



EMPOWERING WOMEN TO ACHIEVE FOOD SECURITY TECHNOLOGY

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More than twenty years of experience with research and development has shown that technology is not neutral. Women are vital to food security and family well-being and their need for labor-saving and income-generating technologies is acute. However, most research and development programs from the 1970s through the mid-1990s only partly recognized women's contributions to the development process and the effect of the process on them. As a result, new technologies often had detrimental consequences not only to the economic security and social status of women and their families but also to these programs' and projects' ability to meet national and regional development objectives.

Women's work, particularly in rural areas, is arduous and time consuming. Women and children carrying heavy loads of wood and water, and women pounding grain, are familiar images. Increasingly, though, girls are also headed to school, studying science, and contributing to technology development. Three areas of technology research and adaptation can make substantial contributions to rural women's well-being and empowerment: agricultural production and postharvest processing, information technology, and energy.

AGRICULTURAL AND POSTHARVEST TECHNOLOGIES

During the 1980s and 1990s, agricultural research of the Consultative Group on International Agricultural Research (CGIAR) brought new visibility to women's roles on the farm. For sixteen years, researchers allied with the Women in Rice Farming Systems network based at the International Rice Research Institute (IRRI) carried out sustained research with women farmers throughout Southeast Asia. They developed both the technologies that addressed women's specific interests and knowledge and the means for conducting gender-sensitive participatory research. Technologies—improved germplasm, crop management and cropping systems, and machinery—were tested and evaluated in specific rice-farming environments using gender analysis, participatory methods, and a systems perspective by a multidisciplinary team of researchers (see box).

In West Africa, scientists at the West Africa Rice Development Association (WARDA) used biotechnology to develop a rice variety with the high yields and shatter-resistance of Asian rice and the drought resistance and broad leaves of African rice. The new variety substantially reduces weeding requirements, lightening a task usually performed by women and children. Despite such initiatives, national-level progress has been slow and more attention to women's needs is required. As more men migrate to urban areas, family labor becomes scarce, soil fertility declines, and more poor rural women become farm

RICE AND RICE-RELATED TECHNOLOGIES WITH POSITIVE BENEFITS FOR WOMEN FARMERS

Technologies	Positive benefits for women farmers
Modern glutinous rice variety	Increases land productivity Provides independent income from sale of glutinous rice cakes
Postharvest machinery for processing rice: rice huller; rice micro mill; rice flour mill	Reduces drudgery of hand pounding Increases volume of rice processed Saves time and provides flexibility in time use Provides additional income Empowers women individually and as a group
Rice husk stove	Reduces use of purchased energy Uses available biomass
Integrated pest management	Increases savings on pesticides Reduces/eliminates harmful effects of pesticides on human health and food in the natural habitat
Upgrading of poultry breeds Use of local crop byproducts as ingredient for swine ration	Provides women independent income Increases profitability of backyard swine production

managers, women need labor-saving and knowledge-based technologies to improve the productivity of both land and labor.

INFORMATION TECHNOLOGY

Information technology (IT) has a strategic link with poverty reduction. The Internet, email, and wireless mobile phones top the list of new tools. IT can directly empower the poor by offering access to services historically unavailable to them because of high cost or lack of infrastructure, particularly in rural areas.

Buying, selling, or renting IT equipment to others is a source of income. In Bangladesh, Grameen Telecom makes loans to those who wish to buy wireless phones and rent them to neighbors. "Phone ladies" benefit from rents and timely access



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IFPRI, a Future Harvest center, is part of a global agricultural research network, the Consultative Group on International Agricultural Research (CGIAR).

to market prices for agricultural products or handicrafts. This new income source allows women to invest in other small businesses, household improvements, or their children's education. While IT could increase women's access to new information in areas where road networks are relatively less developed, access to IT in rural areas is still rare. Where IT is provided in village cyber cafes, access to them may be hampered by women's lack of mobility, the limited hours of service, and safety conditions. Most uses of IT require literacy and education, suggesting that girls' schooling is an essential precondition to their equal access. However, the Honey Bee Network in India transmits information to illiterate women farmers with pictures and voice.

