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WOMEN AND DEVELOPMENT

Final Report of a Workshop conducted by the
American Association for the Advancement of Science
for the U.S. Department of State, as a contribution
to U.S. preparations for the United Nations Conference
on Science and Technology for Development.

March 26-27, 1979
Washington, D.C.

American Association for the Advancement of Science
1776 Massachusetts Avenue, N.W., Washington, D.C. 20036

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INTRODUCTION

The Workshop on Women and Development was the first [illegible] of four workshops conducted by the American Association for the Advancement of Science as requested by the U.S. Department of State as part of the U.S. preparations for UNCSTD. The 2-day workshop, held March 26-27, 1979 at the Brookings Institution, Washington, DC, involved thirty-eight participants, both men and women, with a variety of expertise in the field of women and development. Participants came from federal agencies (U.S.AID, DOE, OTA, NASA), universities, public sector organizations (League of Women Voters, Overseas Development Council, National Council of Negro Women), professional associations and The World Bank.

After an initial general session, participants broke up into three working groups to address the following [illegible] - national policy for development, education and training for development, and technology for development. Each group proposed recommendations which were then presented and discussed by the workshop as a whole. The following report, critiqued by participants, is a compilation of those recommendations, background information and supporting statements, and the eleven background papers commissioned for this workshop.

ACKNOWLEDGEMENTS

The coordinators of this workshop wish to express their gratitude to the many individuals who contributed to the success of this project. Our greatest debt is to the conference participants and authors of background papers whose expertise and commitment is responsible for the richness of this document.

We wish to especially thank Irene Tinker, Director of the Equity Policy Center, for her consultation during the workshop and throughout the project, and for her gracious acceptance of the enormous task of writing the final report.

We extend our appreciation to the people who worked diligently throughout the project and during the workshop: Karen Ehrlich, who coordinated the workshop arrangements and the production of the report; and Jeanette Wedel, Carol Rogers and Paula Quick Hall who served as rapporteurs for the workshop.

Janet Welsh Brown
Office of Opportunities in Science

Priscilla Reining
Office of International Science

AAAS WORKSHOP ON WOMEN AND DEVELOPMENT

EXECUTIVE SUMMARY

The dominant theme throughout the workshop and in the background papers was the centrality of "women and development" issues to all development planning. As even remote villages move into the monetary economy, there is need to improve traditional economic activities of women in the food chain and in the making of household goods through the introduction of new technologies. It is equally important to recognize the economic as well as social and psychological contributions which women make in feeding and caring for their families. As new technologies are introduced to reduce the drudgery of collecting fuel and water, it is imperative to understand the implications of moving the cost for water and fuel from human time to money. This shift requires even greater attention to income-producing activities for women, whether of small scale or through modern industry.

The modernization of the economy is requiring women to buy food and fuel and even water in order to meet traditional responsibilities and obligations, but few jobs in the modern sector are available to women where they can earn the money needed. Given the clearly defined sex roles and responsibilities in most traditional cultures, money earned by the male head of household will not necessarily be used to meet the responsibilities of females. Poor women con-

tinue to feed their families by their own efforts, whether a man is present in the family or not. The workshop therefore focussed its recommendations first on technology to assist women in providing basic needs for her family: energy, food, water; and secondly on technologies to provide new income.

The discussion of these interlocking activities of women was marked throughout by the realization that national and international development and trade policies reach into every home. Price supports, import subsidies, cash crops for export, currency control, all affect the way in which international trade impinges on local agriculture and manufacturing. National planners tend to overlook the economic activity of women when setting national policies precisely because of the insufficiencies and inaccuracies of statistics and other data on the informal sector, where the bulk of women work. Thus a government monopoly on peanut processing designed to raise the export price of the commodity also destroyed the local processing and sale of peanuts by women while at the same time depriving the poor of needed oil in their diets. Planning agencies in all countries need to collect better information about the actual economic roles of women and children, and to consider the costs of adding these workers to the list of unemployed, whenever they weigh the merits of a particular development strategy.

Similarly, development projects for women, whether nationally or internationally funded, should be considered in light of national development goals. Too often women's projects are considered peripheral to mainstream development or are perceived of as welfare programs rather than as economic activities. A recent laudable effort by an African government to improve the quality and quantity of millet being produced by a woman's cooperative was jeopardized by

the granting of import and tax credits to enable Heineken's to manufacture and sell its beer at competitive prices. It is imperative that development planners understand the implications to women and their children, as well as to men, of import policies which undercut local manufacturing.

It was recognized that income-generating projects for women cannot be developed independent of programs to link up women with the banking and financing institutions of their countries and localities and thus with the local and national economy. Women represent an important market for banking services which has largely been ignored. It was underscored that development planners should clearly understand that credit is a means to an end; it should not be taken as the starting point for income-generating projects, but rather as a supplement to an enterprise which has a sound base of operations and marketing strategy.

Recommendations:

The United Nations Conference on Science and Technology is the last major international conference in the Second Development Decade series. As such it is the culmination of international effort to focus all UN activities toward development. Because the subject of the workshop was "women and development", many of our recommendations are as equally appropriate to other fora as to UNCSTD. We call upon the Department of State to carry to all appropriate international conferences the message that throughout the development process the contributions of women to the national economy must be sustained and encouraged.

Our recommendations specifically for the UNCSTD give priority to two vital areas where technology can contribute immediate solutions. The first recommendation responds

specifically to the call by the Secretary-General of the Conference for worldwide projects. In terms of the Preliminary Draft Programme of Action, these recommendations are directed toward national action to improve the planning and use of science and technology (Target area A); B (ii) also underscores the importance of ensuring that technological transfer benefits the workers as well as the owners of new industry (Target Area B).

We urge that the US delegation go to the UNCSTD prepared to support international efforts:

A. to develop a worldwide pilot project to assess present and changing uses and supplies of household energy, (Recommendations 1, 2, 3, 9, 10);

B. to increase income-producing activities for women:

(i) - in the traditional and informal sectors through projects designed to improve technologies

(ii)- in the modern sector through efforts to reduce the exploitative tendencies of industrialization, (Recommendations 4, 5, 6, 7, 11).

Underlying this theme of viewing women's needs as an integral part of all development is the recognition of women as a development resource. Women have always contributed greatly to the economic activity of every country. As development proceeds, it is essential that women be given access to formal and informal education at all levels, through all forms of media, so that they will have the scientific and technical skills to participate fully in more modern economic activity. Further, women must be included in policy and decision-making bodies at all levels from the national planning or research institute to village meetings.

Our recommendations focus in two priority areas: scientific and technical education for women professionals, and skill training for poor, illiterate women. Within the Draft Programme of Action these recommendations fall within Target area A because t' enhance endogenous capabilities of half the population ' increasing the capability and effectiveness of polic -ma ing by adding the dimension of women to national planni . We ask the US delegation:

C. to initiate or support resolutions to increase the number of professional women in agricultural research institutes, agricultural extension services and training centers, and community development agencies

   (i) - to ensure utilization of professional women

   (ii)- and to enhance communication with the women these services are meant to serve, (Recommendations 15, 17, 18);

D. to support and target money for vastly increased training by UN regional commissions of women to act as local trainers to ensure that technology is explained to the users and that the users are trained in its use, (Recommendations 10, 11, 14, 19);

E. to support a series of suggestions to UNESCO, IDCA, and professional associations for increasing the visibility and effectiveness of women scientists by granting prizes, issuing conference invitations, and awarding fellowships (Recommendations 13, 16, 10, 21).

We further ask the US delegation:

F. to support improved data collection on women's development activities and on women scientists and engineers around the world today, (Recommendations 8, 12).

We have asked that reports on these activities and on the development of standards for water supply and employment guidelines be presented to the International Women's Mid-Decade Conference to be held in Copenhagen in July 1980. (Recommendations 4, 6)

Because we value women as major human resources, we ask the Department of State:

G. to include at least four women on the UNCSTD delegation in order to ensure representation by women from each of the concerned groups: the scientific community, the non-governmental organization, scholars versed in women and development issues, and professionals in the Department of State;

H. to appoint immediately a woman at ambassadorial level to coordinate US activities for the International Women's Mid-Decade Conference, and delegate to her on-going oversight of the recommendations made by this workshop.

REPORT OF RECOMMENDATIONS

Made By The

AAAS WORKSHOP ON WOMEN AND DEVELOPMENT

Thirty-five scientists, men as well as women, met in Washington, D.C. March 26 and 27, 1979 to discuss issues of vital importance to women that should become part of the deliberations of the UN Conference on Science and Technology for Development scheduled for Vienna in August 1979. During the opening session Mildred Robbins Leet discussed the activities of the NGO Task Force on Roles of Women for UNCTSD, which she chairs, and reiterated the need for concerted effort if issues concerning women are to come before the UNCSTD.(1) Her remarks made clear the major tactical problem when promoting development projects designed to reach women: should such projects involve only women and women's groups, or should projects be integrated from inception? If women run their own projects, their issues will be paramount, but they may also be regarded as irrelevant to national priorities. If women's issues are combined with those of men, then men and their concerns are likely to dominate. As the recommendations show, the group felt that development projects must be planned within a national context but that special efforts must be made to see that development efforts reach and involve women. Such efforts include working with women's groups and networks both at the village level and at the professional level.

The dominant theme throughout the workshop was the critical need to consider the issue of "women and development" as an integral part of all recommendations and projects flowing from the UN Conference Science and Technology for Development.

Women are, after all, half of the human resource capital available, more than half in many rural areas. Yet in the area of Science and Technology for Development, women have often been treated by development planners as a marginal group, to be placated with peripheral activities unrelated to overall national plans. Alternatively, they have been viewed as part of a family unit that would automatically benefit from opportunities for the male head of household. Such assumptions not only ignored the fact that one out of three households is headed by a woman, but also failed to take into account the fact that in all poor families--and increasingly in middle-class families--every adult must contribute to the family's survival. Thus all development projects, particularly those encompassing income-producing activities, should carefully analyze the differential impact the project might have on women as well as men, and include in both the planning and the implementation stages whatever special provisions may be necessary to ensure an equitable distribution of benefits.

The papers prepared for this workshop clearly illustrate this broad involvement of women in all aspects of scientific and technological concerns. Multinationals are setting up factories in areas where cheap female labor is available and are encouraged to do so by the national governments concerned.(2)

National governments encourage modern food-processing and manufacturing factories which reduce opportunities in

the informal sector thus denying income to women.(3) Women farmers seldom benefit from internationally funded extension programs, and are increasingly deprived of access to land upon which to grow their traditional subsistence and market crops as cash crops become paramount.(4) The Green Revolution, early supported by host governments, has tended to increase unemployment, particularly among women.(5)

The introduction of a pilot solar power unit is designed to bring electricity to a remote village in the Sahel for grinding millet and pumping water, but where will women get money to pay for the grinding?(6) It may depend on who controls the technology.(7) Access of women to credit so that they can, individually or as a group, afford new technology is a world-wide problem.(8) But women of different classes are affected differently by modernization.(9) Poor women need access to information; the radio in Iran played a key role in social transformation of women.(10) Women's organizations are pivotal in the introduction of and training in new technologies, especially for the poor.(11) Finally, these micro studies need to be analyzed and policies developed, if women are ever to become equal partners in the development process.(12)

RECOMMENDATIONS

The twenty-one recommendations made by the AAAS Workshop on Women and Development have been grouped below into two categories:

I. Recommendations Concerning Integrated Planning, and

II. Recommendations concerning the inclusion of Women in the Making of Technology Policy

With each section the recommendations are listed according to the body which is designated to implement the recommendation: international or multi-lateral agencies; national governments of developing countries; the U.S. government; professional associations.

I. Recommendations Concerning Integrated Planning

Recognizing the all-encompassing nature of women's involvement in development, the workshop participants agreed upon a series of recommendations aimed at fostering the inclusion of women's concerns in integrated development planning rather than encouraging exclusive emphasis on separate women's projects. Such planning must include an analysis of the impact on women of all development policies in order to formulate ways of avoiding harm and maximizing benefits. It is important to emphasize the role of women in families, whether or not a man is present, and to see the family unit as a key element in designing and evaluating policies. A specific focus on women needs to be included in the planning process, taking into account the similarities and differences among women in different economic classes, between urban and rural women, and between agricultural and industrial sectors. The ultimate aim of all these recommendations is to develop policy that makes research on women's concerns and activities integral to all program sectors.

A. Recommendations to International Bodies

We support the suggestions of the Secretary General of UNCSTD that a number of pilot projects demonstrating the effective use of science and technology for development be designated at the Conference to be cooperatively developed and implemented by agencies of the UN system.

1. *Women should have equal access to and participate in all these projects at every stage, including identification, formulation, appraisal, planning, design, implementation, and evaluation. In every case the impact of these projects on women and family life should be considered.*

To illustrate the kinds of questions that should be considered in order to make the concerns of and impacts on women operative, we have prepared a checklist of the types of questions that should be asked when considering the introduction of technologies intended to benefit poor woemn. (Annex A) We have also identified five major project areas that address problems of high priority for the welfare of women and families. Two of these lend themselves to UNCSTD pilot projects, two support activities relating to other UN Conferences, and one addresses the need for income-producing projects for women across the entire span of assistance activities.

Household Energy

2. *We recommend that one of the international pilot projects sponsored by UNCSTD focus on present and changing uses and supplies of household energy.*

Each of the regions of the developing world should undertake at least one pilot project, encompassing both urban and rural areas, to improve available household energy by introducing new technologies for meeting the energy needs of households. Both improved traditional and modern methods of providing energy should be offered for choice by the cooperating households. The role of science and technology in improving the efficiency of energy use should be emphasized. It is recognized that the continuing heavy use of certain traditional technologies and sources (e.g., firewood) involves increasing social and economic costs. Technologies

should therefore focus not only on improving existing technologies and supplies, but also on devising new, especially renewable, energy sources and processes Existing technologies to be considered include a variety of stoves (mud, pressure, oil-wick, kerosene), of energy sources (biomass, biogas, electrcity, firewood), and of processes (e.g., hot water pans, grain driers, etc.) A sample project is included in Annex B.

3. *The UN Conference on Renewable Energy Resources scheduled for 1981 should call upon member nations to provide information on present and projected household energy use and supply, both urban and rural.*

It has been customary to account for national energy needs only in terms of the commercial energy resources--oil, coal, natural gas, hydroelectricity and nuclear fuels. This conventional energy-accounting procedure, however, fails to account for most of rural energy uses in the developing countries. Fuelwood (firewood, charcoal and crop residues) accounts for two-thirds of all energy (other than human and animal energy) used in Africa and for one-fifth in Latin America. In India, Pakistan, and Bangladesh, where noncommercial fuels account for about 90 percent of total domestic consumption, nearly half is supplied by dung.(13)

Because the majority of the population in most developing countries lives in the rural areas, which in general are not served by an electrical power distribution system, they do not realize any of the direct energy benefits of the commercial power generating system. Instead the vast majority of the rural population--and the urban poor as well, who cannot afford electricity either--rely on these non-commercial energy resources. Improved information sources on present usage and changing supplies must become part of world planning on energy.

Modern Industry

4. *We recommend that one pilot project examine the socio-economic implications of the drive for technological transfer and rapid industrialization worldwide. The relationship between modern industry employers of women in developing countries and the impact of that employment upon the status of women should be more carefully assessed.*

The employment of women in labor-intensive export industries in some developing countries is a highly contentious area of concern. Trade unions in the developed countries fear the export of jobs; women and men concerned with fair labor standards worry about depressed wages and rapid labor turn-over.(14) Therefore, a project should be initiated in a selected number of countries for which interested United Nations agencies, such as UNIDO, UNCTAD, and ILO, would be called upon to participate as would industrial companies, indigenous voluntary groups, and the Women's Voluntary Fund. A first output would be a set of work guidelines specifically concerning women. Progress on these guidelines should be reported to the International Women's Mid-Decade Conference in 1980.

Giving attention to women's concerns within major UN agencies should lead to the integration of these issues in the international codes of conduct being formulated with reference to multinational corporations. In addition, the appropriate UN agency could evolve a set of criteria for foreign private investment in developing countries which would constitute a development impact statement analogous to the environmental impact statements now required for certain kinds of projects. In this way, the focus on women's problems could have a much broader development effect.

Agriculture

5. *We recommend that programs both at FAO and at the established international agricultural research institutes link research on women in agriculture to broad theoretical concerns with technological development. Extension assistance should be directed towards improving the productivity of subsistence crops, small animal raising, and garden farming.*

   Because these activities are primarily the responsibility of women, assistance should also be directed towards women. Post-harvest food handling should be considered as important to increased productivity as research in new strains. Specific projects introducing new technologies for farm and food-related activities of women should be jointly developed by the agricultural and technological agencies at regional levels.

New technologies for the agricultural activities carried out primarily by women, e.g., transplanting, breeding, processing and preserving, should receive greater emphasis. It is preferable that the technology not displace female labor, but instead, make their labor more efficient and productive. Many current income producing activities of women could be made more profitable with improved technology and consequently increased production. If the technology replaces human energy, then the control of that technology should be granted to those replaced. Too often technology has released women from drudgery but at the cost of reduced income, lowered status, and increased dependency.(15)

Water Supply

The rights of women farmers should be considered when providing water for irrigation. Particularly when providing irrigation to areas inhabited by pastoral societies, women's economic activities should be recognized and supported, or

alternative productive activities should be provided. Women's rights to land for agricultural use, which will be on the agenda at the World Conference on Agrarian Reform and Rural Development later this year (1979), is an important consideration in any project encouraging increased investment in agriculture.

6. *We support the resolutions of the UN Conference on HABITAT and the Water Conference which set a goal of clean water for everyone by 1990. In this connection, we recommend that an international working group be set up to establish minimum standards for water supply by amount of water and by cost in time or money. We further recommend that this group report its findings to the International Women's Mid-Decade Conference in 1980.*

Sanitary water supplies have been long considered a major goal of development, yet women and children still spend many hours fetching water for household use. Simple technologies such as tin roofs or plastic pipe can give women the gift of time--two to four hours more every day--to improve the quality of life of themselves and their families. Selling clean water can provide income and pay for installation. Safer wells and improved storage of water, can increase the supply, but improperly designed or poorly placed wells can endanger the water supply and degrade the land. Further, the provision of water must be coupled with water and waste management. A hierarchy of water systems should be developed which respond to the needs and resources of the community. Women should be trained in all aspects of water and water management in order to provide additional income producing activities to unskilled women and greater overall health benefits to the community.(16)

Income Producing Activities

7. *We urge that multi-lateral assistance agencies as well as USAID designate at least ten percent of their budget to projects designed to provide productive employment for women, both urban and rural. Such projects should balance technological development with training for the users.*

Women's economic activities are vital to the survival of poor families whether there is a man present or not. The lack of new income-generating employment combined with the diminution of traditional employment for women in agricultural handicraft and trading sectors is causing female unemployment of alarming proportions.(17)

Because of the lack and diminution of income generating employment for the least educated, it is necessary to explore options and alternatives. For example, the use and production of foreign technology entails the introduction of capital-intensive modern technology heavily subsidized by local government and populations when an intermediate indigenous technology might at least equally increase production, preserve foreign exchange and provide income-generating employment for those with little access to modern sector employment.(18)

Therefore, we suggest a program which will :

(a) identify goods and services responding to local needs which have traditionally been produced by women using indigenous technology, and

(b) identify technologies which will improve productivity and retain employment for these least educated women.

We recommend wider use of time allocation studies to identify women's tasks that can be made more efficient through new technologies. These technologies should satisfy local needs for products and services and be susceptible to

indigenous financial, managerial and technical direction. Priority should be given to products and services which meet basic needs as defined by the users. It is likely that the product so identified will accommodate the processing of locally available raw materials and the manufacturing of items for daily use, e.g., foods, especially weaning foods, partially prepared foods, preserved foods, easier-to-cook foods; household items, such as soap, medicinals, utensils, matches, fuel for cooking, furniture, implements for home and field, devices to store food and water; cloth and clothing, and means of transporting materials and people.

We emphasize the need to establish projects among the most disadvantaged in both rural and urban areas. Ongoing monitoring and evaluation, both by users and by indigenous groups, including redesign and dissemination, should be a feature of such projects.

While recognizing traditional occupational differentiation by sex, such projects should also open up new activities for women. For example, new activities such as fish ponds, business enterprises, or water management could be introduced to women as easily as to men; indeed they fall within the traditional service activities of women. The tendency has been to introduce new technologies only to men and then to interpret cultural traditions in such a way as to bar women from that activity.

Data Banks

A major problem in the designing of integrated development plans is the lack of statistics on women's economic activities, including the fetching of water and fuel, which beg for technological or scientific solutions. As the projects recommended above develop information and as research

institutes disaggregate the poor by sex, it is important that such information become part of the information contained in the international network of computerized data banks. There is a great resource of information on science and technology for development now available in data banks. It exists in many countries, but the greater part is in the United States where over $8 billion has been invested in the generation of such data. New developments in computer tele-communications and in search technology can now make data bank information readily available as an important resource for development.

8. *We recommend that UNESCO sponsor a working group to review categories for information retrieval to ensure that women's special concerns are both separately coded and adequately cross-referenced, and that the group report its progress to the International Women's Mid-Decade Conference in 1980. In this manner, data will be available for integrated planning as well as for women's projects. We further urge developed countries to support this effort by utilizing the categories in their own data banks and by giving financial support to assist developing countries in establishing and maintaining compatible systems.*

B. Recommendations to National Governments

Each of the five major project areas noted above, household energy, modern industry, agricultural, water supply, and income-producing activities, also calls for priority action at the national level. These projects should be designed to demonstrate the contribution to local and national development that can be achieved when the great energies and talents of women as well as men are fully involved.

Household Energy

9. *Household energy needs should be made an integral part of each nation's energy policy. It is recognized that over 90 per cent of the rural energy supply and nearly 50% of the total*

energy consumed comes largely from non-commercial sources in the developing countries. Further, such energy is inefficiently used. (19)

Improved data need to be generated to measure both use and efficiency of non muscular energy used for the processing, preservation, and preparation of food, for heating water, or for lighting. However, the increasing scarcity of noncommercial fuels, their rising prices, and the widespread land degredation occuring as more and more trees are cut, require immediate attention to improved or alternative energy sources for poor households.

Participation

Emphasis was given throughout the seminar to the importance of consulting the user when introducing any technology. Too often new technologies have harmed those they were intended to benefit. The way that technologies are introduced- by whom, when, how; the social as well as economic costs, and the control were seen as equally critical to its utility as the technology itself. Particular attention should be paid to technologies which reduce the muscular energy required of women to ensure that release from drudgery does not place an even greater economic burden on them.

10. A national monitoring system needs to be developed to ensure that at every level new technologies introduced into developing countries take into account the needs of the users. Provision of and funding for such a monitoring system should be included in all internationally funded technology projects. Users should be part of any evaluation.

The socio-economic impacts of new technologies should be evaluated to see who in fact benefits. When the intended users of technology are primarily women, or when the human energy being replaced has been provided primarily by women, the appropriate monitoring mechanism may be the National Women's Bureau or a local women's research center.

The workshop further emphasized that while national planning must integrate women's and men's concerns, the delivery systems may have to be separate in order to reach women directly.

An important resource in the identification, development and delivery of new technologies are existing networks and organizations that involve women. While individual women face restrictions in access to channels of information, technology, and opportunity in some societies, local women's and community groups are at various implementing stages suitable vehicles for disseminating technological information and supporting risk along locally defined lines.(20) Once aware of technological options, women users themselves decide their needs and priorities and spread information through existing communication networks. Simultaneously, peer support is available for the risk and experimentation sometimes associated with technological change.

11. Women's groups and informal or community groups which include women as well as men should be involved in the selection, evaluation, and promotion of new technologies.

II. Recommendations Concerning the Inclusion of Women in the Making of Technology Policy

The complex and demanding needs of all countries, and of the world, require the wise utilization of all national resources, and especially of all human resources. Women should have the opportunity both to select from the full range of professional and occupational roles and to be trained to fill those roles. When women are better equipped to participate in their society's economic development, national productivity and equity of economic distribution will be enhanced.

Education and training in science and technology are particularly crucial, yet throughout the world the percentage of

women in these fields is low. One reason may be the frequent exclusion of women from research and administrative jobs in the scientific and technical area because of cultural constraints or occupational segregation.

The workshop recommendations therefore stress not only education but access as well so that women may participate fully in the making of technology policy.

The critical need to involve women fully in the planning, selection, and use of science and technology to address problems of social and economic development, requires that development agencies undertake specific commitments in two priority areas: advanced training in both natural and social sciences and in technology; training of local women who are the end users of technology.

A. Recommendations to International Bodies

Despite discrimination throughout the educational process and despite societal pressures away from technical subjects, women scientists and engineers exist in nearly every country throughout the world. Prejudice and institutional conservatism frequently prevents these women from attaining jobs for which they were trained. We argue further that these women will be better qualified than men to provide the bridge to poor women.

Recognizing and Utilizing Women Professionals

12. *Data collected by the United Nations for the International Women's Mid-Decade Conference in 1980 should include information on the numbers of women in all scientific and technological occupations.*

This information should include descriptions of the variety of occupations open to women and a discussion of the factors which inhibit or encourage women professionals in the various fields.

13. *Annual prizes should be established for women scientists from Asia, Africa, and Latin America who have made important new contributions to social and economic needs.*

Such prizes should be offered by the United Nations through UNESCO or ECAST they should be coordinated with similar prizes recommended by participants in the Singapore International Symposium in Science and Technology for Development sponsored by the International Council of Scientific Unions in January 1979.

14. *The regional commissions should concentrate on programs which provide training for project managers and educators in methods of involving the users of technology in decisions about its selection, use, and control.*

The workshop participants stressed the importance of ensuring that local women and men be given sufficient information about technological alternatives so that they can make meaningful choices. Demonstration models trucked to local fairs or weekly markets provide hands-on experience; tape cassettes provide easy reference for illiterates; local dance and drama forms can be adapted to convey information about alternative technologies. All such media techniques should be widely and frequently used.

Most governmental bureaucrats tend to give orders rather than ask local citizens to define their needs. Cadres of personnel trained in community organization will be needed to facilitate opportunities for users to participate in decision-making. UN regional commissions could provide

technological information as well as design training manuals for national project managers. Special emphasis should be given to training in the use of new communications technology.

15. *The international agricultural research institutes should add women professionals to their staff to facilitate both research and extension services to women farmers and in agricultural-related activities.*

While these institutes do not make national policy, their research findings influence international agricultural policy. Currently their staffs are predominantly male. (21) We are convinced that the perspectives of women are necessary to ensure that women's roles in agriculture are recognized and that technological innovations are extended to women as well as men. We wish to stress the simultaneous need for improved service to women farmers along with additional research in crops more likely to be within the woman's domain.

16. *UNESCO should sponsor periodic small international conferences, bringing together both academic and nonacademic professionals engaged in work on women and development.*

There is no professional association at the present time representing the interests of scientists concerned with the impact of development on women, yet there is a need for women from different countries in different disciplines to compare research priorities and findings. Such contact should be more frequent than the occasional world conference, and more scientific than the program meetings visualized under the plan for the International Women's Institute.

