



MODULE II

Gender and Crises: Implications for Agriculture

Overview

This Module examines the nexus between agriculture and crisis brought on by conflicts and natural disasters from a gender perspective. The focus here is on the exceptional circumstances, needs, and opportunities that arise for women and men in the aftermath of crises. Although in many instances the impacts of conflicts and natural disasters are similar, the underlying conditions and environment that humanitarian and development actors encounter can be profoundly different as a result of political and security conditions. In situations involving armed conflict, the politically charged atmosphere affects every aspect of the economy, including agricultural production. By contrast, where natural disasters occur, conditions are not necessarily further exacerbated by military actions or political impasse. These differences can have significant effects on the agricultural sector, but the primary goal in all instances is to ensure basic food security and the protection or recovery of livelihood strategies.

Natural disasters and violent conflict can have severe effects on every aspect of agricultural production. When conflicts break out, the destruction of fields, roads, and markets through the placing of landmines or use of other weapons; the looting of food stores and plantations; and the displacement of local populations are often strategies used by warring parties. In this context women and men are also targeted deliberately and affected differently. Men are at higher risk of being killed or imprisoned and either flee to generate income elsewhere or are forced to fight. Women are

at high risk of sexual violence and displacement and of shouldering the full burden of productive work. The net impact on agriculture is significant. Studies from the 1990s indicate that for every year of conflict, agricultural production can drop by 12.3 percent; in the case of Angola, between 1975 and 1993 there was a 44.5 percent reduction (Zaur 2006). Natural disasters also have a heavy toll. In Asia alone, the 2004 tsunami and the 2005 earthquake in Pakistan caused an estimated \$1.81 billion in damage to the agricultural sector, including livestock, crops, fisheries, and related infrastructure (Kryspin-Watson, Arkedis, and Zakout 2006). The gender dimensions were most starkly evident in the disproportionate number of deaths of women as a result of the tsunami in many places.

AGRICULTURE AND CRISES

Agriculture and related environmental resources can also be the source, cause, catalyst, or fuel of crises. The issues are often interrelated, but three dimensions must be considered:

- *Scarcity of resources:* Scarcity is caused by population growth such that resources have to be divided between more people, or it is caused by increased per capita activity, resulting in increased demand. The combination can cause significant degradation of the needed resources. In Africa scarcity of land and continued environmental degradation are the main ecological dimensions associated with

several conflicts. In Rwanda land scarcity was politicized and helped fuel the ethnic tensions that resulted in the 1994 genocide. In Somalia much of the fighting has concentrated in the agriculturally rich Jubaland region, where factions are vying for control.¹ The 2007 “Sudan Post-Conflict Environmental Assessment” by the United Nations Environment Programme (UNEP) points to severe environmental degradation and its effects on agriculture as causes of the conflict (box 11.1).

- *Abundance of resources:* If scarcity catalyzes conflict, then the abundance of resources (agricultural, mineral, or otherwise) can fuel and sustain conflict. The poppy fields of Afghanistan and coca plantations of Colombia are key sources of income, fueling the drug trade and guerrilla warfare that plague each country. In Colombia the Revolutionary Armed Forces of Colombia (FARC) formed in the 1960s as a Marxist movement fighting against unequal distribution of wealth, land, and power. FARC turned to drug trafficking as its main source of income in the 1990s. With other armed groups (right-wing paramilitary units) and drug traffickers, FARC has militarized the countryside, caused mass displacement of rural populations, and disrupted agriculture and livelihoods, particularly among indigenous communities and jungle-based tribes. An estimated 1.85 million people have been displaced. The U.S. government estimates that FARC supplies 50 percent of the world’s cocaine.²
- *Meeting demand, ensuring supply:* The April 2008 food riots in Egypt, Haiti, and other parts of Africa rang alarm bells globally. Price hikes in agriculture are not uncommon.

But, as the UN Task Force on the “Global Food Security Crisis” states, “the world food situation is rapidly being redefined. . . . The recent trend of unprecedented increases in the price of food and overall import bills for the poorest countries, coupled with diminishing food stocks and difficulties accessing food by some communities, has created a host of humanitarian, socio-economic, developmental, political and security-related challenges.” The main driver of price hikes is the increase in demand, notably from China and India, but many other factors have contributed to create the “perfect storm.” The United Nations points to short-term causes, such as 30-year-low levels of wheat stock, combined with medium-term causes, including climate change and harvest failure due to extreme weather conditions. These factors are exacerbated by long-term resource scarcity, including water shortage, diminishing land for agriculture, and limited sources of energy and oil, which affect food supplies and prices. Speculative financial activities on the part of hedge funds, including investments in commodity futures, national tax and tariff policies, and lack of investment in agriculture development and research are also contributing to the crisis. The poorest people in the poorest of nations are at the frontlines of this crisis. From an international standpoint, this is perhaps the first time in modern history that food insecurity and hunger are igniting violent protests simultaneously in many parts of the world. As the Task Force states, “This risk is particularly high in countries emerging from violent conflict, where fragile security, political and economic progress is easily derailed.”³

Box 11.1 Sudan: Environmental Degradation Causes Conflict

The UNEP study “Sudan Post-Conflict Environmental Assessment” notes that deserts have spread southward by an estimated 50 to 200 kilometers since the 1930s. This land degradation is a result of different developments relating in part to Darfur’s increased population, which has grown sixfold over the last four decades to about 6.5 million. In turn there has been an explosion of livestock (from 27 million animals to around 135 million), which has caused overgrazing of the fragile soils. In addition, a “deforestation crisis” has led to a loss of almost 12 percent of Sudan’s forest cover in just 15 years, and some areas may lose their remaining

Source: UNEP 2007.

forest cover within the next decade. At the same time, average annual rainfall in El Fasher in northern Darfur has dropped nearly by half since data were first gathered in 1917. Increasing scarcity has also led to rising tribal antagonism over the last 20 years. These issues, together with increased banditry and political and economic neglect, catalyzed rebellion in February 2003 and have fanned ethnic conflict. Internally displaced persons and refugees are exacerbating the underlying conditions by cutting down trees, which depletes underground water supplies and thus adversely affects local populations.

- Structural conditions:** The unequal distribution of resources is often rooted in colonial legacies, political struggles, and cultural practices. Tremendous gender inequity may also be embedded in the structural issues. For example, in many instances colonial rulers ignored matrilineal land inheritance practices and excluded women from control over property. In modern times women face legal, political, and cultural barriers to the ownership and control of resources. Structural conditions result in the concentration of resources in the hands of a few, while a vast population is subject to shortages and scarcity, which can trigger and fuel conflict over time. In Burundi, for example, 80 percent of the country's foreign exchange comes from coffee production. Government control over the sector helped finance the conflict against rebels in the 1990s. A government monopoly over exports at one end of the commodity chain was matched with fixing lower prices for producers at the other end. This inequity of resource distribution contributed to the mounting tensions.⁴ In Palestine (box 11.2), inequitable access to water has been a contributor to conflict (Homer-Dixon and Kelly 1995).

After a war or conflict has ended, the return of refugees and internally displaced persons and their claims to land can be a source of increased tension. In Burundi, which covers just 27,830 square kilometers, an estimated 115,000 internally displaced persons and 17,000 refugees were waiting to resettle in 2007. In Afghanistan refugees are returning to reclaim

land after two decades, often confronting their own relatives in their effort to get it back.

An increase in the value of resources, particularly shared land, can also trigger conflict. Where markets develop and farmers intensify production or population pressures increase, the value of resources goes up and competition may heighten. In some instances existing customary practices and informal processes of adjudication may quell tensions but can also fuel them if the access and rights to property rights of all stakeholders are not secure. This is pertinent in the aftermath of conflicts or natural disasters in which traditional practices and leadership structures may no longer exist.

Increased demand and production are also leading to the depletion of resources and destruction of ecological systems that have helped prevent or mitigate the impact of natural disasters. Most notably, clear-cut logging and road building result in a reduction of natural protection against landslides and soil erosion. Similarly, the destruction of coastal wetlands not only affects fisheries but also increases the risk of flooding. The negative impact can be seen in many ways.

MULTIDIMENSIONAL ISSUES OF AGRICULTURE IN TIMES OF CRISIS

To address basic survival, food security, and longer-term livelihood issues, early recovery strategies must fully integrate agricultural sector issues. The approaches needed vary considerably, however, depending on the conditions in each

Box 11.2 Gaza: Structural Inequity and Access to Water

In Gaza, following the signing of the Oslo Peace Accord in 1993, a study revealed the inequitable access to water among Palestinians, Jewish settlers, and the Israeli population. Beginning in 1967, strict quotas were placed on the Arabs' rights to pump water. Over the years, quota levels were maintained by banning the drilling of new wells or the rehabilitation of old wells, blocking springs, or uprooting citrus trees. In contrast, Israelis had no limits placed on them, which resulted in waste and overuse. Pricing structures were also disadvantageous to the Palestinians. Settlers received significant subsidies, paying \$0.10 per cubic meter for

Source: Homer-Dixon and Kelly 1995.

water that costs \$0.34 per cubic meter; Palestinians, who received no subsidies, could pay up to \$1.20 per cubic meter for water from local Arab authorities. Relative to per capita income, Palestinians were thus paying as much as 20 times the amount Israeli settlers paid for water. Water scarcity also led to increased salinity and thus a decline in crop yields for Gaza-based farmers. Without extensive support to the agricultural sector and increased access to water, Palestinian agriculture went into decline. The consumption restrictions and water gap contributed to the friction between the populations.

case. Although there are common features to take into account, significant differences also exist:

- In any given country, an emergency or conflict can be unfolding in one area, while elsewhere in the same country the impact may not be as significant. For example, the effect of an earthquake decreases farther from the epicenter, and the conflict in northern Uganda is less visible in effect in other parts of the country.
- An overlapping of events may occur (for example, Aceh and Sri Lanka were already struggling with the effects of conflict when the tsunami hit). This has implications for the type of actions possible (or constraints relating to security issues) and opportunities for addressing the agricultural sector.
- Conflict situations increase the flow of arms and weaponry, thus creating greater insecurity for local populations and international actors.
- In many postconflict states, opportunities present themselves for redressing structural and legal inequalities that have affected portions of the population. For example, land reform may be on the agenda. Legislation to end discrimination based on identity may be addressed. These are key moments for tackling issues of gender discrimination as well. In the aftermath of disasters, such opportunities can also exist, and interventions designed with prevention in mind can tackle root causes.
- Natural disasters can have either quick or slow onsets (such as earthquakes versus droughts), so the opportunities vary to prepare for, mitigate, or prevent the onset of a crisis. The type of identified hazard determines the necessary nature and type of intervention. For example, droughts can be predicted in advance and the effects mitigated to some degree at a lesser cost, whereas protection from earthquakes and mudslides is structural and costly, and these events can be less predictable. Nonetheless, emergency and early warning systems can be established for sudden-onset events.
- Human-caused and natural emergencies can have both short and protracted effects in terms of displacement, as well as access to and usability of resources.
- Response strategies can be significantly affected if conflict and political tensions are at play (for example, humanitarian relief in Tamil-controlled areas in Sri Lanka was more challenging than in other areas of the country after the tsunami).
- In situations in which humanitarian emergencies are largely the result of conflict or political struggles, the options for effective response can be severely constrained and curtailed by political and military leaders.

These phases should also be considered.

- *Precrisis:* As a drought sets in or conflict escalates, the potential impact on agriculture can be determined. Strategies to prevent and mitigate crises have been developed. Good early warning systems together with effective preparedness and emergency measures can considerably lessen the impact of a natural hazard. Often, however, where natural disasters hit randomly, no effective warning is given, as in the Asian tsunami of 2004 and the 2003 Bam earthquake in Iran. Similarly, although conflict early warning systems exist, the information may not be conveyed effectively to those involved in the agricultural sector, and thus the opportunity for preventive measures or preparedness is limited. Effective communication and emergency preparedness planning to at-risk populations are central to the prevention and mitigation of crises.
- *During the crisis:* Responding during the unfolding of a crisis is also challenging. Typically, natural disasters have a shorter time span than conflicts. Where conflict is the cause of a crisis, the international community may have less access to the affected areas. A danger also exists that external assistance and provisions are at risk of being exploited by partisans in the conflict and thus inadvertently fueling the violence. Moreover, it may not be economically viable to provide agricultural or related infrastructural support if it is at risk of being targeted during the conflict.
- *Immediately postcrisis/transition period:* International assistance and presence increase dramatically in the immediate aftermath of conflict or natural disaster. The transition period is an important time for identifying and addressing root causes of crises and developing alternative preventive strategies for agricultural development.

These phases are not necessarily chronological or consecutive. In other words, even in the midst of a crisis or conflict it is necessary to consider means of mitigating and preventing further damage. This can help limit the negative impact of crisis on a given population. Where protective measures can be put in place, local resilience increases, and recovery processes will also be quicker. In 1999 in Sri Lanka, for example, the International Development Association (IDA) developed a community-based program to rebuild the irrigation systems that had been damaged by the ongoing conflict between the government of Sri Lanka and the Liberation Tamil Tigers of Eelam in the agriculture-rich North East Province. The IDA project focused on rebuilding roads and irrigation systems. Despite the ongoing conflict, the project ensured food security for 33,250

people and enabled the cultivation of 212,944 hectares of prewar farmland (World Bank 2007; see also Innovative Activity Profile 1).

Although the postconflict or emergency period is rife with difficulties, it is also a time of great opportunity. In Rwanda, for example, after the genocide the national Rwandan Demobilization and Reintegration Commission offered a choice of livelihoods to former fighters. Some returned to agriculture, and others were given skills training to enter other sectors (UN 2005).

Particularly in postconflict settings, long-standing structural issues can be addressed. Land tenure, inheritance, and property ownership issues that create significant inequities and result in long-term food insecurity and livelihood challenges can be redressed. Opportunities also are present for promoting economic (including agricultural) diversification to decrease livelihood dependency on land or cash crops.

There is also a clear need and opportunity to reach out and draw on the resources and expertise of both the public and private sectors. Community-based resources must also be harnessed. The extent of damage requires a full division of labor, and the different skills and capacities of women and men must be included.

The arrival and presence of external actors, in particular those providing food aid, can have a tremendous impact on local producers, men, and increasingly women. Situation analyses and consultative processes are important not only for minimizing damage but also for understanding how local capacities can be strengthened.

Recovery and reconstruction programs, therefore, should be seen not only simply for replacing losses but also for redressing conditions that in the past heightened vulnerability. These programs provide a chance to make improvements and, in particular, to address the needs of underprivileged groups and inequalities, including on the basis of gender, that profoundly impact women's and men's access to food security and livelihoods.

GENDER DIMENSIONS OF AGRICULTURE DURING CRISES

Women, men, boys, and girls can have profoundly different experiences and face different risks in conflict situations and natural disasters. These experiences are shaped by and have a direct effect on their capacity to sustain livelihoods, ensure food security, and engage in the agricultural sector. In designing interventions, organizations must understand the social capital (gained and lost) as a result of a crisis and must recognize the gender differences in skills, knowledge, access,

and participation in agricultural activities. It is important to acknowledge that conflict and crisis tend to push women into the productive sphere (as men migrate or are embroiled in conflict). This shift can mean prompt empowerment, but it can also result in women becoming overburdened. External interventions can be helpful and harmful. The challenge is to understand the context and realities of people's lives so that the assistance provided is beneficial to men and women.

Different physical risks and vulnerabilities faced by women and men

Natural disasters can be disproportionately deadly for women. In the Kobe earthquake of 1995, 1.5 times more women died than men, and in the 2004 Southeast Asia tsunami, death rates for women across the region averaged three to four times that of men.⁵ By contrast, conflicts are more deadly for men. In Iraq 90 percent of the dead are reportedly men. Following the 1994 Rwandan genocide, 70 percent of the surviving population was women. Men, particularly younger men, are also more vulnerable to military recruitment and arrest than women in conflict-affected situations. Women (and their dependents) are at greater risk of forced displacement and exposure to insecurity in public spaces and camps for internally displaced persons and refugees.

Women's exposure to sexual violence escalates during times of crisis. In conflict situations, rape is increasingly used as a weapon of war and ethnic cleansing. In the aftermath of natural disasters such as the tsunami, the breakdown of security and social structures fuels the incidence of rape. Within 10 days of the tsunami, the United Nations was receiving reports of sexual exploitation and rape of women, including as payment for being pulled out of the ocean (Lalasz 2005).

Although physiology accounts for some of the differences in mortality rates between women and men, other sociocultural norms also come into play. A 2005 Oxfam report notes that, on average, women and girls did not know how to swim or climb trees as well as their men counterparts; they were not taught these skills and thus were unable to rescue themselves.⁶ Women's dress codes can restrict their mobility. Cultural norms that prevent women from leaving their homes unaccompanied (such as in Afghanistan and rural Bangladesh) increase the risks they face. In many earthquake-prone areas, women working in poorly constructed homes are at greater risk than men, who may be working outside in fields or in well-built public buildings. In India men survived an earthquake by virtue of sleeping on rooftops on warm nights. Local culture there forbids such behavior among women.

Barriers to immediate relief

Women's and girls' access to relief can be inadvertently obstructed. In many societies women have subordinate public positions but still control resources and have power through informal networks and social ties. During crises and relief efforts, during which the process is heavily dominated by men, women are often systematically excluded. Women's marginalization can be compounded by a lack of physical security, increases in their domestic duties that prevent their participation in public efforts, and actions by external actors who may unwittingly empower self-designated men "leaders" to distribute relief.

There are also gender dimensions to food security and nutrition during crises. In many instances in which a food crisis takes place, women and girls reduce their intake in favor of other household members, particularly men and boys. This increases incidence of malnutrition among women. However, men are at greater risk during famines because they have a higher nutritional requirement. As a result, in many recorded famines mortality rates are higher among men than women.