ENERGY

In rural areas, energy from biomass is used for cooking and heating; and energy from human and animal labor performs other tasks. At the household level, the major use of biomass is cooking, but food processing, especially milling and hulling, is the most arduous work. Biomass is now declining as a resource and electrification is limited. To reduce dependency on carbon sources, increase power, and reduce women's labor burden, reliance on wind power, micro-hydropower, and solar photovoltaics is growing. These small, flexible energy sources also offer entrepreneurship potential, for example, in supplying lamp parts in Bangladesh. Energy for lighting, from photovoltaics and batteries, contributes to public safety—a particular concern for women and girls.

In the 1980s, fuel-efficient stoves were introduced in developing countries to reduce women's labor, conserve fuel, and decrease pollutants causing poor health. Acceptance was slow: engineers' designs did not meet women's needs, and women often lacked independent funds with which to buy them. Now, as engineers work more closely with women and local artisans, modified stoves fitting women's criteria are becoming acceptable.

CONSEQUENCES FOR WOMEN

Technology has tremendous potential for enhancing women's welfare and their empowerment. Low-cost, reliable sources of energy for processing, cooking, and lighting can provide a great leap forward for meeting rural women's practical needs for less burdensome work, improved health, and more time. Selling or renting technology or using it for better market access contributes to women's empowerment as her income gives her a stronger bargaining position in household and community decisionmaking. However, experience has shown that when the use of a new technology starts to produce income, whether it is a newly profitable crop or new processing equipment, it is often taken over by men. Care in developing the technology in ways that empower women so they control it is essential.

GENDER-SENSITIVE PARTICIPATORY TECHNOLOGY DEVELOPMENT

Most technologies are bound up in hardware and their products are goods to be sold or used. Questions of access and control are central in determining actual benefits to women. Twenty years of research on appropriate technologies for women and agriculture provide well-tested guidance on how to develop technologies to assure their acceptability to, likelihood of success for, and ability to empower women users. Such efforts require commitment and attention. They have the following elements:

Checking assumptions at the door. Women's invisibility in research and technology development results from several erroneous assumptions. The most salient is that the household head is male and that he is the knowledgeable source of information. Second, it is assumed that his decisions represent the views of the whole household. A third is that scientists, engineers, and planners can develop, without talking to customers, new germplasm and other technologies that would be readily accepted by poor rural women farmers.

Delineating target groups carefully. Women are not a homogenous group and often have different interests. Ethnicity, race, and class are interwoven with gender. There are different categories of women: women from poor landowning households; women from landless households; and female heads of households. Landowners will benefit from technologies that are labor saving and drudgery reducing. Landless women will benefit from mechanical technologies such as a rice mill, but they might be displaced by some labor-saving technologies such as direct seeding and herbicide use if alternative employment and income opportunities are absent.

Forming multidisciplinary teams. Increasingly agricultural research includes social scientists and gender specialists. This is rare in information technology and energy programs where measures of hardware rather than social impact are common. Gender specialists should pair with scientists and focus on the technology questions as well as the gender issues.

Using a gender-sensitive participatory approach. When working with women farmers and entrepreneurs, include participants in each stage of hypothesis testing, planning, design, and evaluation. Women's knowledge, preferences, and feedback are necessary for a proposed technology to fit its niche, or to identify the niche for which technology is needed. This applies equally to information technology and energy.

Working with, or helping to form, women's social- or economic-based associations. Often women are more empowered in a group than they are as individuals. In groups, they can develop their own arrangements in managing and sustaining new technologies. Working in a group, women build their capacity for bargaining as individuals and finding ways to retain the ownership and control of new technologies. ■

For further reading see Thelma Paris, "Bringing Women from the Margin to the Mainstream of Rice Research and Technology Development: Strategies and Lessons Learned" (PhD thesis, School

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