Only through international exchange and visibility will sufficient attention be paid to developing the scientific capacity to understand the complex problems of women's

integration in development. Pioneering work has been done by individual scholars, usually isolated in universities and research institutes. Important information has been collected in many action projects and through the efforts of some national and international agencies. But an integrated approach to women and development issues requires that serious investments be made in (1) building the scientific capacity of individuals and (2) increasing the participation of such trained individuals in those institutions that conduct policy-relevant research in the field of women and development.

Emphasizing the need for integrated development planning, in addition to professional growth, scholars studying women and development should be included in all relevant conferences sponsored by UNESCO.

B. Recommendations to National Governments

The improvement of existing agricultural extension and community development services are imperative in order to mitigate the impact of deteriorating rural conditions in much of the world. Services to rural women, largely ignored in their farmer and entrepreneurial capacities, need substantial redirection. (22)

Utilizing Women Professionals

17. *Agricultural extension services should reflect the sex composition of the actual agricultural work force. Teams should include both male and female members in order to provide better communication with both male and female agricultural workers without disrupting cultural and social practices.*

In order to ensure a pool of qualified female extension agents, governments may need to reserve places in training

centers or universities so that women can receive education not only for home economics and food processing, but also for other types of agricultural sciences, e.g., crop propogation and improvements, fertilizing and pesticides, breeding, etc.(23) It is essential that women extension workers receive equal pay and the same prerequisities available to their male colleagues.

The international pilot projects involving the impact of technology on women which this AAAS Workshop has proposed relate either to women's responsibilities in the household, providing fuel and water, or to income-producing activities from homecrafts to industry. Women are best able to communicate with other women, both in eliciting and transmitting information. Professional women can also make a significant contribution to these projects as planners, creators, implementors, and evaluators. Without their participation, such projects will not succeed.

18. *Women should be included in rural and urban community development agencies which seek to introduce new technologies for household use or for income-producing activities, so that such technologies will be appropriate to women as well as men.*

Training Local Women

In the development process, women have been denied education and training which would lead to income earning opportunities. Although this process is changing for the present generation, in many less developed countries at least [illegible] of adult women still lack access to education and marketable skill training. Adult education classes in the past have tended to focus almost exclusively on literacy training.

19. *On site or informal training geared to upgrading existing skills or providing new marketable skills should be made available widely to women who have been denied access in the past.*

The types of training we are proposing should include:

i) small scale entrepreneurial activities;

ii) food processing techniques and production of crops for commercial purposes;

iii) maintenance and repair of agricultural machines;

iv) practical technical training with which they can earn a living and which should not necessarily depend on literacy;

v) training to organize credit unions and cooperatives

Such training generally reinforces group cooperation and contributes to a more positive self-image. As their horizons enlarge, women tend to increase their use of community resources already available to them thus improving the level of health, nutrition, and education of their families and their communities.

C. Recommendations to the United States Government

As the centerpiece of the U.S. Proposals for UNCSTD, the Institute for Scientific Technological Cooperation should become a model for the inclusion of women into the development process.

20. *We recommend (i) that women have a minimum of two fellowships designed for specific women's concerns in each of the five issue areas;*

ii) that there be created a staff position at the Deputy Assistant level devoted to promoting the participation of women in research and demonstration projects throughout the agency and in each regional office;

iii) that at least one million dollars annually for the first three years be used specifically for exchange and travel activities involving women scientists and technologists.

D. Recommendations to the AAAS and other professional associations

For development to succeed, the resources of women must be integrated into research project design. To provide information to make their inclusion meaningful, greater attention needs to be given to development oriented research concerning women in a social, political, and economic context. Women's special needs should be discussed and explored within the framework of general development theory.

21. *We call upon scientific associations and development agencies to include scholars familiar with women and development issues in all their meetings and deliberations. We further urge these associations and agencies to assure the continuing development of scientific capacity adequate to analyze the complex problems of women's integration in the development process through both basic and applied research.*

Existing methods of data collection and analysis pose special difficulties in the scientific study of women's participation in economic processes. The creation of an adequate infra-structure for basic and applied research on women and development issues is necessary to overcome existing institutional and attitudinal barriers to an integrated approach to research and planning in these areas. Particular attention must be paid to overcoming these barriers through the creation of an adequate body of information, methods of data collection and analysis, and means of communicating findings to an international and interdisciplinary group of researchers and policy-makers. Scholars isolated in universities and research institutes must receive greater support

for their work and should be integrated more fully into existing institutions concerned with these issues.

CONCLUSION

Modernization is essentially the process of substituting scientific findings and technological systems for traditional methods of providing human needs. Because the dominant development theories have ignored or downplayed women's contributions to the sustenance of family and community, women's roles have been increasingly limited and women's status frequently eroded. Specific focus on ensuring that new technologies reach women and address their needs will go a long way to redressing the balance.

The participants in the AAAS Workshop on Women and Development commend the Department of Status for recognizing the importance of including women in the development process by sponsoring this workshop. We urge the Secretary of State to instruct the U.S. delegation to the United Nations Conference on Science and Technology for Development to support wholeheartedly the recommendations submitted in this report.

* * * * * *

Notes and References

1. The goal of the Task Force is the integration of women into the UNCSTD Agenda and World Programme of Action. For a detail of its activities see Mildred Robbins Leet, "The Roles of Women in Science and Technology for Development: The Politics of Consciousness," paper presented at the International Studies Association, March 21, 1979.

2. Linda Y.C. Lim, "Women Workers In Multinational Corporations In Developing Countries," AAAS Workshop on Women and Development, March 1979.

3. Barbara C. Lewis, "Petty Trade and Other Employment Options for the Uneducated Urban West African Women," AAAS Workshop on Women and Development, March 1979.

4. Louise Fortman, "The Plight of the Invisible Farmer: The Effect of National Agricultural Policy on Women," AAAS Workshop on Women and Development, March 1979.

5. Melinda L. Cain, "Java, Indonesia: The Introduction of Rice Processing Technology," AAAS Workshop on Women and Development, March 1979.

6. Grace Hemmings-Gapihan, "Base-Line Study for Socio-Economic Evaluation of Tangaye Solar Installation," AAAS Workshop on Women and Development, March 1979.

7. Maryanne Dulansey, "Can Technology Help Women Feed Their Families? Post Harvest Storage, Processing, and Cooking; Some Observations," AAAS Workshop on Women and Development, March 1979.

8. Michaela Walsh, "Women in Banking, Finance and Entrepreneurial Ability," AAAS Workshop on Women and Development, March 1979.

9. Priscilla Reining, "Prosperity And Poverty In Rural African Areas: Can Economic Development Take Place Without Social Stratification Or Inequality?" AAAS Workshop on Women and Development, March 1979.

10. Daniel Lerner, "Women In Iran Technological Change And Social Transformation," AAAS Workshop on Women and Development, March 1979.

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11. Irene Petty, "The Role of African Women's Organizations In Identifying Needs for Labor Saving Devices," AAAS Workshop on Women and Development, March 1979.

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13. See Joy Dunkerley et al, Energy and the Poor in the Third World, a Resources for the Future Research Paper, 1979; and Environmental and Natural Resource Management in Developing Countries, a Report to Congress by USAID, February, 1979.

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17. See M. Elmendorf, "The Dilemna of Peasant Women," in Women and World Development by Irene Tinker and Michele Bo Bransen. (Washington: Overseas Development Council, 1976).

18. See example of modern rice-hulling plants in Ivory Coast, "Petty Trade and Other Employment Options for the Uneducated Urban West African Women," Barbara C. Lewis.

19. See UNIDO report 1978, "Draft Report of the Technical/ Official Level Meeting to the Ministerial Level Meeting." International Forum on Appropriate Industrial Technology, India, November 1978.

20. Rural elite can take risks and serve as local change agents if there are built-in procedures for diffusion.

Notes and References (Cont'd)

21. The staff of these international institutes tend to be male. Female professional staff have not been recruited for the scarce social scientist positions which might steer Centre policy and research in a direction more responsive to the problems of female farmers. The two female staffers at CIMMYT, for example, are in experimental research and laboratory work rather than in outreach positions. The economists at CIMMYT, IITA, IRRI and ICRISAT are all male. All Directors--General and Program Heads are male. Since these men primarily come from Western countries, they tend to operate from a model in which all farmers are male.

22. Experience with the National Maize Project in Tanzania shows that women have significantly less contact with the extension service than men. In one region only 20 percent of the women participating in the project (which in fact facilitated extension contact) had been visited by an extension agent. In contrast, 58 percent of the men had been visited. Low contact rates are due to socio-cultural constraints on male/female interaction and to the prevailing belief that women are probably not capable of learning technical information. The predominantly male staffing pattern of the extension service reflects the primarily male composition of the student body in agricultural facilities. In 1975 only 25 percent of the graduates of Agricultural Training Institutes (the source of extension agents) were women and 25 percent of these were studying nutrition. Less than 1 percent of Tanzanians sent outside for agricultural training between 1966 and 1970 were women. For a survey of women and extension in other countries, see Jacqueline A. Ashby, 1979, "New Models for Agricultural Research and Extension: The Need to Integrate Women." Paper prepared for FAO Conference on Rural Development and Agrarian Reform. WID/USAID, Washington, D.C.

23. In 1976 Mexico set up a new type of secondary school, Escuela Agro-Pecuaria, with scholarships for rural youth, both male and female.

APPENDIX A

Muneera Murdoch

Priscilla Reining

Grace Hemmings-Gapihan

I. METHODOLOGY FOR EVALUATING IMPACT TECHNOLOGY ON PASTORAL SOCIETIES

Impact of Irrigated Agricultural Development Projects on Pastoral Societies

1. Pastoralists

   a. animals
   b. grass and water
   c. people

2. Division of Labor between men and women

   Women's work is complementary to that of men although the nature of that work might differ from one society to another (i.e., Fulan: women in charge of milking; Subriya: women are not.) Almost invariably women own animals although they might not participate directly in herding.

Development Intervention

1. shift from pastoralism to agriculture
2. from subsistence to cash crops
3. new project oriented toward males
4. males adopt new types of work
5. new work evaluated in cash terms
6. women deprived of traditional mode of production - only left with mundane type of work - power over production is lost
7. women not involved directly in new mode of production - assumption that benefits reaching men will by definition reach women as well
8. man becomes the only generation of cash income
9. women becoming economically dependent on men
10. economic dependence generating social dependence
11. loss of self-esteem among women

Solution

1. What are the roles of women or of men in a pastoral society?

2. How will the new project affect these roles?

3. How could women be involved in the new activities?

II. METHODOLOGY FOR EVALUATING IMPACT OF TECHNOLOGY IN RURAL COMMUNITIES

1. What is the named community?

2. What other groups must be considered below the level of the village level?

3. What is the nature of the household?

4. How are households formed and dissolved?

5. What happens when that person dies or marries?

6. What is the model for the technology?

7. Who buys? Individual or group?

8. Will everyone be able to buy?

9. Who owns the new devices?

10. Who controls its usage?

III. METHODOLOGY FOR EVALUATING PROJECTS IN THE MODERN INDUSTRIAL SECTOR

Such projects may be located in rural areas, e.g. under regional dispersal of industry programs. Many labor-intensive manufacturing industries employ rural women in rural areas directly or as piece workers.

Important Questions which should be asked (and answered)

1. What are the national policy objectives of the particular project/technology to be introduced, e.g. growth, employment, income

distribution? Are women included at the macro level, e.g. as planners, as "targets" of the project?

2. Is the project going to be viable in a long-run economic sense, given antitipated market and technological conditions and changes?

3. What is the product produced, and why is it desirable to produce it? Does it fulfill community needs as articulated by the community, including women?

4. Are women going to be beneficiaries or losers from the project in an economic or social sense (either intended or unintended); how, directly or indirectly?

5. If women are adversely affected by the project, what can be done about it? Can the project or technology be modified or adapted to benefit women? Perhaps a simpler technology involving more labor-intensive processes requiring less formal education and skills (which women do not have), can be substituted; or, project approval may require a component of on-the-job training for women. Can the same technological and market opportunities benefit women more if they are organized differently, e.g. in indigenous enterprises, local co-operatives, joint-ventures, multinational corporations? Are women better off under different institutional arrangements of technology use and control?

6. If women are employed, why? Is it a sex-segregated industry? If so, is the employment of women partly the result of their inferior labor-market status and discrimination because they are cheaper, easier to lay off, more easily exploitable, etc.? Will the removal of discrimination by legislation or negotiation reduce the employment of women? Is this bad if it equalizes women's labor market position, by removing sex segregation in both male- and female-intensive industries?

7. Does social and cultural disruption arise from the wage employment of women? Is it positive for women (e.g. the breakdown of feudal traditions and roles which oppress women) or negative for women, and for their national societies (e.g. an improvement in the position of women may be seen to be a negative cultural disruption by males whose traditionally dominant position is undermined by it.)

8. What is the role of women within the industrial enterprise? Are they represented at all levels of the labor force, e.g. production operators, technicians, engineers, managers? Since most women are production writers, what input/control do they have in the production process -- in management, marketing, technology choice and innovation, hours and conditions of work, etc.?

Water: Distribution and Control

1. Thorough knowledge of water resources: seasonal variations, sites, geography, climate variations.

   What are resource constraints?

   Are they always the same?

   What are the periods of greatest stress?

   Is any increase possible?

   Are water resources managed so that scarce resources are adequately distributed?

   How is water transported or used?

   Can time to get water be reduced?

   What effects will this have on consumption of water?

   Choice of water sites?

   Distribution of water resources?

   What effects will this have on degree of consumption of water for various activities?

Can the community sustain the effects of increased consumption?

2. Health problems connected with water:

   To what degree have these plagued the population?

   At what ages?

   Has the population adapted biologically, by building up immunities to available water?

3. Dependency and development:

   To what degree can the society change its water use patterns in such a way as not to become increasingly dependent on Outside Structures?

   Will ease of obtention of water generate unemployment for herders? For women?

   Are technologies ends in themselves or means of further development?

   Will they use as much as possible of village resources with their people and raw materials?

   To what degree are there useful constraints by nature?

   Availability of clean water by whose definition?

APPENDIX B

Norman Brown

Irene Tinker

Energy for use in household and for rural agriculture and homecrafts goes largely uncounted in national energy statistics. This is due to the custom of measuring only "modern" or "commercial" energy oil, coal, natural gas, hydroelectricity, and nuclear fuels. Yet such an energy-accounting procedure ignores what in many cases amounts to more than one-half the total energy used in many developing countries, exclusive of animal and human power.

Rural areas, where a majority of population in the developing countries still live, are seldom served by electrical power grids. Diesel motors power pumps for irrigation, provide energy for small industries, and run small lighting systems for wealthy enclaves. But most rural people as well as the urban poor cannot afford commercial energy in any form even where kerosene is subsidized.

Some two billion people continue to rely on non-commercial energy resources to cook, smoke food, heat water and space, or provide light and safety. These resources are primarily firewood, twigs and brush, agriculture residues, and animal dung. Resources for the Future has just completed a study on "Household Energy for Use and Supply by the Urban and Rural Poor in Developing Countries" which underscores the lack of data on these non-commercial fuels. They conclude on the basis of available data that the lowest energy consumption is among rural areas of South Asia; due to heavy deforestation, animal dung provides as much as fifty percent of the total rural energy consumed. As the amount of dung burned increases, food production will fall unless artificial - and energy intensive - fertilizers are substituted. (1) (Joy Dunkerley, et al, A Report to the World Bank, October 1978, Chapter III.)

It would seem that many countries are following India's path toward deforestation. Experts estimate that Senegal will be bare of trees in 30 years, Ethiopia in 20, Burundi in seven. (2) (D. French.) 90% of wood consumed annually in developing countries is used as fuel. (3) (World Bank 1978, Forestry Sector Policy Paper.) Reasons for this alarming increase in the use of forest reserves are largely related to the population increase both directly in increased cutting and indirectly as more land is cleared for agricultural crops to feed the growing populations. Improved health measures have opened up river valleys in Africa and the Terai in Nepal to settlers, also reducing forests and exacerbating erosion.

As available resources drop, the time consumed in gathering fuel increases. In India it has been stated that one person in a family of five must spend full-time gathering dung, firewood, and refuse. (3) (Mahajni.) Even higher estimates apply to Tanzania. (5) (USAID.) Such time requirements encourage larger family size, for children help the family more than they cost.

When one examines the use to which this energy is put, it appears that some 40 to 50% of the total energy consumed in rural areas is used in cooking alone.(6) In the case of India, for example, this leads to the conclusion that approximately one-fourth of the country's total energy budget is used in rural areas just for cooking, while rural Bangladesh uses about 40% of that country's total national energy budget just to cook food. (7)

The urban poor must also eat, yet their energy consumption is estimated as lower than that of the rural poor. (8) As much as one third of the family's budget may go for fuel in the Sahelian countries. One study states that "to obtain the same amount of usable energy which can be purchased in the US for about $1.30, a charcoal burning family in Addis Ababa may have to spend about $8.00." (9)

Two things are clear from these scattered reports:

1. there is a crisis in household energy

2. little data are available on actual usages and current adaptations of consumption

It is also obvious that household energy is a problem for women who do most of the cooking around the world and are generally responsible for gathering fuel. Any project dealing with household energy must incorporate women's views and needs at every phase of study and implementation.

International pilot projects

Each of the major regions of the world should undertake at least one pilot project encompassing both urban and rural areas to improve available household energy by introducing new technologies for meeting the energy needs of households. Both improved traditional as well as modern methods of providing energy should be offered for choice by cooperating households.

Each project should consist of four to six sites where international teams will:

***survey the existing patterns of supply and use of household energy, utilizing local women as participants and data-collectors;

***demonstrate and discuss techological improvements which with local community and women's organizations, might be tested. Only presently available technologies would be described. Each site should test only one technology. All stages of the discussion, selection, and introduction of the new technology should be carefully monitored and recorded.

***preliminary reports of the projects should be made available to the UN Conference on New and Renewable Resources of Energy in 1981.

Technologies to be considered

1. Village woodlots: improved or alternative species, better community control, larger size, better management

2. More efficient use of traditional fuels: improved cookstoves, processing of brush and residue for higher temperatures

3. Development and/or adaptation of more efficient methods of charcoal production

4. Alternatives for hot water: introduction and/or improvement of solar ponds or tanks

5. Alternatives for methane converters, small hydro systems

6. Energy for food processing: solar dryers, water or mechanical grinders, solar water pumps

Formulation of Approach

1. Role of individuals or groups within the community

2. Role of outside experts

3. Relation of project to existing social patterns

4. Relation of project to competing or complementary development project

Initial Appraisal

1. What are the anticipated benefits of

   -- reducing the time consumed in fuel gathering

   -- increasing the supply of firewood

   -- local control of woodlots

   -- reducing food preparation time

   -- reducing exposure to combustion products (e.g., smoke from burning dung)

2. What are the anticipated consequences of

   -- accustomizing women to the convenience of charcoal or biogas as compared to wood

   -- the impact on income production from traditional fuel gathering activities

   -- establishment of woodlots in relation to traditional patterns of tree ownership by women or by men

   -- materials requirements for new stoves or biogas plants

   -- providing women with more time

Project Design

1. Specific elements identified that will be included in project

2. Identification of local institutions that will have local responsibility

3. Identification of best-country organization that will have national responsibility

4. Specific studies to gather needed data

5. Anticipated costs

6. Projected time schedule

7. Environmental assessment, if needed

Execution

1. Logistics and managerial aspects of field operations
2. Modification resulting from environmental assessment
3. Participation in studies
4. Participation in construction activities
5. Use of devices, approaches, new institutions resulting from project

Evaluation

1. Benefits
2. Employment opportunities
3. Income level distribution
4. Health
5. Environmental changes
6. Costs
7. Potential for replication
8. Changes recommended

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APPENDIX C

PARTICIPANTS

PARTICIPANTS

AAAS Workshop on Women and Development
March 26 - 27, 1979
The Brookings Institution
Washington, D.C.

Mr. Robert Berg
Associate Assistant Administrator
AID
Washington, D.C. 20523

Mr. Simon Bourgin
Senior Advisor to the US Coordinator for UNCSTD
S/CST Room 1006
New State Department Building
Washington, D.C. 20520

Dr. Norman L. Brown
Special Advisor on Energy, AA/ASIA
and
Chief, Division of Scientific, Technical and Environmental Problems
AID
Washington, D.C. 20523

Ms. Mary Burke
Staff Associate
Center of Concern
3700 13th Street NE
Washington, D.C. 20017

Ms. Melinda Cain (no mailing)
Research Social Scientist
Denver Research Institute
University of Denver
Denver, Colorado 80210

Ms. Kim Conroy
Consultant
The World Bank
1818 H Street NW
Washington, D.C. 20433

Ms. Roslyn Dauber
Research Analyst
Office of Technology Assessment
U.S. Congress
Washington, D.C. 20510

X Ms. Maryanne Dulansey
Consultants in Development
2130 P Street NW, Suite 803
Washington, D.C. 20037

Dr. Mary Elmendorf
Consultant
International Bank for Reconstruction and Development
1818 H Street NW
Washington, D.C. 20433

Dr. Louise Fortmann
Visiting Assistant Professor
Department of Rural Sociology
Cornell University
Warren Hall
Ithaca, New York 14850

Ms. Paula Goddard
Deputy Coordinator
Office of Women in Development
AID
New State Department Building
Washington, D.C. 20523

Mr. Denis Goulet
Senior Fellow
Overseas Development Council
1717 Massachusetts Avenue NW
Washington, D.C. 20036

Ms. Grace Hemmings-Gapihan
Department of Anthropology
Yale University
New Haven, Connecticut 06520

Peter Henriot, S.J.
Director
Center of Concern
3700 13th Street NE
Washington, D.C. 20017

Mr. John Hurley
Deputy Director
Board on Science
and Technology for
International Development
National Academy of Sciences
2101 Constitution Avenue NW
Washington, D.C. 20418

Ms. Leah Janus
Overseas Education Fund
of the League
of Women Voters
1435 West Wesley Road NW
Atlanta, Georgia 30327

Dr. Charles Kidd
Research Professor
of Public Affairs
George Washington University
2130 H Street NW
Washington, D.C. 20052

Mr. Glen Leet
President
International Society
for Community Development
54 Riverside Drive
New York, New York 10024

Ms. Mildred Robbins Leet
Chairperson
NGO Task Force on Roles
of Women for UNCSTD
54 Riverside Drive
New York, New York 10024

Dr. Barbara Lewis
Associate Professor
Department of Political
Science
Livingston College,
Rutgers University
New Brunswick, New Jersey
08903

Dr. Linda Lim
Assistant Professor
of Economics
Swarthmore College
Swarthmore, Pennsylvania
19081

Dr. Michael Maccoby
Director
Harvard Project on Work,
Technology and Character
1710 Connecticut Avenue NW
Washington, D.C. 20009

Dr. Martin McLaughlin
Senior Fellow
Overseas Development Council
1717 Massachusetts Avenue NW
Washington, D.C. 20036

Ms. Muneera Murdoch
Research Assistant
Institute for Development
Anthropology
P.O. Box 45
Westview Station
Binghamton, New York 13905

Ms. Kathleen Newland
Senior Researcher
Worldwatch Institute
1776 Massachusetts Avenue NW
Washington, D.C. 20036

Dr. Hanna Papanek
Associate Professor
of Sociology
Boston University
Boston, Massachusetts 02215

Dr. Irene Petty
Consultant
National Council
of Negro Women, Inc.,
1346 Connecticut Avenue NW
Suite 832
Washington, D.C. 20036

Mr. Jairam Ramesh
Consultant
International Institute for
Environment and Development
1302 18th Street NW
Washington, D.C. 20036

Dr. J. Thomas Ratchford
Associate Executive Officer
AAAS
1776 Massachusetts Avenue NW
Washington, D.C. 20036

Dr. Louis Rosenblum
Chief, Solar and
Electrochemical Division
NASA/Lewis Research Center
21000 Brookpark Road
Cleveland, Ohio 44135

Mr. Peter Schauffler
BioEnergy Council
1625 Eye Street NW
Suite 825-A
Washington, D.C. 20006

Ms. Gloria Scott
Advisor on Women
in Development
Office of the President
The World Bank
1818 H Street NW
Washington, D.C. 20433

Dr. Nwanganga Shields
Economist
International Bank
for Reconstruction
and Development
Room K-4402
1818 K Street NW
Washington, D.C. 20433

Dr. Mangalam Srinivasan
Consultant on Science
and Technology for UNCSTD
3905 Jennifer Street NW
Washington, D.C. 20015

Dr. Kathy Staudt
IPA - Office of Women
and Development
AID
New State Department Building
Washington, D.C. 20523

Dr. Irene Tinker
Director
Equity Policy Center
1302 18th Street NW #203
Washington, D.C. 20036

Ms. Michaela Walsh
Project Leader
Office of Technology
Assessment
U.S. Congress
Washington, D.C. 20510

Ms. Mary Wolff
Associate Director
Aspen Institute
for Humanistic Studies
1919 14th Street #811
Boulder, Colorado 80302

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Department of State

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Project Assistant
Office of International
Science

Ms. Denise Weiner
Program Associate
Office of International
Science

BACKGROUND PAPERS

JAVA, INDONESIA:
THE INTRODUCTION OF
RICE PROCESSING TECHNOLOGY

by Melinda L. Cain

Introduction

Mechanized rice hullers were introduced in Java, Indonesia, in an attempt to modernize agriculture on the island and thus to increase rice production. In addition, the use of sickles and scales, and the tebasan practice, were employed towards the same goal (1). However, the introduction of this technology also created labor displacement, particularly among women who traditionally were involved in rice harvesting.

This article will summarize some of the major social and economic impacts stemming from the Government of Indonesia's attempt to modernize agriculture. It serves to illustrate the ramifications of introduction of technology without due consideration to the social context. In particular, the role of women and the impact of technology on them is of importance, because the women were traditional rice harvesters and processors. (It is acknowledged that hand-pounding is not easy work, and was not enjoyed by women. However, it did supply a needed source of income, and therefore, was missed for that reason)(2). One might suggest that women are sometimes "three times burdened" by the problems of development. That is, first, there are problems which are not specific to women, but characteristic of lower incomes compared to middle and upper income groups in general, e.g., insufficient access to resources--land, capital, technology, education, governmental services; longer working hours with lower incomes; lower social status and relatively little influence in the process of decision making in society. Second, lower income women face problems specifically related to their status as women. Special attention to them is required in order to achieve a greater participation in the process of social and economic development. These include an even more restricted access to resources; longer working hours and even

lower incomes than those of men in the same social-economic class; the special burden of household tasks and child rearing; and lower status in society than that of males in the same social class, resulting in even less or no influence on community decision making. Finally, the large group of rural women without resident husbands are those who might be called "three times burdened." That is, they experience all the difficulties faced by lower income classes in general and the additional difficulties faced by poor rural women without having an adult male to join them in income earning activity or represent them as household head in the community (3).

Thus, the increase in rice production in Indonesia must be weighed against the loss of income for women. Production goals, in this case, triumphed as they probably should have. However, an effort should have been made to develop alternative sources of income for the displaced women. Thus, it is within this framework, that the situation of women and processing technology in rural Java will be examined.

Background

Indonesia includes more than 13,000 islands, the largest of which is Java. Java covers only 6 percent of the total land area (about the size of New York State) but contains two-thirds of the country's total population of 135 million. (It is interesting to note that in 1870 Indonesia's population was 1.6 million; by 1965 it had reached 69.2 million. Now, in a little over ten years, it has almost doubled.) More than 80 percent of this population resides in rural areas. In contrast, other islands (Kalemantan, Sulawesi, Sumatra) do not have enough labor for production.