Dangerous security conditions can limit women's mobility and access to humanitarian aid or markets. Pregnant and lactating women in particular are at greater risk of malnutrition as a result of their physiological condition and limited mobility. Households led by men can also be at risk. Often men do not know how to cook or care for younger children, thereby exposing them to increased malnutrition. Similarly, single men and boys separated from their families are vulnerable to malnutrition. In camps in southern Kenya, for example, it was noted that the young men received food rations but did not know how to cook (UN IASC 2006).

Different structural barriers

In addition to physical and psychological vulnerability, women and men can experience different structural barriers that affect their access to and control of assets. This includes the strength or weakness of institutions (formal and informal) and policies to address food security and agricultural needs and recognize the differential needs and changed circumstances of women and men. For example, land and property ownership and inheritance laws that are gender discriminatory pose significant risks to women's livelihoods. This is partly compounded by higher illiteracy rates among women in many poor countries. Other barriers include the following:

- *Access to assets:* Cultural and legal barriers to accessing credit and physical infrastructure (such as transportation) needed for agricultural production can affect

women more than men. Women tend to work more out of the home and in the informal sector. The destruction wrought by natural disasters can trigger "decapitalization" and a reduction in women's share of productive activities, formal or informal. They sustain direct losses (homes and production) and indirect losses as their share of unpaid emergency domestic tasks rises (for example, care for children who cannot attend school, the elderly, and the injured).

- *Access to markets:* In crises, women's small-scale trading networks can also be damaged, thus reducing a key source of income. Conflict situations, however, can limit men's and open women's access to markets. Men may flee, join armed groups, face imprisonment, or be killed during conflicts, which puts women under greater pressure. Women take on responsibilities in public spaces, including in markets, and formal and informal employment.⁷ But they are at greater risk than men from physical infrastructure or external conditions (such as state of housing or public safety) and from sociocultural conditions, such as the acceptance of women's entry in public forums and labor markets, sectors traditionally occupied by men. Many women are forced out of these social spaces when conditions "normalize."
- *Information flows to and about women and men:* Women and men access different sources of information. Women's vulnerability is exacerbated by their subordinate position in traditional patriarchal societies and often lack access to information that men may have. In Peru fishermen were warned about El Niño and its negative impact on fishing. Women did not receive this information and thus had no chance to plan household budgets or save funds to withstand the crisis. In South Africa women farmers wanted seasonal climate forecasts to be available through community-based channels such as schools and not just over the radio. In attempting to balance their domestic, child care, and farming duties, they had no time to listen to the radio. Data and information (including sex-disaggregated data) are critical for ensuring accurate assessment. Where formal assessments cannot be undertaken, informal consultations are still valuable.

Opportunity in crisis: women's empowerment and confidence building

For men, protracted crises, displacement, loss of income, and the associated sense of lost status and inability to protect their families can be profoundly disempowering. Women are often forced into the public sphere. Although

the burdens of care and responsibility mount, they also gain experiences, exposure, and confidence. Where there is protracted conflict and women are either in communities or in refugee camps, they often develop new skills to sustain livelihoods. By contrast, returning fighters (men or women) may have little or no skills relating to agriculture or production.

In situations in which natural disasters have destroyed their livelihood, men tend to migrate more quickly than women in search of employment and resources. They are less physically vulnerable and less culturally burdened with child care and other daily domestic responsibilities. Women are thus left to carry the family burden alone. Their limited and localized coping strategies can be critical for their own and their family's survival. They also tend to work more communally. Ignorance of gender issues can also exacerbate women's situation. Gains they may have made as a result of their activities and mobilization during the crisis are often lost because of external interventions. At a minimum, external actions must not harm local populations. To ensure this and sustain positive impacts, therefore, the gender dimensions of poverty and insecurity must be understood and addressed (box 11.3).

Box 11.3 Key Principles for Effective Intervention

- *Interventions should “do no harm” and should not perpetuate existing harm.* Gender analysis helps to understand the different obstacles that potential beneficiaries face, their varying capacities to mobilize resources, and their different social and economic responsibilities and skills. Without this basic understanding, we risk ignoring some sectors of the population, which may do damage and fuel the root causes of a crisis.
- *Identifying baseline conditions enables the provision of targeted and more effective programming to improve livelihoods over the long term.* Without gender perspectives, existing local capacities can be squandered.
- *Ending gender-based poverty and food insecurity contributes to future, long-term prevention and survival strategies.* Integrating gender perspectives is one means of reducing people's vulnerabilities and building on their strengths and social capital. It can help identify tactics and strategies to increase their ability to prevent and withstand the effects of crises.

Sources: Anderson 1999; Naraghi-Anderlini 2007.

Although common patterns exist, no one-size-fits-all approach can be seized upon. The context is a key determinant of the risks and opportunities facing people in crisis-affected areas, a point made clear in the following quotation from an International Labour Organization document (Enarson 2000: vii):

While tornadoes, volcanic eruptions, earthquakes and floods may occur with regularity, their social, political, and economic effects are neither inevitable nor “natural.” People's relative risk of harm is a function of their exposure to hazards (e.g., residing in a seismic zone), their capacity to mitigate the effects of these disasters (e.g., seismic-zone construction standards, earthquake preparedness), and their social vulnerability (e.g., lack of income to retrofit housing, restricted social/physical mobility). Vulnerability, in turn, has physical and social dimensions, but is ... a function of relative access to, and control over, key survival and recovery resources. Risk is differentially distributed between and within societies. The root causes [of] social vulnerability are deeply embedded, reflecting political choices made in the course of human settlement and political-economic and social development. ... [D]isaster vulnerability is not synonymous with poverty or social class. Within societies, people's relative ability to access or control key resources is shaped ... by age ... physical ability, citizenship status, racial/ethnic ... cultural group, and gender.

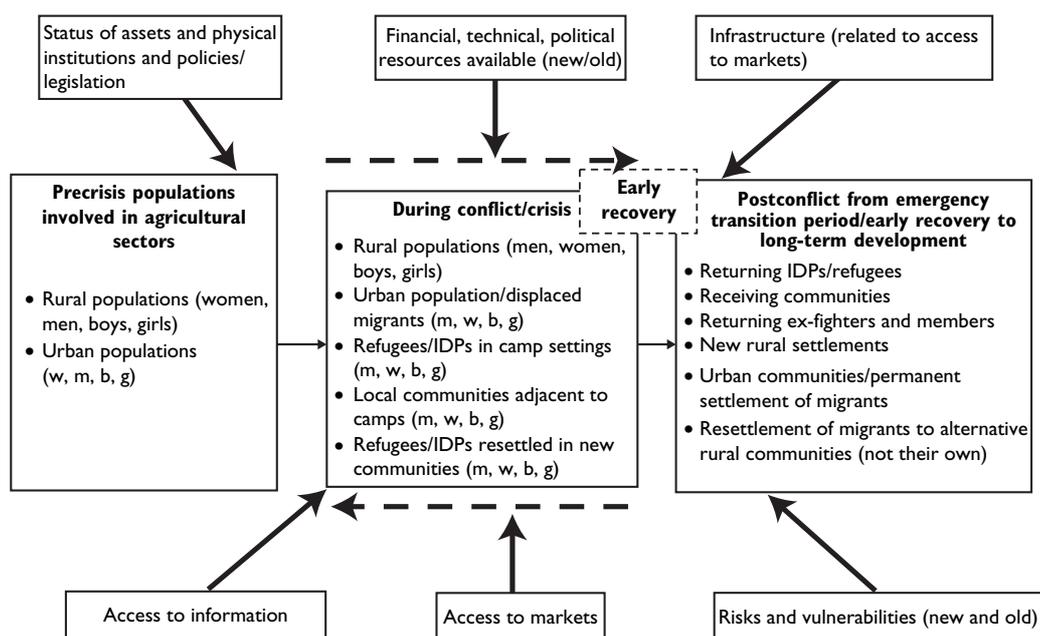
CONCEPTUAL FRAMEWORK FOR GENDER-SENSITIVE AGRICULTURAL PROGRAMMING IN CRISES

Addressing food security, livelihood, and agricultural developments in crises requires preparation and programming in phases: precrisis, during the crisis, early recovery, and post-crisis/recovery. The early recovery phase overlaps the during-the-crisis and postcrisis/recovery phases (see fig. 11.1).

At each phase the full spectrum of the population and their differing needs, situations, and conditions should be considered. This includes the following groups:

- Traditional rural communities directly affected by the crisis
- Rural communities indirectly affected
- Temporary displaced populations in rural areas
- Displaced populations in urban areas
- Urban populations and the related markets.

Figure 11.1 Gendered Impacts of External Factors



Source: Author.

These populations are not static. Over time, as the crisis continues or subsides, the makeup of the population also changes. For example, in the aftermath of crises the following are often found:

- Returning internally displaced persons and refugees into rural and urban settings
- Returning former fighters (opposition or state actors)
- New long-term settlements in rural areas
- Long-term settlers in urban areas.

External factors ranging from access to assets and markets to institutional conditions and policies can help or hinder people at each stage. Typically, a gender dimension contributes to the impact of such factors, with women facing greater barriers than men.

INTEGRATING GENDER PERSPECTIVES

Gender differences exist within each subgroup. Widows, single mothers, and women-headed households typically face greater hardships than married women. Dependents (children or the elderly) in *men only*-headed households also may be more vulnerable than other household members,

because single men may not have needed care-giving skills (such as cooking).

The World Bank, like many organizations, has institutional policies and commitments to ending discrimination against women, including the realization of the third Millennium Development Goal (MDG) of promoting gender equality. These policies could and should be used tactically at the country level to prompt dialogue and ensure the equal and equitable treatment of and attention to women alongside men. Three approaches to gender mainstreaming can be undertaken to ensure effective outreach and benefit to women and men (Greenberg and Zuckerman 2004). These strategies can be undertaken simultaneously, as part of a menu of options, or consecutively in a program:

- *Targeted projects:* Agricultural initiatives can be specifically targeted at either women only or men only to redress inequalities, lack of access or skills, and other issues. Even in broader programs women-only or men-only groups are important in order to gather information, build confidence, and address gender-specific needs before working with mixed groups.
- *Mainstreaming of gender perspectives:* In designing interventions, planners will find it essential to identify

and address factors that could obstruct women's and men's equal access and benefit. This process ensures the inclusion of women and men as equal beneficiaries so that discrimination is not perpetuated and programming is targeted correctly. Mainstreaming includes recognition of the different roles and contributions that women and men can make in communities and agricultural work. Mainstreaming also relates to external actors. For example, the presence of women staff increases access to women in traditional societies and allows for better understanding of their needs, capacities, and solutions.

- *Transformative programs:* These programs are designed to transform or recalibrate gender relations by tackling the underlying structural causes and effects of inequality and food insecurity. For example, initiatives to change inheritance laws and practices (at the community level) can significantly alter the status and access of women to assets, particularly land.

The challenges for agricultural interventions in crisis situations include the following:

- Reducing the vulnerabilities and risks to livelihood faced by women and men
- Strengthening existing capacities and social capital (and ensuring that interventions do not squander or crush these resources)
- Ensuring sustainable, long-term, equal access to opportunities, including to assets and resources and to information and markets
- Helping redress structural factors to reduce vulnerability in the future.

Crises and conflicts not only affect women and men differently but also have a profound impact on gender roles and relations. For women, the heightened physical vulnerability comes with exposure to public space and use of their survival strategies. They are often exposed to new skills and, although overly burdened with the trauma of displacement, also gain new confidence in their own abilities to cope and care for their dependents. For men, it can be a period of

disempowerment and profound socioeconomic change as they struggle to rebuild their lives and provide for their families. It is also a time when they garner new respect for women. Interventions must seek to reach all those affected and address their needs and sustain and strengthen their newfound capacities.

The Thematic Notes that follow explore the practical implications of gender perspectives in precrisis, midcrisis, and postcrisis settings:

- *Thematic Note 1* highlights the nexus between agricultural practices and the relevance of gender to preventive action and disaster risk reduction. It frames the discussion around the provisions of UN Security Council Resolution 1325 (2000), specifically the demand for increasing women's participation in conflict prevention, and the Hyogo Framework's five priorities regarding risk reduction, notably, (1) governance, organizational, legal, and policy frameworks; (2) risk identification, assessment, monitoring, and early warning; (3) knowledge management and education; (4) the reduction of underlying risk factors; and (5) preparedness for effective response and recovery.
- *Thematic Note 2* examines the links between food, agricultural aid, and development during crises. It identifies the gender dimensions and highlights effective means of balancing this aid so that the specific needs of women and men in local communities are addressed and they benefit equitably.
- *Thematic Note 3* focuses on critical land issues, including tenure and inheritance rights, education, information, and outreach issues in the postcrisis setting from a gendered perspective. It highlights critical issues and lessons drawn from current and past crises.

Table 11.1 provides ideas for the monitoring of gender issues in crisis situations (although obviously the nature of the crisis may require very environment-specific monitoring).

Depending on the country or region, considering ethnicity and caste alongside gender (both as comparative indicators and when collecting data) may also be relevant, because women of lower castes or ethnic minorities are usually in the most disadvantaged situation.

Table 11.1 Monitoring and Evaluation Indicators for Crisis and Agriculture

Indicator	Sources of verification and tools
Number of deaths, disaggregated by gender, age, location	<ul style="list-style-type: none"> • Government records
Percentage of women and men receiving weather information—regular bulletins or extreme weather warnings—in accordance with their area of work or location	<ul style="list-style-type: none"> • Focus groups • Household surveys • Media • National-level NGOs, particularly women's groups • Networks of health workers, community organizers, and human rights defenders
Percentage of women and men members of community-based disaster preparedness committees	<ul style="list-style-type: none"> • Community meeting minutes • Women's community-based groups and NGOs
Balanced level of participation of women and men in decision making (at the local and national levels)	<ul style="list-style-type: none"> • Community meeting minutes
Number of men, women, and ethnic minorities who receive extension advice per month	<ul style="list-style-type: none"> • Agricultural extension records • Training records
Percentage of women and men actively participating as members of postdisaster reconstruction committees	<ul style="list-style-type: none"> • Committee meeting minutes • Interviews with stakeholders
Number and percentage of women and men receiving gender-specific disaster training	<ul style="list-style-type: none"> • Training records
Sex-disaggregated assessment of impact of disasters on men and women, girls and boys	<ul style="list-style-type: none"> • Project monitoring • Refugee camp management records
Percentage of women and men receiving land, emergency rations, replacement stock, seed, or loans	<ul style="list-style-type: none"> • Agricultural extension records • Refugee camp management records • Regional land department records
Satisfaction levels of women and men with postemergency management and reconstruction	<ul style="list-style-type: none"> • Focus groups • Interviews with stakeholders
Number and percentage of women reporting violence per month (such as threats, beatings, and rape)	<ul style="list-style-type: none"> • Interviews with community leadership • Interviews with stakeholders • Police records • Refugee camp management records
Percentage of women and men with access to insurance packages	<ul style="list-style-type: none"> • Household surveys
Changes at start and end of emergency support in household nutrition, health, education, vulnerability to violence, and happiness, disaggregated by gender	<ul style="list-style-type: none"> • Household surveys, before and after • Project management information system • School records

Source: Authors, with input from Pamela White, Module 16 author.

Risk Management and Preventive Action

In agriculture, as in other sectors, preventing natural disasters and conflict-induced crises is better than needing to cure them. This principle is easily grasped, but the practice has been harder to undertake because there is still a tendency to address crises through an after-the-fact humanitarian response. Prevention and risk-management strategies are still evolving. The challenge to development actors, including those working in agriculture, is to implement programs that not only provide the stated benefits of improving livelihood and food security but also can help prevent or mitigate the effects of crises in the lives of women and men. This entails recognizing the following points:

- Development can exacerbate conflicts and natural disasters. Therefore, existing practices must be reassessed to ensure that they do not inadvertently expose people to greater risk, diminish their coping capacities, or exacerbate the impact of natural disasters and conflict.
- Disasters can be highly detrimental to developmental gains, and the impact of disasters can vary significantly between women and men.
- A shift toward a culture of prevention and crisis-sensitive development programming may and often does require a change in the way work is done, a deep understanding of local culture and practices, and the inclusion of all sectors of society. Women and men have different capacities and strengths that should be drawn upon in making the shift toward prevention.

PROACTIVE PREVENTION

In 2005 governments participating in the World Conference on Disaster Reduction in Hyogo, Japan, recognized the “importance of disaster risk reduction being underpinned by a more pro-active approach to informing, motivating and involving people in all aspects of disaster risk reduction

in their own local communities” (www.unisdr.org). The resulting 2005–15 Hyogo Framework for Action identifies five key areas requiring attention to prompt the shift toward proactive preventive actions:

- Governance: organizational, legal, and policy frameworks
- Risk identification, assessment, monitoring, and early warning
- Knowledge management and education
- Reducing underlying risk factors
- Preparedness for effective response and recovery.

These issues are also related to the climate change debate. Many now contend that global warming cannot be prevented in the short term, and so responses to the effects of climate change (including increased risks of natural disasters, such as flooding and drought) must be integrated into risk reduction and coping strategies.

Similar issues have been identified in the field of conflict prevention. Conflict early warning and response systems have evolved over the last 15 years, with an emerging discourse on gendered indicators and differential information that women and men may possess. Frameworks for conflict-sensitive analysis and programming exist. Preliminary steps toward proactive prevention have been initiated by the UN system in West Africa and Central America, where they have worked with women’s groups. Because conflict is political, however, questions of state sovereignty continue to hamper external interventions aimed at conflict prevention and transformation. In the 1990s the “Responsibility to Protect” (R2P) principle emerged out of the discourse on addressing the needs of internally displaced persons (IDPs). Part of the approach was to point out that states not only have rights but also have a responsibility to provide protection and security for their citizens. When such responsibility is abrogated, according to the R2P advocates, the international

community has a right to intervene to minimize the loss of life and insecurity.

