

Farming systems researchers must attempt to reorient the generally male-biased system which provides men with agricultural information and technology, while excluding women. Because the extension service has been planned as if men performed all agricultural work, women have had little or no access to such information and innovations (Fortmann, in Dauber and Cain, 1981; Chaney, Simmons, and Staudt, 1979). This has created a skill gap between men and women, in that men can operate machinery and use technical information, while women are left with traditional methods of agriculture. Stereotypes maintaining that women cannot manage technology are reinforced by the fact that illiteracy is more common among women, thus they are unable to read instructions or other printed information (N. Uphoff, J. Cohen and A. Goldsmith, 1979). When they are able to use the technology and it breaks down, women are often unable to fix it, as they have not been provided with the training which men have received.

In addition, when technology has been introduced, it has often displaced women's labor, or has required additional labor, typically by women. For example, women carry the forage and extra water required by unique breeds of cattle and poultry. They carry water used in backpack insecticide sprayers, and do the extra weeding which use of fertilizers entails (Fortmann, in Dauber and Cain, 1981).

Considering these patterns, the farming systems researcher must determine whether information and technological innovations are available to both men and women, and assure that such is the case when working with farming families.

Are there any female extension agents?

Do extension agents seek to reach both men and women?

Are there cultural taboos which prevent male extension personnel from working with female farmers? If so, does the FSR team provide for women to work with other women?

- Are innovations oriented to facilitating work which is traditionally done by men, by women, or by both?
- Do innovations benefit all, or do they increase the work burden for some family members?
- Do training programs take into account the sex-specific nature of agricultural labor, and therefore offer training to the appropriate people?
- Are women or men (or both) trained in maintenance and repair of equipment?
- Do women's competing time demands limit their ability to attend training and/or extension sessions?
- Are provisions made for facilitating women's access to training (i.e., child care, cooperative arrangements with neighbors to tend fields)?
- Do women want to have access to labor-saving information and technology, and what are their priorities and needs in this respect?

While there appear to be definite boundaries between men's and women's roles in most societies, there may also be class or caste systems in operation which limit farm families' access to certain goods or services, and may dictate what types of food they may eat. The farming systems researcher must consider these limitations in order not to infringe upon cultural traditions and customs. Relationships between relatives and neighbors must also be considered, since concepts of social equality often dictate that a family not appear too much more prosperous or successful than a neighbor or relative.

Related to this issue is that of the cultural orientation towards individual or group action. In those societies which believe in collective or cooperative labor and group support, the farming systems researcher will do well to incorporate more than one farm family into activities, and to solicit their ideas on reasonable ways to manage such group activities. In addition, the farming systems researcher must identify influential community leaders whose approval may be necessary before any project is initiated.

Internal Factors

In relating external factors to those existing within and thus under some control of the family, one of the primary issues is production versus consumption. Production encompasses the areas of food as well as cash crop farming, while consumption refers to the influences on families' actual eating patterns, including socio-economic and cultural factors which influence decision-making in this area. Although community norms and beliefs are normally considered external factors, the labor function is considered internal for purposes of this discussion.

As mentioned earlier, the traditionally male-dominated area of cash crop production stands in contrast to women's management of subsistence crops. Although this is generally true, the farming systems research team must determine how much, if at all, these spheres overlap, both in terms of actual labor expended and decision-making power.

- Is there a sexual division of labor between cash and subsistence crop cultivation?
- Which type of crop is considered the priority in the family?
- Who determines how many of the family resources including land, capital, and labor, are allocated to the cultivation of cash crops? To subsistence crops?
- Is higher quality land used for food or for cash crops?
- What proportion of good agricultural land is controlled by women?
- Who decides how much money will be allocated to agricultural inputs such as fertilizers and machinery?
- Are these inputs applied to both subsistence and cash crops?
- Does the use of labor-saving and/or yield-increasing methods increase the time and/or work burdens of women and/or children?
- Who makes decisions as to what, where, and how many cash and subsistence crops will be grown, the cropping system to be used, when and how to diversify, and who to sell crops to (if they are sold)?
- Who grows each type of crop, and does their distance from the family's house impose a burden on that (those) person(s)?

Where women are involved in crop production, do they control what they produce, and what share of the profits do they receive?

Are they compensated with nonmonetary benefits, or as wage laborers, or are they independent producers?

Are women in control of the cash or other benefits they receive, or are these earmarked for family expenses?

What is done with excess produce beyond what the household needs for subsistence? Is it sold, bartered for other food or goods, given away, or fed to animals?