Indonesia is representative of the more than one-half of the world's population that depends on rice for a basic food supply. Approximately 90 percent of the world's rice is produced in Asia (4). Sixty percent of the total calories and 65 percent of the protein in the Indonesian diet come from rice (5). Domestic consumption of rice in Indonesia is higher than the country's capacity to produce it, which means that rice must be imported to meet local demand. In fact, in 1978 Indonesia was the world's largest importer of rice.

Obviously, agriculture is crucially important to the Indonesian economy. For example, in 1968 it contributed about 50 percent of the Gross Domestic Product, provided employment for about 70 percent of the total labor force, and produced about 50 percent of all exports (6). In the second five-year plan of Indonesia, REPELITA II, national

efforts were defined as being direct to increase productivity and achieve ultimate self-sufficiency in rice production, to expand agricultural exports and to reduce rural unemployment (7). The largest single program in the plan is to increase the production of rice (paddy), of secondary crops (such as corn, sorghum, cassava, soybeans, and peanuts), and of horticulture. The plan outlines increases in rice production from 14.5 million tons in 1973/1974 to 18.2 million tons in 1978/79, or an average annual increase of 4.6 percent, which is about double the rate of population growth. The increase in production is primarily due to the expansion of cultivated land and to increases in per-hectare yields. The governmental program (initially launched in 1968 and revised on several occasions since that time) to support the campaign for increased rice production is called BIMAS, an acronym taken from the Indonesian expression "Bimbingan Massal" ("mass-guidance"). This program is attempting to mobilize the Indonesian peasants in an effort that involves a massive infusion of fertilizer and high-yielding seed varieties (HYV). Some reports indicate that the program has been far from successful for a variety of political and administrative reasons (8). Nonetheless, the national goals of increased rice production and self-sufficiency remain.

Since 1971, when Amir Khan of IRRI wrote that most of the rice production in Asia was done with traditional, nonmechanical methods, a strong effort has been made to mechanize rice cultivation. This effect has not been without problems, however, as noted by Khan:

> Mechanization of rice production in the tropics has many problems which still remain unsolved. Attempts to transfer the highly advanced Western and Japanese mechanization technologies have not produced effective results for the small farm holdings in the tropical regions. The overwhelming need today is to develop an intermediate mechanization technology to suit the prevailing set of agricultural, socioeconomic, and industrial conditions of the tropical regions (9).

Traditional Rice Harvesting

Traditionally, Javanese rice farmers did not restrict anyone who wished to participate in the rice harvest. The harvesters were mostly women from within the village and from neighboring villages. The women used an ani-ani (small finger knife) for harvesting. The ani-ani was suitable for cutting local varieties that matured at different times and had varying stalk lengths. The har-

vesters carried the rice in sheaves, bound in the field, on shoulder poles to the owner's house. This method of harvesting required large numbers of people, and literally thousands of landless families were involved. In fact, one farm survey showed as many as 500 persons employed per hectare (10). The harvester's pay was a share of the crop, with a ratio of about seven to ten for the owner and one for the harvester. The division was made by bundles and not by weight.

The Tebasan Harvesting System and the Use of Sickles and Scales

Traditional methods of rice harvesting in Java have changed significantly partly because of the increased population pressures on land. Individual farm sizes have become smaller as farms have been subdivided from generation to generation, and it has become more difficult for farmers to run a profitable business. The population increase also has meant that a larger number of landless laborers are looking for harvesting work. As the amount received by harvesters has has grown smaller, they have tried to obtain larger shares than custom dictates. Furthermore, farmers customarily have felt a social obligation to let all the harvesters participate. Therefore, farmers have found their share of the harvest diminishing.

One way of improving the farmers' share is to limit harvesters. This can be done by the adoption of the tebasan system. Tebasan is a harvesting sytem that enables the farmer to sell his crop to the penebas (middleman) before harvest. This limits the number of harvesters and avoids the problems of supervising the harvest and dividing the shares. About one week before the harvest, the farmer sells his crop to a buyer, who then arranges for the harvest and sells the rice. The penebas may be from the same village or from outside the village. The farmer usually is paid within one week after the harvest if not at harvest time.

The penebas is recognized as a trader, and his right to a profit is accepted. Individual harvesters may benefit from this sytem, especially when the penebas can control the number of participants, thereby ensuring larger returns for each harvester. Based on village surveys, some rice always has been purchased by the tebasan method. However, the system has become more important with the use of HYV, because there are now two harvesting seasons, and thus, more rice to harvest.

A comparison of costs of harvesting with the penebas were estimated from a sample of village surveys. Using the ani-ani rice knife and the traditional system, the estimated harvesting costs were about $30.00 per hectare. Comparing those costs with about $15.00 per hectare that it costs the penebas to harvest, it is evident that the harvest costs can be reduced about 50% by using the tebasan system (11).

Tebasan and the introduction of HYVs have caused an important technical change in the method of harvesting rice: this is the use of the sickle. The ani-ani is more suitable for cutting traditional varieties of rice; the sickle is preferable for cutting the HYV. When the sickle is used, the rice is threshed in the field, then carried in sacks to the penebas's house, where harvesters are paid in cash according to the weight, not according to bundles. Thus, when the penebas began to use sickles, scales became necessary to weigh the shares for the harvesters. Furthermore, harvesters must provide their own sickles, threshing mats, and sacks to carry the rice. With sickles, only about 75 person days are required to harvest one hectare, while with the ani-ani, 200 or more person days may be needed.

The Introduction of Rice Hullers

Due to governmental initiative, mechanized rice hullers were introduced in 1970 to 1971. The diffusion of hullers occurred very rapidly after 1970, as illustrated by Table I. By 1978, only about 10 percent was being hand-pounded, mostly for family consumption (12).

An English model by Engleberg is widely used in the Philippines. This machine has few moving parts and is very durable. However, a Japanese model that uses rubber rollers is more common in Indonesia. Pasawahan, a village in west Java, has three milling centers that use the Japanese hullers and polishers.

Rice must be processed through the machine four to eight times. It is first poured into the top of the huller; the hulls and (bran) excess material then travel through a pipe and are discarded outside the building. The hulled rice is then run through the polisher three or four times.

Choice of Technology and Economic Aspects

Timmer has discussed the choice of the rice hulling technology in Indonesia by analyzing the four alternative milling/storage/drying facilities that were considered by USAID/Jakarta and the Indonesian government in order to

"modernize" the rice marketing sector. He mentions four efficient alternatives, of which the most capital-intensive required $65,000 investment per worker and the most labor-intensive required only $700 (13). Timmer also points out that beneath the decision to modernize lay a deep-felt bias on the part of Western and Western-trained technicians that "identified capital-intensive with modern, and modern with good (14). " Such value judgments may play an important role in determining technological choice, as shown by the widespread introduction of the Japanese rice mill.

In part due to Timmer and other work, the Indonesian government chose the mechanical but less-high technology alternative because it was economically preferable. Also, loans to buy hullers were available at 1 percent per month interest, whereas regular village credit runs about 5 to 10 percent per month. Therefore, the machines were well subsidized and available to those who could afford them.

Collier estimates the average investment costs of a hulling center to be $3,111 for machinery, buildings, and land. Such a hulling center would have an average capacity of .58 tons per hour. This figure is based on the combined use of old and new equipment. Timmer estimates $8,049 as the initial cost of a hulling center with a capacity of .42 tons per hour (15).

In Pasawahan, the initial cost of a huller in 1976 was Rp 2.5 million (or about U.S. $4,000). The owner of the huller said that operating costs were low except for repair, which did not occur very often. Both the huller and polisher were diesel-powered, using a crude kerosene fuel that cost Rp 30 per liter (five cents per liter, or less than twenty cents per gallon). Ten liters would run the huller for five hours or about one ton of rice. Repair costs so far had been few. The owner pointed out a small part that had recently been replaced for Rp 40,000 (sixty-six dollars).

At this particular hulling center or mill, about two tons of rice could be hulled per day. (This compared to the hand-pounding of forty kilograms per day by one woman.) Two men who operated the huller and polisher could process about 100 kilograms of rice in twenty minutes and were paid Rp 45 for every 100 kilograms. Labor use as estimated by Collier was four to five hand laborers to hull 92 tons per month (average) in contrast to Timmer's estimates of twelve laborers to hull 1,000 tons per year.

In order to compare costs of using hullers and hand-pounding, it was found in one survey that the average cost

of hand-pounding was $1.45 per 100 kilograms. In comparison, the average cost to the farmer of using a huller was $.54 per kilogram. In addition, the by-products were kept by the miller while in the traditional harvest, women were able to keep the by-products to use as animal feed (16).

Impact of the Technology

During the last five years, the mill has taken over work traditionally done by women. Two examples illustrate these changes: "A former rice trader, now turned mill owner, stated that he used to employ eight women to hand pound his rice. Four women working five hours could hand pound 100 kilograms of gabah. This rice trader could buy 200 kilograms per day of gabah. The women's wages were 10 percent of the rice they provided, which amounted to just under two liters of milled rice per day. Thus, over the harvest season these eight women earned perhaps sixty liters of milled rice each or enough to feed themselves for four months." "In Kendal, Central Java, a farmer said that in the past there were more than 100 women "hand-pounder" laborers in his village. But now they have no work (17)."

Estimates of jobs lost ranged as high as 1.2 million in Java alone and as high as 7.7 million in all of Indonesia as a result of the introduction of the new technology. Collier estimated that the loss to laborers in earnings due to the use of hullers was U.S. $50 million annually in Java, representing 125 million woman days of labor.

The rice farmer pays less to the mill for threshing and the process is much quicker, but the women have lost a highly remunerative source of income. They are now forced to work longer hours at other jobs, if such can even be found. The shift from a traditional technology to a more modern one has eliminated one of the more important sources of income for landless villagers.

Thus, although the adoption of the use of HYV, tebasan, sickles, scales, and rice hullers has served to increase rice production in Indonesia, it has not helped to solve the problems of unemployment and income distribution in Java. Rather, it appears these problems have been exacerbated. Furthermore, there is little evidence to indicate that the rural unemployed are being taken up by work opportunities in the cities, or have been able to find replacement sources of income in the rural areas.

Concluding Remarks

Indonesia, to state the obvious, is a land of contrasts. Java and Bali are islands with dense populations that create massive unemployment problems. Other islands (Kalimantan, Sulawesi, Sumatra) lack enough labor for production purposes. While the observations made in this case refer specifically to Java, it is important to note the differences within Indonesia and to refrain from generalizing to other islands. This implies that it is possible, if not probable, that regional variations within a country might well dictate the need for several different policy packages vis a vis technology choice or use within a single country. In this case, the policy for modernizing agriculture was applied generally throughout Indonesia, and as illustrated on Java, this caused some unanticipated, negative impacts.

In addition to illustrating the need for region-specific technology policies, this case also shows that technology, itself, is neutral; it is the use of technology that determines whether it has positive or negative effects. It is, therefore, important to consider who will own the technology and who will benefit from its use. On Java, those with a substantial income were able to afford the new technology. Those who were at the subsistence level (mostly women) were not in a favorable position to purchase the hullers and thereby lost access to one source of income. In contrast, I was told that women in W. Sumatra have used the introduction of rice hullers to their advantage. Due to the matriarchical system, women there own land and make agricultural decisions. They were able to form cooperative groups with sufficient access to financial resources to buy the hullers, and use them profitably.

Finally, this case describes a common trade-off in development situations: modernization or mechanization versus labor utilization. It is difficult to call rice mills a "mistake" because the process is more efficient in terms of input/output, and such efficiency is necessary due to national goals of increased rice production. Furthermore, hand-pounding of rice is an arduous task, and it is unlikely that the women were sad to see such hard work be replaced. However, if technology is to be introduced that may have implications for labor displacement, a prudent policy consideration would be to provide alternative sources of income, employment and training for those who might be displaced. One way to deal with these consequences is to promote rural industry based on local materials. For example, in one Javanese village where brick making is a local industry, some women have turned to pounding gravel. Bricks are of higher

quality when the women are used, because gravel is a better substance for the bricks than the sand that is used when women are not involved. Thus, with some creativity, alternative sources of income can be found.

TABLE I Number of Sample Farmers Processing Rice with Hullers, and Numbers of Hullers in Sample Villages, 1970 and 1973 (*)

	No. of Farmers in Sample	No. of Farmers Processing Rice with Hullers		Number of Hullers in the Village	
		1970	1973	1970	1971
West Java					
Kab. Serang					
Sentul	27	0	0	0	0
Warungjaud	24	0	17	0	*
Kab. Cianjur					
Jati	29	15	29	3	5
Gekbrong	27	0	0	0	0
Central Java					
Kab. Banyumas					
Kebanggan	30	0	29	0	1
Sukaraja lor	30	0	22	0	*
Kab. Kebumen					
Bulus Pesantren	30	0	27	0	*
Patemon	30	2	25	0	1
East Java					
Kab. Ngawi					
Geneng	29	0	26	0	3
Gemarang	30	n.a.	21	0	2
Kab. Jember					
Sukosari	30	0	26	0	8
Tanggulwetan	28	8	27	n.a.	8

*Farmers from these villages used hullers in neighboring villages.

FOOTNOTES

1. This case history is relevant to one island--Java. Generalizations suggested here are not applicable to other Indonesian islands.

2. Ben White, et al. "Studying Rural Women in W. Java." Bogor, January, 1979.

3. IBID.

4. Amir U. Khan. "Present and Future Development of the Mechanization of Rice Production." Paper No. 71-06 (Manila, The Philippines: International Rice Research Institute (IRRI), 1971.

5. Personal Communication, Director Tomadias, Social-Economic Division, Nutritional Research and Development Center, Department of Health, Bogor, Indonesia.

6. A. T. Birow, "Pembaugunau Pertanian and Shategi Industrialisasi, "Prisma," (August 1972): 31.

7. Government of Indonesia, Department of Information, REPLITA II, p. 19.

8. Gary E. Hansen, "Indonesia's Green Revolution: The Abandonment of a Non-Market Strategy Towards Chance." SEADAG Papers (New York: The Asia Society, 1971); and Gary E. Hansen, The Politics and Administration of Rural Development in Indonesia. The Case of Agriculture. Research Monograph No. 9 (Berkeley: University of California, Center for South Southeast Asia Studies, 1973).

9. Kahn, "Present and Future Development of the Mechanization of Rice Production."

10. William L. Collier, et al., "Agricultural Technology and Institutional Change in Java," Food Research Institute Studies 13 (2): 174.

11. IBID, p. 185

12. Personal communication, Pudjiwati Sajogyo, Center for Rural Sociological Research and Soesarsono, Food Technology Development Center, Bogor.

13. Peter Timmer, "The Choice of Techniques in Rice Hulling in Indonesia." Harvard University: Center for International Affairs, 1975), p.25.

14. IBID.

15. Collier, "Choice of Technique in Rice Milling: A Comment. Bulletin of Indonesia Economic Studies Vol. X(1) March, 1974. pp.113-15.

16. IBID, p. 115

17. IBID, p. 108

TABLE * IBID, p. 109

CAN TECHNOLOGY HELP WOMEN FEED THEIR FAMILIES?

Post Harvest Storage, Processing, and Cooking; Some Observations

By

Maryanne Dulansey

This paper sets forth issues related to technology which can help rural women in developing countries in their major task, feeding their families. Ideas have been developed from field observations with colleagues whose continued interest in this problem is acknowledged: Bob Bates, Joan Fiator, Kenton Harris, Margot Higgins, Hugh Roberts, Moussa Salleh and Fred Weber.

Woman is the universal symbol of sustenance and nourishment. The symbol is based on reality. In the developing world especially, women have a great deal to do with food. Not only do women do the cooking, they plant the seeds, weed the fields, harvest the crops and carry them home. They are the ones who see to storage and preservation. Any processing that is done at home level is done by women. All of this is a great deal of work, especially for families who live at the subsistence level in rural areas throughout the world. A grain or starchy tuber is the staple item in the diet: corn, rice, millet, sorghum, wheat, potato, cassava, yam, taro, plaintain, sweet potato. Depending on the place, one of these is the mainstay of life, to be supplemented in good times with vegetables and some animal protein, and in times of scarcity to be substituted for or simply done without.

The international perception of the problem of hunger and malnutrition has shifted since the beginning of the Second Development Decade from emphasis on lack of food in general, to lack of protein--specifically in the "at risk" pregnant/lactating mothers and children under five--back to a lack of calories, usually expressed as an insufficiency of the staple food. If we were to have asked women, they would

have told us that there was not enough food to eat, especially at certain times of the year (just before harvest when the stores run out) and under weather conditions which adversely affect the crops.

In efforts to assist in the "war on hunger", U.S. development assistance agencies, both government and private, have tried various strategies ranging from food aid to technical assistance in growing food, from assisting with capital infrastructure such as roads and dams to family planning. One of the strategies currently receiving attention is that of appropriate technology. Since women are responsible for feeding the family, and thus the nation, can technology help women with this important task?

The obvious answer is, it depends. It depends not so much on the "what" of technology but on the "how". The conscious change in terminology from "technology" to "appropriate technology" is, I believe, the signal of an awareness that the "how" is much more important than the "what". It has come about because of the failure of technology to fulfill its development promises, yet it seems that the change in thinking has not yet come the full distance. Appropriate technology is failing in its turn to the extent that it does not concentrate on the how of application.

Why have we gotten into such a bind? It is because we have excluded people in our definition of technology. We have concentrated on the hardware, sometimes to the total forgetting of the people for whose use it is intended. Since such is indeed the situation, we should not be surprised to find that the technology is not used. Even as this omission is redressed, a similar error is committed. People may be brought into the picture, but they are rarely the right people, the women. They are the major potential users of technology related to food.

The answer to the question, "Can technology help women feed their families?" can be a positive one, given two conditions. "Yes", if women perceive the technology to work for them, to deliver what they need and want. "Yes", if women can pay for it, and be assured the benefit of their investment. In this regard, women of developing countries are no different from any other consumer group.

Before taking a closer look at these two conditions, let us look at women in developing countries, most of whom live in rural, subsistence farming situations, to see how they might find technology of use to them.

Women are very practical people. They have to be, especially the women we are talking about here. There is evidence of a belief that women enjoy their role as cultivators, as carriers of water and wood, as harvesters, preservers, preparers and servers of food. The "traditional woman" who spends long hours each day in the arduous work needed to nourish her family is well thought of. Yet if truth be told, women are human; they do not appreciate the hard work and long hours any more than men, even though social value attached to performance of these tasks is important to women. Indeed, women take the first opportunity to move into other occupations, usually small commerce, so as to escape to some degree these tasks. If they are able to earn money, they hire other women to hand pound or grind their staple food if mechanized milling is not available. They pay others to carry water and wood, to prepare meals, to care for children, and even to nurse them. Therefore, women are prime candidates for technology which helps them cut down on the work involved in the whole process of getting food to the family, or so it would seem.

What is the problem, then, with the technologies which are available, and which have been introduced in developing countries? Our first condition, negatively stated, is that women have not perceived the technology to work for them, to deliver what they need and want. What good is a solar cooker to the woman who spends her time in the field from sunup to sundown? If her family doesn't like the taste of the food made as a result of applying a technology (which may range from improved seeds to various types of processing), how valuable is the technology to that woman? If improved storage has the effect of taking the staple out of the control of the woman responsible for delivering it to her family, can she be expected to embrace the improved technology? If the woman is not aware of the technology and what it can do for her as food provider because technologies have been, and continue to be, delivered to men, then how can she be expected to respond? And lastly, no one appreciates displacement, especially women who must support themselves and their children--a significant group in developing countries. They are vulnerable to sudden loss of income-producing activities caused by improved technology. All women agree that hand pounding/grinding of staples is onerous, yet how will the woman who presently earns her keep by grinding the grain of others survive with the introduction of a mechanized mill?

Technology introduced by those outside the community runs great risks of failure, since it is difficult to know and understand all the factors which condition women's

perception that the technology will work for them. Those closer to the community may also unwittingly find women "invisible" in their food-related tasks. This invisibility was marked in work on post harvest loss in Senegal and El Salvador and on rural development in Peru. In the former cases, it was extremely difficult to get accurate information about the procedures in post harvest handling, because the women, who did the tasks, were consistently ignored and the men simply did not know the answers so they "approximated" them. In the latter, although women could be observed working in the fields, the investigator was consistently told that women do not work in the fields. When a photo was produced showing both men and women in the field, with the women bent over working and the men standing upright, it was still almost impossible for women to respond with the realization that it was they who were working.

If women are not party to the development and application of both tools and methods--the hardware and software of technology--how can they be expected to think it useful to them? This becomes dramatically important when women produce items for sale. Developers could well learn from entrepreneurs who find a market before they make a product to be sold. In effect, nothing has been done to match the product to the market, the specific technology to the intended user. Small wonder there is so little demand from buyers and crushed hopes from "producers".

The other condition under which technology has not proved useful in helping women feed their families is that women won't pay the price of that technology, when not convinced of the benefit of their investment. Problems with available technology can often be reduced to economics, to the fact that the technology is beyond the economic reach of those who need it. Often this most obvious factor is ignored by technology purveyors from developed countries who make an unwarranted assumption of the economic capacity of potential users, or fail altogether to take it into account.

Take the example of an American scientist who, travelling in Egypt, observed the laborious way in which people were lifting water from the Nile River, and had an inspiration. He thought of the principle of the drinking bird, the curio that, once set in motion, continues to bob its head up and down. Surely that simple principle could be applied inexpensively to save the fellahin from such a painful task. Some five years and one major study later, it was sadly concluded that the cost to the users would be too high, and the project was abandoned. Surely an early estimate on cost and economics could have shown the problem.

The word "appropriate" currently qualifying the word "technology" is often thought of as signifying low cost. It is time to come to the point of admitting, both intellectually and emotionally, that the cost of the currently proposed appropriate technology is not low enough to reach rural women in developing countries, who have even less access to resources than do men.

Women are not only practical, and planners, they are also managers. Again, they have to be. In the marginal circumstances of most developing people, the difference between life and death rests on the managerial talents of the women of the family. Women in Niger achieved increased status within the family as a result of the drought. Men acknowledged that had the women not done so well in keeping goats which were sold to buy food grain, the family would have perished. (Food was scarce, but was available throughout the drought; lack of money to purchase it was the major problem.) Women can be observed to apply sophisticated scheduling and prioritizing techniques in their daily work which respond to a number of complex and changing conditions, especially in situations where resources are extremely limited. Women also devise time- and labor-saving techniques.

Daily planning is required for women to fulfill their responsibilities for feeding the family, in addition to child care and maintenance of the home. Providing food can be broken down to five major activities--farming, trading, getting water and wood, processing, and cooking. All these tasks are time and energy-consuming and must be scheduled so that they will get results under varying conditions. Weather affecting the agricultural cycle is a major condition, and is often critical. For example, activities must be shifted suddenly to take advantage of the rains at planting season; women in parts of the Sahel sharply curtail food processing and cooking during rainy seasons so they can spend more time in the fields. Water is more abundant then; thus women do not travel such long distances to get it. In Upper Volta it was reported that women stockpiled wood near their fields in advance of the rainy season so they could carry it home at the end of each day, saving the time and effort usually spent gathering it, often at considerable distances.

Women constantly make decisions based on the relation between cost and benefit. Women's success in seeing that their families fare well necessitates a high degree of skill in applying management techniques. In areas of Senegal where millet is the staple grain, but cash crop peanuts can also be grown, a sensitive mechanism is at work. Investigators working on a methodology to assess post harvest grain loss were

puzzled to find that although the women farmers realized that leaving millet in the field beyond the time required to dry it resulted in the grain loss to birds, rodents and insects which could be prevented, they nevertheless persisted in this practice. Later it was found that evidently the farmers made the choice of delaying millet harvesting in order to harvest the peanut crop.

Moreover, women are skilled decision-makers when it comes to the question of whether or not they benefit from new technologies. Women are at an even greater disadvantage than men in acquiring money. Therefore, they make harder decisions about the investment of their resources. It has been suggested that women's consistent lack of interest in reforestation activities in Niger (and the Sahel in general) is not so much due to the traditional male-female division of labor as to the fact that women do not find it worthwhile to invest time and labor in the planting of trees which they most likely will not be able to utilize, given the system of land use.

Women's benefit from investment is a matter of women's judgment, and is something that they do decide for themselves. Of a group of women extension agents in Cameroun many found polygamy undesirable, but none the less favored it on the basis of sharing work among wives. When it came to the holding of goods in common, the percentage of those in favor dropped sharply. Researchers commented that women in Upper Volta were engaged in income-generating activities, yet seemed to spend most of their money on festivities rather than on more "serious" investment. Upon closer inspection it was found that the festivities were important social events which gave women status and carried economic considerations, that society's means of insurance of help in the future. In Cameroun, joining a credit union was seen by women to be a drawback, because their husbands could lay claim to a "loan" from the wife simply by asking to be shown the passbook. Some women in Senegal where a change in millet grinding from hand to machine methods is being considered raise the question of title to "waste products". It has been traditional for the women to reclaim the approximately 10% of waste and use it for various things from chicken feed to human food to scouring material. With the mechanization of milling, women will lose these materials, or so they fear.

These illustrations, which are taken from real cases, most of them in the Sahel, indicate that as currently practiced, the provision of technology from richer to poorer societies must be radically changed if there is to be any hope of success. There must be an equality between

technologist and user, especially where women in their important task of feeding families are concerned. Together they must;

- identify and develop methods and machines which meet the needs of the users,
- beginning with the technology currently in use,
- operating within the context of the resources available to the user community, and
- relying more heavily on the methodology, or the software, of technology.

Many indigenous technologies are in use to aid women in their task of feeding the family, or have been used in the memory of rural women. These must be consciously recovered, examined by a group made up of technologists, the benefitting village women, and any others who act as the bridge between. However, before that can happen, a change in attitude on the part of the technology purveyor is required. Our experience signals a need for more humility and respect for women in their role as feeders of the family than we have shown to date.

Women, in turn, are more likely to perceive a technology working for them if they are decision-makers in the development process of that technology. Their input further assures them of a technology that has a greater chance of existing within their economic means. They are more likely to take the risk of using it. Only after this point is reached can we know if technology can help women feed their families.

THE PLIGHT OF THE INVISIBLE FARMER: THE EFFECT OF NATIONAL AGRICULTURAL POLICY ON WOMEN

by Louise Fortmann

As a general rule, national agricultural development policies seem to proceed from the assumption that either agricultural producers are all male or the sex of producers is not a relevant factor. Occasionally the productive role of women is acknowledged at the rhetorical level, but this is rarely reflected in national policy. Rather, planners appear to operate from a world view in which only men are producers. Women are seen as reproducers and consumers of both goods and social services. Both their labor and their production problems are for all intents and purposes invisible.

If there were little or no difference in the roles and resources of men and women, this would be of little consequence. But often the differences are significant. Hence, agricultural development policy which ignores or misunderstands the needs of women producers may have adverse effects on women and/or fail to increase agricultural production.