Despite the conceptual advances, the practice of conflict prevention is still limited, especially in states in which violence is impending. It has gained credence in postconflict situations in which the risk of resurgence (and the memory of violence) exists, and thus the desire for and commitment to preventive initiatives and peace building are stronger. In 2000 the UN Security Council passed resolution 1325 on women, peace, and security, a key development in the realm of conflict prevention and peace building. It was the first major international legislative document calling on states, multilateral organizations, and nonstate actors to ensure the participation and contributions of women in conflict prevention and to address women's protection needs during conflict and in the recovery processes.

This Thematic Note highlights the nexus between agricultural practices and the relevance of gender to preventive action and disaster risk reduction. It frames the discussion around the provisions of resolution 1325, specifically the demand for increasing women's participation in conflict prevention, and the Hyogo Framework's five priorities regarding risk reduction.

PRIORITY I. GOVERNANCE: ORGANIZATIONAL, LEGAL, AND POLICY FRAMEWORKS

Generating a culture of prevention is perhaps the most important and challenging issue. This involves raising awareness, building political will, and leadership. It further requires effective legislation, the establishment of an overarching national framework, and effective multilateral approaches, including mechanisms that do the following:

- Link national to local actors.
- Ensure inclusion of the different needs and capacities of different stakeholders in overall assessments and analytical frameworks.
- Enable coordination between sectors.
- Integrate risk reduction and conflict sensitivity into ongoing development policies and programs.
- Prompt the development and implementation of strict compliance and regulation standards for infrastructural work.

Conflict and natural disasters affect societies in different ways. Typically, those who are most vulnerable under “normal” conditions are most affected when a crisis hits. Given that women represent 70 percent of the world's poor and their unequal social status in most societies, they are often at

greater risk than men. However, women are not passive actors. They are often proactive in their efforts to minimize risks and adapt to evolving conditions.

To be effective, state or multilateral initiatives must acknowledge and draw upon this duality of experience—vulnerability and ability to adapt—to guide and develop the policy frameworks and macrolevel initiatives that they establish. Drawing on research conducted among village women in Bangladesh, India, and Nepal, a 2007 ActionAid report offers a set of policy recommendations with a view to mitigating the risks faced by communities, as well as means of assisting communities in adapting to the heightened risk and prevalence of natural disasters arising from climate change (Mitchell, Tanner, and Lussier 2007). They include the following:

1. At the bilateral or multilateral level, ensuring that adaptation funds under the UN Framework Convention on Climate Change have clear guidance and targeted measures for the inclusion of women in adaptation assistance projects and as beneficiaries. For mechanisms that are not directly operational, gender and poverty must be included as central guidance measures for negotiators. Recipient countries must have gender-sensitive approaches in place and measurable outcomes specifically regarding the impact and inclusion of women as beneficiaries.
2. At the state level, policies and mechanisms relating to adaptation must ensure the following:
 - Women's full participation in adaptation financing discussions and decisions
 - That women's needs are considered and addressed in livelihood adaptation programming
 - That regressive sociocultural practices do not hinder women's capacity to adapt
 - That the most vulnerable sectors are provided with insurance packages to prevent complete devastation. The Self-Employed Women's Association (SEWA) in India has initiated such a program (box 11.4).
3. Legislative guarantees are needed that promote and protect women's equal rights to the following:
 - Relevant knowledge and information
 - Land and property ownership: laws that mandate joint titling of land and property can help reduce women's vulnerability and risk of losing property or being evicted in the aftermath of disaster or conflict
 - Equal participation in decision making (at the local and national levels)
 - Access services such as agricultural extension and veterinarians.

Box 11.4 India: Insurance for Low-Income Workers

SEWA represents low-income women workers in India's vast informal sector. Under a basic program that asks for a fixed deposit of \$22 and an annual premium of \$1.85, its members can secure insurance against hospitalization (up to \$43), house and asset insurance (up to \$110), and insurance against accidental death (\$870). Higher-priced schemes providing more protection also are available. Over a 10-year period, 2,000 women received benefits amounting to \$327,400.

Source: UN ISDR, review of the relevance of eight MDGs to disaster risk reduction and vice versa, quoting SEWA, Jivika: Livelihood Security Project for Earthquake Affected Rural Households in Gujarat, www.sewa.org and www.sewainsurance.org.

4. Coordination mechanisms are needed to link national and local actors and empower grassroots communities in disaster mitigation. Experiences from Latin America and Asia illustrate the positive impact of women's participation on the community's well-being. The initiatives (box 11.5) have reduced communities' dependence on external interventions while strengthening rapport and ties and transforming attitudes toward women and other marginalized groups.

PRIORITY 2. RISK IDENTIFICATION, ASSESSMENT MONITORING, AND EARLY WARNING

Risk identification, monitoring, assessments, and early warning systems are among the range of tools being developed and used to inform policies and programs focusing on risk reduction. Numerous obstacles remain to be overcome, however, including the need to shift institutional practices and business-as-usual approaches in development practice. Assessments and analytical frameworks often highlight gaps in existing practice and require significant changes in the formulation of projects and programs. But bureaucratic inertia and lack of familiarity with new initiatives can hinder the full integration of risk reduction and conflict sensitivity into program planning. Consequently, one-time projects are often initiated alongside existing programs, but this can result in no significant change in practice. In other words, conflict and risk

Box 11.5 India: Including Grassroots Women in Disaster Recovery

Following the 2004 tsunami, Caritas India's Relief and Reconstruction Programme aimed at assisting the marginalized communities and vulnerable sectors of the population. The program shifted priorities following the intervention and inclusion of grassroots women in the decision making. The women prioritized the reconstruction of shelter and housing and the establishment of a community-based disaster preparedness (CBPD) initiative with some capacity building. Women's committees were formed to monitor the CBPD and shelter program. The CBPD enhanced the knowledge of local actors—women, men, and children—in responding to crises. Each community devised and implemented its own local solutions to crises. These solutions include organizing a village emergency fund (composed of handfuls of rice and kitchen utensils) for flood-affected families, forming self-help groups and community task forces trained in firefighting, converting and controlling waste to rid villages of disease-carrying mosquitoes, and providing housing to widows and orphans and other vulnerable community members.

Source: UN ISDR 2007.

reduction is not yet being effectively mainstreamed into development initiatives.

The issues are further complicated by the range and variability of risks that need to be considered. In Afghanistan, for instance, schools and clinics were built with light, flexible roofing to meet seismic standards as part of a \$73 million program, but the roofs could not withstand the heavy snowfalls that are common in the region. In the winter many children were left without a school (Kryspin-Watson, Arkedis, and Zakout 2006).

In principle, gender perspectives should already be fully integrated into development planning. In reality, confusion and lack of understanding and awareness of gender differences have meant that gender perspectives remain marginal. Often practitioners are unaware of the value that gender perspectives can bring to their work and how it can enhance the impact of their initiatives. If baseline assessments overlook the different needs and contributions of women and men, programs can be poorly targeted. Existing social capital can be overlooked, and negative consequences may be present.

For example, with regard to early warning about environmental change in Peru, women in fishing communities complained that state officials informed the men of an impending El Niño (and its negative effect on fish stock), but women, who were responsible for household resources, were not informed. Similarly, in 1991 in Bangladesh, warnings about an impending cyclone were posted in public places. But because women were more restricted than men in their movements, many were not aware of the risks. This contributed to the disproportionate rate of death among women versus men (71 per 1,000 versus 15 per 1,000) (Seager and Hartmann 2005).

Various frameworks and initiatives do exist. The Food and Agriculture Organization's (FAO) Socio-Economic and Gender Analysis Programme provides extensive resources illustrating the relevance and means of integrating gender analysis to macro-, meso-, and microlevel agricultural programs. The World Bank and the United Nations Development Programme have taken preliminary steps toward integrating gender perspectives and indicators into their conflict and development analysis frameworks. Oxfam and other international nongovernmental organizations (NGOs) have developed tools and guidelines. In Nepal the NGO Center for Population and Development Action provided basic training in gender and social inclusion to government ministries as part of the peace-building process as a means of building state capacities to assess and integrate the differential needs of women and men in all sectors, notably agriculture, where women represent the majority of workers.¹

Still, much of the existing information is not entering mainstream frameworks. This is reflected in a 2005 UNEP Division for Early Warning and Assessment (DEWA) report "Mainstreaming Gender in Environmental Assessment and Early Warning" (Seager and Hartmann 2005). The authors conclude that "neither DEWA nor UNEP has been proactive in bringing gender analysis to its work". In highlighting the challenges, they also point to the following:

- A lack of research directed at the early warning, environment, and gender nexus
- The importance but lack of sex-disaggregated data relevant to early warning climate assessment
- The inherent problem of using an aggregated "household unit" as the level of analysis, which obscures the gender differences (sometimes profound) that exist within households
- The fact that "the field of disaster management is highly [men dominated] which typically results in the actions and knowledge of women being marginalized, unrecognized

and undervalued. Women are still poorly represented in planning and decision-making processes in disaster mitigation and protection planning" (Seager and Hartmann 2005: 30).

A shift in practice requires a preliminary attitudinal shift among analysts and practitioners. As long as gender analysis is perceived as a burden and a nonessential issue, it will not be fully integrated into assessments or early warning systems. Yet, given the differential roles, experience, knowledge, commitment, and capacities of women and men, it is clearly a fundamental aspect of risk reduction.

PRIORITY 3. KNOWLEDGE MANAGEMENT AND EDUCATION

The Hyogo Framework also calls on states to "ensure equal access to appropriate training and educational opportunities for women and vulnerable constituencies; promote gender and cultural sensitivity training as integral components of education and training for disaster risk reduction" (www.unisdr.org).

Knowledge management, like early warning, must be a two-way system. On the one hand, national or international policies, practices, and strategies must be made available to local communities so that they benefit from the progress being made, lessons being learned, and information being acquired. On the other hand, at the local level, people (women, men, boys, and girls) have access to information and knowledge that are often needed to develop national responses and preventive strategies. Depending on their function in the household or community and their familiarity with their local environment, they may be the first to notice changes that are indicative of a larger phenomenon. They may also be the first responders to famine or other crises.

In rural Ethiopia, for example, FAO documents the use of wild-food and famine-food plants that are typically collected by children and women. When food shortages arise, "able-bodied men migrate to find work. ... Women and children are left behind to manage as best they can" (FAO 2005: 1). Often women have better knowledge of local wild fruits and plants, their nutritional and curative values, and means of improving them. National strategies must incorporate methods of accessing specialized knowledge in a timely manner and ensuring that the stakeholders, particularly women, are included in the development of all aspects of risk-reduction strategies.

In many societies women and men access information through different channels. In rural communities women

and men often work in separate spaces and sectors; thus, in the event of a natural disaster, it is essential that they are equally informed about risk-reduction strategies and that the information given to them is tailored to their environment. For example, if men engage in fishing and water-related activities, they need to know how best to survive potential earthquakes and tidal waves. For women, on the other hand, if they tend to work inside homes or in fields, the risks they face (such as a roof collapsing) and related survival strategies may be different.

They also need to be educated regarding the preparation of emergency kits or materials to take with them in the event of a natural disaster or conflict.² Information and education regarding the maintenance of livestock and produce are another gender issue. In Nepal women expressed interest in the importance of skills training and exposure visits that could help them diversify their income-generation pool. Where monsoon crops are at risk of flooding, for example, they mentioned goat and poultry rearing as alternative activities (Mitchell, Tanner, and Lussier 2007).

In some instances, culture and traditional practices can appear to be obstacles to the sharing of knowledge and can contribute to the subservience of women. However, cultural practices are not static, and sensitive interventions can yield results. A 2004 study in India revealed that women performed 50 to 90 percent of all day-to-day care and management activities of domestic livestock and poultry (Ramdas and others 2004). Yet women were denied access to specialized knowledge relating to the healing of animals because for generations this knowledge was transferred from father to son. However, when traditional healers were told of the roles and responsibilities of women, they took a pragmatic approach, agreeing that it was important to share the information with women as well.

Another critical aspect of knowledge and information sharing is the integration of resource management into education curricula. Gender issues and the particular roles of women and men in communities can be a tremendous asset. This was exemplified in northeastern Brazil as part of a groundwater management project in 2003. The project's goal was to empower women, men, and children in sustainable and collective management of scarce water resources, as a means of reducing drought risk. The program integrated gender perspectives by acknowledging the different and important roles of women and men in water use and management. For example, it brought farmers (mainly men) together with teachers and health workers (mainly women) for capacity-building workshops, training and information exchange, and the collective development of educational

material. It also targeted younger community members, the future guardians of the land and environment, in an effort to educate them about resources and engage them in material development.

The social roles and responsibilities ascribed to men and women in each cultural context can and often do determine the education they have, the information they can access, and the limits they face in sharing their knowledge. Yet, as indicated above, ensuring the full inclusion of women and men in risk-reduction strategies is integral to the success of such efforts. Women need to be included because they have different information and skill sets that can help reduce vulnerability. They need to be included because crises often force them to cope with the consequences alone. They need to know because they, more than any external entity, are committed to ensuring food security and sustainable livelihoods for their families and dependents in the long run.

PRIORITY 4. REDUCING UNDERLYING RISK FACTORS

Reducing the underlying risk factors as much as possible is fundamental to prevention. In conflict prevention new initiatives that integrate peace building into development programming are emerging. This includes training community members in conflict resolution and mediation skills to enable more effective negotiations when tensions arise. In Cambodia, for example, village women are known as the “backbone of the forestry network” and are a strong presence in the environmental movement. In 2002 they led demonstrations against major logging interests and the abuse of people's land rights. Trained in nonviolent action and mediation skills, they often intervene within and on behalf of communities to dispel tensions (McGrew, Frieson, and Chan 2004).

The international debate over natural disasters and climate change has evolved in recent years, with many experts asserting that efforts to curb global warming or reduce greenhouse emissions are not enough to protect the most vulnerable populations in the near term. Measures to adapt to climate change and reduce the risks of crises must be put in place. Typically such efforts are highly localized, and to be effective they must be tailored not only to the local environment but also to the sociocultural context. Once again, gender comes into play, as women and men use and manage different resources and have differing roles depending on the context and immense potential for contributing to risk reduction.

In Bangladesh, for example, women use a variety of strategies to withstand the impact of flooding. They take

livestock to higher ground, store seeds in higher places, seek refuge with relatives, or raise the levels of their homes using a plinth. To reduce losses from rotting crops, some have changed to crops that can be harvested before the flood season. Evidence of diversification is also seen. Recognizing the effect of the floods, women have switched to running fisheries alongside their vegetable farms. The women are frequently alone, because their husbands migrate to find work, and so they need (and many are demanding) skills training to enable a scaling up of their ventures and more effective access to markets (Mitchell, Tanner, and Lussier 2007).

In Nepal women are also developing asset-sharing strategies, including group saving programs and self-help groups to avoid private lenders and high interest rates. Many have also expressed interest in adopting labor-reducing technologies, multicropping strategies, and adopting more-marketable, drought-resistant crops, but typically women lack access to the necessary financial and technical resources (Mitchell, Tanner, and Lussier 2007).

In El Salvador, as well, there are community-based initiatives. During the rainy season, landslides are a regular occurrence, creating environmental hazards for the communities of Lake Coatepeque. Throughout a series of community meetings conducted in 2007, community members identified measures to prepare for natural disasters, including planting fruit trees and shrubs that require little water but can mitigate the effects of landslides, developing emergency evacuation plans and training women (who are more likely to be at home) to prepare basic necessities, making retention walls using chicken wire, and engaging church and community leaders to encourage people's participation in disaster preparedness and planning (Morehead 2007).

Men and women living with the threat of crisis are committed to reducing risks wherever possible. They devise their own strategies but can benefit significantly from external guidance and support. Because of women's traditional absence from public spaces, and particularly from decision making, women's initiatives are often less formal and less visible but are essential and effective nonetheless. Acknowledging women's roles and engaging with them is an essential aspect of any external intervention. No risk-reduction initiative can afford to overlook the capacity and needs of 50 percent of the population.

PRIORITY 5. PREPARING FOR EFFECTIVE RESPONSE AND RECOVERY

The steps noted in the preceding sections contribute immensely toward effective response and early recovery, as

they help to limit the damage done. Nonetheless, the loss of life and destruction of property and livelihoods can be devastating with long-term effects. Gender issues are again central to recovery strategies as women's and men's survival strategies and needs often vary. The UN Inter-Agency Standing Committee (IASC) produced a gender handbook for humanitarian action (2006) that provides a comprehensive and practical approach to the integration of gender perspectives in all emergency response processes. The handbook notes the following three basic steps:

- Ask the difference between women's and men's experiences.
- Undertake participatory assessments including women, men, boys, and girls together and separately.
- Use the information to guide programming.

A critical first step toward effective response is knowing the demographics and profile of the target population and determining its specific needs and capacities. The collection of sex-disaggregated data is essential, as is analysis of the data to understand the implications. Where this is not done, the potential exists for compounding the existing vulnerability of sectors of the population, particularly women.

Understanding the division of labor and coping strategies of women and men is also important to effective recovery. In Sierra Leone, for example, a World Bank study noted that agricultural rehabilitation was hindered by the fact that seeds were distributed to households, and the household heads, who were typically men, were the source of information on what resources were needed. Yet women and men in Sierra Leone farm different crops and thus require different sets of tools and seeds (UN IASC 2006). Care International adopted an alternative approach of distributing seeds to all adults. In this way women obtained groundnut seeds (a crop typically planted by women), and this contributed to their income generation and empowerment alongside men. Care's approach was effectively gender mainstreaming with the benefit of empowering women as part of the process.

The IASC handbook provides a series of checklists and guidelines for a full range of issues (registration, shelter, provision of food and nonfood items, support to livelihoods, and health care). Its key message is that interventions should identify beneficiaries, work with them collaboratively, and adapt programming as needed. The framework for gender-sensitive emergency response and early recovery programming is summed up by the acronyms ADAPT and ACT collectively (box 11.6).