Are women satisfied with their roles in agricultural production?

When women are involved in both subsistence and cash crop production, and there are competing demands, to what type of crop do they devote their energy and time?

What do family members do during light work times?

Is labor hired during heavy work times, and if not, whose work load is increased?

Although crop cultivation is probably the primary area for concern among farming systems researchers, they must also consider family members' other subsistence-related and domestic activities and values in order to understand some of the constraints on women's time.

What agricultural work do women and children do? Do they sow, plant, transplant, weed, harvest, and/or store food?

Who cares for livestock and/or poultry? For children?

Who carries water and/or firewood?

Who sells crops in the market?

Do children's agricultural responsibilities prevent them from attending school?

Are agricultural duties also sex-dependent or do men sometimes do "women's work", and vice-versa? What factors decide this, and if roles are variable, how does this affect the value placed upon that work?

How do women's time demands and agricultural responsibilities impact on the family's nutrition? In the Sahel, for example, families eat better during the dry season when there is more food in storage and women have less agricultural work to do and thus more time to prepare food (World Bank, 1979).

What cultural taboos exist about what foods, and for whom?

How do these taboos impact upon the choice of crops for cultivation, and/or upon family members' participation in crop production activities?

How much time do women spend on domestic, or home-bound chores, and what effect does this have on agricultural work?

Would women prefer to have labor-saving devices in the home or for their agricultural activities?

What requirements would they have for these methods (e.g., a method of facilitating water-carrying which does not interfere with the social nature of this task)?

Would women prefer to commercialize home or agricultural activities, and how would this be thought of by the men?

How would commercialization and income generation by women affect the time and/or energy available for crop production and/or food-related activities?

An additional internal factor (which some might consider external), male out-migration to urban areas and other countries, is prevalent in developing countries. For this reason, up to one-third of the households in the world are female-headed. This obviously adds to women's and children's work loads, but how much, and what type of work?

Do the family members left at home take on a double load, or is labor hired?

Do neighbors help each other in such a situation?

How much decision-making power do men retain when they are absent for long periods?

In polygamous cultures, how does male out-migration affect family relationships and production?

Not only does male out-migration affect remaining family members' work loads, but the cash sent home from wage labor introduces a new consumption pattern. A dependency on cash income can ensue, and with it, less emphasis on self-sufficiency in food production or in other material goods.

The farming systems researcher must determine, where female-headed households are the case, how much male out-migration is impacting on their food production activities and their productive capacity in general.

Are previously homemade items now purchased in the market?

If dependency on cash income has developed, has this affected nutrition within the family?

Have agricultural worksharing systems broken down due to migration?

The preceding discussion indicates the inter-relationships between household/community and infrastructure constraints and motivations, all of which impact on the roles women play in agricultural development programs. Women are obviously a moving factor in agricultural development. As such, it is in the interest of farming systems researchers to include them and the household as one of those systems which influence a project's success or failure.

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APPENDIX

The following is an expanded topic-specific list of research questions assessing women's roles in farming systems. The researcher may choose those questions most appropriate to his/her topic.

Subsistence vs. Cash Crops, and Input

- Do women have the responsibility for cash crops? Subsistence crops? Both?
- What is the extent of any sexual division of labor between subsistence and cash crops? What overlap is there?
- Which are more important to women - subsistence or cash crops? To men?
- When there are competing time demands, what tasks do women devote themselves to?
- Who takes care of "important" crops?
- How much land is allotted to each type of crop? What quality (type) of land?
- What amount and type of land is allotted to livestock? What livestock will be kept?
- How much land, capital, labor (resources) are allotted to subsistence crops? To cash crops?
- What portion of "good" agricultural land is controlled by women?
- What type and amount of inputs are to be acquired and used? For which crops?
- How much money goes to agricultural inputs such as fertilizer, machinery?
- Do agricultural inputs benefit men and their duties, women and their work, or both?
- What is the distance from house to fields for women? For men?

Decision-Making

- Who decides what crops will be grown? Where they will be planted? How much of each type of crop to plant?
- Who determines the cropping system? The sequence of agricultural activities? Whether labor will be hired? Roles of children in agriculture? When and how to diversify crops? Who to sell crops to (if they are sold)? Watering methods to use?
- What cultural taboos exist about what foods, and for whom? How do these taboos impact upon the choice of crops for cultivation and/or upon family members' participation in crop production activities?

Do women control what they produce (i.e., do they decide whether crops will be stored, eaten, or sold)?

Who decides whether women-tended crops will be marketed?