In order to understand the effect of agricultural development policy on women, it is necessary to identify their roles in agricultural production. In any given country it may be necessary to make this determination separately for women by class, ethnic or religious group, and marital and parental status. Once the relevant divisions have been determined, the following questions can be asked for each group:

What do women do? Do they grow cash or subsistence crops? Are they wage laborers or independent producers? Do they care for livestock or poultry?

How do they do it? What technology are they using? What are the institutional arrangements that govern their access to land, labor, and capital?

What benefits do they receive? Do women control what they produce? What share of the profit do they get?

Once women's role in agriculture has been determined from the perspective of these three questions, some fundamental questions about policy can be formulated. Again, the policy questions must be asked separately for each group of women, since the general problems of women producers are often magnified in poorer or female-headed households.

a) Are there factors constraining the role of women in agricultural production which fall into a policy vacuum, or are women the subject of policy which has not been enforced?

b) Do policies include women in the target population but fail to reach them because of program design?

c) Do policies adversely affect the position of women?

d) Are policies designed so that women receive the benefit from the labor they contribute?

Using this framework, this paper explores the effect of agricultural policy on women in Tanzania. Tanzania presents a particularly interesting case because equality between the sexes is an avowed government policy. The President has a strong personal commitment to improving women's status and has repeatedly stressed the importance of their contribution to development. Women have been appointed to the highest regional and district political offices. University entrance requirements were adjusted to facilitate the education of women. And women are registered independent of their husbands and fathers as members of their village. The latest policy initiative was the February 1979 announcement by the Vice President that the exclusion of women from mosques was inconsistent with the national policy of equality. As a result, some mosques were open to women for Maulid (1).

Women are central to Tanzanian agriculture. Of economically active women, 97.8 percent are involved in agriculture. Their work is most significant for village and household production. Some women are also involved as wage laborers, but they make up only 5 percent of agricultural employees (2). Women traditionally have been responsible for the subsistence production which feeds the family (3). Often (but not always) men will help with some of the heavier work, such as clearing and cultivating. Weeding is almost exclusively a women's task. If the household has cows, women are generally responsible for milking them. While cash crops are

considered men's crops and men control the money received from them, women do a considerable amount of the work, especially the tedious tasks such as thinning and weeding. Women are also important to agricultural production because they do all domestic maintenance work--food storage and preparation, cleaning, collecting firewood, and hauling water. Thus women not only work more hours per day and more days per year in agriculture than men, but their domestic work also frees men to spend such time as they may choose in agricultural work.

Given this central role of women in agricultural production and the serious effort to promote the status of women, it might be expected that agricultural policy would take account of their needs. This has not, however, been the case in several respects.

Factors Constraining Women's Agricultural Production Which Are Excluded from Agricultural Policy

The most critical factor in agriculture is access to land. Access to land in their own right has become increasingly important to women because of the monetization of the economy and the breakdown of traditional support systems. Monetization of the economy has placed women in the position of needing cash to meet both subsistence needs and government requirements such as school fees. Breakdown of traditional forms of social security such as the levirate or the right of return to the household of one's father or brother has left women economically vulnerable in the event of losing (or never obtaining) a spouse.

All land belongs to the nation, and in theory every citizen has the right to its use. But commercialization of agriculture and land pressure in some areas have made land in many instances an increasingly valuable and scarce resource. For the most part, allocation of land to individuals is in hands of elected village councils. In practice, traditional land rights have considerable influence over the allocation process. The traditional right of women to hold land varies significantly from tribe to tribe. Zaramo and Luguru women have traditionally had the right to inherit or to apply to their clan for land. Arusha widows may continue to cultivate their husband's fields, but upon their death their sons and not their daughters inherit. Haya women do not inherit their husband's land and may be removed by the son who does (4). Village councils have been known to refuse to give land to women and to deny women's groups land for planting permanent cash crops (5).

For a woman, then, access to land often becomes a function of having a living husband. Or she may try to raise money to buy land (6). In theory the policy of ujamaa provides women with independent access to land. But it is only in a very few places that ujamaa production has reached a level that meets the subsistence needs of the members.

The inability to hold land not only reduces the production potential of women; it keeps them economically powerless and forces them into master/servant relationships with their husbands or fathers. Because a woman's need for land is not perceived as a problem (or is perhaps perceived as a threat), there are no procedures by which she can enforce her theoretical right to have it. The establishment of such procedures and clear-cut rights to land for women involves extremely complex issues--residence rights, cultivation rights, and resolving conflicting systems of inheritance. But this lack constitutes the single greatest gap in Tanzanian agricultural policy in terms of women.

A second difficult policy area is that of legal rights over children. Children are economic assets in rural Tanzania because they provide a supply of labor (7) and are relied upon for support in their parents' old age. Children are traditionally the estate of the husband (and, often, his male relatives), and he may take them after the age of seven (roughly the age at which they cease being only consumers and can be useful in herding, weeding, and so on). Thus a divorced or separated woman, even if she has land, may be left without the assistance of her children in her fields and their support in her old age.

A third issue concerns the failure to define the women's domestic activities as an enabling function for agricultural production. Women spend a great deal of time in drudgery which directly or indirectly contributes to production. A case in point is the provision of water, which has most frequently been defined in terms of social welfare. In fact it is properly a matter for agricultural policy. Not only is water directly necessary for the utilization of many improved agricultural technologies (water for irrigation, water for mixing with chemicals, water for livestock and poultry), but a significant part of most women's day is spent in carrying water--for both domestic and agricultural needs--time which might otherwise be applied to more productive activities. Tanzania does, in fact, have an ambitious village water program, but its importance in relieving a constraint on agricultural production, particularly subsistence production, goes basically unrecognized.

Agricultural Policies Which Are Implemented in a Way Which Excludes Women

Some agricultural policies are intended to affect all cultivators, but because of women's special problems of access they are excluded. The extension service is a prime example. Because the system is designed as if women did not do most of the work, extension agents and agricultural information rarely reach them. Data from a study of the National Maize Project (NMP), a production project, are presented in Table 1.

Table 1. Comparison of male and female information contact scores† (by region and participation in the National Maize Project)

	Males	Females	t
Arusha			
Participants	4.08	3.54	0.68
Nonparticipants	2.16	1.24	2.27*
t	4.33***	5.73***	
Morogoro			
Participants	5.18	2.87	2.52**
Nonparticipants	2.75	1.51	2.60**
t	4.66***	2.89***	

N = 485

* Significant at .05 level.

** Significant at .01 level.

*** Significant at .001 level.

†The information contact score consisted of the following items: knows the extension agent's name, visited by extension agent in the past year, attended a farming demonstration in the past year, knows there is a demonstration plot in the village, listens to the agricultural radio program, reads the agricultural magazine, has seen a film on maize.

Data from (6).

On the whole, women scored significantly lower than men on the information contact score. This reflects the prevailing norms about appropriate behavior for women and the staffing pattern of the extension service. Most of the extension staff are male. There are social constraints on male/female interaction which reduce the likelihood of a male agent's talking directly to a female farmer. Further, the conventional wisdom that women cannot reason as well as men reduces any incentive for working with women. The result is a system under which women must rely on a man to relay the information second hand from the extension agent. (In Morogoro Region, for example, extension agents visited 58 percent of the men participating in NMP but only 20 percent of the women [9].) Reliance on indirect communication runs the risk that the information may not be transmitted accurately. This is particularly important because women actually implement the decisions their husbands may make on the basis of the extension agent's advice. Further, female heads of household (roughly 25 percent of the population) may have no channel of information at all. There is a clear need for female extension agents or some other means by which women can obtain equal access to the technical information they need.

The extension service is primarily male, because women have not been admitted to agricultural training in large numbers. In 1975 only 25 percent of the graduates of Agricultural Training Institutes (the source of extension agents) were women, and 25 percent of these were studying nutrition, not agriculture (10). Very few women were sent to the (now defunct) farmer training courses. Women's child care responsibilities constrain their ability to attend training courses. The current Folk Development Colleges do not always have facilities for child care or nursing mothers.

Access to relevant new technologies also tends to be a problem for women. Although Tanzania has a vigorous food crop research program, the majority of agricultural research is directed toward cash crops, which are controlled by men. Some of the cash crop technologies could be utilized by women on their subsistence crops. The ultra-low-volume (ULV) sprayer, for example, developed for use on cotton, could as easily be used on maize. However, most cash crop inputs, including sprayers, are distributed through the cash crop authorities to their growers; hence women tend to be excluded.

In general, credit and input supply programs seem not to reach women producers. Only 8 percent of the participants in the National Maize Program in a sample of 27 villages were women (60 percent of these being female heads of households).

In two villages there were no women participants at all, reportedly because the men refused to allow them to buy inputs (11).

It is not altogether clear why women did not participate. It is, however, clear that the answer is not that they are inferior farmers. As the data presented in Table 2 clearly show, women who participated in the program were as progressive as the males, while male nonparticipants were as traditional as female nonparticipants. It may be that discrimination against women by program administrators was not limited to only two villages. Since female-headed households are often the poorest, they may not have been able to afford the inputs or to risk taking credit for them. In the case of a wheat credit program, farmers with small acreages (often the case with female heads of households) could not afford to put their land into wheat production. In order to include women in production programs, the constraints under which they operate must be considered.

Table 2. Comparison of male and female good maize practice scores (by region and participation in the National Maize Project)

	Males	Females	t
Arusha			
Participants	9.88	9.68	0.00008
Nonparticipants	4.09	4.17	0.125
t	9.38***	7.39***	
Morogoro			
Participants	6.81	5.83	0.856
Nonparticipants	4.08	3.55	0.896
t	4.07***	3.34***	

N = 485

*** Significant at .001 level

Data from (12).

Policies with Adverse Effects on Women

Some policies have adverse effects on women by increasing their work load, which already averages over ten hours a

day. Nonagricultural policies can have this effect by luring men away to wage labor, leaving the women to run the household farms completely alone. Other policies emphasize technologies which require additional labor--usually women's labor. It is the women who must carry the forage and extra water required by exotic breeds of cows and poultry. Women carry the water for backpack insecticide sprayers. Women do the extra weeding that follows the use of fertilizer. Women harvest, thresh, and sometimes carry to market the extra produce from high-yielding varieties. Sometimes ujamaa falls under this category. In some places villages were forced to cultivate an ujamaa farm. It was not an uncommon response for men to send their wives to work on this farm as the token family members. These women then had ujamaa field work added to their regular work load, often without much return.

A second set of policies may adversely affect women by driving them out of agriculture or significantly reducing their income-generating capacity. In the past few years the Tanzanian government has indicated increasing interest in production on large mechanized state farms. These parastatals often utilize so much land that they create a land shortage in their immediate vicinity. Land shortages can be expected to aggravate the problem of women's access to land. This is not compensated for by access to jobs. The high-paying nonmanagerial jobs on such state farms--driver, mechanic, foreman--are reserved for men. For some crops--sisal, for example--only men are employed. In other crops the proportion of women workers is minute. Regulation of markets, including the imposition of market fees, may have the effect of precluding women from selling their own produce. Relatively few women in Tanzania actually sell in the market. Those who do tend to be smaller operators who can least afford these fees (13).

Ensuring That Women Benefit from Their Labor

President Nyerere has said, "Women who live in villages work harder than anybody else in Tanzania." Often they fail to get the benefit of all this hard work.

The early settlement schemes, for example, were planned in terms of male settlers and their families. In some schemes, settlers left their wives at home to tend the family fields and picked up a female companion along the way. These women did most of the work but, having no legal status, had no right to the fruits of their labors (14). Ujamaa policy, which gave women individual membership, provided a partial

solution to this problem. But even women with the legal status of wife have no guarantee that their husbands will share with them the profit from the cash crops which they helped to grow. Finding a means of protecting women's interests, particularly in the latter case, is highly problematic.

Tanzanian agricultural policy has been shown, despite the best intentions of the government, to ignore or run counter to the interests of women on a fairly regular basis. Access to land, the extension services, inputs, improved technology, and credit are inadequately provided them under existing policy implementation. The production-enabling significance of their domestic activities remains unrecognized.

One might speculate that women farmers are invisible because there are no women on the planning staff to look for and look out for them. There are no women in senior policy positions in any of the organizations dealing with farmers--the Ministry of Agriculture, the Tanzanian Rural Development Bank, the National Milling Corporation, or the cash crop authorities.

Solving the problems of female farmers is no simple task. Family power relationships and negative attitudes do not lend themselves to simple solutions. But an agricultural policy which ignores women is in a real sense not an agricultural policy at all and is doomed to be ineffective. Women producers must have secure rights to land and labor; must have access to information, inputs, and improved technology; and must benefit from their own labor. Without these, to the detriment of national production, their yields will remain low and their potential wasted.

References and Notes

1. Daily News (Dar es Salaam), 7 February 1979.

2. C. Koley, "Agricultural data," pp. 149-155 in The Population of Tanzania, Census Volume 6, B. Egero and R. A. Henin, eds. (Bureau of Resource Assessment and Land Use Planning, University of Dar es Salaam, and Bureau of Statistics, Dar es Salaam, 1973).

3. There is relatively little class formation in Tanzania; hence it is possible to speak generally of Tanzanian women as a whole. Some differences between ethnic groups are described in this paper. Problems are almost invariably aggravated for female heads of households.

4. R. Young and H. Fosbrooke, Smoke in the Hills (Northwestern University Press, Evanston, Ill., 1960), p. 61; M. L. Swantz, Ritual and Symbol in Transitional Zaramo Society (Gleerup, Uppsala, 1970), pp. 96-97; and M. L. Swantz, "Strain and strength among peasant women in Tanzania," BRALUP Research Paper No. 49 (Bureau of Resource Assessment and Land Use Planning, University of Dar es Salaam, 1977), pp. 6-7.

5. Planting permanent crops is sensitive, since, for example, the person planting an orange tree retains possession of that tree regardless of who owns the land.

6. Contrary to government policy, land in some places is openly bought, sold, and rented. The only businesses readily open to village women are brewing beer and, in a few instances, petty trading. Haya women have a reputation for becoming prostitutes, using their earnings to buy land.

7. Universal Primary Education presumably is reducing the amount of such labor.

8. L. P. Fortmann, "Women and Tanzanian agricultural development," Economic Research Bureau Paper No. 77.4 (University of Dar es Salaam, 1977), p. 14.

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BASE-LINE STUDY FOR SOCIO-ECONOMIC EVALUATION

OF

TANGAYE SOLAR INSTALLATION

by Grace Hemmings-Gapihan

In 1978 I conducted a baseline socio-economic study in the village of Tangaye, Upper Volta. The study preceeded the installation of a solar unit, the first of its kind in Upper Volta. Research was focused on the three issues affected by the installation of the solar unit in the village. These were: 1. the need for alternative, inexpensive, sources of energy; 2. the need for labour saving devices, particularly for women; 3. most significantly, the means of integrating a highly complex technology into village society. In regards to the third issue, my purpose was to discover, and perhaps activate, the structures within the village that could potentially administer the solar unit. This is to say distributing the services equitably and permanently, as well as providing adequate maintenance.

Description of the solar unit

The solar unit consists of two components: a solar cell array designed to transform solar energy into electricity, and a battery designed to store electricity. This photovoltaic system, as it is so named, supplies the electric energy necessary to power a food grinding mill and a water pump. The mill has a maximum food grinding capacity of 92 kilograms of sorghum per hour. Millet and maize may also be ground though at a reduced hourly capacity. The pump is capable of pumping 1,457 liters of water per hour. One of the most significant attributes of the solar unit is that it has a battery that stores energy. Although there are other solar energy units in Upper Volta, this system is unique in the country.

Description of Tangaye

The village of Tangaye was chosen as the site for this pilot project for many reasons; among them the village's accessibility. It is located on a major road linking Ouagadougou, the capital of Upper Volta, to Fada N'Gourma, a semi-urban administrative center. Since most of the technical monitoring of the unit originates from Ouagadougou, ease of access was an important consideration in the selection of a site.

Tangaye is a large village with a population of approximately 2,000 inhabitants. It is located in a high population density rural zone. There are at least 40 inhabitants per kilometer square. Residents refer to themselves as the Zaose and are genealogically linked to the Mossi. According to their accounts they are sedentarized pastoralists. Most of the villagers combine subsistence agriculture with animal husbandry.

The village is located in the eastern region of Upper Volta within the sudanic zone. Roughly speaking there are two distinct seasons characteristic of this zone. These are: the dry season from November to May, and the rainy season from June to October.

During the rainy season farming is practiced to the exclusion of all other activities. Farmers cultivate the staples, millet and sorghum. Small quantities of corn, rice, and peanuts are grown in addition to a variety of other products.

Activities during the dry season vary. High pouplation density and poor soil conditions contribute to inadequate food supplies. Since the villagers do not produce the necessary quantity of food to sustain themselves for the entire year, dry season activities are crucial. Villagers must earn money, during this season, to supplement their meager food supply. They do this by engaging in all forms of small scale business ventures. These include migrant labour, production and sale of crafts, and marketing processed foods. Thus food processing and water consumption are at their height in the dry season. It became quite clear that this was the season in which labour saving devices of reduced energy costs, such as promised by the solar unit, would be most useful.

Labour saving devices and the cost of fuel

Everyone agrees on the importance of solar energy systems, especially in countries such as Upper Volta, where there are few natural energy resources. Wood is the main fuel utilized by the majority of the population. Suffice it to say that defforestation, in this drought ridden land, is a growing problem.

When one considers the energy supplies required for powering food grinding mills, the fuel problem in Upper Volta aquires greater significance. Mills are powered by diesel oil which must be imported at rising costs to the millers. In the past the population has seen the cost of milling services increase with the rise in fuel cost. The increase in rate means fewer people can afford to use the mills. A vivid example of this is provided by the case of a milling establishment in the vicinity of Tangaye. When the cost of fuel rose 33 three years ago, the miller raised his fees 25 percent. This raise was equal to two american cents. (5 francs CFA). As a result of this he lost so many customers that he was obliged to open the mill twice a week, on market days, rather than every day as he had done in the past. Few people in the area could afford the 25 percent increase in milling rates. Expenditures for fuel comprise 50-60 percent of the monthly cost of running the mill.

Clearly an inexpensive source of energy is essential if the residents of the area are to have access to labour saving devices. The limited monetary resources of the people places major constraints on the degree to which they may utilize local labour saving devices, particularly in light of rising fuel costs.

Use of commercial mills in the area

As forementioned, the villagers have had experience with labour saving devices in the form of commercial mills. Interviews and observations at these mills revealed the degree to which the population in the village and elsewhere relied on the services of the mill.

There were two such mills in the vicinity. Villagers reported that almost all families had utilized commercial mills at least once. Nonetheless, use of the mill was, and remains, infrequent. Approximately 61 percent of the visits were made after 1975. This was so despite the fact that mills had been in the vicinity since 1968. The majority of these visits (55 percent) were made during the rainy season.

Large quantities of millet, more than eight liters, were usually ground on these visits.

Most of the villagers did not visit the mills regularly. Those who used the mills regularly were generally vendors who sold regularly in the market where the mill was housed. The majority of the residents of Tangaye availed themselves of the services of the mill only on special occassion.

Daily observations at mill sites revealed that more than 90 percent of the customers utilizing the mill were women. They were, for the most part, residents of the village in which the mill was housed. They came to grind small quantities of grain for the evening meal. This shows that the services of the mill are still in great demand even for women who do not market as regularly as vendors.

Solar mill and pump: labour saving devices for women

The two segments of the population most directly affected by the services provided by the solar unit are women and herders. Women are primarily responsible for furnishing the drinking and cooking water used in their homes. They are also responsible for processing grain for the preparation of all the food consumed in the village.

One of the questions that I set out to ascertain was the degree to which the pump and grinder would be a labour saving device. Exactly how much labour and how much time was involved? To do this it was necessary to measure as accurately as possible the time consumed in food processing and water procuring activities. This segment of the study was divided in two sections: 1. food processing activities among women and; 2. water procuring activities among men and women. In addition, an estimate of daily food and water consumption was made, thus establishing the extent to which the services of the solar unit would meet demands in the village.

Food

It was established that diet, food preparation, and level of consumption varied significantly from dry to farming season. Time constraints and available food resources showed marked seasonal variations.

The dry season is the social season. A larger variety of food is available in greater quantities. This is because it is the season immediately following the harvest. Food preparation for feasts, and more commonly for marketing, takes on added importance. Grain is usually ground for the

purposes of brewing beer and baking cakes commonly sold on the market. During the dry season it was shown that women spend at least 60 percent of their work day processing food and fetching water.

In the rainy season, however, women had to devote the greater part of their work day to farming. Marketing diminishes. The frequency of consumption of food increases with the expenditure of energy required for farm labour. During this season food is prepared twice a day. Sometimes large cultivation parties organized for bride service require large scale preparation of food. The burden of labour increases twofold for women at this time. They must cultivate as well as prepare meals twice as often.

Yet the women employ many labour saving devices. These, coupled with the greater availability of water during the rainy season, cut down on the time women devote to processing food and obtaining water. Thus women spend only 30 percent of their working day processing food and obtaining water. It must be stated that their working day was considerably longer in the rainy season. In absolute terms women diminished their cooking time by an average of one hour, and the time spent in search of water by one hour and ten minutes.

They diminished their cooking time by altering various aspects of their customary food processing methods. This included occasionally cooking whole grains rather than making flour, and grinding a coarser grind rather than a finer flour. A kilo of red sorghum may take anywhere from 20 minutes to one and a half hours to grind depending on the quality of flour desired. Thus women may save up to an hour of grinding time if they are willing to eat coarsely ground flour.

It was established, therefore, that the mill would be a great help to women in the dry season when the volume of food processing was at its height. Women had already found ways to diminish the time spent in food processing during the rainy season. Therefore, the presence of a mill might affect the quality of the food consumed rather than contribute to any great degree to the time saved in processing. Especially when one considers the time taken to travel to the mill, waiting to be served, etc.

Water

Villagers use of wells showed dramatic seasonal variations. People depended entirely on wells for their water supply during the dry season. During the rainy season, how-

ever, the wells are almost never used. The population relies on seasonal sources of water provided by the often torrential rains. The earth in this area is not very absorbent. Water slides off the soil and settles in depressions in the earth, thus forming pools. These pools are often more conveniently located than the wells. In addition, the people prefer certain types of water laden with calcium-like soil deposits. They label this type of water white water. It is considered to be healthier and more palatable than well water. Hence, the water pump will have added importance in the dry season when water is scarce and people must drink, bathe, cook, wash their clothes, and water cattle from diminishing sources of water.

Many wells dry out at this time of the year, rendering the population dependent on a few sources, and forcing women to travel long distances in search of water. This is a time of numerous conflicts over the use of water sites, particularly between women and herders. Herders, often the proprietors of the wells, forbid women the use of the wells at certain times of the day when they must water their cattle. Women often have to wake up very early in the morning, before sunrise, in order to obtain enough water to meet their daily needs. Women averaged ten trips per day to the water sites during the dry season. They covered a distance of approximately 14 kilometers per day. This distance was covered while transporting heavy containers of water. Herders had to lead animals to the wells and supply them with large quantities of water.

The solar unit provides one pump, located on one of the major wells of the villages. As a labour saving device, it is quite limited. The pump relieves the effort of drawing water from the well. Clearly, the pump will be much more attractive to herders than it will be to women. The main burden in this case is the necessity to draw large quantities of water. Women, however, must transport water over long distances. Thus the main effort is in the transportation. I would venture to say that, given a choice, women will utilize the nearest source of water rather than the pump. Herders, however, will simply walk their animals a greater distance in order to utilize the pump which will save them the effort of drawing water. This arrangement may still be advantageous to women. Women may find that the wells closest to them have been liberated, once the herders are drawn to the pump.

Management of the solar unit

Technical aspects of the functioning of the mill are by no means the most important considerations. Most important is the integration of such a system in the recipient society. There are numerous examples of useful technology either being abandoned by the local population or giving rise to social abuses.

It seems to me to be out of the question to expect government agencies in Upper Volta, a country poor in administrative resources, to be solely responsible for the management of the mill and pump. Indeed, if the project is to be extended to other areas, it is imperative that the management of the mill be local. My purpose in designing the management plan was threefold: 1. to stimulate personal interest on the part of the villagers in the management of the mill; 2. to make the services of the mill accessible and profitable to all segments of the population; 3. to minimize the possible social abuses in the distribution of the services.

We are dealing with a complex and delicate issue requiring sensitive handling and striking at the very foundations of common procedure at the inception of development projects. Since it was my opinion that the solar unit would be best run by the villagers, I began by investigating traditional means of management of public works within the village. The traditional political system was the first branch investigated. In the past, the chief of the village had the authority to invest certain individuals with the power to administer public resources. However, since the advent of colonialism, the village chief has been divested of the power to administer. In addition he can no longer tax the villagers and use the revenue, as he once did, for managing public works. In fact, all of his present resources are personal. If he were to manage the mill it would have to be managed as his personal property and thus run the risk of using the mill to enrich a minor segment of the population.

The other solution was to open the possibility of management to all segments of the village population. Villagers show great talent as business managers. I investigated the management of water resources and milling enterprises specifically. There are also, however, numerous examples of enterpreneurship in the village. All of these, whether water resources or milling enterprises, were privately owned despite the fact that use of the service open to the community at large.

If the villagers are to apply their management skills to the solar unit, the delicate issue of private management of public property is raised. I devised a system in which the villagers would be able to invest in the mill and share in the profits from the services provided.

The idea of not charging for the services of the mill was dismissed because of potential conflict and monopolization of resources by a certain segment of the population. In addition, if the services were free, it would be impossible to equalize access to the mill without excessive policing. Hence, a reasonable price for the services was charged.

Those willing to invest in the mill by providing services and the money for the operating costs would have a part of the monthly profit. Part of the monthly profit has to be put aside for future investments in development projects within the village that the villagers themselves would decide upon. In this way, private investors and the entire community will benefit from the profits gained from the milling enterprise.

In order for this system work, it is absolutely necessary to have input from the population. This requires an intensive information program permitting villagers to criticize the system, detect possible flaws, suggest improvements, or even propose other management plans better suited to their needs.

Even before the mill is installed, it would be necessary to inform the villagers of the implications of housing such a system in the village. They should then be asked if, given the risks, they would want it to be installed, The villagers would then decide, knowing the full implications of housing such a unit.

Although investment in the mill should be open to all villagers, no one should be coerced to invest. Only those who want to participate should do so. Those who have doubts should have the option to see if the system works before commiting themselves to an investment.

The villagers should make all the decisions relating to the organization of labour, the repartition of profits, etc. Last, but not least, provisions have to be made for maintenance and repairs of the mill. Permanent members of the village, particularly those most concerned by the services offered, (women and herders), should be trained in the proper maintenance and repairs of the mill and pump.

Alienation, resulting from the inability to understand the technology on which they are depending, and from the lack of personal investment in the project, must be avoided at all costs.

Too often development efforts of this nature fail because of insensitivity to crucial elements of societal structures available for the integration of new technology in village society. Project designs fail to take into consideration the needs of the population, their resources, and their often excellent suggestions. The knowledge that the recipients are more conscious of their needs, more capable of suggesting adequate solutions than most expatriates or government officials generally divorced from the setting for which they are expected to design development projects, is crucial to the success of any project design.

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[1] The name given to a young man's obligatory services, prior to marriage, to his future father in law. This usually takes the form of periodic cultivation of the father in law's fields.