Over the last decade, reams of documents, policies, resolutions, and reports have been produced by states, multilateral

Box 11.6 IASC Framework for Emergency Response

ADAPT and ACT collectively:

- Analyze gender differences
- Design services to meet needs of all
- Access women, men, boys, and girls
- Participate equally
- Train women and men equally and
- Address gender-based violence in sectoral programs
- Collect, analyze, and report sex- and age-disaggregated data
- Target actions based on analysis
- Coordinate actions with all partners

Source: UN IASC 2006.

organizations, and NGOs addressing the relevance of gender perspective to development, agriculture, conflict prevention, and disaster mitigation. Nonetheless, gender analysis is still an add-on or afterthought in the daily business of risk identification, assessments, warnings, and program implementation. Misconceptions about gender issues and confusion among agency personnel (across many entities on the international and national levels) are compounded by limited data and analysis. Despite the evidence of their effectiveness, gender-equitable approaches are not being embraced and implemented often enough. As a result, the practices are ad hoc, documentation is weak, and people remain vulnerable and excluded. Risk reduction and conflict sensitivity are increasingly being recognized as necessary ingredients for sustainable development. If gender sensitivity is not acknowledged and prioritized in the same way and across the five priority areas of the Hyogo Framework, the chances of effective action are diminished.

From Relief to Recovery and Self-Reliance: The Relationship between Food Aid and Agriculture in Complex Emergencies

When disaster strikes or conflict erupts, emergency food aid becomes a critical component of international aid. It saves lives and is generally recognized as being effective in containing the extent of suffering and damage caused by crises, but it is not a neutral entity. Conventional wisdom suggests that food aid is detrimental to agricultural development and creates a culture of dependency and even exacerbates conflict. Yet when crises disrupt agricultural production and distribution, displace populations, and render land unusable, food aid is of critical importance in the short term. The question, however, is when and how agricultural assistance should be provided. How can it be provided given physical insecurity and potential for violence in many of the places where humanitarian emergencies persist?

This Thematic Note examines the links between food, agricultural aid, and development during crises. It highlights effective means of balancing this aid so that local communities benefit most. It also identifies the gender dimensions of this work. The Note draws on key findings emerging from recent studies undertaken by the Organization for Economic Co-operation and Development (OECD), the World Food Programme (WFP), the United Kingdom's Overseas Development Institute (ODI), Oxfam, the Food and Agriculture Organization (FAO), and others.

EMERGENCY FOOD AID, SHOCKS AND CRISES

Although it is commonly believed that local agriculture is damaged by the arrival of food aid and relief, according to the OECD, in natural disaster situations, the impact on agricultural development—"either direct disincentive impacts on markets and production or indirect effects through policy"—varies (OECD 2006: 33). One factor that determines the likelihood of negative impacts is the type of food aid given. Bilateral food aid—from governments to

government, or from government to NGOs—is generally monetized to provide resources for development activities. The monetization process—timing and choice of market—can have negative impacts on local markets. Food aid delivered to multilateral agencies such as the WFP is generally not monetized and is used in targeted project interventions resulting in a far lower likelihood of negative impacts.

In some instances, particularly where the food aid is significant, the positive economic impact can include indirect effects of growth in consumer demand for food and local products. Although studies on the long-term impact of food aid are relatively new, the OECD quotes a 2004 report on sub-Saharan Africa that concludes "large-scale food aid operations to meet short-term deficits in drought affected countries in sub-Saharan Africa in the early 1980s and early 1990s were important in preventing destabilizing effects of covariant shocks on largely agricultural economies" (OECD 2006: 31). These positive effects are nonetheless contrasted against negative consequences, including the following:

- The scramble to provide emergency relief often results in funds being diverted away from long-term projects designed to bolster self-reliance and recovery. According to Oxfam, for example, in May 2006, a month after its launch, the UN's Consolidated Appeal for Somalia was just over one-quarter funded (27 percent). The majority was directed at immediate relief. In the same year, the appeal for Ethiopia had generated 78 percent of its funding requirement for food and 64 percent needed for water and sanitation, but projects aimed at longer-term solutions had received just 1 percent of the requested funds.¹
- Late-arriving, inflexible relief that does not allow a switch from imports to local purchases hampers the recovery of local economies affected by natural disaster.

It can also contribute to changes in consumer preferences and increased demand for imported foods.

- The restricted basket of commodities available as emergency aid creates difficulties in providing socially and nutritionally appropriate rations.
- Preexisting development-oriented food aid programs can be helpful in times of crisis because the aid can be delivered more rapidly. The effect should not be overstated, however, because there can be significant targeting problems resulting from the inflexibility of geographical coverage and beneficiary selection at a household level. Typically the poorest and most vulnerable can be left out, particularly women and children. Some food aid implementers have explicit requirements, such as targeting women as recipients of food aid and seeking 50 percent representation of women in local food aid committees.
- Political sensitivities can be exacerbated. For example, U.S.-sourced genetically modified maize in southern Africa in 2002 caused controversy and highlighted the political sensitivities in recipient countries—even in crisis—that can disrupt distribution plans and raise costs because of donor inflexibility on sourcing.
- A culture of dependency can arise with no space or opportunity to nurture self-reliance.
- Although “vulnerable” groups may be targeted as recipients, at times less attention and fewer resources are directed to addressing the causes of vulnerability or diversifying the agricultural sector or livelihoods to enable communities to withstand crises in the long term. The WFP and others do engage in a variety of development-oriented programs, including watershed management.
- Governments that are reliant on revenue generated through bilateral food aid programming and sales may have no incentive to support long-term programs that bolster domestic food production.
- Local procurement of food aid, as increasingly done by WFP, can foster market development. A risk of market collapse exists, however, if WFP no longer requires food after several years of procurement.

The potential negative effects of food aid are more notable in conflict-affected states. Government and opposition forces can exploit food aid provision for their own benefits and hold local populations hostage to their own demands. This violates the right to food as enshrined in the Universal Declaration of Human Rights. Moreover, food and other forms of humanitarian aid have fueled conflict. The links between war, famine, and humanitarian aid became most evident in Ethiopia and Sudan during the 1980s and

conflicts that emerged in the 1990s. With the end of the Cold War, humanitarian agencies were able to expand relief operations into war zones and areas controlled by insurgents, but the assistance provided was exploited by warring factions. In some instances the food and clothes designed to reach the most vulnerable populations became a source of competition between factions. In the Democratic Republic of Congo following the Rwandan genocide, international aid literally fed the perpetrators and enabled them to continue the sporadic cross-border violence and fueled ongoing conflict in neighboring Burundi (Barber 1997). Conflicts in Liberia and Sierra Leone were among cases in which civilian populations were seen to be deliberately targeted as a means of creating displacement and ensuring an influx of international aid that was then used to fuel the violence.

Thus, on average, internationally procured food aid is seen as a second best option for responding to emergency situations. Where markets function and effective trade links exist, the OECD suggests that “financing of public imports through the commercial sector, and allowing the private sector to respond to rapidly changing market conditions” is more effective (OECD 2006: 32). The WFP procures its food aid locally where donor resources provide flexibility and local markets can support the demand without causing price rises, which would affect non-food-aid recipients. In some cases, for example, the WFP procures food and grains locally, even though some stocks have been imported commercially. The international response, says the OECD,

“should be sensitive to the specifics of the options that are practically available, the social and economic environment and governance in the affected country. For example, in the 1991–93 drought crises in Southern Africa large-scale commercial imports were organized and arrived more quickly than food aid and so played the key role in averting a regional crisis. Allowing the private sector to respond to rapidly changing market conditions through commercial imports and stock adjustments, as in Bangladesh after the floods in 1998, limits the need for potentially destabilizing increases in public expenditure” (OECD 2006: 31).

Moving from food aid to agricultural assistance

The real challenge, however, is how and when to initiate assistance for local agricultural production. This is critical for food aid beneficiaries who may sacrifice food consumption in order to save food aid given as whole grain for planting. Recent years have seen a growing consensus on the need to shift toward early recovery and self-reliance as soon as

possible. In part this is a means of mitigating the negative impact of food and humanitarian relief on conflict, but it is also recognition of the chronic and long-term nature of many of the crises that exist today. For example, the average length of displacement is now 17 years (taken globally among displaced populations; UNFPA 2007: 6). Affected populations cannot and should not be reliant on an ongoing cycle of short-term humanitarian relief. The situation is complex, however, as allowing displaced populations to settle can itself be a source of conflict with host communities and contribute to land and resource degradation. In addition, displacement can result in the loss of skills and knowledge in food production from one generation to the next, as household heads, typically women alone, have to develop alternative coping and livelihood strategies in the new environments in which they find themselves.

In 1997 the international humanitarian community produced the Sphere Humanitarian Charter and Minimum Standards in Disaster Response (Sphere Standards) as a means of setting a standard for the provision of aid to people affected by crisis and conflict. The guidelines touch on all aspects of humanitarian assistance, including the need to ensure food security and livelihoods. The standards address the full range of issues from conducting nutritional assessments to protecting production mechanisms, ensuring sustainable and diverse agricultural practice, and guaranteeing access to markets for producers and consumers in crisis situations.

Taking a step back and focusing on preventive measures, the World Bank report *Mainstreaming Hazard Risk Management in Rural Projects* (2006: 9) draws attention to the actors and stakeholders that need to be included. Consensus is emerging “on the best way to organize the components of national systems for hazard risk management has begun to converge around several key points.” First, the report notes that regardless of whether existing systems are centralized or decentralized, risk management involves multiple stakeholders, including representatives from a range of national-level institutions or sectors, including land-use planning, environment, infrastructure, communications, utilities, and health. Second, the report points to the importance of local level capacity and participation in comprehensive risk management. Reasons for this include the following:

- The effect of disaster is first felt by the community, and they are the first to respond.
- Failure to understand the behavior and culture of the community can result in badly designed early warning systems.

- Involvement of local people builds self-reliance.
- Reconstruction efforts are more effective if the community is actively involved and feels a sense of ownership.
- Many communities are remote and rely on their own resources to cope with crises.
- Preparation at the community level is a building block toward improving national capacities to respond and cope.
- Increased community participation can lead to increased local pressure on governments to address disaster risk issues adequately.
- Community-level focus allows for targeted identification of access, and engagement with a full cross-section of society, including the elderly, the disabled, the young, women, and minority groups who are often excluded (World Bank 2006).

Theory and realities on the ground, therefore, emphasize the need to shift from relief to interventions that aid early recovery and self-reliance. Yet international practice lags behind. A decade after Sphere, neither the standards set for protection of agricultural production nor those regarding access to markets are being fully met. Multiple challenges remain to be overcome:

1. The lack of security, particularly in conflict-affected areas, can be a major obstacle to the provision and implementation of agricultural programming. Access can be hazardous, land may be mined and unusable, and the presence of armed groups and the proliferation of weapons contribute to insecurity.
2. The lack of effective institutions and the collapse and loss in many cases of social capital are profound obstacles to any sustainable development effort.
3. Tensions exist between short-term relief efforts and long-term rehabilitation and development programming. In theory, early recovery and rehabilitation initiatives conducted during or after conflict or crises are meant to promote self-reliance and resilience and help transition societies from relief to development. In practice, however, the processes are at odds with one another. For example, relief efforts often operate on short-term (sometimes six months) budgeting cycles. Thus, the support provided is often piecemeal, as opposed to being comprehensive and infrastructural with longer-term durability.
4. Lack of coordination between donors contributes to the ad hoc and at times duplicative nature of the support provided.

A 2007 ODI study (Longley and others 2007) offers further insight into the current gaps relating to agricultural programming in “fragile states”—those prone to, or affected by, conflict and those with limited ability to provide basic services (including guaranteeing food security) to their citizens. It critiques existing agricultural programming in such situations for being piecemeal and not tackling underlying structural and institutional issues that affect agriculture. It also notes that insufficient links still exist between agricultural programming and social protection. Reflecting on seed aid programs in Afghanistan, Sierra Leone, and southern Sudan, for example, the study highlights the following:

- In Afghanistan seed distribution was used to promote “new variants” to farmers without providing the requisite training to inform them about the seeds or activities such as trials and demonstrations to allow them to learn more. No systems are in place here for ensuring that aid agencies are accountable to their beneficiaries.
- In Sierra Leone “lack of regulation in the procurement and distribution of seeds led to efforts to promote the local production of these inputs . . . involving community seed banks.” Yet observers noted few incidences of sustained and successful programs, “raising questions about the appropriateness” (Longley and others 2007: 2) of the initiatives.
- In southern Sudan local seed production systems were formed in the 1990s. Yet they were overly reliant on NGOs, and when the NGOs were forced to pull out of the region, many farmers were unable to market their seeds. Concerns about dependency on NGOs and external actors remain.

The study calls for consideration of four overarching issues (Longley and others 2007):

- *Addressing vulnerability and livelihood strategies:* Agriculture may not be a source of livelihood for many of the poorest people, and it is necessary to assess and understand the structural causes of vulnerability, including sociocultural issues that affect equity and discrimination.
- *Coordinating a comprehensive approach:* A more coordinated and comprehensive program of assistance to farmers is required that includes a diverse range of inputs and services.
- *Promoting markets:* Private sector involvement is needed in the provision of agricultural services and inputs, and the strategy of stimulating demand through the provision of resources (cash or vouchers) to beneficiaries.

- *Strengthening institutions:* The paper advocates attention and enhancement of institutions as a means of supporting rural livelihoods and agriculture. In many instances significant reform of such institutions is needed to ensure that the root causes of conflict are addressed.

In addition, greater understanding of and respect for local coping mechanisms and traditional knowledge are needed, including understanding the gendered division of labor, so that interventions are appropriately targeted. An understanding of traditional knowledge and means of coping in crisis situations is also needed. Outsiders need to grasp the sociocultural context, while also drawing on their mandates to ensure that marginalized groups are not doubly victimized.

The link between agricultural assistance and institutional structures is of particular importance. For responders, however, a need exists to acknowledge the differential circumstances wrought by conflict and natural disasters. In conflict situations, relief aid is typically provided by external actors outside the confines of the state structures. Sometimes this is important because the state has no actual capacity to deliver the aid. At other times the key is to access communities directly without hindrance from the state. With the end of conflict, a noticeable shift occurs as rehabilitation and reconstruction aid is channeled to the state.

Transformative recovery

An overarching goal of international reconstruction efforts is to enhance state capacities to move reconstruction away from fragility toward sustainability. The dilemma, however, is that re-creating past status quos and systems can also mean re-creating the conditions that led to conflict in the first place. In other words, not only should outsiders avoid doing no harm with interventions, but they should also avoid perpetuating harm or discrimination that existed and contributed to the crisis. Thus, in postconflict situations the goal should not be simple recovery, but actual transformation and tackling of root causes to limit future vulnerability. From the perspective of the agricultural sector, this touches on issues ranging from redressing land ownership and tenure, to rural governance structures, to policies relating to diversification of products and skills and market and infrastructure development.

In the case of natural disasters, however (where there is no violent conflict), the state and its armed forces are often the first responders. Donors and humanitarian agencies typically coordinate with the state to ensure the delivery

of relief. In the aftermath, however, programming aimed at building up national capacities to manage and withstand crises is not focused on building state capacities per se. Recognition and inclusion of the multiple stakeholders, at all levels, as the World Bank (2006) study says, are thus essential.

KEY GENDER ISSUES

Men and women must be recognized among the “multiple stakeholders” noted by the 2006 *Mainstreaming Hazard Risk Management in Rural Projects* World Bank study. Interventions must build on the local knowledge and responsibilities of women and men in agricultural processes. For example, in Afghanistan and Pakistan, women play a central role in animal husbandry. In some areas in Pakistan they also manage the finances and resources. Practices vary across cultures. If interventions are planned based on assumptions or with disregard for the gendered dimensions of agricultural work, they can fail or do harm.

Emergencies and disasters affect people differently depending on their gender, stage of life, socioeconomic status, and cultural practices. Even within the same family or household unit, the impact and capacity to respond can vary. For example, in many instances women will eat less and share their portion with their boy children. Pregnant and lactating women can be at acute risk of malnutrition in crises. Similarly young men or men-only-headed families are also vulnerable because they often do not have the necessary cooking and food preparation skills. Recognition of these issues creates indicators of who the most vulnerable may be and can ensure more targeted, relevant, and early responses for those groups.

Crises: challenges and opportunities for redressing gender inequality

Crises—conflict or natural disaster, short or long term—can affect the composition of households with extended family members, widows, unmarried women, and others joining together. Often men are absent (because of death or migration), leaving women with multiple burdens in the public and private spheres. Changes in these situations are related to and affected by sociocultural norms, which in turn should inform relief and recovery programming. For example, even in a traditionally men-dominated society such as that of Nepal, it cannot be assumed that, in times of crisis, households are led by men and relief can be distributed through them. Elsewhere, past practices that favored the distribution of food and relief to men proved to be not

only highly inequitable toward women but also contributed to the cycle of violence, for example:

- Sale of relief aid in exchange for alcohol or other substances
- Sale or exchange of relief aid for weapons
- Common practices of polygamy so that distribution of family rations to one man results in lack of rations for other wives and children
- Malnutrition among young men in a displaced camp due to lack of cooking skills (and inability to use the rations provided).

The changes, while difficult, also create opportunities for addressing longstanding discrimination against women. For example, the WFP has initiated procedures to distribute relief primarily through and to women. This can benefit them in the short term and prompt greater empowerment over the longer term. Similarly, targeted efforts to allocate land and assistance to women in postconflict and crisis situations can be initiated. In postwar Cambodia and El Salvador in the 1990s women were recipients of land. Yet for the effect to be sustainable, equal access must be matched with equitable treatment and understanding of the underlying factors that could affect women detrimentally.