Who decides what will be done with excess subsistence (food) crops? (i.e., sale, barter for other goods, give away, feed to animals)

Roles and Responsibilities

Who is the head of the household (male or female)?

Is "women's" work deemed as valuable as "men's" work?

Is women's workload increased during the peak agricultural season? How?

Do neighbors and relatives help each other during the peak season?

Is labor hired to lessen work burdens on family members?

To what extent, and in what areas do women's/children's workloads increase when their husbands out-migrate? How does this affect decision-making?

Does male out-migration and cash income create a dependency on the cash economy? Does cash income affect the family's self-sufficiency negatively, or do they peacefully coexist? (e.g., are previously homemade items now bought ready-made?)

What do women do when agricultural responsibilities are light?

What percentage of women's time is spent in agricultural work? In domestic or 'home-bound' work?

Do women/children buy seeds and equipment? Buy livestock and/or poultry? Tend livestock and/or poultry? Plow? Sow seeds? Transplant? Weed? Harvest? Forage for food? Store and/or preserve food? Prepare food? Sell crops in the market? Gather firewood? Carry water? Care for children?

What other "female" responsibilities impact on women's time available for agricultural work?

How do women's time demands impact on the family's nutrition?

Do boys do "men's" work and girls do "women's" work?

Do children have established agricultural duties, or are they dependent on the family workload? At what age do they commence farm work? How do their duties change as they get older?

What are children's roles in agricultural production?

Are agricultural duties considered more important for children than schooling?

Do children stay away from school during the peak agricultural season?

Social Relationships

What is the cultural custom in regard to individual vs. collective group action? (This impacts on FSR's planning in terms of target audience.)

In polygamous cultures, how is agricultural work divided?

How do relationships between relatives and neighbors impact upon farming? (e.g., how overtly prosperous can one family be? Is good fortune to be spread out to others?)

Do caste boundaries limit a family's access to goods or services? Do such boundaries influence decisions on what crops to grow, food to be eaten, etc.?

How do women's farming activities impact on their status? Does it increase, decrease, or stay the same?

Access to Land

Do women have the right to own and inherit land as individuals, or do they cultivate land controlled by their husbands or others?

What are traditional patterns as well as modern legal policies regarding women's access to land? To water?

Do proposed land reforms take into account both traditional and modern land tenure codes?

Is land controlled according to a sexual division of labor, or does it all belong to the family?

Do patterns of land tenure impact on women's commitment to agricultural activities? (i.e., are they less interested in agriculture because they do not control the land, or vice versa?)

How do men feel about women owning and/or controlling land?

How does dependence on men for land holdings (if such is the case) affect women's livelihoods if their husbands out-migrate for work?

Access to Cash and Credit

What is women's relationship to the market or cash economy?

Would women prefer to "commercialize" any of their tasks in order to bring in money or other goods to the family? How would men view such a development?

How would commercialization of activities and income-generation affect women's time and/or energy available for crop production and food-related activities?

Do women have access to profits from marketing - is the profit theirs to do with as they please? If not, where does it go? (i.e., family expenses?)

Can women obtain credit? If not, what are barriers or obstacles (e.g., literacy requirements, land-holdings or other property collateral)

Can women invest money?

Do men have access to or a claim on women's credit and/or investment accounts?

Do credit cooperatives exist and can women use them? If not, what are the obstacles? (e.g., sex segregation)

Do informal mechanisms for credit extension exist? (relatives, money lenders, etc.)

Do marketing cooperatives exist or can they be developed? Do women have time to participate in the administration of marketing cooperatives?

Access to Information and Technology

Are there female extension agents in the area? If so, do they work with both sexes? If not, why not?

Do extension agents seek to reach both men and women?

Do women have access to agricultural information and technology through extension agents and other sources? If not, why? (e.g., sex segregation when extension agents are all male) Does lack of access impose labor-intensive methods upon women, or displace their labor? Are there other effects?

Do women participate in extension training programs? If so, does this include agricultural programs? If not, why not? (e.g., literacy requirements, land ownership requirements)

Do women have access to information, training and technology which relates to specifically women's duties? (e.g., machinery which makes their jobs easier) If not, why not?

Is technology gender-neutral (usable by both sexes, to the benefit of all)?

Are innovations oriented towards facilitating work which is traditionally performed by men, by women, or by both?

Are training opportunities offered to the appropriate people (i.e., those who are responsible for that particular duty)?

Are provisions made for facilitating women's access to training? (e.g., child care, cooperative field-tending arrangements)

What (if anything) do women want in terms of labor-saving information and technology?