WOMEN IN IRAN

TECHNOLOGICAL CHANGE AND SOCIAL TRANSFORMATION

by Daniel Lerner

When the history of the twentieth century is written, it may turn out that the most important social revolution in this revolutionary century was the "liberation" of three-fourths of the human population. Throughout recorded history, virtually all societies have been dominated by elder males. It is only in this century that all females (roughly 50% of the total population) and younger males (roughly 25%) have been freed from traditional constraints and allowed to enter actively into the world of public affairs.

Few people now alive remember that, even in the Western world, adult women did not receive the franchise until after World War I and people of both sexes under 21 not until long after World War II. Yet, these innovations in the more developed countries (MDC) have produced a tidal wave of social change that already is transforming individual, family, community, national, and world relations. These transformations are likely to continue well into the next century, particularly in the less developed countries (LDC).

Most striking has been the effect of "liberating" women and youth in the third quarter of this century. Consider that the only three elected female prime ministers in the world have been in LDC countries--Mrs. Golda Meir in Israel, Mrs. Gandhi in India, and Mrs. Bandanaraike in Sri Lanka. In this respect, LDC has already "leapfrogged" MDC in this crucial transformation of social relations. The West has had many illustrious queens who reigned by vox dei, the voice of God transmitted by the "divine right" of genealogical bloodlines. But it has produced no females who governed by vox populi, no presidents or prime ministers elected by the voice of the people rather than ordained by divine prescription. Consider that in the United States, the self-proclaimed innovator of democratic institutions in our century, only a few women have served in the President's Cabinet

and no woman has ever been named to the Supreme Court. In this dimension of public life, MDC has much "catching up" to do.

In many other dimensions, less grandiose than governance but more meaningful in the daily round of life, it is LDC that has the "catching up" to do. Note, for example, that none of these three female prime ministers was elected in a Muslim country. In the Islamic world, given the strictly interpreted Koranic injunctions against women's faces in public places, the transition has been more difficult. This has been especially true among Shi'ite Muslims, who traditionally have been even more severe in constraining their women than the majority Sunni of the Arab countries, where a woman was traditionally worth less than a camel.

A Muslim woman was only a brood mare, designed to produce a child--hopefully male--each year. It was understood that one of every three children would die at birth or before it reached the age of five. The brood mare herself died at the average age of 32. Since Muslim males outlived their enslaved females by an average of four years, those who could afford it took up to four wives (according to Koranic wisdom) in order to keep the brood mares producing enough male children for the private sustenance and the public weal.

In the face of all this, I invite you to consider the case of Iran, where a mighty revolution in the Koranic and Shi'ite conception of women was initiated only 25 years ago, when the young Shah returned from the exile imposed upon him by then Premier Mossadegh, who gained world notoriety by coming to weep before the U.N. in his pajamas. The Shah has been reviled by "The Left" of Iran (mainly students in the West) for his autocratic personal style, his reliance on the military and secret police, his tolerance of corrupt self-aggrandizement by his family and friends. Unfortunately, many of these charges have been true.

What few observers have stressed, including those like myself who have been studying Iran for a quarter-century, is that the Shah--in his own autocratic manner--has been revolutionizing Iranian society. The Shah-People Revolution he enunciated in 1965, only 14 short years ago, certified his intention to carry through his programs of land reform, secularization, and women's liberation. Each of these efforts by the Shah produced an adversary among the traditional elites of Shi'ite Iran--the landowners, the ulema (powerful landowning clergy), and the male chauvinists (led by the wealthy Bazaari who controlled most of Iran's traditional import-export wealth).

What now becomes patently clear to all observers, in the wake of the coup d'etat organized in the name of Ayatollah Khomeini, is that the Shah was driven into his present exile not by the ideological orators of the Left but by the entrenched "malefactors of great wealth" (Teddy Roosevelt) on the Right. The people most likely to suffer from this reactionary coup are the 75% of the population "liberated" by the new social relations institutionalized in the 20th century--the 25% of younger males and the 50% of females. Since it is the latter that mainly concerns this workshop, let us now go from the larger context to the specific case of women in Iran.

The most conspicuous effects of women's liberation in Iran have appeared in the statistics on education and occupation. A quarter-century ago under 20% of Iranian women were literate. By 1977, this figure had risen to nearly 50%. The past rates of increase led to the projection that female literacy would surpass male by 1985. There is no Muslim country in the world--probably few countries of any description--where such a reversal of traditional roles has occurred.

Not only are women moving rapidly toward parity (or better) with men along the full continuum of formal education, including university and professional school, but they have already surpassed men in their use of the informal media of communication. There has been an enormous growth of radio and television in Iran over the past decade or so. Data compiled by National Iranian Radio-Television (NIRT) show that women consume far more of the media output than do men. It is true that women prefer "soap opera" to news and educational programs. But soap opera--despite the disdain of "TV snobs"--can be very enlightening to people with little or no prior exposure to the world beyond their village or neighborhood.

I was asked, during my Spring 1978 semester in Iran, to write a paper summarizing the changes I had witnessed during my quarter-century of studying the country. (Publication, originally scheduled for 1979, will doubtless be postponed or suppressed by the present regime.) I stressed that the entry of women into public life was the fundamental social change. The transformation of women's public place transformed virtually every aspect of the Iranian social order.

Let me try to convey a sense of this transformation in a few sentences. First, the invisible Iranian woman, shrouded for centuries in her head-to-toe chadur, had suddenly become visible. Second, the Iranian woman, tradition-

ally silent on matters of public concern, had suddenly become audible. In the advanced institute where my wife and I worked last Spring, much of the research was done by young women with PhDs who had received their higher education in Iran or abroad.

But, since these could rightly be regarded as a small elite group, my summary paper illustrated the more general process with a detailed account of an interview with an illiterate middle-aged woman in the city of Shiraz. Sitting on traditional Persian carpets without shoes or veil--but surrounded by an impressive radio, tape recorder, color television, and digital clock--she responded positively to a variety of questions that few Iranian women dared to answer even a decade or so ago. Her answers were clear and concise. Evidently she had put the "communication technology" that surrounded her to good use. Moreover, when her husband interrupted at a point in the interview which mentioned the Shah (then still in power), she vigorously disagreed with him (she pro-Shah, he anti-Shah) and went on to show that she was actually the better informed of the two.

Let us come, then, to our final point about the new place of Iranian women in the occupational ladder. Not only are these women now visible and audible, but they are seen and heard in places made feasible for them by new technology--including the new technology of administration. The occupational census shows that Iranian women have moved rapidly into the upper professional levels as doctors, lawyers, and "communicators" (NIRT). The same census shows, although less clearly than a walking tour of any Iranian city would do, that they have moved into the middle occupational levels as typists, clerks, junior executives in offices, banks, shops--and even the bureaucracy, hallowed preserve of traditional male dominance.

The essential "structural" transformation of Iranian society by new technologies has been at the level of the village. I illustrate with a single case. An Iranian acquaintance, about to open an electronics factory near Bandar Abbas, went to study the methods of similar factories in the United States. He learned that, for many types of industrial operations, women are better suited than men. He racked his brains to find an application of this "new wisdom" in the traditional world of unseen, unheard women that had nurtured him. With great glee he told me that his solution was to hire girls from outlying villages. He sent buses early each morning to bring them to his factory and return them each evening. "The girls are wonderful workers," he told me.

"But, I have a problem," he continued. "During the first year, the acknowledged spokesman for the girls requested that I give them two paid hours of free time one Thursday a month (our Muslim Saobath being, as you know, on Friday) for socializing with the boys in the plant. Since she and the other girls had become indispensable to my operation, I could hardly refuse. Last month she requested that their paid period of Thursday socializing be made weekly instead of monthly. Again, I agreed. My problem is: what am I to do when these village girls start marrying these town boys with or without their parents' consent? The basis of our Islamic society will be taken apart before my eyes. What, dear Professor, am I to do?"

I muttered an American equivalent of <u>che sera, sera</u> (what will be will be, Inshallah) and went on to tell him that women's liberation in Iran was a much deeper process than "women's lib" in America, that this movement had transformed Iranian society so fundamentally--from bottom to top--that he would be foolish to try to stop it.

Ayatollah Khomeini has tried not only to stop this process but to reverse it--to bring Iran, and particularly its women, back to the solitude and servitude of Mohammedan desert origins, where a woman was traditionally worth less than a camel. I make no predictions about the future of Khomeini's regime except that it will be turbulent and therefore unstable. Most observers, including myself, think that a military takeover may come about. But few observers have foreseen that Iranian women will not readily give up their new liberation. I expect that, when the Khomeini regime is compromised or toppled, the women of Iran will have played a great part in this turning point of Iranian--possibly world--history.

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PETTY TRADE AND OTHER EMPLOYMENT OPTIONS FOR THE UNEDUCATED URBAN WEST AFRICAN WOMEN

by Barbara C. Lewis

West African urban women are constantly in search of gainful employment. Regardless of marital status or educational level, they seem more anxious than women elsewhere to earn money. This is because, besides responding to the universal rising costs of living, West African women, married and single, occupy social roles in which total dependence on others is neither expected nor acceptable. A woman is expected to help her kinsmen; women with western education state that their parents paid for their schooling to ensure old age support, and that is why they must work. Also, a rural woman produces much of what her household consumes; her urban counterpart may welcome the freedom from endless agricultural labor, but she, too feels she should not leave the material needs of her children in her husband's hands. In addition, a woman in a polygamous marriage (or one in which her spouse has outside mistresses) knows that even if her husband provides all the basics, her contributions will often ensure that her children have the advantages which she wishes them to have. Also, she must be able to buy her own clothes and other necessities, because "It is shameful to hold one's hand out to one's husband." Lastly, a wife's ability to contribute both to her children's and her kinsmen's well-being ensures her an improved strategic position: first, her kinsmen are then willing to defend and support her in disputes with her spouse, and second she directly lessens her husband's household costs. A woman with her own income strengthens ties and gains leverage with spouse and kinsmen; she gains in economic and social status, but also increases her sense of self and of well-being.

The importance of work to all West African urban women--not just those who are single or whose spouses are poor--is demonstrated by data from a sample of women from the capital of the Ivory Coast.(1) Table 1 shows that the best predictor of economic activity is educational level. The more

educated women are able to find salaried employment. Because there is, as yet, little factory work in the Ivory Coast, the less educated and the uneducated are very unlikely to find salaried work in the modern sector. Those who work are largely self-employed in the informal sector, selling goods which they either produce themselves (prepared foods, dyed cloths, simple sewn garments) or purchase from indigenous producers (agricultural produce) or purchase from importers (toiletries, cloth, plastic and metal housewares). Table I, showing clearly the positive relationship between cash earning activity and French education demonstrates the marginal utility of work. Among those able to get regular salaries, few are inactive. Those able to earn money only in petty trade and home manufacture constitute the overwhelming majority of women. That only about half of these little educated women describe themselves as economically active bears witness to the saturation of this sector, and the under employment, marginality, and low earnings of these women.

Women active in petty trade have a great variety of activities. Among them are the very few notable women who are wholesalers or large scale vendors, the fortunate women with stalls in an urban marketplace, and women who walk the city streets selling wares from a tray on their heads or sitting in front of their homes, local schools, or businesses, selling as little as a half dozen peeled oranges. Capital outlay and profits range from substantial sums (a seller of yard goods in the Treichville marketplace banking $24 per day) to a few cents. The majority are underemployed and earn little because competition is too keen. The minimal entry requirements in skill and capital and the great pressure to earn money result in a fairly dismal economic reality beneath the colorful scene presented by West African market women.

The syndrome of underemployment, economic marginality, and the saturation of markets among the poor and unskilled is a familiar finding in underdeveloped societies: too many people for too little work. But the problem is so intractable and the promise of development as cure-all so seductive, that the needs of the poor--the uneducated and unskilled, and particularly women in this category--are rarely addressed. Indeed, the tendency of developers and planners is to overlook the informal sector. Household production and vending by independent small entrepreneurs is often omitted from official records and statistics, and policies aimed at increasing productivity or the volume of work in this sector are rare. Rather, development tends to be conceptualized as the shrinking of the informal sector. But as growth occurs, the informal sector will probably shrink because its functions are assumed by the modern formal sector at a greater

pace than the population it supports is integrated into the modern sector labor force. Uneducated and unskilled women are far from alone in bearing this burden. However, they are disproportionately numerous and their labor force participation is of least concern. Indeed the tendency to stress the homemaking functions of the moderm woman suggests a desire to decrease women's presence in the labor force.

Work available to little educated women

The following consideration of the range of economic activities available to these little or uneducated women includes potential employment which can be realized at low cost or even at savings to the national community. Also considered are government policies or practices which limit the employment possibilities of little educated urban women.

There are currently few factories where uneducated men and women can find work. Jobs in the sardine cannery and two textile plants offering jobs to women are much sought after. The Ivorian planners envision increasing modern manufacturing which will mean more jobs for the many women now obliged to work in petty commerce.

Other available work includes making children's and women's clothes in small shops employing 15 to 30 women and producing for local markets. The outsider may feel little enthusiasm for salaried factory work or piece work in sewing sweatshops which removes the worker from her home for long hours. (When returning home for the 2-3 hour lunch break is impossible, a woman may be away from home 11 hours a day.) But we must also remember that women welcome such work because it substitutes regular pay for the uncertain income and the risk of bankruptcy of petty trade.

These few available salaried jobs for the unskilled are generally sex-segregated even when the enterprise hires both men and women. None of my respondents questioned this practice, perhaps because salaried employment is so attractive to them. Their acceptance of sex segregation is also doubtless rooted in the sex segregation of economic activities in the rural economy and cottage industry. In commerce, this rule is not absolute. Some women, called commodity queens in Ghana, compose the minority of Ghanaian wholesalers,(2) and a woman or a man may vend cigarettes or pineapples. However, in the marketplace, where sellers are grouped together by the produce they sell, most sections are sexually homogeneous. Reportedly in one textile enterprise,(3) the men threatened to strike when the French management proposed to seat some women in the (all male) sewing machine section. In this

case, differential salary scales, work group solidarity and the entire weight of culture were doubtless at the roots of the men's response.

Equal pay for equal work--and access to more remunerative jobs must be a feminist goal. But we must ask in which economic activities segregation by sex is tolerable. Also, where can the precedent of sexual integration be set with greatest long term impact and least social resistance? Should development schemes which prolong sexual segregation of the labor force be shunned even if they increase jobs available to women?

In the Ivory Coast, cottage industry is largely traditional manufacture; it does not at present include piece work for large enterprises or for the export market. Cloth dyeing is among the most successful; many commercial dyes have been added to the indigo blue and kola nut brown women used traditionally. Women from the north dominate this industry, for they excel in the art of sewing pleats or tying the clothes before dyeing to produce beautiful multi-color designs. Patterns change rapidly in this competitive and fashion minded business: indeed, it is often impossible to purchase patterns that were common a few months before in the markets.

Entrepreneurs in this business prosper largely despite government policy. They compete with imported cloth as well as cloth from the new Ivorian ICODI factory (a protected industry), and have learned to work with a wide range of fabrics. Their produce is made into a variety of goods purchased by Europeans--wall hangings, lamp shades, curtains, shirts, nightgowns, tablecloths, upholstery fabrics. But the European demonstration effect has not had a large impact on African buying preferences, and dyed fabrics are largely used for women's clothing by Ivorians.

The preparation and sale of food covers a wide range--from popsicles (for those able to buy a freezer) to the traditional plates of hot sauce and a starch staple (rice, made from corn; to foutou, made from yams; to attieke, made from manioc). Some are sold in the marketplaces for use in food preparation (tomatoe paste, peanut butter, palm oil) while others are sold indirectly to the diner--usually workers on meal or rest break. The growing size of the city, inadequate roads and limited cheap transportation mean that many workers leave home very early and eat breakfast as well as lunch at their place of work. The food vendors put down their wares in available space either on the side walk or in

the business' courtyard, which ever is tolerated by city police and the business' management.

Food preparation and sale by individual vendors receives increasing competition from both the private and public sector. Staples, some perishables, and housewares are sold by chain stores of both a private firm (La Chaine Avion) and a public corporation under the direction of the Ministry of Finance (La Chaine PAC). Most women still do food shopping at the market (the risk of perishables make them less attractive to the chain stores; thus the marketplace offers a far greater choice. Nonetheless, the chain stores are increasingly becoming the place where one buys a week's supplies of nonperishables (including rice, the single greatest expenditure of many households). Bulk purchasing gives the chain store a price advantage over market vendors. Market women have tried to organize wholesale purchasing and group savings schemes, but their projects have failed. No government assistance, neither financial organization, has facilitated their efforts.(4)

The situation with prepared foods is similar. Lunch shops and fast food shops are appearing, but they remain too expensive for many workers. Commercial caterers providing pre-packaged means for business and government employees in the work place are a recent innovation, assisted by government tax policy and hailed as progressive and modern by the national newspaper.(5) I am aware of no cost study examining the possibility of encouraging individual producers to contract meals or to sell food at their own risk in exchange for access to the workplace. The press made much of the catering system's uniform quality and sanitary controls which mass production makes possible. However, although negotiations with a number of small producers might prove more complicated (particularly for European personnel in managerial roles), but the result might provide a better product as well as being labor intensive rather than capital intensive. As long as the defining characteristics of progress are perceived to be increasing scale and mass production, the informal sector will certainly suffer.

Another illustration of the belief that removing an activity from the informal sector to the formal sector is progressive is the government's plan to build regional rice husking factories to service local producers--largely for local markets. Currently small entrepreneurs with simple kerosene operated husking machines in their homes fulfill this function. It is noteworthy that the World Bank's otherwise extremely laudatory analysis of Ivorian development policy critizes this plan because it is a premature and unnecessary

use of investment capital displacing fully adequate Ivorian workers.(6) Also noteworthy is that this occupation is in the majority male: it serves as a reminder that disinterest in the informal sector is not solely a feminist issue. Lastly, in this instance, one wonders if officials are not attracted by the prospect of a sure and profitable business to counterbalance the vast number of public corporations which operate regularly with a deficit.

In the above instance government policy impinges on persons in the informal sector by oversight rather than by intent. The number of ways in which this occurs is largely where public corporations compete with subsidized industries. Subsidization also takes other indirect forms. Investment codes may favor big producers reportedly to attract capital. In societies with exchange controls, official or licensed buyers have a monopoly over goods available at the more advantageous official rate. The petty seller is more likely to depend on the black market, where he will get a lesser amount of foreign currency (or equivalent goods) for his money; thus he subsidizes the official buyers or the government's chosen buyers.

Another area to explore is the nature and extent of adult education programs available to little or uneducated women. In the Ivory Coast, the available courses are given by the Social Centers, run by the Ministry of Work and Social Affairs. These Centers, located in neighborhoods throughout the city, dispense routine health care, including monthly weighing and health check ups and routine innoculations for infants. This public health component brings many, many women to the Centers, and some return for courses. These include demonstrations in nutrition, hygiene, and family health, cook (usually European dishes: I attended a session in which women were taught to bake flans), and sewing. The courses appear designed to refocus women's attention away from money-making toward homemaking, rather than providing social or technical skills to upgrade gainful productive activities. They teach arts which, in the Ministry's view, are "relevant to the preparation of women and girls for their role as maitress de maison and wife."(8) The Social Centers also offer adult spoken French and literary courses. While this may appear the most blatant evidence of a useless imperial heritage, French competes with Dioula (an African language) as the lingua franca, and thus a French speaker is advantaged in many commercial and bureaucratic situations.

Table 2 shows the attendance of the various adult education courses both for the entire sample and for women of differing educational levels. Although few women with no French attend these courses (because French is the language usually spoken in the courses in multi-lingual Abidjan), many women who have picked up some French but never attended school do attend the Social Center courses. The most educated women are disproportionately grouped in the "internship programs" (called stages de formation) which are on the job training programs run either by firms or by schools in conjunction with firms.

Internships and sewing classes are much better attended than the other courses. In both cases, the students are attracted mainly by the prospect of gainful employment. The better educated women attend the internship programs, which lead to salaried jobs in the modern sector. The sewing classes, attended by the little or uneducated, attract women not because they want to develop homemaking skills, but because they want a skill which has market value. Although the sewing courses were instituted to enhance the modern homemaker, most women in them hope to use the skill intheir own commerce. About one fourth of the women interviewed who were taking or had taken the sewing course said they were currently active vendors. Forty percent were inactive (perhaps because they were contented by homemaking, more probably because they had not yet been able to buy a sewing machine or because they had not completed the courses). Forty-three percent were in petty trade; of these the majority sold their own home sewn clothes. Although there are real barriers to entry into sewing commercially, the data support what respondents said about the Social Centers: that sewing is the most attractive course offered, because it has an income-producing application.

Implications for Policy

What conclusions can be drawn about the impact of current government policies on the category of women we have focused, and what kind of alternative can be invisioned?

Modern Industry. First, one may hope for increasing jobs for the unskilled in industry to take the pressure off the informal sector: more jobs in industry would increase the employment available for the many women who currently earn no income but want to work. Second, women in modern factory jobs should be given equal pay for equal work and not be segregated into different jobs. As urbanization and economic growth increases, the division of labor by sex will hurt women increasingly. The total absence of earning power al-

ready characterizing half of the unskilled uneducated women points toward a pattern of greater relegation to homemaking for women. Reversal of considerable de facto segregation in the informal sector would be difficult, but at least the pattern should not be permitted to extend into the modern sector. Third, adult education may prepare the little educated for salaried industrial jobs requiring modest vocational training.

Cottage Industry. Another use of adult education courses (given at the neighborhood Social Center or elsewhere) would be training in skills appropriate to cottage industries. However, this area is a troublesome one: some feel that women are most exploited in this type of employment. Nonetheless, one could encourage greater production of existing products of traditional skills. Certain technological improvement might expand the market for such goods, or at least improve the staying power of these cottage industries in the face of competing cheap manufactured imports. For example, new techniques for making colorfast dyes, for firing pots so that the pottery is more enduring, etc., would require small changes in procedure; therefore they should be easily adopted by artisans.

The introduction of innovation procedure to produce new goods made at home or in an artisanal setting is a more ambitious project. Markets for indigenous craft goods appear initially to have been hurt by the demonstration affect: people see imported goods as more attractive. However, observers in India have remarked that the trend favoring imported goods has reversed itself: the success of indigenous artisanal products among foreigners has produced a new wave of consumption of these goods among the Indian middle class.(9) In the Ivory Coast, traditional pottery and weaving are declining. Only the dyed fabrics retain a significant share of the market. However, Africans use the cloth largely for dresses; it is Europeans who buy the innovative products (wall hangings from the dyed clothes; novelties woven or potted). Put production of such goods both for export and for local expatriate buyers could be encouraged; this might uncover a broader market at home. Encouragement does seem to be needed, because currently the innovative sellers are marginals in Ivorian society such as traders from Dakar or Lebanese.

The entire area of cottage industry poses perplexing problems. Not only does the crush of cheap imported goods seem overwhelming--plastic buckets and dishes from Hong Kong, plastic sandals from Yugoslavia, tin cups, etc.--offering few promising avenues for local entrepreneurs, but earnings are also very low. Women are frequently exploited as they

use traditional skills in sex segregated work settings. And yet there are few alternatives. Factory work will not meet women's demand for gainful employment in the foreseeable future. Women swell the ranks of the distributive trades; petty trading is more than saturated, and thus for the less educated, the choice may be accepting no employment or working in one of a (potentially) expanded range of cottage industries or home manufacturing businesses.

Efforts must not be restricted to thinking up inventive schemes for the production of novelties; the degree to which the informal sector--both manufacture and distribution--is disfavored by direct and indirect subsidization of the modern sector (under the guise of encouraging import-substitution) must be scrutinized. Choices must be based on relative cost calculations, including capital investment versus the employment of plentiful labor.

Halting the subsidization of competing businesses (for example, restraining public corporations from moving into competition with indigenous entrepreneurs) will produce mixed benefits. For example, in Ghana, indigenous entrepreneurs and traders are often (although the majority are men(10)) illiterate market women who by luck, skill, and persistence, have amassed the capital to establish wholesaling monopolies or imported goods. These "commodity queens" have also come to control the shipping and marketing of goodstuffs produced in the interior for urban markets. The hierarchial clientage structures over which these men and women preside are common in West Africa. Men and women who have established the right to a market place stall, who have capital from real estate, or who have managed to acquire needed equipment all become quickly surrounded by men, women, and children who do the manual labor. One can debate how great the inequality in such arrangements is and how responsive the patrons are to the needs of the clients dependent upon them. But the reality--that increasing resources or business opportunities for urban economically marginal women will produce new inequalities--must be confronted.

There are several possible choices. One can permit unconstrained resource accumulation. Or a variety of reformist measures can be designed to encourage new entries into a business and one can enforce "fair practices" to discourage monopolies. Or cooperatives which require equal participation may be planned. The latter are common in projects among the economically marginal, perhaps because cooperatives promise to concentrate scarce resources, perhaps because their egalitarian and communitarian aspects appeal to their designers. Cooperatives schemes and group ownership of equipment

may be appropriate and successful. But here too the decision must be informed and clear-eyed, based on the actual economic and political environment as well as the goals sought.

The hope must be for greater attention to the informal sector, and the vast majority of women who work in that sector or seek entry to it. Objectives--whether the attainment of purchasing cooperatives, lowered taxes and fees and adequate settings for vending, or implementation of innovative production ideas, easier credit terms, or new low cost technology for home manufacture--must be economically viable and defensible. Political forces and dominant visions do not favor using scarce resources to shore up the small scale, low efficiency businesses of semi-literate women. Yet the goal is worthwhile, for it concerns a wide population of willing workers who will contribute significantly to their societies both in their generation and, through their children, to the next.

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References and Notes

1. Based on my survey of African urban women done in 1973-74 in Abidjan supported by the Population Council under the auspices of the Ministry of Planning of the Republic of the Ivory Coast. The sample is a stratified random sample of Bete, Baoule and Dioula women, 20-44 years old, in Abidjan, the capital of the Ivory Coast. It was drawn to over-represent the more educated women in the city. Interviews were conducted in French and in all three African languages by Ivorian female interviewers. Note also that women were asked whether they did anything to earn money, not whether they worked, as the latter is often understood to mean salaried employment. The results summarized here appear in a ms. entitled "Female Socio-Economic Status, Adult Education and Employment in Abidjan, Ivory Coast." The report to the Ministry of Planning is "La fecondite, l'emploi, et le statut de la femme en milieu urban," Abidjan: Ministere du Plan, 1974, 158 pp.

2. See Ernest Dumor, Center for Development Studies, University of Cape Coast, Ghana and the Dept. of Sociology, Michigan State University. "Commodity Queens and the Distributive Trade in Ghana," paper prepared for the ASA meetings in Baltimore, November, 1978.

3. Interviews in Gonfreville (textile) factory in Bouake, 1966.

4. For an account of these efforts, with particular emphasis on the declining success of rotating credit (savings) associations on the marketplace, see my "The Limitations of Group Action among Entrepreneurs: the Abidjan Market Women" in Women in Africa, Hafkin and Bay, eds., Stanford University Press, 1976, 135-157 pp.

5. Personal observation, summer 1976 in Abidjan.

6. Ivory Coast: the Challenge of Success. A World Bank Country Report. Baltimore, Maryland: The Johns Hopkins University Press, 1978.