In the case of food aid, for example, local conditions (such as corruption, loss of food aid to local militia, distances that goods need to be carried, and weight of packages) can prevent equal access and expose women to further insecurity. In the case of land allocation, in Cambodia often the tracts given to women were of the poorest quality and in areas that were difficult to access. Moreover, women heading households required the assistance of men in their communities to undertake the hard physical work. For many women, simple ownership of the land was not enough to enable them to sustain a livelihood. In Rwanda after the genocide, changes in legislation to enable women’s inheritance of their husband’s property were not readily implemented at local levels, where they went against culture and historic norms. In effect, although opportunities exist, to avoid a backlash, intervention must be designed with sensitivity to the cultural norms. A key aspect of program design is to understand the differing roles, responsibilities, capacities, and constraints of women and men in the region in question. This includes understanding their traditional division of labor in the agricultural sphere, as well as the changes that have resulted from the crisis. Although formal needs assessments can be difficult to undertake in the midst of crises or where insecurity is rife, informal and ongoing consultations with different sectors can provide the necessary

information and ensure gender-sensitive programming as in the case of the Sri Lankan irrigation project (see Innovative Activity Profile 1).

Where the issues are addressed and integrated into programming, the positive impact is not felt by the individual beneficiaries but by the community as a whole. A 2004 study in El Salvador documents that in communities where women received basic support such as child care, they were able to participate in community development initiatives, whereas they were absent in areas where such support was not provided. The study indicates that where women were involved, the community's overall development and economic standing were greater than in communities where they were not (Pampell-Conaway and Martinez 2004).

GUIDELINES AND RECOMMENDATIONS FOR PRACTITIONERS

Food aid and agricultural assistance are both necessary components of effective interventions in most crisis situations. The key to sustainability, however, is to ensure that the aid provided is not perpetuating or harming the communities and stakeholders it aims to assist. This requires substantial knowledge of the ways in which the agricultural sector works, as well as the existing sociocultural underpinnings. If information is gathered during "normal" times, it can assist in planning for crisis response. Establishing networks of local communities and organizations can be a means through which information is gathered and shared. The capacities built locally can also be a critical aspect of early recovery.

The FAO (2003) and the UN's IASC (2006) have developed frameworks for conducting needs assessments and establishing contact groups to inform external actors of the changing nature and conditions of affected populations. Similar approaches can be taken in formulating agricultural initiatives. IASC guidelines on food security, for example, offer advice on gathering information about the following issues disaggregated by sex:

1. *Demographic factors*, including numbers of landless poor, herdless pastoralists, poorest in caste or ethnic groups, most marginalized communities (by composition and sex), migrants (long and short term)
2. *Local capacities*, including
 - Understanding the local division of labor between women and men
 - Identification of preexisting community structures (formal and informal) and how or by whom they are led; in

many cases women have structured networks of support that may not be overtly visible but are essential for effective food production, storage, and sales

- Understanding the importance of local and household-based power structures relating to use of food, land, livestock, tools, finances, conservation, storage, and other productive resources, to ensure that interventions are tailored to each group and are culturally appropriate
 - Understanding the skills needed by women and men (particularly those returning from conflict)
3. *Changes in social factors*, including
 - Household composition
 - Division of labor
 - Needs (including of the sick, elderly, the young, and their caretakers)
 - Different needs and coping strategies of women and men (for example, dislocation and the loss of jobs and social standing can traumatize and disempower men, whereas for women, taking on new responsibilities, while difficult, can also be a source of empowerment)
 4. *Changes in economic factors*, including
 - Incidences and nature of poverty (for example, it is typically high among widowed women)
 - Identification (through consultation) of forms of intervention that are most targeted and beneficial to the full cross-section of the population (for example, for many of the very poorest with no land or livestock, cash or vouchers are a means of generating a livelihood)
 - Ensuring equitable access to markets for food procurement and the sale of goods (for example, in Bangladesh a "ladies' corner" was established in one local market to provide a culturally accepted space for women to sell their goods)
 - Ensuring that subsidies do not inadvertently harm women's and men's food and crop production and incomes
 5. *Political conditions that can affect women and men differently*, including
 - Discrimination based on group identity
 - National and customary practices and laws that limit equal access to agricultural resources, particularly land and access to agricultural services (including training, equipment, seeds, and support)
 - Changes in legislation to promote gender equality (and the potential backlash locally or among select groups)
 - Access and involvement in consultation processes and decision making, ability, and constraints related to engaging with external actors and donors

6. *Institutional and security factors, including*

- Mechanisms and arrangements to enable full participation of community members (men, women, differentiated by age, economic status, and so on) in consultative processes
- Physical security threats facing women (and men) in traveling to and participating in markets and accessing support
- Impact of landmines and weapons on women's and men's ability to work fields and reach markets
- Impact and incidences of sexual- and gender-based violence that threatens women's security and negatively affects their capacity to engage in agricultural work

7. *Information gathering and dissemination, including*

- Ensuring effective outreach to women and men in rural communities through use of special measures (for example, partnership with community radio and networks of rural health workers) where necessary to inform most excluded groups (for example, widows in Afghanistan or Dalit women in rural Nepal with no literacy skills and knowledge of dialect languages)
- Ongoing consultative processes or forums (such as village-level councils) to enable all stakeholders to provide feedback on the impact of the interventions and participate in problem solving and decision making.

Managing Land and Promoting Recovery in Postcrisis Situations

Land and issues—from tenure to usage, ownership, reform, and redistribution—are a critical feature in crises and emergencies. “The relationship,” states a 2004 USAID study, “is stark, whether we are talking about how land issues function as causal or aggravating factors in conflict, or whether we are thinking about land-related issues that arise in post-conflict settings.”¹ Access and usage are not only a question of immediate survival but have sociocultural implications tied to issues of history and identity. The Israeli-Palestinian conflict is a case in point. On the Palestinian side, the incursion of Israel into the “Occupied Territories” is not just a military issue, it also has meant the destruction of homes and orchards and their replacement with modern housing, erasing the identity of their owners.

Land is also a cause of and can fall victim to natural disasters. Overuse, deforestation, and desertification can lead to landslides and flooding. Earthquakes and tsunamis can wreak devastation on a massive scale, sometimes causing irreparable damage.

As a crisis or conflict continues, the issues become even more intertwined.² Displacement and resettlement among new communities can ignite new tensions. The destruction of traditional social networks and family structures, the increase in women heads of household and widows, and the inevitable reformulation of relations give rise to disputes, as people from diverse communities (or identity groups) often have differing approaches and practices relating to land management and usage. These changes spill over into the postconflict and crisis setting, and if they are not addressed, they can cause a resurgence of violence.

This Thematic Note focuses on key land issues in the postcrisis setting from a gendered perspective. It highlights critical issues and lessons drawn from current and past crises. Additional gender analysis related to land can be found in other Modules in this *Sourcebook*. The Rural Development Institute (RDI) identifies the following linkages between women, land, and improving livelihoods:

- Women represent over 50 percent of the world’s population and provide 60–80 percent of the world’s agricultural labor, yet research indicates they own less than 5 percent of the world’s land.
- Assets and income in the hands of women result in higher caloric intake, better nutrition, and food security for the household than when they are in the hands of men.
- Women’s property rights increase women’s status and bargaining power within the household and community.
- Secure land rights provide women with greater incentives to adopt sustainable farming practices and invest in their land. More than 80 percent of farmers in Africa are women, yet women in most African countries do not have secure rights to the land they farm.
- Providing women with secure rights to land has the potential to mitigate the impact of HIV and AIDS on food security and reduce high-risk behaviors.

POSTCRISIS ISSUES

Physical recovery from crisis (manmade or natural) is complicated by practical issues such as weakened local management structures; the loss, destruction, or falsification of records; and the return of IDPs and refugees who make claims on land or have it allocated to them. As noted in a 2004 FAO publication, governments and donors rarely consult, coordinate with, or compensate local communities with regard to the resettlement of refugees and IDPs (Unruh 2004).

Differing interpretations and implementation of international laws and norms pertaining to land access can also cause difficulties. Sometimes the confusion arises among donors themselves with “disagreement . . . as to the direction that the development of the property rights system should take after a conflict, with differences often tied to the economic and foreign policies of the donor countries involved” (Unruh 2004: 3). The drive toward private property ownership

can clash with traditional communal tenure and ownership practices, as well as demands for social justice and equitable distribution of resources. This can be particularly stark in the case of widowed or single women claiming the right to live on their family property while the law prohibits women ownership.

Security plays a role as well. In postconflict settings, mined land is useless for cultivation and is a drain on limited resources because demining is slow and expensive. In Afghanistan and Mozambique, for instance, much of the most fertile lands was mined. It is also a public health issue. Farmers are often driven (or need) to cultivate mined land that has lain fallow but expose themselves and their family to great risk, as landmine victims require long-term care and assistance. Women in particular are more vulnerable if harmed because in many societies men may shun them if they can no longer perform household duties. Lack of effective security structures is another challenge. Criminal gangs and splintered armed groups can emerge in the vacuum created by a weakened state. Extortion can become commonplace, as in Nepal, where it emerged during the Marxist-led conflict. Sexual violence is a common feature and can debilitate women's productivity and movement. State-sponsored confiscation or expropriation also occurs, fueling tensions and stifling economic growth.

Time is another key factor. Immediately after the crisis need and demand exist to move quickly to resettle people and regenerate the economy and livelihoods. Many states emerging from conflict may not have the personnel or technical capacities to address the issues. As stated by FAO, "in post conflict situations a land rush can occur after a conflict, which very quickly outruns the ability of a re-establishing formal tenure system, and the best intentions of government and donors to manage. This can take community and household land tenure, resettlement, eviction, restitution and disputing in directions that are largely outside of the control of a slowly reformulating formal tenure system" (Unruh 2004). Inevitably, the combination of traditional practices, the lack of women in decision making, and the lack of sensitivity among policy makers and international actors to the differential experiences and needs of women and men results in the inadvertent exclusion of women as beneficiaries.

Yet the difficulties that emerge in postcrisis environments come with new opportunities to review and redress long-standing or root causes of conflict and discrimination. Just as there are conflicts that arise over land issues, so too can peace agreements set into motion land reform and reallocation. The recovery period can also be a time for national institutions to review and revise legislation that

discriminated against one group or sector of the population. In South Africa, for example, the changes in legislation were directed at benefiting the majority black population that had endured decades of discrimination. The influx of international aid and technical support can help establish alternative livelihood opportunities. Mechanisms for resolving disputes and ensuring more equitable access to land can be put in place. After experiencing a crisis—especially a natural disaster—national and community leaders and stakeholders may be more amenable to embracing more sustainable livelihood methods as a means of reducing risk and future vulnerability.

LAND AND TRANSFORMATIVE RECOVERY: THE CHALLENGES FACING WOMEN

The challenges and opportunities present in postcrisis environments affect women and men. In most instances, however, the challenges facing women are greater than those faced by men. The reasons vary according to region and culture. On the one hand, women, more than men, are engaged in agricultural production and the cultivation of land. On the other hand, women farmers' literacy and educational skills are more limited than those of men. Often they have little or no legal protection or ownership rights. Cambodia in the aftermath of the Khmer Rouge regime and the 1991 peace agreement is a case in point. Women are responsible for 80 percent of the food production, yet most have no control or ownership of the land they work. Nearly 50 percent of women farmers are either illiterate or have basic primary school education (World Bank 2004).

The situation is exacerbated by natural disasters or conflict, as men migrate for waged employment, join armed groups, or are targeted by them, leaving women alone in rural settings. In Honduras, for example, the proportion of women-headed households doubled in the aftermath of Hurricane Mitch in 1998 (Bradshaw 2004). In effect, the vulnerability and disparity that exist for women under "normal" situations (for example, lower skills and education, less access to decision making, no formal ownership rights) are exacerbated when crises emerge and livelihoods and traditional social systems are destroyed. Initiatives aimed at promoting recovery must therefore aim to address and resolve some of the baseline criteria that contribute to the gendered disparity and vulnerability.

The key issues facing women in postcrisis settings have been noted in a range of reports, including a 1999 UN Center for Human Settlement (Habitat) study (UN Habitat 1999), and are summarized in the following five sections.

Legal barriers

In many instances women's rights to land, housing, or property are limited during times of peace. Their rights are circumscribed by customary practices whereby access is determined by men relatives. In many societies women have no right to own, rent, or inherit property in their own name. Across Asia and Africa women often need their husband's permission to access credit or acquire titles independently (Farha 2000). Conflict and crises can exacerbate this. As refugees and IDPs they lose access to their homes and properties. Once the crisis subsides, the situation does not improve. As widows (or with spouses missing), as women heading households (caring for siblings or elderly relatives), as daughters or sisters, they often have no legal protection or claim on their homes or properties, yet often they are the sole caretakers of families. In Rwanda, for example, a decade after the genocide women led some 30 percent of households (Brown and Uvuza 2006). In Aceh, after the tsunami, women have been caught in disputes with in-laws or men family members laying claim to land and property (Fitzpatrick 2007). In Palestine women are subjected to not only the confiscation of land by Israeli forces but also social pressures to renounce inheritance rights when husband or fathers are killed (Farha 2000).

Registration and recordkeeping

Recordkeeping and documentation can also have significantly different implications for women and men in postcrisis periods. Customary practices and the protection afforded by clan elders are often destroyed during crises, making women more vulnerable. In many cases only the men head of household is recorded, and property, whether or not it is jointly owned, is recorded under men's names. Sometimes it is inadvertent. In Java, Indonesia, for instance, customary practices dictate joint ownership by husbands and wives. Yet when registration was put in place, the registration forms provided space to register only a single owner, and typically men's names were recorded. This minor bureaucratic oversight had significant implications for people's lives (Brown and Uvuza 2006: 25).

Often during conflicts, administrative offices and records are deliberately destroyed in looting and property ownership becomes a disputed issue. In natural disasters the destruction of records is among the many consequences. In the recovery period, systems are put in place to handle claims. But with men absent or dead, women may face challenges to their claims of joint ownership. Even where state laws give men and women equal rights, without proactive efforts to

realize and protect women's rights, they can be neglected or abused. In a 2007 Oxfam study in Aceh (Fitzpatrick 2007), the issues women raised regarding their ability to claim property included the following:

- Their access was limited, because only the men members of their families were registered on property titles.
- They were too traumatized to venture into the public sphere and make their claims.
- With their primary responsibilities as caregivers and providers for their families, they had neither the time nor the resources to mobilize and assert their rights.

Other factors that affect women include the following:

- Their traditional social networks are destroyed, and they have less access or capacity to influence local leaders, who are often charged with decision making.
- They face entrenched sociocultural barriers, so decisions are often made against them and in favor of men.
- They lack information or knowledge about their legal rights or where to get assistance.

Land allocation and reform

Peace processes or political transitions often catalyze land and property reform, liberalization, or reallocation programs. Such programs, however, are often hampered by a lack of sufficient resources from the outset. For example, in Guatemala prior to the civil war, 2 percent of the population owned 70 percent of the land. The 1996 peace accords included a provision for land reform. Land taxes and a land fund associated with an autonomous government agency (Fontierras) were among the mechanisms established to enable the reform, but the costs of undertaking land reform far outweighed the allocated budget. By 2006 it was estimated that only 2 percent of the demand had been met.³

The purchase of the land amounts to only 30–40 percent of the total costs associated with sustainable land reform, according to one Africa-focused 2006 World Bank Study (Van den Brink and others 2006). Other costs associated with resettlement, housing, start-up grants, agricultural inputs, training, and advisory services are also critical to success, yet they are rarely accounted for. South Africa, for example, has allocated a realistic budget toward land purchases but underfunded the nonland costs (Van den Brink and others 2006).

Women, especially widows or women heading households, are often losers in land reform programs. Before the conflict in Cambodia, for example, women's rights to ownership were

recognized. They had equal access to land through inheritance, and acquisition through cultivation. However, the postwar period coupled with liberalization policies has marginalized women, making them more vulnerable to market forces, debt, and landlessness. Close to 50 percent of war widows have no access to land. Of those who do, some 84 percent have less than 0.05 hectare of often poor quality land, making it difficult to sustain a livelihood (World Bank 2004).

The reasons for disparity vary. One reason is lower literacy levels among women and less knowledge of land titles, tenure requirements, or new land laws. In family disputes (or divorce) women do not have knowledge of their legal rights. Another reason is that in many places women are also socialized to care for elderly and sick parents and are thus more likely than men to spend savings, go into debt, or sell assets to provide care. Yet another reason is that social stigma is attached to women engaging directly with men regarding legal issues or local authorities. This can impact their inheritance rights, because their men relatives may keep the certificates of entitlement and directly (or indirectly) pressure women to conform to societal norms (McGrew, Frieson, and Chan 2004).

Equality but not equity: the multiple burdens of women

As noted above, although the law may often offer some protection or rights to women, in practice societal forces present obstacles to the realization and implementation of the law. In effect, there is legal equality, but in practice, the situation is not fair or equitable.

As heads of households in postcrisis situations, women have the combined burden of domestic and agricultural responsibility. Many cannot make full use of their land or maximize their production and revenue with limited literacy skills and an overwhelming combination of domestic and productive duties. They often have no knowledge of or time to seek out information regarding their rights or the nature of titling procedures. Their exclusion from the men-dominated bodies that administer land issues and are an integral aspect of social and political networks compounds the problem.

Compared to men, women farmers also tend to have less access to high-quality inputs or information about improved techniques. Often agricultural extension staff are predominantly men. As such, in many traditional societies they cannot engage in face-to-face contact with women farmers. Moreover, little attention is given to the fact that women and men specialize in different tasks. Research and outreach to women's specialized tasks are limited.

Women typically have less access to credit. According to FAO, where data are available, only 10 percent of credit allowances are extended to women.⁴ Their access to markets is also more circumscribed. Security concerns and domestic duties prevent women from engaging in market-related activities and accessing basic services (including health or education regarding land management). Thus, even where land laws may espouse equality or be progressive (such as the one passed in Cambodia in 2001), the differences between women's and men's access and opportunities remain stark.

International financing: helping or harming?