Would women prefer labor-saving devices for domestic, or agricultural work? How would women be likely to use the time saved by these innovations?

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Office of Women and Development
Virginia Tech

Mary Rojas
Co-ordinator

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Afghan Women - 17 min. (1974)

Women's role in an Afghan rural community, revealed through their words and their daily activities.

Andean Women - 19 min. (1974)

Aymara women embody a common paradox. The cultural ideal is that women should be subservient to men and assigned tasks appropriate to their inferior strength and intelligence. In fact, they perform tasks vital to family and community survival, yet they see themselves only as helpers. (Faces of Change Series)

Boran Women - 18 min. (1974)

Impressions of the daily lives of women in northern Kenya. Even while maintaining their traditional roles in a herding culture, education and modernization are changing the women's attitudes. Native dialogue with sub-titles. (Faces of Change Series)

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Bottle Babies - 26 min. (1975)

Focuses on connection between multinational corporations and world hunger. Babies in the Third World are dying because they are fed infant formula rather than their mother's milk. Those who do not die are seriously malnourished leaving them physically and mentally stunted for life. Mothers are influenced by the widespread advertising campaigns assuring them powdered milk is the best guarantee for healthy, happy babies. Unfortunately, they do not have the money or facilities to use the formula properly.

Children Know, The - 33 min. (1974)

Explores the deep division in Andean society between campesinos and mestizos, rural and townspeople, which begins at birth and is perpetuated by schools. (Faces of Change Series)

Controlling Interest: The World of the Multinational Corporation - 45 min. (1978)

Reveals the connections between economic development, runaway shops, world hunger, human rights violations, U.S. foreign policy, and the growing power of the multinational corporation.

Cost of Cotton, The - 30 min. (1979)

Today just about everyone wears blue jeans made from 100% cotton. Documents the effects of the international demand for cotton on a developing nation. Guatemala is one of the world's most successful producers of cotton. Cotton couldn't be grown on a large scale in the tropics without the use of DDT. Pests used to be removed by hand, but with the introduction of pesticides, yields have soared, as have the grave health and environmental problems associated with DDT. Many of the workers are ignorant of the dangers they face. Children chew the flowers of the cotton plant; DDT levels in mothers' milk are the highest recorded anywhere; birds and fish are disappearing; and, shipments of beef out of Guatemala contain high levels of DDT.

Crossroads/South Africa - 50 min. (1980)

Crossroads is an illegal shantytown on the edge of Capetown. Under apartheid's system of contract labor, thousands of men holding work passes are separated from their families and housed in "bachelors" hotels. Under South African law their families are forcibly removed from the white areas and are resettled in the barren bantustans, often hundreds of miles away. The families of Crossroads refused to be separated. They built a community of 20,000 complete with schools and community organizations. South African government countered with bulldozers, police raids and imprisonment for Crossroads citizens. Despite this, Crossroads survives.

Into the Mouths of Babes - 28 min. (1978)

Reliance on powdered milk formulas rather than breast feeding by Third World mothers is causing severe malnutrition among their children. Bill Moyers' CBS Reports focuses on the Dominican Republic, where multi-national corporations are selling and encouraging the use of infant formula to mothers who have inadequate resources and facilities to use it properly. Interviews with infant formula company representatives, doctors, government officials, and users of the infant formula.

Wet Rice Culture - 17 min. (1974)

Looks at cultivation methods of the Taiwanese rice farmers that achieve the highest average yield per acre in the world. They rely less on mechanization and more on human labor to produce and harvest two crops per annual agricultural cycle. (Faces of Change Series)

Women in World Cultures: Women in China - 18 min. (1980)

Filmstrip; cassette; filmstrip guide; 2 books. The historical and contemporary status of women in China is discussed. Some powerful female roles in Chinese history and prominent contemporary women are presented. Two books included: "Women in Traditional China" and "Women in Modern China."

Women in World Cultures: Women in India - 14 min. (1980)

Filmstrip; cassette; filmstrip guide; book. Shows the diversity of roles of women in India. Includes the book "Women in India."

Women in World Cultures: Women in the Middle East - 14 min. (1980)

Filmstrip; cassette; filmstrip guide; 2 books. Reviews and emphasizes the effects of segregation, seclusion, and veiling of women in the Middle East. Two books included: "Women in the Middle East" and "Women in Israel."

Women in World Cultures: Women in the U.S.S.R. - 17 min. (1980)

Filmstrip; cassette; filmstrip guide; book. Demonstrates the diversity of conditions of women in Russian and Soviet history. Includes book: "Women in the U.S.S.R."