7. Although the Ivory Coast does not have exchange controls, this is a common situation in Third World countries.

8. "Information sur le Centre Social et Ses Activities," Ministry of Work and Social Affairs, Republic of the Ivory Coast, 1971, p. 1.

References and Notes (Cont'd)

9. Personal communication, Professor Shanti Tangri, Dept. of Economics, Livingston College, Rutgers University, 1979.

10. My 1970 research on market women in the Ivory Coast; see also Dumor, op.cit.

TABLE I

EDUCATIONAL AND EMPLOYMENT STATUS

Educational Status / Employment Status	No Ed. No French	No Ed. Speaks French	Some Primary	Some Secondary	University or Professional	
Inactive	44%	45%	55%	23%	2%	281
Trader	55%	50%	20%	4%	5%	254
Salaried	0%	4%	21%	57%	71%	195
Student, Trainee	1.6%	1%	4%	16%	22%	59
Total percentage	100%	100%	100%	100%	100%	
Number	190	227	124	111	137	

Kendall's Tau C = 44, signif. 0.0

TABLE 1A

EDUCATION, AGE AND EMPLOYMENT STATUS

Age		20-24	25-29	30-44	
Education	Occupation				
No Education	Inactive	58%	41%	38%	414
	Trader	36%	57%	58%	
	Salaried or Student	6%	2%	3%	
		100%	100%	100%	
Some Primary Education	Inactive	71%	50%	15%	124
	Trader	14%	29%	30%	
	Sal. or Student	15%	21%	56%	
		100%	100%	100%	
Some Secondary Education	Inactive	34%	18%	0%	111
	Trader	2%	6%	9%	
	Sal. or Student	64%	76%	91%	
		100%	100%	100%	
University or Professional sch.	Inactive	4%	2%	0%	136
	Trader	2%	2%	11%	
	Sal. or Student	94%	95%	89%	
		100%	100%	100%	

TABLE 2

STANDARD EDUCATION LEVEL AND ADULT EDUCATION PROGRAM ATTENDANCE

Standard Education / Adult Education	No Ed. No French	No Ed. Speaks French	Some Primary	Some Secondary	Prof. or Univ.	Total Number	Percent of Total
No Adult Education	90%	66%	59%	53%	64%	541	68%
Adult Literacy Course	2.6%	8%	4%	1%	0%	29	4%
Sewing (May Include Home making arts)	7.4%	24%	15%	4.5%	7%	101	13%
Home Making Arts: Cooking, Health	0%	2%	6%	2%	1%	15	2%
Job Training, Voc.	0%	4%	16%	40%	28%	104	13%

Total Percentage
Total Number
Percent of Total

*"Sewing" includes four women who have taken home-making arts plus sewing and a "stage de formation", ten women with literacy and home making and sewing, and seven women with a literacy course plus sewing. Thus of the total 101 in this category, 80 took sewing only. They have been grouped in this manner because sewing is most relevant to the analysis.

WOMEN WORKERS IN MULTINATIONAL CORPORATIONS IN DEVELOPING COUNTRIES

by Linda Y.C. Lim

Much of the current discussion on women in development focuses on the detrimental effects of economic development in the Third World on women's role in the economy. Many studies have observed that traditional women's work in both agriculture and manufacturing is displaced by the introduction of more capital-using methods of large-scale production for wider markets. At the same time, discrimination against women in both education and employment opportunities systematically excludes them from participation in the growth of wage labor in the modern capital-using sector. Instead, women are increasingly confined to unpaid work in the home and to marginal service jobs in the urban informal sector; frequently, female labor force participation has even declined with modern economic growth.

In this paper I discuss an important, and increasingly widespread, exception to this general observation that women's participation in modern wage labor is often restricted, and even reduced, in the process of economic development. In the last ten to fifteen years, the expansion of labor-intensive manufacturing for export from developing countries has created large numbers of modern factory jobs for women in these countries. Whereas traditional labor-intensive manufactured exports of textiles, garments and leather goods --industries with relatively simple technologies and stagnant or slowly-growing markets in the developed countries-- have until recently been confined to only a few small countries, most notably Hong Kong, the practice of "offshore sourcing" by multinational corporations in technologically sophisticated industries with rapidly growing markets has spread this source of massive female employment to many more countries in Asia especially, but also increasingly in Latin America, and also, Africa.

Offshore sourcing refers to the location by multinational corporations domiciled in the developed countries of manufacturing plants in the developing countries, producing for export. Semi-finished goods and intermediate components incorporating inputs from the home country are assembled in the offshore location and then returned to the parent corporation for finishing and sale in its home or third country markets. Finished goods may also be returned to the home country, or exported directly from the offshore location to third country markets. Offshore sourcing is concentrated in labor-intensive industries, or in high technology industries with some labor-intensive processes, all of which have traditionally employed women in the home countries of the multinationals, and do the same overseas.

The offshore sourcing industry par excellence is electronics--which makes radios, televisions, digital watches and clocks, cassette recorders, calculators, TV games, C8 radios, telecommunications equipment, and sophisticated intermediate products such as integrated circuits and micro-processors which are vital parts of satellites, aircraft and computers. In the late-1960's, the dominant U.S. electronics industry, faced with labor shortage and labor control problems in home production and increasing home and world market competition, especially from Japanese imports, began to move nearly 90% of its labor-intensive assembly operations offshore--a move which was rapidly followed by competing European and Japanese firms. By the mid-1970's there were perhaps a million workers employed in the offshore electronics assembly industry in Asia, about 90% of them women. Developing countries which now host electronics assembly plants include Taiwan, South Korea, Hong Kong, Singapore, Malaysia, Thailand, the Philippines, Indonesia, Mauritus, Mexico, Brazil, Barbados, Haiti, El Salvador and the Dominican Republic. The People's Republic of China has just entered the field, and a number of African countries, most notably Tunisia, are attemting to attract similar investment by multination corporations.

To the multinationals, the chief attraction of offshore manufacturing in developing countries is the abundant supply of extremely cheap, industrious and docile labor in these countries, with wage rates as low as less than 5% of that of U.S. workers doing exactly the same job. and productivity in many countries as high as or better than that of equivalent workers in the developed countries. In addition, host governments anxious to attract foreign investment for employment creation and

foreign exchange earnings through labor-intensive manufacturing for export have offered the multinationals a wide range of very attractive investment incentives, typically including the establishment of Free Trade or Export Processing Zones. These are fully equipped industrial estates, with all the necessary infrastructural and factory building facilities provided by the government, and with exemption from all import and export taxes granted to establishing firms, which are allowed 100% foreign ownership, free movement of capital out of the country, and corporate profit tax holidays of up to twenty years. In addition, to guarantee low wages and labor stability, restrictive labor legislation has been introduced, in many cases prohibiting labor organization, unionization, strikes and other labor action in multinational subsidiaries. To permit the employment of women on night shifts, "protective" labor legislation has been removed. The "political stability and labor docility" required by multinational investors has been provided by a variety of politically repressive measures enforced by, in many of these countries, political dictatorships and martial law regimes.

The electronics industry, like the traditional labor-intensive export manufacturing industries such as textiles, garments and footwear, overwhelmingly employs women in its labor-intensive assembly processes, in both home and host countries of the multinationals. In this paper I will examine this phenomenon of preferred female employment, and its effects on women, in the two most important offshore locations of the multinational electronics industry--Malaysia and Singapore, where currently about 50,000 women are employed in the industry in each country. The results of my study(1) corroborate those of similar studies of female employment in labor-intensive manufacturing in other industries and other countries, and may therefore be taken to be broadly applicable to other cases of this most common form of female wage labor in modern manufacturing industry in developing countries.

Why are women almost exclusively employed in the multinational electronics industry? The following quote from an investment brochure issued by the Malaysian government in the U.S. indicates some of the reasons:

> The manual dexterity of the oriental female is famous the world over. Her hands are small and she works fast with extreme care. Who, therefore, could be better qualified by nature and inheritance, to contribute to the efficiency of a bench-assembly production line than the ori-

> ental girl? No need for a Zero Defects program here! By nature, they "quality control" themselves.

Manual dexterity and good eyesight are important requisites for electronics assembly work, and it is often asserted, including in United Nations documents, that women have a "natural advantage" in such work because they have smaller hands and are used to the experience of needlework. My research indicates that a far more important reason for the supposedly higher productivity of women than men in this industry is their greater docility and willingness to subject themselves to the rigid discipline and tedious monotony of the assembly line. The rare firm which has experimented with male workers in the same jobs finds them to be insubordinate and restless, "unable to sit still for eight hours a day doing one boring repetitive task." Men tend to be "troublemakers" while women are "obedient," no doubt due to their differential socialization and acculturation in patriarchal societies. To further ensure such "obedience," firms hire only inexperienced young women, from sixteen to twenty-two years of age, who have about nine years of formal schooling on average, so that they have been habituated to the rigid discipline and conscientious work habits inculcated in schools and required on the factory floor. Personal interviews screen job applicants to select those with "the right personality"--co-operative and quiet, and to weed out potential "troublemakers."

Productivity aside, women workers are cheaper than men, and Third World women are the cheapest labor available in the world. Prevailing labor market wage rates for women in Malaysia and Singapore are one third less than men's wages, and start at about U.S. $2 a day. Multinationals located in the same industrial estate further collude to keep wages down by discouraging free labor mobility (job-hopping or factory-hopping) through the common practice of blacklisting (refusing to hire) workers who leave one company in search of a better job in another, or hiring them without regard to seniority and experience, at the starting wage rate. Single women are preferred because of reluctance to pay required maternity benefits, and because it is expected that most of them will leave on getting married, to be replaced by newer and therefore cheaper workers. Since firms try not to compete with each other for labor by bidding up wages, they attract workers by offering fringe benefits tailored to the sex and assumed feminine interests of workers, such as cooking classes, dancing lessons, fashion and make-up classes, and beauty contests, in addition to occasional picnics, outings, dinners, Christmas parties, Western movies and English lessons. The prevention of unionization by both the

host government and the multi-national employers in Malaysia, and the effective control of unions by the host government in Singapore, also ensure continued labor docility and low wages.

All export-oriented industries in developing countries tend to have unstable employment patterns because of their subjection to business cycle fluctuations in export markets in the developed countries. In addition, electronics, though a rapid-growth and high-employment industry, suffers from an industry cycle which turns down about every two years. These frequent recessions are viewed by employers as a "blessing in disguise" providing a "good excuse" to lay off older and more expensive workers (who have accumulated more wage increases and benefits), since there is only a short learning curve-with each worker reaching maximum productivity within six to nine months. This periodic shedding of labor serves several useful functions to employers. It keeps labor costs low, with average wages remaining low because of the short job tenure of workers; it depresses the general wage level by increasing unemployment and disciplining workers--there have been instances of workers accepting lower wages for the same work in order to avoid being laid off; and the high labor turnover inhibits worker cohesion and organization and helps to forestall the formation of unions. In addition, employers are provided with the opportunity to introduce labor-saving equipment if wages have risen during the preceding boom.

The instability of employment in electronics and other labor-intensive export industries seems to be more readily acceptable in host countries because it is women, rather than men, who experience the layoffs. One of the industry's reasons for preferring to hire single young women is because there is a "natural" high turnover rate with them leaving to get married and have children. There is a prevailing assumption that women's employment in the wage-labor force is necessarily temporary, and that women's income is only secondary income, optional to the survival of themselves and their families, providing only "pocket-money." This is clearly not true where a second income is required because of the high cost of living in an urban setting (Singapore), or where a high proportion of males are unemployed and women are often important breadwinners (Malaysia). Despite this, there is a tendency to regard women as only a reserve army of labor, which can easily be absorbed into the home when laid off, and need not even be counted in unemployment figures.

In summary, it is partriarchal attitudes to women's work in both host societies and among multinational employers

which justify both the payment of relatively low wages for women and lack of compunction in offering them unstable jobs with short tenure. At the same time, it is these easily "exploitable" characteristics of women workers which have led to a massive increase in their employment in labor-intensive factories. In both Malaysia and Singapore, female labor-force participation has risen to well over 40%, with 77% of women in the eighteen to twenty-six age group being employed in Singapore. The great demand for the labor of young women has led to considerable internal as well as international (from Malaysia and Thailand to Singapore) migration of these women to the Free Trade Zones and industrial estates where the factories are located. During the period of employment, the women benefit from the money incomes which they are able to earn for the first time in their lives, and many of them enjoy their new-found independence from home and family. The vast majority of those who work do so out of economic need--their own, and that of their families, to whom they contribute a sizeable proportion of their earnings.

However, for the individual worker, her chances of becoming laid off permanently or temporarily are very high. Horizontal mobility among firms in the same industry is severely restricted, and she does not learn any transferable skills which enhance her mobility to other sectors of the economy. Often the only alternative forms of wage employment available to young women are domestic service and prostitution. For the worker who retains her job in the factory, there is no vertical mobility within the offshore plant. Since it is only an assembly facility, 87% of the jobs are for operatives, and there is no internal job-ladder or promotion opportunities. Again, it is assumed that women do not mind such "dead-end" jobs because they have limited career aspirations and financial obligations. It is often stated that "the girls like this routine work because it is not mentally demanding," whereas men are "too impatient" and "too ambitious" for this type of work which has "no future."

Thus the gains from this kind of employment for women are limited and temporary, and not obtained without a considerable welfare cost to the workers. In multinational electronics factories, the work is intense and meticulous, involving looking through a highly-magnified microscope for eight hours a day, in a rigidly regulated environment. Output goals are constantly raised, and productivity incentive schemes designed by the companies often exact more work from all workers without commensurate monetary reward--for example, in the ubiquitous "competitions" among girls on a line, among different lines, and among different plants, for "prizes" such as a gift of cheap cosmetics for the best girs of the

week, or a free dinner for the best production line of the month. The nature and pace of work lead to many widespread health problems--of which eye strain and eyesight deterioration, persistent headaches, stomach ailments, fatigue and nervousness are the most commonly reported, Shifts which rotate every one or two weeks have been shown to be hazardous to employees' physical and psychological health in the U.S., but the companies claim that rotating shifts are good because they "give the workers opportunity for day and evening social life." A few factories which employ married women permanently on the night-time or "graveyard" shift say this is a good practice because it "does not interfere with domestic life," permitting the woman to work at night and still do housework and look after her family during the day. Mass hysteria is a frequent occurence on the night shifts, especially in Malaysia, where they have forced several factories to close down for a few days.

Outside the factory, living conditions are often poor, especially where most of the workers are migrants and have to rent "deplorable" housing facilities at exorbitant prices around the industrial estates, where housing shortages are acute. The women are often crowded into dormitory-like facilities, and rotation of bedspace among women who work different shifts is sometimes practiced. Others may live as far as thirty miles away, and transportation is both scarce and expensive. Given their low wages, heavy family contributions, and monopoly pricing of basic necessities around the Zones, many workers can barely survive. At the same time, relations between the women workers and the host communities where the factories are located are often strained, and even hostile. A major source of friction between the women and conservative local communities in Malaysia, for example, is the change in social and cultural mores, in dress and life-style which develops as the women work for multinationals which, as part of their fringe benefits, initiate them into the world of modern Western fashions, music, dancing, parties, movies, and even swimsuit beauty contests sponsored by the companies. The "modern" social and sexual behavior of some factory women gives all of them a reputation for "loose" morality, which can sometimes damage their long-run matrimonial prospects.

In general, it seems that modern factory employment in multinational corporations frees young women from some of the conservative strictures of their essentially patriarchal traditional societies, granting them a modicum of financial and social independence. However, it also leads to new forms of exploitation of female labor in the workplace, where low-paid, dead-end, unstable jobs provide only small and tempo-

rary income gains. New mores seen to be disruptive of traditional society create divisions between the women and their local communities, sometimes fuelling religious fundamentalist objections to women's wage employment. At the same time as the development of a class consciousness among the female proletariat is hindered by repressive labor controls, the short duration of employment, and ethnic and linguistic differences within the labor force, there are signs of an emerging individualist feminine consciousness which would be considered "traditional" in the Western home countries of the multinational employers, and is encouraged by their labor practices.

My research and that of several others suggest that the successful creation of massive job opportunities for women in the modern manufacturing sector of developing economies does not necessarily mean an improvement in women's welfare, and social and economic position in these countries. Rather, it may merely introduce further exploitation of women and, in some cases, reinforce their inequality in the labor force by confining them to marginal, low-wage, sex-segregated industrial employment. The lot of female workers in labor-intensive multinational factories can only be improved if host governments intervene to ensure better wages and working conditions, health and living conditions, and job security. To do so requires the concerted action of all governments of developing host countries engaged in or interested in engaging in labor-intensive export manufacturing by multinational corporations. Otherwise, since all these countries are competitive suppliers of cheap female labor, the attempts of any individual government to legislate improvements in the conditions of female employment will only raise the relative cost of female labor in that country and prompt the footloose multinational to shift its offshore production to another, cheaper, location. More importantly, national development plans must pay attention to developing more attractive alternative employment opportunities for women in stable, higher-productivity and higher-income industries and occupations. The provision of equal education and training, the removal of discriminatory wage differentials based on sex, and the elimination of sex segregation in industries and occupations are necessary steps toward this end.

Internationally, it should be noted that the "new industrial protectionism" of developed countries, aimed at restricting the export of manufactures to their home markets from developing countries, directly threatens the employment of millions of women factory workers in the latter countries. The freeing of trade in manufactures between developed and developing countries, and increased co-oper-

ation instead of competition among developing host countries, are necessary, though partial and limited, steps towards enlarging and securing the participation of women in the economic development of their nations.

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[1]See Women Workers in Multinational Corporations: the Electronics Industry in Malaysia and Singapore, Michigan Occasional Papers No. 9, Women's Studies Program, University of Michigan, Ann Arbor, Fall 1978.

THE DIFFERENTIAL IMPACT OF PROGRAMS AND POLICIES ON WOMEN IN DEVELOPMENT

by Hanna Papanek

The goal of "integrating women in the development process as equal partners with men" has been accepted by member governments of the United Nations since 1975 and has affected the national policies of some of them. But the diagnosis of women's special needs and the design of policies to meet these needs have continued to face many obstacles.

In this paper, I argue that serious commitments to diagnosis and policy design have not yet been made in international agencies and national governments to the extent required by the goal that has been accepted. Both diagnosis and policy design require a differentiated view of the women in a particular country, one that takes account of distinctions of income and class in the context of economic, political, and social factors. The present undifferentiated view, underlying much development planning, often takes a curious "as if" stance--as if women were like men, as if all women were alike, or as if women did not exist at all.

I argue further that problems of diagnosis and remedy exist at many levels, from local community programs to national development policies and the policies of aid-giving agencies. Lack of effective linkage between local and national levels, or between specific programs and macro policies, usually prevents the achievement of women's integration in development. The most significant problem remains the failure to recognize that women--like men--are affected by all development policies. The gains achieved by a local project can be wiped out by a policy change at the national level. Women are not an isolated group in the population of any country but are integrated into every institution, from the family to the state, even if that integration takes different forms for women and men. Because women are already integrated into their societies, already participating in economic and political activites, albeit usually with less

power than men, the integration of women in development requires specific measures appropriate to their particular situation. The idea that the benefits of development will automatically "trickle down" to the poor has already been challenged in many quarters. Why should we then assume that the benefits of development, once they reach men, will automatically "trickle over" to women?

Diagnosis and policy design also depend on accurate research, even if policy decisions are ultimately made within the fairly narrow constraints of resource availability and national or international political considerations. With regard to the importance of research, it has already become clear that the large investments made in development-oriented economic research have paid off in terms of effective policy design. For this reason, I argue that some investments must be made in research on women in the context of the same broad frameworks of analysis also used other types of development research on economic, social, and political issues. Until now, research on women and development has largely been the province of individual committed scholars in many countries.(1) Occasionally, this research has been supported by public or private resources but the scholars themselves tend to remain in isolated positions in universities or national and international agencies that do not recognize the value of their work. In other words, little has been done to date to create the scientific competence to carry out broadly based policy-oriented research on specific problems of women and development, so that understanding gained in one region or academic discipline can be applied to the solution of problems encountered elsewhere. Without this body of scientific competence, it remains difficult to plan and evaluate programs, projects and policies affecting development and women. Yet attempts to create this broader understanding often run into persistent obstacles.

These obstacles to research also stand in the way of effective policy regarding women; both sets of problems deserve more detailed discussion. The most significant obstacle to both research and policy design is the existing emphasis on isolated "women's projects" or programs or "women's components" in development projects. Many of these undertakings are excellent in themselves and may meet the pressing needs of women in many communities. But they are not enough. An analogy may make this point clearer. In South Asia, regional development programs to benefit less developed regions of undivided Pakistan were common before Bangladesh became independent but the benefits of these remedial programs were usually wiped out by the effects of national policies, such as an exchange rate that favored import-substi-

tuting industries (mainly located in West Pakistan) over export-oriented activities (mainly located in East Pakistan, now Bangladesh). In other words, excellent local programs may benefit women in the short run but the effects of such programs can be wiped out by policies at the national level that appear to be unrelated to women but actually affect their interests in many ways.

In the second place, an emphasis on isolated "projects" or "components" reflects an approach to women that hampers their integration in the development process rather than advancing it. Of course, it is well known that the "project approach" is characteristic of many national and international agencies concerned with development. In the United States, for example, the Percy Amendment (no. 574 to the Foreign Assistance Bill of 1973, S.2335) states that the major provisions of the Foreign Assistance Act "shall be administered so as to give attention to those programs, projects and activities which tend to integrate women into the national economies of foreign countries, thus improving their status and assisting the total development effort."(2) Other examples of the project approach can be seen in the procedures and criteria used by many international and national bodies in the field of development.

While the project approach may be the most feasible for the implementation of certain kinds of solutions to problems of development, it should be kept in mind that--in the case of women--this approach perpetuates certain conceptual and institutional barriers to women's integration in the development process. For example, in the case of India it has been pointed out that "the national consensus to keep the women's question out of the sphere of political controversy has resulted in "projecting it as a purely social issue of long-term changes in attitudes, through education and development."(3) Under such circumstances, it is not surprising that development planners and researchers tend to focus on remedial programs for women and on education, rather than on possible direct changes in economic, political, and legal structures as they affect women.

An institutional consequence of this view of women's needs--which is widely shared by other nations besides India--is the location of most women's programs and projects in educational and social welfare agencies. But remedial agencies are not at the center of power in any nation. Major policy decisions about economic and political development are made elsewhere. Of course, there have been many important positive outcomes from programs undertaken by social welfare and educational institutions that have greatly benefited

women. This makes it even more difficult to contemplate changes in the structure and location of agencies concerned with women's needs and interests. In many countries, social welfare ministries may be the strongest advocates for women; they are often staffed by the most committed supporters of development programs for women. P[illegible]s as a result, there may be few supporters in other parts of the government in many nations. Women's interests have not yet been accurately perceived to matter politically or being important to the effective functioning of other public and private agencies. For example, while women may often be effectively mobilized around issues such as legal reform, their support is often dissipated in struggles between other interest groups instead of being organized around specific issues that may unite women's economic or social interests. For another example, it should be recognized that, in many instances, the effective integration of women into specific aspects of development may spell the difference between the success and failure of a development program, such as the introduction of new agricultural techniques.

The mistaken idea that women are always the dependents of men usually accounts for the notion that public agencies can only intervene when the family has failed and that policies directed toward men will automatically benefit women. In actual fact, of course, women contribute as much as men to family earnings, particularly among the poor, whether this contribution is reflected in national income statistics or not. Furthermore, many families are supported entirely by women, as when men have died or disappeared, or when they are ill, disabled, or incompetent. There are significant distinctions between cultures with regard to women's participation in the paid labor force, but these differences are often overshadowed by the importance of class and income. Research on these distinctions will be of great significance for development policies, since many stereotypes and preconceptions obscure the true facts and lead to false prescriptions.

The conception of women as "backward" group whose needs can be met by scattered programs and projects not only undermines the formulations of adequate development policies but also affects the building of an accurate data base and relevant frameworks of analysis in research. There is often a divergence between the kinds of research produced by scholars and those that policy-makers consider important. This divergence is particularly severe in the case of research on women and emphasizes the importance of building scientific capacity for work in this area. Many kinds of research management are, of course, employed to bridge the gap between the research

priorities of policy-makers and those who actually carry out research, particularly if they are independent scholars. These methods range from the selection procedures of private and public agencies in awarding research grants to the processes by which national and international agencies select research consultants and sub-contractors. Women are not well represented on most of these bodies. Research on women, moreover, is often not taken seriously by those who set research priorities, either because the field is relatively new or because of generalized prejudice.

Furthermore, the requirements of institutions for certain kinds of information are more likely to set the terms of reference for research than the perceived needs of the group to be studied or the interest of individual scholars. The problem-solving needs of a concrete enterprise usually determine the framework within which research is formulated and the "language" or approach to be used. While some perception of the needs of a particular group may contribute to the formulation of the problem to be solved, members of that group rarely influence the ways in which research is carried out and used in arriving at solutions. Individual scholars are often closer to the population to be studied and may be more aware of the terms of reference the "target group" would like to see applied to them. The possible divergence between these two sets of interests must be resolved between the researcher and the institution interested in her results. The possibility of this divergence, sometimes anticipated in the selection processes of development agencies, may lead many such agencies to prefer commissioned research or the collection of information by their own staff. This problem is particularly acute in research on women and development, for several reasons, and has a bearing on the development of the field as a whole.

First, the new scholarship on women does not yet have the great variety of clearcut theoretical frameworks typical of established intellectual traditions, even though important beginnings have been made. As a result, it is often difficult to integrate the findings of other relevant research into the framework used for a new study. Second, many scholars interested in women and development tend to conceptualize their concerns for women in more generalized terms than development agencies may find acceptable, especially since they are often coupled with advocacy for women. Although intervention programs with profound consequences for local populations are often supported by development agencies, there seems to be wide-spread tendency to be much more cautious with respect to women's programs.

In this situation, two kinds of responses seem to be very common. One is the practice of demanding particularly strong documentation that a program for women is really needed.(4) Simultaneously, the claim may be made that "nothing is known" about women. This is usually not the case, even though it may be quite true that nothing is known to the individual making the claim. The proliferation of publications about women in several countries has been accompanied by a tendency to relegate them to a special "women's corner" or as irrelevant to the development of knowledge, even where these publications are demonstrably relevant to broad economic, social, political concerns. The argument that little is known about women must also be taken with another grain of salt--development planners must often make many of their decisions on the basis of inadequate information because of a poor data base or underdeveloped data-collecting institutions. The same considerations should be applied to data on women as are used for other types of needed information that may be hard to obtain. On occasion, there have also been attempts to condense data on women into a single index figure, such as "the status of women in country X," possibly as a result of the Percy Amendment's reference to the goal of improving women's status. A single status indicator, however, is not a good substitute for more complex data on women. Aside from the analytical problems of developing a single index for a highly differentiated population, status is a construct involving comparisons. Should a status index reflect the position of women relative to the men of their society, or relative to women in other societies? What about class differences? Almost inevitably, such an index is both invidious and inaccurate. Whenever a single status indicator is demanded, in lieu of more complex information on women, this should be seen as an immediate warning signal that the need for accurate information on women is not taken seriously. It may reflect the same vision that relegates women, regardless of education or class, to a single category of the disadvantaged--a view of women as a backward tribe, living far up in the hills.