International aid comes rushing in after crises, but the impact on women and men can vary deeply. Women can be inadvertently negatively affected. Issues that arise include the following.

Location and resettlement of refugees and IDPs. At times, international actors do not consult, compensate, or coordinate sufficiently with local communities regarding the settlement of refugee or IDP populations. Differences in customary tenure practices versus government practices can cause increased tensions and fuel conflict between the two communities.

Competing ideologies and lack of coordination between donors. Donors can have differing interpretations of or priorities relating to international laws and norms and how they affect land tenure issues in postcrisis settings. Donors' policies can be contradictory. Many may support gender-equality measures but unwittingly undermine equality as they call for a shift toward a market economy and privatization as a precondition for the provision of financial assistance. This means a shift away from customary titling practices toward private ownership. Where customary practices hold sway and are the only safety net available to women, the move toward privatization can be devastating. Widows (who traditionally were permitted to remain in their homes until death or remarriage) find themselves evicted by men heirs keen on generating an income or benefiting from increased land prices that are a common feature of postcrisis countries.

Ad hoc approach to international laws especially women's rights. Within the framework of international laws and conventions, numerous provisions articulate women's rights to property ownership (see summary in box 11.7). The World Bank, like other entities, has its own policies and guidelines. In many postcrisis settings, women's rights advocates rely on such provisions to further their demands and ensure protection for women. Yet support provided by international actors—bilateral or multilateral entities—is at best ad hoc.

Box 11.7 Summary of Selected Key International Laws and Standards

UN Convention on the Elimination of Discrimination against Women (CEDAW) (1980), adopted by 191 UN member states, includes the following:

- Article 15: “State parties . . . accord to women equality with men before the law”; “they shall give women equal rights . . . to administer property.”
- Article 16: “the same rights for both spouses in respect of the ownership, acquisition, management, administration, enjoyment and disposition of property.”

The Habitat Agenda (1996), adopted by all UN member states, commits governments to “providing legal security of tenure and equal access to land to all people including women . . . and undertaking legislative and administrative reforms to give women full and equal access to economic resources including the right to inheritance and to ownership of land and other property.”

Source: Author.

UN Sub-Commission on the Prevention of Discrimination and Protection of Minorities, Resolution 15 (1998), urges all governments “to take all necessary measures . . . to amend and/or repeal laws and policies pertaining to land, property, housing which deny women security of tenure and equal access and rights to land, property and housing, to encourage the transformation of customs and traditions which deny women [this] security, and to adopt and enforce legislation which protects and promotes women’s rights to own, inherit, lease or rent land, property and housing.”

UN Security Council Resolution 1325 (2000): “Calls on all actors involved, when negotiating and implementing peace agreements, to adopt a gender perspective, including . . . the special needs of women and girls during repatriation, resettlement and for rehabilitation, reintegration and post conflict reconstruction.”

Cultural relativism is often used as an excuse to avoid the pursuit of measures that can protect women, despite the fact that the demands for such changes are often emerging from grassroots communities themselves. Inconsistency, apathy, or ignorance of institutional policies can heighten women’s vulnerability at a time when they are struggling to survive and maintain their households and communities.

USEFUL LESSONS AND OPPORTUNITIES FOR ADDRESSING GENDER DISPARITIES

Despite the difficulties that arise, major crises also create new opportunities for tackling gender-based disparities regarding land ownership, tenure, and use. Most important, perhaps, is that many women come to the fore as a result of the effects of crises. As refugees and IDPs, they often have an opportunity to mobilize, gain awareness of their rights, and assert their demands. Support from international entities can strengthen their capacities while still ensuring that the demands are locally driven and homegrown. Moreover, women themselves are the best navigators of their cultural terrain. If informed of the international policies and norms, they can be effective in bridging the purported divisions between the policies and traditional practices without

prompting a backlash or accusations of cultural insensitivity. Opportunities include the following:

Peace accords as a key entry point. Peace accords can be a key entry point for addressing land reform. As in Guatemala, in the Israeli-Palestinian conflict, land ownership and occupation are clearly among the most contentious yet critical issues to be resolved. Just as marginalized ethnic or indigenous groups may demand their rights to land, specific discrimination against women can also be highlighted. In Sri Lanka in 2002, a women’s coalition comprising local and international women’s rights advocates held lengthy community-based consultations to identify women’s concerns around the then-emerging peace process. Land issues were among the issues noted (box 11.8).⁵ The recommendations they developed were aimed at national parties to the conflict as well as international entities involved with supporting the implementation of agreements or assisting recovery.

New constitution and legislations. Eritrea, Ethiopia, Mozambique, and South Africa are just some of the countries where women’s mobilization, political pressure, and public demands enshrined their rights to property ownership in the constitution and legislation. In South Africa, the land reform legislation introduced following the end of the apartheid era explicitly addresses gender equality. Within

“Land rights appear to be one of the most difficult and contentious issues throughout the northeast. The displaced [people] need to reclaim their land and property and receive compensation for loss and damage. Those who cannot return must be resettled elsewhere. Those occupying land and property abandoned by the displaced or evicted must vacate such property and be re-settled. Women and, in particular, widows and women heads of household must be given title to land and property. Issues of inheritance for women must be clarified and women's right to land & property protected.”

Source: Excerpts from Women and Media Collective (2002).

Recommendations made by the Mission:

1. Land laws must be reformed to ensure equal rights of women to inherit and dispose of land and property.
2. Where necessary, lands must be surveyed to establish boundaries.
3. Ownership rights should be respected, and persons living in houses owned by others should be provided with alternative accommodation.
4. Widows and relatives of the disappeared need assistance in accessing the documentation they require to prove their rights to property and inheritance.

the Land Affairs Department a Sub-Directorate on Gender Affairs was also established. In Rwanda, in the aftermath of the genocide, inheritance laws were changed in 1999 to allow equal inheritance rights for sons and daughters and to protect women's joint property rights in formally registered marriages. In 2005 parliament adopted a new Land Law to establish rights to land and leaseholds, resolve uncertainty in land holdings, and encourage consolidated use as a means of promoting productivity. The law will be implemented through a series of more issue-specific legislation and regulations.

Such legislative changes provide a new normative framework through which the issues affecting women can be addressed. However, they are often neither sufficient nor comprehensive. For example, the 1999 inheritance law does not provide protection to women in consensual unions (or other customary practices) and has been interpreted to limit a widow's claims on her husband's properties. Typically local women's organizations are among the first to identify such gaps. To address them, they require assistance and support from a variety of actors, including international agencies.

In any context, effective and equitable implementation of new land laws requires a number of other measures to inform the cross-section of stakeholders at national and community levels and ensure their support and adherence. Nepal offers an example of an opportunity to implement legal change. As the peace process began there in 2007, local NGOs identified some 103 laws that discriminated against women. The state must take a lead in repealing or striking

down such laws and drafting new provisions that explicitly recognize and protect the independent and equal right to property ownership and inheritance for women and men. NGOs and international agencies can provide technical and financial support to local actors. They can lead research and analysis to provide the necessary information. They can lead by example, incorporating existing international norms and standards in their own practices.

*Protecting women's rights in registration.*⁶ As noted earlier, registration procedures are critical to ensuring equal and fair access and ownership of land:

- In Vietnam, when it was discovered that only men were being registered on land titles, new certificates were issued that included space for the names of both spouses.
- In Cambodia, at the time of registration, an assistant is nominated at the village level with responsibility to inform women and the most vulnerable members of the community of their rights and to assist them in making land claims or objecting to existing claims.
- In Aceh recommendations for more equitable practice include making joint titling mandatory. Registration forms could include questions about existing spouses or others who are co-owners of the land (for example, men or women siblings).
- In addition, as noted by the Sri Lankan women (box 11.8), land must be surveyed, and all stakeholders (with special outreach to women) should be included in community mapping, consultative, and adjudication processes.

Inclusive consultations. Direct interaction and consultation between the makers and implementers of land policy and women's rights groups are essential for understanding the specific issues facing women and the contributions women can make toward effective resolution and implementation of land reform policies.

In 2006 the Rural Development Institute (RDI) and Women Waging Peace (renamed the Initiative for Inclusive Security) cosponsored a workshop for Rwandan government personnel and women's civil society groups with the goal of enabling direct discussions about the implementation of the new land laws and remaining gaps regarding women's protection and needs. The women's groups formed a policy and law task force to comment on forthcoming legislation and provide lawmakers and government officials with recommendations to better protect women's land rights. Similar initiatives could be sponsored in other settings. The effect is beneficial to all stakeholders.

Outreach and education programs with special attention to women. Informing land administration officials, the judiciary, and others involved in land adjudication and communities about upcoming changes is fundamental. As part of the officials' training, there is an opportunity to alert them to and highlight the specific needs of women. Ensuring targeted outreach to women to inform them of their rights (and the processes being put in place) is also a key dimension of many initiatives aimed at improving laws and practices:

- In Cambodia government initiatives included targeted outreach and education programs for women and other groups at risk of being harmed by reform processes. The interventions were scheduled for times and located in places that were easily accessible to women.
- In Rwanda the National Women's Council, a governmental body with representatives at the community level, was interested in taking a leading educational role in the implementation of new land laws in 2006.
- In Nepal, *ASMITA*, a magazine owned and run by women journalists with a focus on women's rights, has been a key conduit of information about and for Nepalese women. The magazine's target audience is semiliterate rural women; thus, it is picture heavy. The publishers also produce booklets and posters addressing issues such as women's land rights and other legislative changes.⁷

Data, research, monitoring, and impact. In many postcrisis settings, little documentation and analysis exist regarding the impact of legislation or customary marital property

and inheritance practices. In Nepal, for example, the direct impact of conflict on women and the related migration of men are not fully understood in the context of land ownership. Yet land reform is a key element of the 2007 peace accord. Without this information, new laws, policies, and programs can inadvertently do harm or exclude the majority of women, as in the Rwandan 1999 Inheritance Law.

A paucity of sex-disaggregated data and analysis in terms of the impact of crises on women and the effects of provided aid or assistance also exists. Reflecting on responses to Hurricane Mitch, a 2004 study by the Economic Commission of Latin America and the Caribbean (ECLAC) states that "There are still not many statistics on impact differentiated by gender. Most of the agencies interviewed indicated that they did not explicitly take gender into account and did not break down their data on the disaster by sex nor analyze their results from a gender perspective" (Bradshaw 2004: 19). A review and revision of existing data collection methods and frameworks are needed to enable sex-disaggregated data gathering at the household and other basic levels.

Finally, implementation needs to be monitored and adjusted to address the needs of all sectors of the community. RDI's recommendations for Rwanda's 2005 Land Law resonate in other instances:

- The implementation of new laws should be piloted and assessed from a gender perspective. Women and men should be directly targeted regarding their experiences of the different dimensions of the program, ranging from their exposure to the public education efforts to registration. Comparative case studies should be conducted to highlight the differential experiences and needs of women and men (for example, widows, women heading households, and married women and men). Monitoring and evaluation of the pilots, including consultations with the target groups, should inform and be addressed in the draft legislation and related regulations, programs, and budgets.
- Resources should be dedicated to the development of a specialized monitoring and evaluation process and technique that can be applied nationwide once the legislation is being implemented. The process can include and inform policy makers as well as civil society actors and other stakeholders, with a view to identifying gaps and obstacles at an early stage and enabling their resolution.
- Existing assessment frameworks and questionnaires, such as those developed by FAO, ECLAC, and other entities,⁸ can be adapted and tailored to each case.

CONCLUSIONS

To be sustainable and to reduce vulnerability, recovery has to be transformative. Crises present the opportunity to initiate new practices and systems. The challenge is to balance the drive toward returning to a status quo and recognized past practices with the need to address the practices that contributed to the vulnerability. External interventions must

seek to raise awareness among local leaders of the existing gender disparity and the consequences for the community as a whole. Local populations and leadership are often open to change in the aftermath of a crisis. They also are often conscious of the extreme vulnerability of women and are ready to seek solutions. External actors should prioritize the provision of technical assistance and support to enable this shift.

Food Aid versus Agricultural Support and Sustenance of Social Capital

SRI LANKA: NORTH-EAST IRRIGATED AGRICULTURAL PROJECT

In 1983 war broke out between the government of Sri Lanka (GoSL) and the Liberation Tamil Tigers of Eelam (LTTE).¹ Over the years the North East Province of Sri Lanka, where the conflict has been most violent, has been devastated. Before the war nearly two-thirds of the population depended on farming, fishing, and livestock as their main source of livelihood. The conflict destroyed much of the irrigation system and road infrastructure. It also caused mass displacement and the collapse of social institutions such as farmers' organizations. Gender-based disparities in income and occupation resulting in higher poverty rates among women were further exacerbated by war, as women were burdened with traditional men's tasks as well. War-affected communities and displaced populations in the region have been exploited by both sides. The conflict hampered international humanitarian efforts. According to a 1999 British Refugee Council briefing document, "the restrictions and delays in agricultural inputs [were] in part . . . responsible for a substantial reduction in agricultural production with resulting decrease in jobs and income."²

What's innovative? The recognition and inclusion of the Women's Rural Development Societies in this project was a significant achievement. Before the project, these groups had not been given the chance to play such a central role in the well-being of their communities. The project gave them the chance to build their institutional strength, as well as demonstrate their capacities to contribute to and gain the respect of the community as a whole.

PROJECT OBJECTIVES AND DESCRIPTION

Amid these difficult political, human, security, and logistical conditions, the International Development Association in collaboration with the GoSL initiated a community-focused project to (1) help conflict-affected communities in the northeast and adjoining areas reestablish at least a subsistence level of production and community-based services through assistance for jump-starting agricultural and small-scale reconstruction activities, and (2) build the capacity of such communities for sustainable social and economic reintegration. Initially, 398 villages were included in the program, of which 30 were in the Jaffna district (Wanasundera 2006).

The project was the first large-scale development project funded by any major donor in the area after the outbreak of war in 1983. It was thus a pioneering initiative for the restoration of livelihoods among the internally displaced population and conflict-affected people. Its proactive outreach to ensure the full and equal inclusion of women and men was also innovative. The successful implementation of the project in the first two years paved the way for other major donors, such as the Asian Development Bank and Japanese Bank for International Cooperation, to plan and implement similar complementary operations in the North East Province targeting the conflict-affected people.

Typically, irrigation tanks provide water for irrigation and drinking water for rural villages in Sri Lanka.³ The project focused on the revival of agricultural production in conflict-affected villages through the restoration of irrigation tanks damaged by the war or abandoned by people fleeing the villages. The irrigation tank restoration was complemented by the rehabilitation and provision of essential village facilities, such as village access roads, drinking water facilities, construction of community buildings, and support for income-generating activities to enable the displaced people

who returned and were returning to the villages to revive their livelihoods. To plan and implement these interventions and ensure care of the rehabilitated facilities at the end of the intervention, the project facilitated the revival of community organizations, such as farmers' organizations and women's community-based organizations (CBOs) that existed in the villages before the outbreak of the war but were weakened or fell apart because of the war.

The project's development focus was therefore appropriate and timely to provide sustainable livelihoods for conflict-affected people and encourage the return of the IDP. At its start, the project had four major components. A fifth component, the livelihood support activities (LSAs), was added halfway on the basis of the experiences emerging from the initial implementation and the priorities identified by the target population.

- *The rehabilitation of irrigation projects.* The project sought to rehabilitate 400 irrigation projects, including refilling breached sections of embankments, raising low spots on embankments, repairing or replacing sluices, fixing and improving spillways, repairing scheme access roads, and cleaning and desalting main canals and irrigation tanks.
- *Community capacity building and small-scale reconstruction.* The project financed community capacity building, including support and partnership with *Madar Sangam*, the women's rural development societies (WRDSs); support for social mobilization, including repaired rural roads and drinking water facilities; and technical assistance to community-level organizations.
- *Feasibility studies.* Feasibility studies were done for rehabilitation of the 10 most dilapidated major irrigation schemes in the North East Province and in the border villages of the four neighboring provinces.
- *Provision of technical and financial management auditors.* Given the limited banking facilities available, the project financed independent technical and financial auditors to ensure transparency and accountability.
- *Livelihood Support Activities.* The LSA was added in 2002 to make the project more inclusive. It provided an opportunity for the landless and the most vulnerable families, as well as women, who could not benefit from irrigation tank rehabilitation to access project support. The Development Credit Agreement was amended in December 2002 to permit (1) livelihood support grants to WRDSs and (2) WRDSs to provide repayable loans to members for undertaking small individual household income-generating activities related to (a) agriculture

and allied activities, (b) improved production and marketing of commodities, (c) promotion of various microenterprises, and (d) construction of common assets such as community buildings.

Although security conditions and the mobility of people in the project area slowly improved after the signing of the cease-fire agreement in February 2002, the situation in the project area remained precarious following the LTTE's withdrawal from the peace talks in April 2003, the LTTE's internal conflicts in March 2004, and the tsunami disaster in December 2004. Despite these constraints, the project successfully achieved its development objectives and completed its physical targets, as is evident from the Implementation Completion Report.

KEY ELEMENTS

The following section discusses key elements of the project.

Community consultations. When the project was initiated, the conflict between the GoSL and LTTE was raging. Because of the consequent security constraints, conventional project preparation activities (social assessments, institutional analysis, baseline surveys, and beneficiary consultations) could not be undertaken. However, wide consultation was undertaken with the main stakeholders, including the North East Provincial Council, district secretaries and government agents in the project area, the United Nations High Commission for Refugees (UNHCR), the International Committee of the Red Cross (ICRC), commanders of the Sri Lanka army (SLA) in the project area, and the political wing of the LTTE.

The project director, a woman, was based in the region and had in-depth knowledge of the active communities and organizations. According to external assessments, other project officials were not as sensitized to the gender issues, but she was and selected *Madar Sangam* (WRDSs) as an implementing partner because of their efficiency (Wanasundera 2006).

Lessons drawn from past experiences, including a previous World Bank irrigation project, demonstrated that a simple operation focused on irrigation rehabilitation through community participation was possible in the North East Province.

Active participation of conflict-affected communities. The project design also recognized the need for active participation of the conflict-affected communities in the planning and implementation of the project interventions.

Inclusion of and support to women. From the outset within the community capacity-building component, specific attention was given to the inclusion of WRDSs. The project director knew the groups' work and integrated them into the project implementation. The idea was embraced

by project officials, other local partners, and the community, as they experienced the “dynamism” that the WRDSs brought.⁴ Additional adjustments were made later to ensure that women and landless people could benefit from the project.

Pragmatic and tailored project design. The implementation design was simple and pragmatic and recognized the unique context of the conflict situation and the related constraints. Interventions were planned in both “cleared areas” (areas under the military control of the SLA) and “uncleared areas” (areas controlled by the LTTE), the division of which changed continually at first. The difficulties that the project team faced included (1) working staff of line ministries and departments based in Colombo (capital of Sri Lanka), who were reluctant to travel to the North East; (2) requiring clearance from the SLA and the LTTE before moving any government and Bank staff, vehicles, and construction materials into uncleared areas; (3) developing monitoring mechanisms for project funds needed in the uncleared areas that were acceptable to the SLA and the GoSL; and (4) working in areas where there were no formal banking facilities. To address these difficulties, the project design included developing strong partners and consulting with them to determine pragmatic and simple solutions. The partners include the SLA, NGOs, UNHCR, ICRC, and independent technical and financial auditors.

Localized responsibility and accountability. The project management responsibility was fully devolved to the North East Provincial Council (NEPC), despite claims by several central government ministries based in Colombo to become the lead ministry for project implementation. However, the Ministry of Provincial Councils and Local Government was appointed as the anchor ministry for the project, but its role was limited to a facilitative role for matters that could not be resolved at the NEPC level but required the attention of high levels of the government, including the Treasury and Ministry of Defense.

The NEPC devolved implementation responsibility to the participating districts to enable transparent and consultative selection of focal villages and beneficiaries, close liaison with other development partners at the district level, and better supervision and monitoring. The implementation at the district level relied upon collaborative working partnerships between relevant provincial council agencies and the district wings of the central government departments. This arrangement promoted collaborative working partnerships between the agencies of the provincial council and the central government within the districts. The design included NGOs as implementing partners. This was appropriate because the NEPC lacked capacity and prior experience in

community mobilization, and the partnering CBOs and NGOs (including *Madar Sangam*) had already been engaged in community-based activities in the project area.

Key role of partnerships. The inclusion of SLA, ICRC, and UNHCR as formal members of the project steering committee proved to be invaluable in identifying and targeting focal villages, coordinating and monitoring project activities, enhancing accountability and transparency in the use of project resources in uncleared areas, and facilitating security clearances to ensure speedy and timely mobility of staff, vehicles, and construction materials to project sites.

Independent auditing. The inclusion of both independent technical auditors and financial auditors, carried out by private sector agencies for the first time in a Bank-funded project in the country, was important to GoSL, particularly to SLA. The engagement of audits not only satisfied their concerns about transparency and accountability in the use of development funds in the prevailing risky environment, but also helped the Project Management Unit in enhancing the diligence in financial management and engineering quality of the design of subprojects during the implementation.

BENEFITS AND IMPACTS

An estimated 55,000 families benefited from the project (31,000 farm and 24,000 nonfarm families). The project, centered around 378 small and medium irrigation schemes, reached more than double the anticipated targeted families and total population, totaling 275,000 people, of whom 123,750 were men and 151,250 were women. At the time of project’s conclusion:

- 369 irrigation schemes had been rehabilitated (others were near completion), enabling the cultivation of 24,980 hectares of prewar farmland.
- 1,294 kilometers of roads were rehabilitated.
- The original target of rehabilitating 300 drinking wells was increased to 775 (to address needs), of which 754 were completed.
- 379 village-level multipurpose buildings were completed (as planned). Of these, 291 were taken over by rural development societies (RDSs) and WRDSs. The buildings serve as meeting places, shelter for kindergartens, mobile clinics, and other purposes.
- Women were given access to credit through the LSA to start microenterprises, including poultry raising and grinding mills.
- The project, recognizing the women’s groups’ commitments, also prioritized women’s organizations in several village/field assessments (Wanasundera 2006).

The project successfully reactivated, created, or strengthened a total of 1,057 CBOs—371 farmers organizations, 369 RDSs, and 317 WRDSs—in all focal villages. These CBOs engaged in planning and implementing project-supported activities satisfactorily in their respective areas of responsibilities. The project contributed to community capacity building through (1) introducing and supporting bottom-up planning processes of developing Village Social Profiles and Village Development Plans facilitated by NGOs; (2) providing training on procurement, financial management, and technical aspects of project-related civil works; and (3) creating linkages between CBOs and government offices, such as the Irrigation Department, Agrarian Service Department, Provincial Road Development Authority, and the Rural Development Department.

The WRDSs and the resultant empowerment of women were one of the project's most important achievements. Prior to the intervention, institutionalized groups of women did not exist in the focal villages. The WRDSs included the majority of women in the villages targeted, and their representatives demonstrated strong leadership. The WRDSs were seen by many as being the most robust village-level CBOs, catering not only to women but also to the poor and the vulnerable.

Although the LSA component was added later, the impact was significant. The WRDSs administered loans to a total of 18,975 households. The LSA was new to project staff, but by reaching poor households, it boosted the overall impact of the project. All loan recipients were women, and the activities undertaken were in most cases geared to their economic empowerment (microcredit enterprises) and household food security (as noted above). The success of the LSA was largely attributable to effective management of the loans by WRDSs. By and large, the capacities of the WRDSs for financial management increased, although more systematic support would have enhanced them further and should be included in future projects.

The project design did not specifically provide for an institutional or implementation arrangement for ensuring construction quality of civil works, nor did it provide for developing practical management information and monitoring and evaluation systems.

The successful implementation of the project led to the preparation of a follow-up operation. The Bank's board approved the Second North East Irrigated Agriculture Project in 2004. By 2007, progress had been slow. The project was restructured to be more demand driven, flexible, and resilient in light of the reescalation of the conflict.⁵ However, the impact of increased levels of violence in the region was not known fully at the time of writing.

GENDER-SENSITIVITY APPROACHES

From a gendered perspective, the project was somewhat inclusive and sensitive to the differential experience and capacities of women and men, but this was partly ad hoc. The woman local project director was the key to identifying and integrating the WRDSs into the process. According to FAO, other "officials implementing this project understood little of gender issues" (Wanasundera 2006: 21).

The project documents do not provide detailed information on the processes and approaches taken to ensure equitable inclusion of women and men in the consultative processes and as beneficiaries. Nonetheless, they do refer to the work done and achievements relating to women. No analysis or reflection on the impact of the project on men per se is included as well, or why the farmers' organizations (run by men) were not as effective as the WRDSs.

At the outset, the project consciously adopted two strategies: *mainstreaming* and *transformative* approaches. Recognizing that this still excluded a significant portion of the women's population, the project added a third strategy halfway through that was directly *targeted* at women: the LSA component. These three strategies are summarized in the following:

- *Mainstreaming*: The selection of a woman project leader was a key step. Her knowledge of and selection of the WRDSs as implementing partners was a good example of mainstreaming. From the outset, the project leaders included women in the consultative processes and as beneficiaries. Although the project could have integrated women into the RDSs, there was recognition of the efficacy of enabling women to operate in new parallel structures, as opposed to trying to find their voice and leadership in preexisting (and perhaps entrenched structures). The approach taken from the outset was very pragmatic. The goal was to assist conflict-affected populations, and this naturally included attention to women. The selection of the WRDSs was also pragmatic in part because they were known to be effective, committed, and able to reach all affected populations. Their selection was not perceived as an overt focus on women only, which could have caused a backlash among the community and landowners.
- *Transformative*: A key goal and achievement of the WRDSs was to empower women and increase their roles in local decision making and management. The selection of the WRDSs by the project director was itself transformative because it brought their work (and commitment) to the attention of the project officials. The FAO also

notes that in programs (run by other agencies) in which men-dominated NGOs were selected as project partners, women remained marginal beneficiaries with access only through small entities. The partnership with the project also increased the WRDSs' status (and women's status) in the communities. As stated, the project did not highlight this as an overt goal but implicitly wove this dimension through the practical initiatives. This enabled women to demonstrate their leadership at the community level alongside men, without creating a backlash or being seen as the sole beneficiaries of the intervention. That women's organizations were prioritized in field and village assessments is indicative of how the project staff became aware of (or changed their attitudes) toward the relevance and potential of women in recovery programming.

- *Targeted:* The project realized that despite its efforts to integrate women in the community structures, many women (particularly the very poor and landless) were still not benefiting from the intervention. The LSA component sought to redress this by targeting loans to women specifically. Giving implementation responsibility (and technical support) to the WRDSs was also a means of enhancing their management capacities. Interestingly, the introduction of the LSA late in the process could be a positive technique for providing targeted support to women. If others are already benefiting from the intervention, they may be more willing to acknowledge that the very poor are still excluded and thus be supportive of (or at least not against) targeted efforts to reach them.

LESSONS LEARNED AND ISSUES FOR WIDER APPLICABILITY

The degree of gender sensitivity that emerged in this project was not overtly planned at the outset. It was a positive and somewhat unanticipated outcome, but one that does indicate that gender-sensitive assessment and analysis are critical to a program's overall effectiveness. The lessons and issues that emerge for future projects include the following:

- Women-run CBOs are often the most effective partners in supporting the poor and the most vulnerable. Where women's organizations are not included as project partners, women typically do not benefit from the resources available and remain marginalized and more vulnerable (Wanasundera 2006).
- Delivering assistance directly to communities and forming strategic alliances between key stakeholders are critical determinants of project success in conflict-affected situations.
- Anchoring a project at the provincial level can increase ownership at the local level and facilitate project implementation, particularly in "pause-in-conflict" and post-conflict situations in which institutions have become weaker but need to revive their lost capacity quickly to engage in broader reconstruction programs, as was the case with this project.
- Innovation and flexibility in project design, initial piloting of project activities, and close and competent supervision are important if projects are prepared quickly in conflict-affected situations.
- In a conflict situation, securing technical assistance to build local capacity is critical. The changes wrought by conflict and the impact in every sector are overwhelming for states and grassroots communities. These impacts are exacerbated over time as education and skill-building opportunities diminish (because of violence), technocrats or other skilled citizens migrate, and the violence forces isolation on those left in rural areas. Communities (and governments) often need support to assess and understand the changed conditions, the needs that exist, and means to work when basic infrastructure is weakened or destroyed (such as no banking systems).
- Selecting villages in poorer areas and activities targeted at poor and landless people ensures that the benefits of irrigation-led projects reach communities and families most in need of assistance.
- The full inclusion of women's structures at the village level can be an effective means of drawing upon and strengthening women's leadership.
- Livelihood support to women can make a project more inclusive and has tremendous potential for alleviating poverty. It would be necessary, however, to ensure that every sector in society is benefiting equitably and that "traditional" community leaders are informed and consulted about targeted support to women. Otherwise a risk of backlash exists.
- CBOs need sufficient training and technical backup to sustain project-created assets. This can range from training in maintenance of the new infrastructure to management of resources and funds to monitoring and accountability methods and consultative decision-making practices.
- Continuous monitoring and assessing of project processes and impacts with beneficiary participation should be part of project monitoring and evaluation systems. It is not sufficient to have technical auditing without a clearly defined practical quality management system in place. Such monitoring should include collection and

analysis of sex-disaggregated data at the outset, mid-point, and end of the project to assess if and how women and men have benefited. It could also include consultations with beneficiary groups (or individuals) to determine whether needs were met and how processes can be improved.

- The project reports and documentation should provide more information and analysis of the strategies and tactics adopted to ensure women's inclusion. This should

include analysis of the reactions of and interactions with the traditional leadership in the community. In addition to the quantitative data needed, a description and analysis of processes undertaken would be helpful for future efforts. For example, the project should document how men and women were consulted (as groups, individuals, together, separately) and what differences the approaches made. The impact of the interventions (such as grants to landless women) should also be documented.

Niger: Taking Preventive Action with Food Banks

Niger, one of the poorest nations in the world, is a landlocked Sahelian country with a predominantly agrarian society. Eighty percent of the population lives in rural areas characterized by subsistence crop production and livestock keeping. Sixty-three percent of Niger's population lives below the poverty line, and the country's policy makers are confronted with high illiteracy and child mortality rates. Women and women-headed households constitute the country's poorest and most vulnerable social group.

Niger's agricultural production is hampered by insufficient and irregular rains, which lead to frequent droughts. Low soil fertility, parasite attacks, and a high population growth rate aggravate the pressure on agricultural production. As a consequence, the country is faced with chronic food insecurities, particularly during the so-called hunger season, which is the season before the harvest. In 2004 Niger experienced insufficient rains and locust attacks, which caused a severe food crisis in 2005. The Maradi region and women and children were hit especially hard. The crisis was described as a situation in which food was either not available or not accessible to the population.

What's innovative?

- The most vulnerable in the population, women in a particular region in this case, are exclusively targeted.
- Food bank beneficiaries elect and control the management committees, which results in high commitment to the operations of the food bank.
- Management committees are intensively trained on the regional level to ensure efficient operations of the bank.

As a reaction to this situation, the government of Niger, with the support of foreign donors, established an emergency program in 2005 to distribute free food, emergency seeds, and fodder. In 2006 IFAD and the Belgian Survival Fund started a second emergency program, which established food banks to ensure sustainable supplies of food and, ultimately, to relieve food insecurities of vulnerable households. The program targeted the most vulnerable women in the Maradi region.

The program was implemented in several steps:

- Villages in the Maradi region with a food deficit of more than 50 percent were identified as target villages. Selected communities were informed extensively about the setup of food banks.
- Within the target villages, the most vulnerable women were identified according to predetermined criteria. These included the possession of land and livestock assets as well as the income and food security situation of the household. According to these criteria, women were classified as extremely vulnerable, very vulnerable, vulnerable, and slightly vulnerable.
- In every village, management committees consisting of a president, treasurer, and secretary were appointed by a general assembly of food bank beneficiaries. The members were selected on the basis of their displayed commitment. Most of the committees were composed entirely of women. In villages with very low women's literacy rates, a literate man was appointed secretary. Committee members were then trained at the regional level on how to manage food banks and were provided with management manuals to be used on a day-to-day basis.
- After the establishment and training of the management committees, food was purchased and a storage place (the food bank building) was arranged. The initial food stock financed by the project was about six tons per bank.

Food distribution (of mainly cereals) takes place weekly during the hunger season, which generally runs from July through September. Only women may take a food loan from the bank. After the harvest, recipients have to repay the bank in kind the amount of food taken out plus 25 percent interest. The interest rate is determined by the management committee and may be lowered in times of bad harvests. Stocks are thus recovered and stored for the next hunger season. The allocation and recovery of the food stock are managed entirely by the elected committee member. Finally, a follow-up and evaluation process at the regional and governmental levels was established to assess clearly which households benefited and in what ways. The evaluation process is carried out jointly by the management committees and the project managers. Because the food banks started in 2006, no quantifiable impacts on beneficiaries are yet available.

Over the period of one year (2006–07), 111 food banks in 111 villages were set up. About 683 tons of cereals were distributed, which benefited 26,000 households in the Maradi region, or approximately 200,000 persons. Census data that quantify how many women, apart from the woman loan holder, live in a beneficiary household are not currently available. Eighty percent of the beneficiaries were food secure for less than six months a year. Repayment rates for the loans are 97 percent, which is unusually high. Consequently, the increase in food stocks varies between 10 and 25 percent in the target villages. Part of this success is attributable to the fact that beneficiaries of the bank are actively involved in the bank's management. This kind of empowerment gives rise to a close personal identification with the food bank and consequently results in high repayment rates.

GENDER APPROACH

The project targets and deals with women directly in all its stages, which is unusual for the men-dominated society that prevails in Niger. The project targets the most vulnerable women in the Maradi region, and only they are allowed to take out food from the food banks. Remarkably, the management committees of the food banks are predominantly composed of women, who are actively involved in the establishment of the bank. In addition, the management committee controls the allocation and recovery of the food stock. Committee members and beneficiaries meet regularly to discuss problems and needs associated with the food bank and decide upon the potential solutions. Placing the project management and control into the hands of beneficiaries is unique in this context and has

empowered rural women in a positive way, as illustrated in the following section.

BENEFITS AND IMPACTS

The impacts of the project have yet to be quantified because the project began so recently, in 2006. Still, it is reported that the food banks allowed the beneficiaries to cover most of their food needs during the hunger season. The increase in food availability led to a reduction in malnutrition, particularly for women and children, who were able to increase the number of meals available to them. For example, children received two to three meals, on average, during the hunger season. With a larger availability of food, the number of meals increased to three to five meals each day.

Other direct impacts of food banks are related to the coping strategies that rural households employ during a crisis. For example, agricultural productivity of the target households improved because farm households were no longer forced to redirect household labor off-farm to earn additional income for food purchases. Productivity also rose because the physical capacities of farmers increased because of regular food intake. In addition, farmers were no longer forced to harvest their crops prematurely, which often leads to lower yields.

The higher availability of food, supplied by food banks, also resulted in lower rates of livestock sold to raise income for food supplies. Livestock usually belong to women in Niger. Therefore, the higher food availability led to a higher retainment of women's assets. Similarly, households took out fewer loans, which they often resort to in response to a crisis, resulting in lower household debts.

Interestingly, indirect impacts have also been reported. Through their active involvement in the formation and management of the food banks, women raised their organizational capacities in areas that are traditionally men dominated. Moreover, closer social networks evolved among women, who started to share a common goal. Most importantly, by targeting and involving the most vulnerable women, the project helped them improve their social position and decision-making power within the household and the village.