A more fundamental problem for researchers is the general inadequacy of social science theories and methods for the study of women. Social science might be seen as reflecting the life experience of its makers--and it is obvious that the theories and methods based largely on the life experiences of middle class men from highly industrialized societies are not adequate to understand the problems of other kinds of people. This is particularly serious for categories of persons, such as women, whose interests are not well represented among social scientists themselves but who figure large in their personal lives. As a result of personal

familiarity and scientific ignorance, research on women is often considered both superfluous and unnecessary by individuals and institutions.

Integrating research on women's work in development analyses

The key issue in most women's projects at the micro level has become "income generation" or, more simply, paid work. Particularly in the poor countries of South Asia, local projects to improve women's capacities to earn have proliferated in recent years under both private and public auspices. In Bangladesh, for example, women's credit coopeattives have been developed as part of the Integrated Rural Development Programme.(5) Women have also been trained as para-medics in rural health delivery programs, where young unmarried village women provide health and family planning services for other villagers.(6) Earning opportunities are emphasized in all these programs, even where non-formal education is the stated major goal. In both India and Bangladesh, several very ingenious projects have been developed to provide earnings for poor women in rural and urban areas.(7) A special project for self-employed women has been develped by the Textile Labour Association founded by Mahatma Ghandi.(8) In all these efforts, special stress has been placed on providing paid work for poor women.

The development of these work programs for women in South Asia is closely related to major social trends, demonstrated by research on women but still not widely appreciated by analysts and planners. These trends are of crucial importance to the integration of women in development and indicate the complexity of the problems to be faced by planners. In India, the long term trend in recorded economic participation of women in the paid labor force shows an overall decline. Since 1921, the proportion of women in the total labor force has dropped steadily, as has the percentage of gainfully employed women in the total population.(9) At the same time, education has expanded in the post-independence period, although more slowly for women than for men, especially at the primary and secondary levels. By comparison, higher education for women has expanded more rapidly than at other levels, although this expansion is practically confined to the urban middle and upper classes.(10) The educational expansion has been coupled with a slight increase in women's participation in white collar and professional occupations; higher employment rates for women with technical degrees than in non-technical fields have also been recorded.(11) The women's programs already mentioned have found that the illiteracy of poor women presented barriers to their employment, particularly in non-agricultural work and in new occupations

for women. But, as these research findings also show, "While illiteracy drives many out of employment, education does not necessarily lead to their employment."(12)

Findings of this sort require explanation in terms of large-scale systematic factors at the macro level most relevant to national policy formulation. Local projects to increase the employability of women may remedy immediate local problems; such projects can be set up and evaluated without large-scale research on the causes of the decline in women's labor force participation. However, these local programs will not affect the general trend. National, macro level policies to deal with a general trend of this sort must be based on an analysis of the systemic causes of the special relationship that appears to obtain among women between education, employment, and socio-economic class. Yet such a general analysis of this sort is unlikely to be undertaken as long as women's needs are defined purely as a "social issue" in terms of traditions, attitudes, and social norms. To be sure, generalized attitudes about the individual's place in society are bound to affect the position of women but they provide only the framework for the more highly differentiated factors that affect women of specific classes, regions, ethnic or language groups in any particular society. The causes of the decline in labor force participation of Indian women, for example, must be sought not only in terms of these highly differentiated factors but also in larger aspects of the Indian economy and the relationships between India and other nations, through trade, aid, and politics.

The phenomena described above for India are not unique; other nations have experienced similar relationships between women's education and their participation in the paid labor force. Since these relationships appear to differ from those obtaining for men, some explanations must be found in terms of a women-specific model. What needs to be explored is the variation between women's responses to education and employment opportunities at different levels of income and socio-economic class. How and why these patterns differ for women and for men also needs to be explained for specific times and places. An overly general explanation, referring only to stereotyped notions of men's and women's work or to "the status of women" will not serve the purpose. The most useful kinds of explanations are probably those linking both education and employment to the class position of the women's families--both those in which they were born and into which they have married. Attitudes toward women's proper social roles held by families at different class levels are likely to be very important in explaining patterns of education and paid work. In other words, research that differentiates

among women according to class and income, at a level of analysis that takes account of economic, political, and social structural factors over a period of time, is needed to explain the observed facts. This must be coupled with a critical examination of the methods used to collect data and the categories used in data collection (as they vary over time) since serious problems in these areas are characteristic of research on women.

A similar type of analysis is also needed to explain another set of findings that again stresses class distinctions. These paradoxical findings, contradicting the conventional wisdom, are noted here not only for their intrinsic interest, however. They are also intended to support the point that an integrated approach to research on women and development is as necessary as an integrated approach to women's programs at the local level. In Indonesia, data from the 1971 Census indicate an unexpected relationship between schooling and mean number of children ever born. Fertility increases with schooling in both rural and urban areas, falling off only for the very small number of women with the highest levels of schooling. This inverted U-shaped relationship between schooling and mean number of children ever born exists in every age group in both rural and urban areas.(13) The same study also found support for this relationship in micro studies. For example, in a single rural community in central Java, researchers found that upper income women over thirty had from one-fifth to one-fourth more births than poorer women, even if only currently married fertile women without marital disruption were considered.(14)

While these findings are undoubtedly interesting in themselves, they can, however, be distinguished from the paradoxical findings on women's education and employment in that an analytical framework is available to understand their broader significance. Studies of fertility and family planning have now reached a point of development where a further integration can be attempted, in terms of an "analytical framework sufficiently flexible to accomodate explanation of the wide variety of historical and ongoing trends, fluctuations, and differentials in the shift from premodern to modern fertility levels."(15) This has been made possible, in part, by the huge investments that have been made over the past three decades to understand a recognized world-wide problem with social, economic, and political implications. An enormous research infra-structure has been developed to which both policy-relevant and project-related studies can be linked.

Such a framework of analysis is not now available to understand some even broader issues involved in women's changing relationships to the processes of economic development. There is no comparable research infra-structure, consisting of a body of data, interpretations, institutions, publications, conferences, and funding agencies. It remains an open question whether the need for developing analytical frameworks and research infra-structures on the subject of women has even begun to be understood by the consumers or research in national and international agencies concerned with development. It goes without saying that such efforts cannot be developed in isolation. Indeed, the primary requirement for the development of a scientific capacity for dealing with questions of women and economic changes is that it must be integrated into existing systems and structures of development-related research and planning.

For example, in the single most important area--women's work--existing tools of data collection and analysis may tell us something about who is in the paid labor force, but rarely what women do and when they do it, in the course of a day, a month, or a lifetime. We may know something about women workers but very little about women's work. The difficulties of diagnosing the problems of women's integration in development become most apparent in this gray area of what constitutes women's work and its rewards. In the absence of a clear understanding of the problems, it becomes almost impossible to develop suitable remedies at the macro and micro levels except in the cases of most pressing and obvious need.

The conventional assumptions of economics and sociology do not suffice, for a good historical reason. The methods of data collection and analysis developed in western countries at a time when industrialization was relatively new and the separation between home and workplace was very salient in people's lives. As economic analysis became more sophisticated, it was applied to cases where information was most readily available, namely in firms large enough to need precise data as part of their mode of operation. Very precise data have never been necessary to subsistence farming or to small retail operations. It is only under the conditions of resource scarcity that development planners in poor countries and aid-giving agencies in rich countries have found it necessary to develop more precise data on agricultural production, human fertility, and the composition of the labor market. Since housework in all its complexity has never depended on precise information either, and since the separation between home and workplace precluded the inclusion of domestic work in conventional analyses (except insofar as it involved paid labor or production for sale), there has

been even less concern with developing measurement techniques and analytical concepts for the work done by most of the world's women for most of their lives. Indeed, much of this work has been overlooked or mistakenly classified as "leisure" or "non-work." Nothing could be farther from the truth, as can easily be shown by the paradox that while the work of "non-working women" is considered to be without much economic significance, all substitutes for it are very expensive.

The recent upsurge of interest in women's relationship to the development process has resulted only in the most superficial sense from changes in the "consciousness" of planners, scholars, and politicians. Instead, I am convinced, it has resulted from the more general pressures generated in resource-poor countries by the need to utilize all available human resources in order to survive. Since these pressures have been generated, in the first instance, by political institutions concerned with economic development, I also believe that the agencies most closely concerned with development planning at the macro level must be convinced to implement the commitments of International Women's Year where it really counts. Women must be integrated into the development process not only symbolically, and through concrete local projects, but in the most central processes of resource allocation in development planning. This is a key issue. It must be made clear that this is not only in the interests of women themselves but is, in fact, indispensable to the process of development. In resource-poor nations, agricultural growth cannot occur without a more precise and rational allocation of existing resources. Although "everyone knows" that women have always worked hard on the land, whether their work was publicly visible or not, knowledge about the nature of women's work has now become important to the complexities of allocating resources for development.

Attention must be paid to the work of women not only because that is good for women. Those who plan development policies must also realize that it is good for development.

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THE ROLE OF AFRICAN WOMEN'S ORGANIZATIONS IN IDENTIFYING NEEDS FOR LABOR SAVING DEVICES

by Irene M. Petty

International Women's Year paved the way for many African women to participate in a world wide program focused on the needs and aspirations of women. Women from a majority of the African nations present were full participants at the historic IWY conference in Mexico City. Since 1975, they have been responsible for creating new or strengthening already existing national organizations in their various countries. Women's groups identified as federations, unions or councils are tackling the social problems of women in a number of geographic areas. Because a majority of African women live in rural areas and engage in agriculture, one of the basic problems facing these women's organizations is how to devise methods and strategies to alleviate the heavy work loads of those who are responsible for the production of subsistence food crops, in addition to the care of the children and the home.

National women's organizations concern for the problems of rural and urban poor has gone far in changing the image of elitist organizations as defined by Lloyd.(1) Despite the rapid rate of change in Africa, the majority of rural and urban women continue to play the roles of mother, wife, homemaker, producer and protector as delineated by tradition. In addition, they also assume the major responsibility for maintaining and passing on traditions and customs to succeeding generations.

In the traditional work places the African women are witnessing the development and transfer of new technologies which often replace them as laborers or force them to even lower levels in the social and occupational hierachy. With little or no education, they are generally not able to understand or utilize the newly developed technologies. More often than not, they are excluded from the teaching of new methods and techniques in the time-honored fashion of reserving educational privileges for men only. Women's informal and formal groups play an important part in assisting

and explaining the complexities of new technology to those citizens who have not been exposed to them.

This paper will briefly explain the role that traditional organizations performed in societies and how nonkinship voluntary organizations performed additional roles not included in the social structure of society. It will further explain how modern organizations have taken over duties formally performed by these organizations. Specific examples will be cited from Senegal, the Ivory Coast and Togo in West Africa. These examples are based on activities presently being explored with these countries and the National Council of Negro Women. They are working closely with local women's groups in rural areas. Technical innovations are geared towards the use of local resources to enable the population to continue the projects after the departure of the donors.

The Traditional Role of Community Voluntary Organizations

Historically, voluntary community voluntary organizations have been among those groups in society that helped maintain stability during periods of rapid change. A society depends for its existence on the presence, in the minds of its members, of a certain system of sentiments by which the conduct of the individual is regulated in conformity with the needs of the society.(2) Ethnic and village associations or groups help maintain this system of sentiment and transmit them from one generation to another. Traditionally, associations have served to preserve songs, history, language and moral beliefs. These organizations were concerned with the general well being of the entire village or village group and the socialization of its members. Although many institutions exist for governing life, kinship was the dominant force. However, nonkinship groups were organized to provide functions not handled by other units of the traditional society. These nonkinship groups transcended the kinship groups and had the effect of creating strong bonds between non-relatives.(3)

Although most African populations still live in rural areas, the changes in their society are so dynamic that the majority of them are nevertheless effected and therefore, no longer isolated. Transportation and communications brings its goods and services to their doorsteps. Urban teachers, development planners, agricultural experts and political organizers all seek to integrate the peripheral citizen into the main economic stream. Significant, also, is the increasing population movements from the rural villages to the cities. While many of these movements are temporary or seasonal, the results are that participants inevitably bring new technology and ideas back to the village. The need to pay school fees and buy food items not locally grown neces-

sitates cash flow and encourages family members to seek jobs outside the rural community. As the able people leave the villages, an undue hardship is placed on the women left behind. Lacking formal training, they consequently cannot take advantage of the new technologies which were developed to alleviate their burdensome work.

Modern Women's Voluntary Organizations

Women's organizations conjure up in the minds of the uninformed westerner a vision of tea parties and fashion shows. Presently this perception is less valid as women's organizations in Africa are increasingly becoming more involved in developing strategies to improve their status. For both urban and rural African women, one of their major concerns is economic independence. Increasingly, organizations are assuming the roles and functions formerly held by kinship, age groups and others. In many instances, they hold the key both to individual adaption to new circumstances, and to natural propensities towards group survival. Whereas in traditional societies, groups were organized to preserve ethnic ways and structures against the intrusion of the modern world, current new urban women's associations accept the reality of this intrusion and help their members cope with it both socially and economically. Members may now turn to such associations for support, employment, education, socialization and sympathy. Economic survival is on most priority agenda, and these women community organizations strive towards goals such as helping to raise capital, regulate prices, discouraging business competition and organizing cooperative activities.(4)

Many of these new voluntary organizations have sections or chapters in rural areas and therefore have access to a broad spectrum of the society. This simplifies the process of introducing new ideas and of examining the problems as expressed by members less articulate than themselves. Moreover, an awareness of the parent women's organizations access to government and international organizations, encourages the rural counterparts to make their needs known. The umbrella organizations are aware that the government cannot satisfy all the needs of its citizens; therefore, they seek to find alternative approaches and intermediate, innovative ways to assist their members. Although they are often operating under strenous conditions without sufficient financial support and technical assistance, they do have an impact. These groups are "action oriented" and they provide immense resources to the development process. A few examples of several West African women's organizations activities will illustrate the potential role of such groups. These groups in Senegal, the Ivory Coast and Togo are collaborating with the National

Council of Negro Women in planning projects to improve the family life in their respective countries through the use of improved technologies.

The Federation of Senegalese Women's Organizations

The Federation of Senegalese Women's Organizations combines twenty-two local private organizations who are involved in volunteer activities. Membership averages about fifty for each organization and includes all nationalities, ethnic and religious groups representing a wide variety of individual interests. To avoid becoming too large and unwieldy a group, and to facilitate the actual work of the Federation, a working committee was formed composed of five members from each of the organizations. While maintaining their separate identities, they joined forces and collaborated to develop strategies for solving some of the common and most urgent social problems of the country. They are presently addressing themselves to the problem of unemployment and migration of youth.

Although the organizations of the Federation are urban-based, they organize contacts in many other parts of the country for obtaining information concerning the needs of the local population. Needs identified include access to water either by digging wells or extending water pipes to rural areas and simple wheelbarrows which would facilitate the transportation of firewood and garden produce to nearby markets. Organizations along with other groups raise funds for orphans, the handicapped, vaccines, small farm implements; organize nonformal adult education classes and plan and participate in various activities as requested by the community.

A particular concern of the Federation is the steady increase of young people migrating to the cities seeking work but lacking marketable skills. A major goal is to consult with these young people, and help them adapt to their new environs and circumstances. There is also some effort to encourage them to return to their villages. For others, occupational training is preceived as the best alternative to prevent youth from turning to illegal activities.

The National Union of Togolese Women

The National Union of Togolese Women (UNFT) has twenty regional sections plus the main branch in the capital city of Lome. Membership is open to all Togolese women. The overall goal of this group is to improve the life of the rural women. To accomplish its goal, UNFT concentrates on adult education, self-help projects, community development and cooperatives, hygiene nutrition and child care. The

Minister of Women's Affairs works very closely with the Union in fulfilling the joint objectives which are closely tied to national development priorities. Through constant touch with the regional sections, a dialogue is maintained to ascertain what women perceive as their needs. The organization, UNFT, serves as a channel to bring these issues to the attention of policy makers. Paved roads, access to water and experiments with solar energy are examples of how these issues and needs are being met. UNFT also maintains contacts with international organizations and agencies as well as skilled technicians to whom they can articulate the needs of the constituents. Togolese men and women work closely together in meeting overall national goals.

At the present time, there is a concentrated effort to move new projects out of the cities and into rural areas where the need is greater. Several major projects have been identified by UNFT. These include methods to decrease pottery breakage, techniques for making soap more saleable and competitive with imported soaps, and acquisition of hand tools and rice huskers to reduce time spent in farm activities. UNFT assists in developing marketing potential and in finding financial assistance for locally produced items.

The Association of Ivorian Women

The Association of Ivorian Women (AFI) was organized in 1963 and has 122 chapters throughout the country. The wife of the chief of state is the honorary president. The active president of AFI is the Minister of Women's Affairs. Women from every strata of the society participate in the association. AFI members are kept abreast of what is happening throughout the country by internal travel or through information transmitted via the media and family network. A major objective is to help rural women solve problems at the village level and to aid them to control their own future. They seek and welcome assistance from international organizations and are prepared to collaborate in mutually beneficial efforts. Members attend international conferences and therefore can share with colleagues new information on solutions to similar questions posed elsewhere in the world. They, as women everywhere, work full time, care for the home and participate in the community work of AFI. Functioning as a part of the dominant party, they are involved in its major decisions. Unlike similar western organizations, this tie makes them more effective and involved in national policy. For example, AFI was the major force responsible for changing legislation for unwed mothers and other aspects of the civil family code.

The research department of the Ministry of Women's Affairs has conducted surveys throughout the country to deter-

mine what the local needs are as perceived by the people themselves. Needs have been identified related to water, food production, fuel, literacy, hygiene and nutrition, child care and income-generating activities. AFI and the National Council of Negro Women are working on a project to improve the method of preserving and storing fish. This is a major activity of women in the fishing villages. Income derived from this activity contributes to the well being of the entire family. If this project is successful, it will be replicated in other villages which have the same problem. Since its inception, this project has been a joint endeavor between the villagers, AFI, NCNW and the U.S. aid agency.

AFI established a large urban training center in the nearby community of Adjame within the city of Abidjan. Literacy training is offered as well as instruction in practical skills. Admission is on a first-come, first-serve basis and enrollment numbers about 1,000. The program is divided into half-day shifts with a daily average attendance of 100.

These examples illustrate how women's organizations functions as communicators and facilitators in improving the life of poor urban and rural women. Science and technology are being utilized to eliminate some of the drudgery of women's work.

SUMMARY

African women's organizations represent a cross section of the population and should be recognized as a rich national resource. Great effort is expended in identifying citizen's needs and methods of finding solutions to them. In spite of heavy family and social responsibilities, the women are actively involved in community projects on a broad scale. They provide a model and inspiration to women in less fortunate circumstances and to those of future generations. They encourage their fellow women to realize their potential and value as individuals and as citizens. They raise the consciousness of policy makers and are involved in decision making. They also play a major role in the implementation of projects geared to the needs of the most needy. The visible confidence and poise of these women create an atmosphere among urban and poor women that is conducive to the introduction of new ideas and technology. It is relatively easier for these group members than for outsiders to explain ideas and offer suggestions to rural people.

In spite of this new determination on the part of many women, there is little indication that they want to reject their traditional role as ascribed and accepted by the majority. Their efforts tend to compliment national efforts

as they become more actively involved in decision making. It would be advisable for foreign donors and benefactors to examine and become more receptive to ideas and projects designed by women's groups. They must realize that these groups are representative spokespersons for the many who will never have the opportunity to stand before national and international bodies and verbalize their needs.

When American teams are sent abroad on technical missions it would be appropriate and perhaps essential, to include women on the teams in order to set a good example of mutual cooperation. American women's organizations could supply the expertise for many of these teams.

African women will continue to organize for common causes and pressure national policy makers and international planners to include them as partners in progress. Further research is needed in order to fully understand the real contribution women's organizations are making. Research should be conducted by teams consisting of members of local organizations, international bodies and foreign counterparts. Information is needed on how these organizations function and how information is disseminated to its members. Teams of both men and women would be effective in the countries where there is already a tradition for communal work by both sexes. The majority of the preplanning should be done in the host country in order to avoid taking in pre-packaged plans based solely on foreign ideas. Traditional and classical research methods and techniques should be adapted to the circumstances in the country in question. There should be continuous dialogue between participants after research is completed. It cannot be emphasized too often the great importance Africans attach to outside researchers sending copies of their findings back to the country where it was conducted. Failure to do so has been a very serious breach of scholarly protocol, not to mention common courtesy, in many countries.

If nation building is to progress, all human resources must be involved in the development process. With recognition, involvement, financial and moral support, the women's organizations of Africa can play an even greater and significant role in development.

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PROSPERITY AND POVERTY IN RURAL AFRICAN AREAS: CAN ECONOMIC DEVELOPMENT TAKE PLACE WITHOUT SOCIAL STRATIFICATION OR INEQUALITY?

by Priscilla Reining

As Henry Steele Commager reminds us, De Tocqueville perceived that in America the goals of social and political equality had great implications for the future but were awkwardly caught up with economic individualism and inequality in ways which would always be difficult to reconcile. (Moyers). In this short paper, I would like to suggest that the benefits and liabilities which De Tocqueville saw here not only continue to be difficult to reconcile in this country but the assumptions we make about economic individualism, and its effect on inequality, complicate our donor roles. We fail to see that these inconsistencies may be passed on to developing countries along with the specific results of development projects. The presence of newly prosperous farmers and newly poor farmers in rural areas in developing countries is now being documented. The relevance of these observations to the status and role of women in developing countries is also quite clear: women of the prosperous families are almost surely better off than were their mothers and grandmothers; women as individuals and as members of the poor families are almost surely worse off than their immediate forebears.

The processes which lead to the observable and felt inequalities will probably be investigated by cooperating social scientists, men and women, in both developed and developing countries. In the interim it is probably easier to see the processes by which earlier inequalities--political, social, and economic--are reinforced and accentuated locally than to demonstrate the creation of inequalities persisting is an inadvertent result of policy decisions.

As western social scientists we are all familiar with the history and some of the major analytical theories which account for the formation of classes in western society.

For at least two decades we have also become well acquainted with the urban elite/rural dichotomy in developing countries. Less familiar in the rural areas of developing countries is the elite/rural poor dichotomy. I wish to emphasize that the changes are not simply matters of income nor of amount of land, but in the examples from my own work and others, of important emerging differences in lifestyles. Those differences are grounded variation in the amount of land, education, income, and they include other social, economic and personal attributes which refine and support those inequalities. In short, class formation is beginning to take place in rural areas, patterned and tied to analogous formation in the towns and city. Whether one uses "inequality" or "social stratification" is a matter of theoretical bent. (Fallers).

Can we realistically expect that "development" catering to the poorest of the poor can ever be possible without furthering the creation of the poor we are hoping to aid?

It may very well be that some inequality is commonplace in rural resource allocation systems and perhaps inevitable. Therefore, one needs to distinguish between a normal, predevelopment range in resource distribution--land or cattle or allocation of other goods or services--and comparatively recent changes which are clearly associated with modernization and which are tending toward increasing differentiation in ways which are likely to become not only permanent but distinctively class-like. To put labels on these new distinctions is probably premature. However,for descriptive purposes we are talking about cultivators who are becoming middle class farmers and other cultivators who are so resource poor that they are for practical purposes landless and become laborers.

In those parts of the world where women have traditionally played a significant role in agriculture, the immediate circumstances of their families and their own personal attributes were both of considerable importance in determining the amplitude of their life styles. But in modern circumstances radical changes in access to land alter that situation. Women may be using their agricultural skills in growing subsistence crops for their families, their familiarity with skills may enable them to take managerial roles in new farms or they may need to practice their skills as day laborers. In this paper I do not deal with societies in which have not, traditionally or at present, had an active role in agriculture.

The developing country differences are very modest in relation to the very substantial differences in the distribution of wealth in the United States. (Brittain).

A concept, familiar to people in the United States, namely individual ownership of arable land is part of the conceptual transfer taking place in the modernization process. I want to recount the effect of Land Reform in Kenya, of the rather unsuccessful attempt to discourage the implementation of these concepts in Tanzania, and the sum of the consequences of agrarian reform.

The well watered, fertile and high potential land in the south central part of Kenya became the subject of the world famous dispute in the fifties between African smallholders and Europeans. After the end of the Emergency a major plan of land consolidation, individual land title and credit, combined with farming plans, and the promotion of coffee as a smallholder was instituted under the name of the Swynnerton Plan. In the space of some four years, much of the land inhabited by Kikuyu was consolidated, farm boundaries defined and titles issued. Farm plans, however, were prepared only for the farms larger than five hectares. (Herz, 89-92). Size of farm was related to prior holdings and also the relative status of the individual, and of his lineage. It was understood by Swynnerton and others at the time that only the larger farms would be sufficient in size to attempt coffee farming in addition to subsistence crop farming. Cattle were included, for milk and manure. It was also understood that some cultivators would of necessity become laborers on the farms of their neighbors.

Twenty five years later, we studied one of the very first villages to undergo the land consolidation process. (Reining, et. al.) We found that status differences are emerging between the landowner-cultivator-employer (*muremi*) and cash laborer-employee (*muremia*). The former term has been in the Kikuyu lexicon for a long time and has meant cultivator. The latter term is new and when paired identifies the employer-employee relationship. Some of the employees are women, though most are men; most of the employers are women, though some are men.

The land base of these farmers and the empirically derived estimate of their socioeconomic status follows as a quote from that study.

Kikuyu: Size of farm and socioeconomic status of farmers. Total acreage is 515 hectares. Total number of farms is 196.

Range in Farm Size	No. of Farms	Total Hectares	Percentage	Socioeconomic Status of Farmers
0.1-2.5 hectares	119	127	25	1,2
2.6-5.0 hectares	44	146	28	1,2,3
5.1-7.5 hectares	19	105	20	3
7.6-10.0 hectares	9	77	15	3
10.0 plus hectares	5	60	12	3
Totals:	196	515	100	1= cash laborer 2= neither 3= commercial farmer

The principal point of this paper is to raise the question of what are our expectations as development takes hold. What is the model? Cancian in a short but interesting article states two basic social principles. They appear to apply very well to the example just cited from Kenya and the one to follow, also from Kenya.

However much the effects of development on income distribution are unanticipated in other places, land consolidation and the introduction of cash cropping in Kenya were expected to produce a prosperous group, as we have seen. In this vein the two basic social principles noted by Cancian are borne out in Kenya.

> The first is simply that: Individuals and classes of people will struggle to improve their lot relative to all other individuals and classes of people. This is not a surprising social principle. It is basic to classical economic theory, to Marxist theory, and to the every day American competitive spirit. The second

principle is that: All other things being equal, individuals and classes of people who have more resources at the beginning of an isolatable period of struggle will have the advantage in the struggle and in the end improve their position relative to others (Cancian).

Land consolidation is taking place in other parts of Kenya. In one of them, Embu District on the lower slopes of Mount Kenya, land consolidation procedures were started ten years ago and are being completed now. A recent study of the distribution of land, now held by individuals, by Brokensha, Riley and Hunt (1979) shows a pattern of distribution similar to that found amongst the Kikuyu. As we shall see some of the other concomitants are also similar.

Number		Range in plot size	% of total land
117	people (14%)	had plots less than 2 ha.	(2% total land)
323	" (39%)	" " between 2 & 4.9 ha.	(18% " ")
252	" (30%)	" " " 5 & 9.9 ha.	(31% " ")
99	" (12%)	" " " 10 &19.9 ha.	(25% " ")
32	" (4%)	" " " 20 &39.9 ha.	(16% " ")
8	" (1%)	" " 40 or more	(8% " ")
831	100%		100%

Brokensha, 1979, 5.

In Embu District, land has now acquired commercial value and is worth K. shs. 6,000/= an acre, approximately $850.00 an acre. Unlike Kikuku country, this land on the lower slopes of Mount Kenya is much more fertile on the upper reaches than it becomes at lower altitudes where it is also drier. It is medium potential land in a semi-arid environment and development of these lands was the goal of a project --the Special Rural Development Programme (SRDP). Among the results: the richer farmers can adopt the innovations of new crops or varieties and technology while the poorer farmers with less land cannot.

I go on to quote the emerging division of labor among the Mbere.

> 3. Labor skills and requirements. The old sexual division of labor has been much modified, with men and women doing the same work, when necessary. A few tasks remain almost exclusively male (thatching a roof; erecting a fence; plowing with oxen), and some are still done only by women (collecting thatching grass; washing babies; grinding millet and pounding maize). But in between are all the other domestic and agricultural tasks that are done by either men or women -- looking after cattle; clearning new land; brewing beer; weeding; harvesting, storing, selling crops; even collecting water and firewood.
>
> Further comment on the changing roles of men and women is appropriate at this point. Traditionally, an Mbere woman was expected to be obedient (to parents, and husband, and in-laws); polite; hard-working; generous; a careful household manager; patient; even-tempered; faithful. A man was expected to be kind, considerate, brave, hard-working, have adequate gardens and cattle; respectful to elders; modest; supportive of family and clan. In addition he should avoid gossip, and excessive drinking.
>
> In contemporary Mbere society, other qualities are admired -- especially education and wealth. Yet even today, women play an important part in decisions not only about the domestic affairs of the homestead, but about all agricultural decisions. Here, as elsewhere, there is a wide range of actual behavior. We know a few old men who like to appear as autocratic heads of households, but we are told that even they listen to their wives "when the children are asleep and the outside fire has been extinguished." Men may have more influence over cash-crop decisions, but they must have the willing and active cooperation from their wives, if they are to be efficient farmers. In fact, many women are successful farm managers while their husbands are working elsewhere. (Brokensha).

Before agrarian reform started, access to land was based on the principle of communal tenure and rights were acquired through lineage membership. Now title is held individually. (Brokensha, p.4). The lowest decile in the population holds one tenth of one per cent of the wealth; the highest decile holds 44% of the wealth. In conclusion, the authors state:

> There have always been differences in wealth in Mbere households, but until fairly recently (a) this was measured in number of livestock, and (b) it was a more flexible system that allowed for some degree of personal mobility, through hard work or a good marriage. There was also a more egalitarian style of life, whereas today the way of life of the rich is vastly different, in all ways, from that of the poor, as are the expectations of their children. (p. 14).

In Kenya the policy of land consolidation and reform is avowedly based on the principles of individual ownership and an assertion of the rights of individuals to own property, "develop" it and raise credit on the basis of their ownership. In Tanzania, land policy and settlement policy has been directed in recent years toward villagization and implementation of ujamaa--the creation of more compact villages and the introduction of some communal farming. Under villagization some eleven million people have been resettled and much effort has gone into the promotion of communal farming. It is notable that the villagization program has directed to the medium and low potential land, where for environmental and cultural reasons the adaptive strategies of land use had taken the form of dispersed settlement and field rotation. In such areas, before "villagization" there were neighborhoods or residential areas which were called "villages." However, they were less compact or well defined than the neighborhoods or villages in the high potential land where land values have always been high and boundaries important.

In these areas, women have and do play an active role in agricultural cycle, undertaking or aiding the preparation planting, weeding, harvesting of food crops.

The high potential areas villages--occurring in places of high rainfall or high altitude or both--have not been subject to villagization for two reasons. They already have villages of high population density; their inhabitants resist attempts at resettlement. Compared with the two examples from Kenya there are high potential areas in Tanzania where individual tenure applies. In northwestern Tanzania, individual tenure of small holdings antedates the colonial period (Reining). However, that tenure was part of a feudal-like system in a centralized state, not a common state of affairs elsewhere in Tanzania though found in Uganda, Ruanda and Burundi. The villages are very old in Bukoba and the tenure/state system undoubtedly developed over a long period of time (Schmidt, 1977 and 1978). Power in the indigenous

state system was held by a ruling dynasty whose members also had "big" coffee and banana farms. In the fifties the power to create "big" farms had been abrogated, land was transmitted through inheritance to ruling dynastymembers and cultivators and some land was being bought and sold. It still is. Coffee had been converted into a cash crop. The average farm consisted of two very intensively cultivated acres. Accurate measurement of these small holdings is extremely difficult. The land distribution history in Bukoba is incorporated in the following table which places it in context with some of the other distributions in high potential land in Tanzania. (See Table on following page).

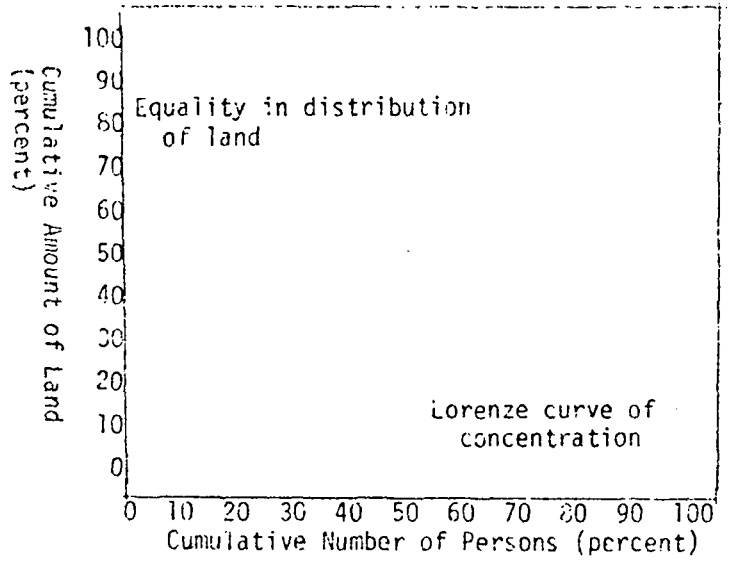
The several ethnic groups in the high potential areas are relatively prosperous compared with the recently resettled groups in the medium and low potential areas. There is a trend in Usambara toward increasing disparity and some consistent differences can be observed in life styles in Moshi and in Bukoba. We do not have any Moshi (Chagga) data at hand. In the high potential areas there is an emerging group of comparatively prosperous farmers, a prosperity based on a combination of good land, valuable cash crops (coffee and tea), early realization of the uses of western education, and conversion to Christianity along with adoption of western technology. Sometimes all three were transferred at the same time and through the same auspices. One sees the Protestant Ethic. There is a kind of re-enactment of the processes described by Tawney and Weber for western Europe's industrialization and modernization. Like Europe there are also households and groups who do not participate in the prosperity for a number of reasons: they lack adequate land, they have little education, they are of low status within their villages or districts or they are disadvantaged in other ways.

One way of testing relative inequalities in distribution of land is through using the Lorenze curve of concentration. In Niger, among the Songhai who have lived for many centuries along the great bend of the Niger river, the distribution of land within the dominant lineage and between lineages was tested. The inequality of distribution is much greater within the dominate lineage (or those tributary to it) than among the five lineages in the village from which these data were obtained (Reining). There are a number of landless men within the dominate lineage and there are also persons who are called slaves. They are, by definition, landless.

Place	This % of the population	Hold this % of all land	% of the pop. with less than 2 acres	% of the pop. with less than 5 acres
Ismani[a]	9% .01%	53% 21%		
Rungwe[b]	6%-10%	0%	37%-78%	75%-96%
Bukoba[c]	3% 50% 47%	0% 33% 66%	60%	99%
Bukoba[d]	25% 30%	10% 40%	about 60%	about 90%
Bukoba[e]	10% 60%	19-27% 36-38%	more than 50% (f)	
Usambara[g]	33.3%	66.6%	90%[h]	99.5%[h]
Usambara[i]	33.3%	60%-76%		
Usambara[j]	Wealthiest 25% hold mean of 6.8 acres; poorest 75% hold mean of 2.5 acres.			
Mbeya[k]	12.8%	0%		

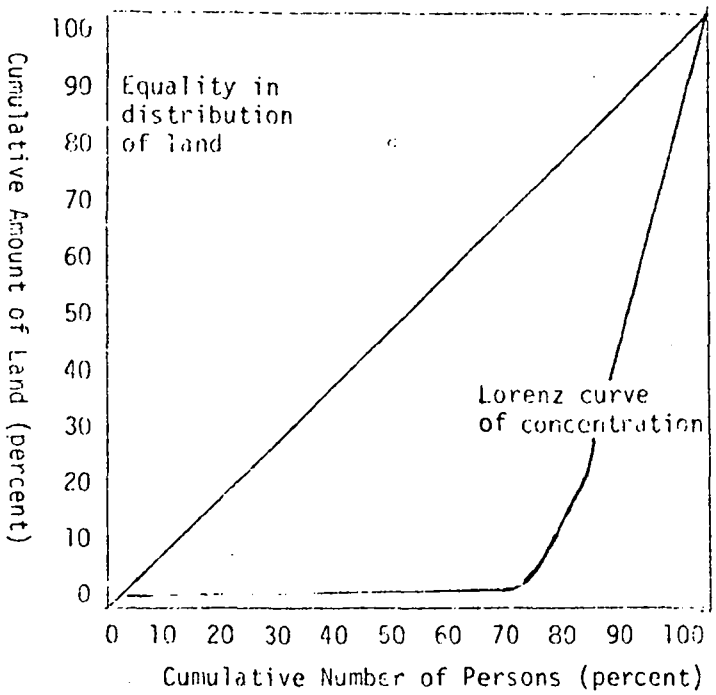
a. Awiti 1973; b. Van Hekken and Van Velzen 1972; c. Reining 1963, 1967; d. Friedrich 1968; e. Boesen 1973; f. Rald and Rald 1975; g. Attems 1967; h. 1975-1980 Tanga Regional Development Plan; i. Sender 1974; j. Fleuret 1978; k. Pipping 1976.

Table 14. Distribution of Land within Village 1, by Quartier/Lineage.



Hect/person	Lineage	# persons	cum # persons	%	# hectares	Cum. # hects.	%
.542	3	108	108	20.1	58.5	58.5	14.1
.675	1	(208)	312	58.2	137.9	196.4	47.9
.907	5	103	15	77.4	93.4	289.8	70.6
.924	2	75	490	91.4	69.3	359.1	87.4
1.12	4	46	540	100.0	51.6	410.7	100.0

Table 15. Distribution of Land within Quartier/Lineage in Village 1, by Compound



Hect/ person	# of persons	Cum. # of persons	%	# Hect	Cum. # Hect	%
0.0-0.09	120	120	57.7	2.9	2.9	2.1
0.1-0.19	25	145	69.7	4.0	6.9	5.0
0.2-0.29	3	148	71.1	0.7	7.6	5.5
0.3-0.39	0	148	71.1	0	7.6	5.5
0.4-0.49	0	148	71.1	0	7.6	5.5
0.5-0.59	2	150	72.1	1.0	8.6	6.2
0.6-0.69	0	150	72.1	0	8.6	6.2
0.7-0.79	1	151	72.6	0.7	9.3	6.7
0.8-0.89	8	159	76.4	7.1	16.4	11.9
0.9-0.99	0	159	76.4	0	16.4	11.9
1.0-1.9	20	179	86.0	27.3	43.7	31.7
2.0-2.9	19	198	92.3	47.4	91.1	66.1
3.0.3.9	9	207	99.5	29.5	120.6	87.4
4.0	1	208	100.0	17.3	137.9	100.0

In this quick review of some work in East and West Africa, the evidence is strong that modernization does not occur in a vacuum and that planned or unplanned it is accompanied by increasing social differentiation or inequality. Where classes did not exist, they are forming. Where earlier systems of stratification had arisen they are important in modernization. We need to ask, however, what is "normal" distribution, what kind of inequities in resource distribution are always present? We have some least:most ratios (1: 8 for the Shambaa, land only, 1:16 for the Haya, land only in sample village 1953, 1:333 for Mbere, weighted 1979, 1:400 for the Kikuyu, land only in one village 1976, 1:5,000,000 for the US weighted, 1969).

Summary

Considerable changes are in evidence in many parts of the developing world as modernization, the great transformation, takes hold. The fate of women, their changing status, loss of old and acquisition of new roles are linked to these changes, inevitably. In this paper I have sketched some of the recent studies which point to important shifts in the nature of rural African societies. Some women thrive in the new circumstance, others fare much less well.

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WOMEN WITH BANKING, FINANCE AND ENTREPRENEURIAL ABILITY

by Michaela Walsh

"Women with banking, finance and entrepreneurial ability," specifically as it relates to the UN Conference on Science and Technology for Development, is too ambitious a topic for anyone to try to undertake in one sitting. In fact, to address this particular weave of issues with any degree of self-confidence, we would need far more information and experience than women generally have access to. However, if we all agree that we know very little about how the system really works--then we free ourselves to start to address issues related to the economy from our own experiences and perceptions with greater confidence. That's a good place to start.

I believe strongly in the existence and motivational power of profits and in encouraging a better understanding of the elements which create a profit. Those characteristics which are generally attributable to a successful business, are also the basic elements of a flexible and healthy economy. One of our major problems today is, I believe, a fundamental misunderstanding or lack of understanding about profits. The issue is not "whether" profits, but what creates profits? How? For whom?

The world has changed radically during the past five years, and in another five, it will be difficult to recognize today's systems, traditions, and economies. The dialogue about how a global society can best organize and sustain itself has undergone major changes as well. We have hardly begun to struggle with the new concepts, realities, and turfs which are fast becoming the realities of the 80's. At the same time, most of the women I know who are working in development programs for low income women are still working within the classical mode of development--one that is welfare-oriented and characteristically trendy,

with the trends set by male voices. Welfare is easy, and so is the short-term reactionary approach of many "welfare"-oriented programs. It is certainly less risky than is the commitment to work within the economic system to help drive that system. The latter is non-reactionary by nature; and to put that commitment into action requires a longer term, more narrowly-defined focus than is usually the case with projects where bottom-line accountability is not a priority. Certainly, when working as a producer of and within the economy, and not as a consumer, we have to think differently; motives and time frames are different; accountability must be a two-way dialogue. And most importantly, when producing in a changing economy, demands are placed on our capacities to trust our own judgments about unfamiliar types of advice and expertise.

One concern I have with today's dialogue relates to credit. How often have you heard, "Credit is the key to women's success"? To use terms and strategies such as "credit" that have such major implications on people's lives with, apparently, so little understanding and only a general sense of expectation is a scary phenomenon. It's that welfare attitude again. "Just get the money and everything will work out." What is at issue is to understand that many women who have been socialized to plastic "instant-satisfaction" credit cards are writing programs and credit schemes for women in other economies quite unlike our own. We first have to understand that our own position and situation as credit consumers is in a centralized, consumer-oriented economy which has provided the jobs and salaries to cover the indebtedness and inflationary interest rates of such an economy. We have to begin to understand the impacts of credit in our own economy before we can begin to enter a dialogue with women in a differently-structured economy, and in which the impacts of credit will necessarily be different. Further, we have yet to fully realize that there are many different kinds of credit arrangements. Each kind will have differing impacts and only some are fair and equitable for the borrower.

The credit myth is great for us (and please don't misunderstand me, credit and banking are crucial to anyone who is a part of the modern economy), but what about a government credit system that provides seed, fertilizers, and pesticides to small subsistence farmers who must repay with interest at the rate of 1/3 of their harvested crop. Does local government bureaucrat provide the credit to the male farmer for new cash crops; and, if so, does that displace the women from their traditional roles in family

farming? What happens to those farmers when crops fail? What happens to a family's diet when cash crops are substituted for family farming? Each of us has experienced the effects of inflation as a major by-product of credit opportunities, but what do we know about the effects on the health of women and children in subsistence economies when they can no longer afford the cost of sugar, milk or other staples because of inflationary prices?

The second point at issue regarding "credit" is: How many of us understand that "credit" is not the starting point to financial success and that when taken to be the key to success, it more than likely will lead to the failure of an enterprise or the financial enslavement of an individual. The components which do form the basis of a viable enterprise are a sound operating plan with start-up and expansion closely attunded to the fluctuations of the market and courage and commitment to develop and sell an idea or product. Only then will a fair and decent credit scheme be put to its best advantage.

I'd like to share three examples of well-run and economically profitable enterprises. They are successful because the individuals involved do know more about their own projects, their market potential, and their economies than anyone else. Credit is used judiciously only after commitment and operation are in place. It is important to understand that a bank's primary role is to reinvest other people's money and not to give it away. With this in mind, you'll better understand why these projects are regarded as good credit risks by their bankers.

The Self-Employed Women's Association in Ahmedabad, India: In 1972, Ella Bhatt organized S.E.W.A. as a means by which to further the economic independence of women who were engaged in earning their own livelihoods as street vendors, cart pullers, junk-smiths, etc. Most of these women were illiterate. There were no credit programs extended to them by the banks to enable them to break the vicious circle of borrowing at high rates from money lenders--because they were illiterate and could not read the banking forms. Furthermore, the amounts of the loans they requested were too small to cover the bank's administrative expenses for processing them. S.E.W.A. began with a penny savings program for its members and a training program about the use of savings. Eventually these monies and Ella Bhatt's unique energy created a guarantee fund, which now helps provide low-interest loans for these women.

The result has been that many of the women now own their means of production, and their income is not eaten up by high interest rates and by rental payment on their equipment. Other by-products of S.E.W.A.'s profits include a health care center for its members, training program, and a day care center.

Deidre Bonifaz began her effort five years ago. Artisan's Cooperative/Cooperative Craft Marketing Center at Chadds Ford, Pennsylvania has provided several hundred women artisans in economically depressed areas of our country with marketing and technical assistance. Through her efforts, women from over 50 cooperatives are insured of monthly orders for their crafts at prices considerably higher than they could obtain locally. Sales, which now have exceeded $1/2 million annually, have enabled them to buy their materials in bulk at discount prices and to finance the opening of six retail stores in affluent areas. The Cooperative is now expanding to include exchanges with women artisans from other countries and an international commercial mail-order catalogue. Most importantly, for a majority of these women their new earning power represents a significant, and stable, share of their families' total income.

Gerard Pantin's Trinidad and Tobago Development Foundation is another example of a long-term effort to encourage the greater participation of women and men previously excluded from the banking and financial systems of their economies. The Foundation asks only three questions in their consideration of whether or not to help an undertaking: 1) Is it really a project that has come from the community? 2) Is the community able and willing to pay for the project? 3) Is the only problem that the community cannot obtain a loan from the commercial banks? Another crucial element is the willingness of the community members to sign <u>personal</u> guarantees. If the answer to all these questions is "yes," the foundation proceeds to guarantee the loan. This is, to my way of thinking, an excellent example of appropriate technology at work. When such a philosophy and orientation is put into action, it is easy to understand why a program can be considered successful--twenty-one projects have been funded to date for a total of $150,000 at a repayment rate of ninety-four percent!

Each of the three individuals, Ella--Diedra--Gerard--is first and foremost committed to making a small project/business work; and in producing resources or profits in the economy rather than in consuming them. To that end, they are first concerned with understanding and controling their markets, the cost-effectiveness of their operations and the interest and profitability of their products. Their success is measured in the improved economies and well-being of the individual women (and men) they serve. Each year, the members of each of those groups have had more money to spend than they did the year before and they have more choices about how to live their lives. To me, that is profit. As a side note of comparison--Do you know that the paper requirements of the Geneva office of the U.N. alone utilizes 6,000 acres of timberland annually? I ask you, is that the most efficient way to help create and maintain a flexible world economy? I'm beginning to wonder.

While I know many of my colleagues who disagree, I am increasingly convinced that the small-scale entrepreneur --and especially the woman entrepreneur--is the key to establishing a healthy and stable economy. For starters, think about efficient household managers. They represent the best examples I know of real entrepreneurs and appropriate technologists. They are labor-intensive, small-scale, locally-maintained, use limited resources (both natural and capital) efficiently. Similarily, a successful entrepreneur or appropriate technologist cannot be replicated or mass-produced by others. One day I escorted Margaret Mead from New York to Washington. During our flight, we talked about the new appropriate technologists in this country; and she said, "You know, the real potential for new innovation in technology will come because during the next decade we will see the first wave of women into the field of technology design." New ideas and new technologies are emerging at a faster rate than we are capable of comprehending. We know that during the next decade we will see an explosion of new information and educative technologies. How many women are involved in the forefront of understanding and developing those new areas and markets which are expected to have major impacts on our lives--and economies.

As I suggested at the U.N. last spring, until we, as women, have enough courage to risk new development thinking designed to change the dialogue so that all individuals have a greater stake in and potential benefit from a 'New International Economic Order,' we will never succeed in having an equitable share in the decisions about how our economies are run and in the choices about the technologies we will be using. This will occur only when women have the courage to create new dialogues, new partnerships and programs designed around new markets in which women control their fair share.

Generally, greater attention is needed to better understand what is going on among women all over the world, and then to help design new ways to support those efforts without controlling or diverting them from afar. A serious analysis and closer monitoring of the charter of the World Bank, the UNDP, and other "assistance" programs should provide us with new insight about how decisions within those programs are made and how greater accountability can be required. More importantly, an effort should be made to convey that information to women in recipient countries to encourage an understanding of the importance of those programs on their lives.

More specifically--(to those women who help design and support women's programs)--

- Read E. F. Schumacher's Buddhist Economics and Susan Griffin's Women and Nature and Jean Baker Miller's Toward a New Psychology of Women.

- Begin to think in terms of the "marketplace," of financial viability, or profit -- when designing a program. This will involve a great deal of research and analysis of the local-national economic environment. But no enterprise can succeed without that knowledge.

- Redefine concepts about experts. This is the most difficult task to thinking differently. The organic process of searching for and identifying new sources of expertise is comparable to the complex process of learning. It simply cannot be packaged. Appropriate Technology is already encouraging us to redefine our terms, and to identify "experts" at all levels of a community. At a recent Workshop of "AT" practitioners a new strategy

for development was designed to place new emphasis and priorities on the experiences of individual community members, including women, the aging and the handicapped, etc. (See Appendix I).

- Create funding attitudes which allow for greater flexibility and longer term financing as determined by specific circumstance.

- Establish your presence. A profitable enterprise cannot be managed from afar. Work together as equal partners on the nitty-gritty of every day operations of the project or enterprise.

- Once a profit has been realized, work harder to keep it.

As a guideline for how we might begin to redefine and redesign our development programs for women, I have attached hereto a strategy for development suggested by a group of appropriate technology practitioners.

I'd also like to briefly share with you some of our planned programs for Women's World Banking. As many of you may know, Women's World Banking is designed as a mechanism to encourage a sharing of money-making and entrepreneurial expertise among women from around the world. There is a tremendous resource of experience and knowledge among women already--women who understand their national and local economies; who know how to use and influence their banking institutions; who can help identify and control their marketplace; and who know how to survive in the world of profits. These skills and knowledge for the most part are not just words. They have been acquired from long, hard experience. What Women's World Banking intends to do is to begin to tap that expertise and encourage the link-up of women in traditional banking and finance organizations with women entrepreneurs--many of whom have survived without benefit of traditional banking services. To that end, we are planning an international workshop of women leaders in banking and finance to be held later this year. While experiences from within any specific economy cannot be imported or super-imposed one to another, we do believe that skills and opportunities for women within a specific economy can be strengthened by a greater catalytic effort on the part of all women. Our international workshop is a first step to encouraging womens' growing participation in the marketplace, in their economies, and in the banking and financial institutions

of their countries. What is now required is a new look at how we as women work together; how do we trust each other's experience and perspectives; and how do we make a new commitment to individual candor and integrity about what we know and do not know..

STRATEGY FACTORS IN APPROPRIATE TECHNOLOGY*

As a strategy for development, AT is relevant in all primary sectors of human activity, including food and agriculture, health and human services, industry, commerce and economic activity, transportation and communication. In each of these sectors, this AT strategy has four crucial components: 1) People, 2) Financing, 3) Training, Education and Skills, 4) Organization.

1) PEOPLE

People, end-users, are at the center of the AT strategy. Several key factors define the strategy of working with people:

a) Need must be defined by end-users. This definition of need is situation-specific and builds from where people are.

b) Proper diagnosis of problems should be made and presented by the local people as a prerequisite for acceptance of the project.

c) Interest and participation are self-defined; outside resources are at the disposition of the end-users.

d) Risk is accepted and taken by people, end-users. This implies direct venture participation, and excludes welfare orientations and hand-outs.

e) People's direct participation begins with program choice, planning and design, and continues through program implementation and evaluation.

f) Special emphasis should be given to encouraging participation by women and others traditionally excluded from program planning and implementation.

* FROM: Workshop of Appropriate Technology Practitioners
Winrock International Conference Center, Morrilton, AK
December 1 - 5, 1978.

2) FUNDING

Funding mechanisms have a direct bearing upon the implementation of AT and thus become a key factor in overall strategy of AT. The following factors define this strategy:

a) Financing of AT can be multi-source, tapping private, government and international resources. Emphasis is on a mix of funds which will ensure the independence of end-users.

b) Financing of AT can be multi-faceted, i.e., grants, loans, services, aides. Start-up development costs must be built into all programs; the important factor is that these funds provide subsidies only as long as necessary to ensure project viability.

c) Financing must be as direct as possible to project participants.

d) Since financing is not administered or distributed in a vacuum, there must be at least some minimal government awareness to ensure legitimacy.

e) Financing levels should meet the needs of the end-users; small- or large-scale funding is situation-specific; over-funding should be avoided.

f) It is important that the participants in a project contribute either finance or labor or both--to ensure their close identification with the project.

g) Financing must be flexible, requiring as little paperwork and bureaucracy as possible. Emphasis should be given to more small-scale financing.

3) TRAINING, EDUCATION AND SKILLS

AT's strategy of working directly from people's interests, needs and risks requires a complementary factor: the build-up of specific skills, talents and human resources. This factor is further refined:

a) Skills are program-specific, though they tend to divide into technical, managerial, organizational and leadership.

b) Skill models may be imported, from other regions or nations, if controlled locally, but the essential goal and product is the development of idigenous models.

c) The social, cultural, educational, and skill-learning level of people involved must be the starting point for program development.

d) Emphasis should be placed on "hands-on" training and educational-training exchanges between existing AT groups.

4) ORGANIZATION

AT can work through institutions and structures, either private or public, to ensure continuity and replicability; but it can also operate on a people-to-people basis.

a) Institutions must be as close to working directly with people as possible. This ensures that they will be responsive to, and representative of, the local community. These institutions include cooperatives, not-for-profit agencies, small businesses, local village and municipal governments, decentralized government agencies.

b) AT organizations can, and should, through boards of directors, advisory committees, local councils, bring together representatives of a cross-section of the community, including government, end-users, service organizations and the private sector. Sectors with specific resources, such as funding and skills, should be incorporated and effectively utilized.