To ensure the continued success of food banks, further steps have to be taken. The stock of food should be increased to about 10 tons per bank to allow for the coverage of food needs during the whole hunger season. Moreover, upgrading of storage facilities and further strengthening of management capacities are necessary to improve the performance of the food banks.

LESSONS LEARNED AND ISSUES FOR WIDER APPLICABILITY

Establishing food banks where food is taken as a loan and repaid in kind is an approach not frequently followed in Niger and other developing economies. Yet the project illustrated that food banks can serve (1) to act as an efficient tool to ease a food crisis, (2) to prevent sustainably future food crises, and (3) to avoid having the most vulnerable households be hit hardest by food shortages. Food banks may also act as an instrument to relieve household debt and to prevent the out-migration of young men to earn off-farm income. Placing the management and control of the bank into the hands of the beneficiaries is a unique element of this project that resulted in a high commitment to the project and thereby may cement its success and sustainability. The empowerment of vulnerable groups, particularly women, in the management of the bank may be a channel for improving these groups' social position in the village and in the household.

NOTES

Overview

The Overview was written by Sanam Naraghi-Anderlini (Consultant) and reviewed by Nata Duvvury and Catherine Ragasa (Consultants); Deborah Rubin (Cultural Practice); Kaori Abe, Suzanne Raswant, Ilaria Sisto, and Richard Trenchard (FAO); Katuscia Fara, Maria Hartl, and Sheila Mwanundu (IFAD); and Ian Bannon, Lynn Brown, and Eija Pehu (World Bank).

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Thematic Note 1

This Thematic Note was prepared by Sanam Naraghi-Anderlini (Consultant) and reviewed by Nata Duvvury and Catherine Ragasa (Consultants); Deborah Rubin (Cultural Practice); Kaori Abe, Suzanne Raswant, Ilaria Sisto, and Richard Trenchard (FAO); Katuscia Fara, Maria Hartl, and Sheila Mwanundu (IFAD); and Ian Bannon, Lynn Brown, and Eija Pehu (World Bank).

1. Author involved in the program, December 2007.
2. In Liberia and Timor-Leste, community activists noted that in the rush to flee the onslaught of violence, women tend to carry mattresses with them, not cooking pots or other utensils needed for food preparation. (The author of this Note participated in a UNFPA workshop in which the issues were raised, in Tunis in June 2007.)

Thematic Note 2

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Thematic Note 3

This Thematic Note was prepared by Sanam Naraghi-Anderlini (Consultant) and reviewed by Nata Duvvury and Catherine Ragasa (Consultants); Deborah Rubin (Cultural Practice); Kaori Abe, Suzanne Raswant, Ilaria Sisto, and Richard Trenchard (FAO); Katuscia Fara, Maria Hartl, and Sheila Mwanundu (IFAD); and Ian Bannon, Lynn Brown, and Eija Pehu (World Bank).

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5. The full report is available at www.lines-magazine.org/Art_Feb03/WomenMission.htm.
6. As documented in Brown and Uvuza (2006).
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Innovative Activity Profile 1

This Innovative Activity Profile was prepared by Sanam Naraghi-Anderlini (Consultant) and reviewed by Nata Duvvury and Catherine Ragasa (Consultants); Deborah Rubin (Cultural Practice); Kaori Abe, Suzanne Raswant, Iliaria Sisto, and Richard Trenchard (FAO); Katuscia Fara, Maria Hartl, and Sheila Mwanundu (IFAD); and Ian Bannon, Lynn Brown, and Eija Pehu (World Bank).

1. The descriptions and assessment provided here are predominantly drawn and largely directly quoted from the official project documents available at www.worldbank.org.

2. The British Refugee Council, Sri Lanka Monitor Briefing, October 1999, "The Food Aid Weapon," www.brcslproject.gn.apc.org.

3. *Irrigation tank* is the name used in Sri Lanka to describe a lake or reservoir of water constructed to capture and store seasonal rainfall for use in irrigation during the dry season and for domestic use in the villages. Most of the rural human settlements (villages) have typically evolved and located near irrigation tanks.

4. In a communication with the author, the World Bank project director stated that the idea was introduced and welcomed. The FAO document points to the "dynamism" that the WRDSs brought.

5. Available from www.worldbank.org.

Innovative Activity Profile 2

This Innovative Activity Profile was prepared by Ira Matuschke (Consultant) and reviewed by Nata Duvvury, Sanam Naraghi-Anderlini, and Catherine Ragasa (Consultants); Deborah Rubin (Cultural Practice); and Hubert Boirard and Maria Hartl (IFAD). This was heavily from the author's experience and from several sources: Government of Niger (2007), IFAD (2007a, 2007b); Roumanatou and others (2007); and UNOPS (2007).

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MODULE 12

Gender in Crop Agriculture

Overview

CROP AGRICULTURE, GENDER, AND PATHWAYS FROM POVERTY

The proposition that *agriculture, including crop production, is the only realistic driver for mass poverty reduction and rural development in most of the developing world*, and perhaps particularly in sub-Saharan Africa, is now accepted by many academics, international development organizations, and national governments (Lipton 2005; World Bank 2007) (box 12.1).

A further proposition, emphasized in a recent *World Development Report* (World Bank 2007), is that *farming is a key pathway out of poverty for women*, and that women's prospects for taking this path improve when they have better access to resources. Because of their limited access to essential production resources, such as land, labor, and inputs, women's role in crop agriculture is often restricted to producing subsistence food crops with low potential to generate income. The prospects for women to expand their incomes through alternatives such as seasonal migration or labor markets outside agriculture are limited. Women's mobility is usually more constrained by social and cultural norms, and women play a central role in raising and caring for children.

An important element of development strategies that rely on agriculture is to enable women to improve food production and—depending on the context—to move beyond subsistence production into higher-value and market-oriented production (World Bank 2007). Women, more than men,

spend their incomes on food, with consequent improvements in household food security, nutritional security, and especially the development of children. In Guatemala the amount spent on food in households whose profits from nontraditional agricultural exports were controlled by women was double that of households in which men controlled the profits (World Bank 2007).

As a means of understanding agriculture's present and prospective role in development and poverty reduction, developing countries can be grouped into three broad categories: agricultural-based economies, transforming economies, and urbanized economies (World Bank 2007). Farmers (including women) in each category face different challenges in improving their living conditions. This Module focuses on agricultural-based economies, in which many poor women rely on agriculture for their livelihoods and in which improvements in crop agriculture can yield the greatest impact. This Module and accompanying Thematic Notes also examine the role of gender in high-value and organic crop production.¹

CROP AGRICULTURE AND EARLIER DEVELOPMENT TRENDS

To understand changing perceptions of crop agriculture and its role in development, a review of earlier development trends and policies is important. A major principle in the development of crop agriculture has been to raise the yields of a selected number of staple food crops. This effort,

Box 12.1 Shared Views of Agriculture as a Driver of Poverty Reduction and Rural Development

Food and Agriculture Organization: “There has been a shift in the general trend of giving low priority to agriculture as compared to industrialization. A new recognition is growing in many parts of the world of the crucial role of the agricultural sector for increasing export earnings, generating employment and improving food security.”

World Bank: “Rural poverty is as diverse as are the rural poor in their livelihood strategies, but in most of the poorest developing countries agriculture is the main source of rural economic growth. That is why improved agricultural productivity and growth are central to the Bank’s strategy.”

International Fund for Agricultural Development: “Investment in agriculture is the key to meeting the MDGs [Millennium Development Goals] given that 75 percent of the world’s poorest people, living on less than a dollar a day, live in rural areas and depend on agriculture and related activities for their livelihoods.”

Department for International Development, United Kingdom: “Agriculture should be placed at the heart of efforts to reduce poverty . . . [as] there is a mass of evidence that increasing agricultural productivity has benefited millions through higher incomes, more plentiful and cheaper food, and by generating patterns of development that are employment intensive and benefit both rural and urban areas.”

Sources: DFID 2005: 1; FAO 2007a; IFAD 2007; World Bank 2003: xv.

originating on a wide scale for developing countries in the middle of the twentieth century, led to vast increases in food supplies in many Asian countries (Tripp 2006).

The 1960s represented a time of great hope for agriculture in developing countries. This decade marked the beginning of what became known as the Green Revolution in Asia, the principal manifestation of which was the distribution of short-stawed, fertilizer-responsive varieties of wheat and rice. For a few years it looked as if the strategy of supplying appropriate varieties and complementary fertilizers, pesticides, and other inputs could end rural poverty and chronic food shortages (Tripp 2006). Eventually it became

evident that these new packages of technology were not spreading evenly among farmers; they mostly benefited farmers in favored environments with access to productive soil and irrigation facilities. Evidence emerged that widespread adoption took place in countries and regions that invested in infrastructure development and input and credit supply while supporting and stabilizing the prices of cereal crops (Gabre-Madhin, Barrett, and Dorosh 2003).

Attempts to address this imbalance and replicate Green Revolution experiences in less-favored regions led to the conclusion that farmers in “complex and risk-prone” areas (Chambers 1997) were unable to benefit from standardized technology packages and that alternative processes of technology development were required. The poverty levels of many farm households precluded any reasonable hope that they could take advantage of technologies requiring a significant financial investment (Tripp 2006).

Market orientation was and remains another important driver for crop agriculture development, resulting in improved crop varieties (notably hybrids) with uniform yields and crop characteristics and a dependence on external inputs and technologies. In market-oriented crop production systems, access to production resources is crucial, which poses potential gender inequalities. These inequalities are widened even further because very few improvements in farm technology have been devised to overcome women’s constraints. Efforts to intensify agriculture by promoting large-scale farming and commercial crop production for export, farm mechanization, improved seed, fertilizer, and pesticides have been linked mostly to cash crop production, from which men are more likely to benefit. On the other hand, where surplus staple crop production is sold, local food and seed markets are flourishing. These types of markets are often dominated by women (Smale and others 2008).

RETHINKING CROP AGRICULTURE DEVELOPMENT STRATEGIES

Crop agriculture faces a new set of challenges. The persistence of poverty reveals the need to reconsider development strategies to improve equity and access. The environmental costs of previous crop production strategies are another important consideration. So-called second-generation problems with Green Revolution technologies have been observed. For example, evidence is at hand that rice yields in Asia are reaching a plateau (Horie and others 2005). Serious questions are being asked about natural resource degradation and the long-term sustainability of some intensive

cropping systems (Murgai 2001; Oluoch-Kosura and Karugia 2005).² The use of agricultural methods that rely heavily on external inputs has caused 38 percent of agricultural land to be lost to soil erosion and depletion. Although soil erosion is a common effect of various land-use practices, 70 percent of annual erosion is estimated to occur on land used for agricultural purposes (Crucefix 1998).

The recent Millennium Ecosystem Assessment (2005) delineated the negative impact of intensive agriculture on vital ecosystem services and biodiversity—outcomes that were not considered sufficiently in the past. A growing body of evidence shows that the poor depend and will continue to depend on biodiversity as an important livelihood resource (Ash and Jenkins 2007), whereas modern crop production is based on only a few plant species (Gruère, Giuliani, and Smale 2006).

Climate change and its potential consequences for agricultural production also require urgent attention in strategies for crop agriculture development. The role of crop diversity is an important element to consider in developing such strategies.

New methods of plant breeding have also affected current crop production strategies, and their impact on gender in crop production is not yet established. For example, the private sector has invested substantially in developing genetically modified (GM) crops, such as Bt maize, with a clear commercial focus. Bt maize contains an endotoxin from *Bacillus thuringiensis* that protects plants from insect pests such as corn borers. Disease-resistant crops, herbicide-tolerant crops, biofortified crops,³ and renewable energy crops are just a few additional examples of new technologies that are available or under development.

All of these factors make it important to reconsider how and why crop production technologies are developed. Although market orientation remains an important driver of new crop technologies, new niche markets are emerging for organic and fair trade products, among others, which could offer an opportunity for women to participate.

Innovation in agriculture now gives greater emphasis to processes that depend on local resources, including knowledge and skills, natural resources, and social structures. The realization that most technologies need to be adapted not only to local agroecological conditions but also to individual socioeconomic farm circumstances is an additional justification for promoting innovations based on local resources and skills, and the development of such resources and skills certainly offers an opportunity for empowering women as well as men farmers and their communities (Tripp 2006). It

is important to recognize that this strategy does not entail a wholesale rejection of external inputs to improve productivity, but rather the increased recognition and reinforcement of complementarities and a thorough analysis of resource availability and needs in subsistence and commercial production systems.

The Thematic Notes that accompany this Module demonstrate the extent to which using local resources is vital for improving crop agriculture. The first two Thematic Notes focus on gender in relation to soil and seed, two of the primary natural resources essential to crop production. A central theme of these Notes is the role of human and social capital in the knowledge-intensive management of agricultural technology. The Notes also identify potential complementarities between (1) local and external inputs and (2) knowledge and institutions. The third Thematic Note focuses on gender and crop protection, because crop protection is another knowledge-intensive area with high potential to improve crop productivity.

WHY IS GENDER A VITAL CONSIDERATION IN CROP AGRICULTURE?

Addressing gender is crucial in crop agriculture for reasons discussed in the following sections.

Women play vital but unrecognized roles in crop production, household food security, and household nutrition

The need to increase food production is clear. Growing populations and declining agricultural productivity are leaving millions without secure sources of food. Yet advances in food production are constrained by the “invisibility factor”—in other words, by women’s major but largely unrecognized roles in agriculture.

Although detailed statistics are not available and figures vary depending on the geographical context, it is fair to say that women supply a large proportion of the agricultural labor and in some societies produce up to 80 percent of the food crops (FAO 2007b). Failure to recognize this contribution is costly. It results in misguided policies and programs, forgone agricultural output and associated income flows, higher levels of poverty, and food and nutritional insecurity (World Bank 2007).

It is widely understood that gender and household food security are fundamentally linked. Many cultural and regional differences exist in women’s involvement in crop

production, but rural women are the main producers of the world's staple crops—rice, wheat, and maize—which provide up to 90 percent of the food consumed by the rural poor. Women sow, weed, apply fertilizer and pesticides, and harvest and thresh crops. Their contribution to growing secondary crops such as legumes and vegetables is even greater. Grown mainly in home gardens, these crops provide essential nutrients and are often the only food available during the lean seasons or when major crops fail (FAO 2007b). Yet women often have the least access to means for significantly increasing output and yields.

Women's contributions to crop production are not just qualitatively but quantitatively invisible as well. Statistics on women's yields, women's technology adoption rates, and women's uses of inputs are rarely reported, which proved problematic in developing this Module (the importance of gender-disaggregated data is discussed in Module 16).

Women manage complex, species-rich production systems

Women tend to manage complex production systems with multiple functions, purposes, and species. These systems are not designed to maximize the productivity of any single crop but to ensure overall stability and resilience among the crops that are produced. This agricultural reality is often overlooked when yields of a single crop are taken as a criterion for evaluating the performance of crop production. Given the increasingly severe weather events caused by climate change, criteria such as crop stability and resistance may be valued more highly in the future.

Women have limited access to agricultural services and inputs, are more likely to lack assets, and grow more subsistence crops

Women farmers are more likely to be asset-poor subsistence farmers. In sub-Saharan Africa it has been calculated that agricultural productivity could increase by up to 20 percent if women's access to such resources as land, seed, and fertilizer were equal to men's (DFID 2007), yet women still face serious constraints in obtaining essential support for most productive resources, such as land, fertilizer, knowledge, infrastructure, and market organization (these issues are discussed in detail in other Modules). The ease of obtaining agricultural services and inputs is even more important in light of women's heavy workloads and time constraints outside of agriculture.

Although rightly contending that the effectiveness of development strategies hinges on reaching African smallholders,

agricultural experts seldom recognize that most of Africa's smallholders are women (World Bank 2007)—as seen by the costly errors that have arisen from ignoring the fact that women smallholders may face different constraints than men do, and that such constraints are therefore an important part of the problem. The Agriculture for Development Policy Brief (World Bank 2008: 1) states, "The design of many development policies continues to assume wrongly that farmers and rural workers are men. The important role of women in agriculture in many parts of the world calls for urgent attention to gender-specific constraints in agricultural production and marketing. Mainstreaming gender in agricultural policies and programs is essential for development success."

Beware narrow assumptions about women's "food security first" agenda

Women's engagement in farming is commonly associated first and foremost with a food security agenda. Although this statement is certainly true, such a narrow view will limit women's engagement with commercially oriented crop production and will do nothing to help women achieve their broader livelihood goals (NEF 2006). In many situations, women combine both food production and commercial agriculture, although often on a small scale. The gender division of activities in crop cultivation can be quite complicated, with different fields being cultivated for different purposes by men and women or family groups, especially in sub-Saharan Africa. Women often manage the home gardens, and small-scale crop production can contribute significantly to women's incomes as well as to household food security. Women often grow "minor" crops with limited or no market value. However, it is important to realize that women have the potential and the right to participate in more commercially oriented crop production. Local markets offer a good opportunity to earn income through small-scale sales of staple crops and vegetables. Often these opportunities are only seasonal.

Crop production is the primary employer of women in most countries

Crop production is still the primary source of employment for women in most developing countries, particularly in sub-Saharan Africa and Asia. Almost two-thirds of rural women are from low-income households. Women-headed households are the poorest among these, making up more than 35–40 percent of all heads of household in some parts of Asia (Balakrishnan and Fairbairn-Dunlop 2005). Box 12.2

Box 12.2 Women in Agriculture and Crop Production: Indicative Statistics

Although statistics on women's role in agriculture are not widely available—a failure that the Food and Agriculture Organization, in conjunction with other United Nations agencies, is seeking to address—it is nevertheless possible to glean some indicative data from the literature and databases:

- In Southeast Asia, women provide up to 90 percent of the labor for rice cultivation.
- In sub-Saharan Africa, women produce up to 80 percent of basic foodstuffs, both for household consumption and for sale.
- Women perform from 25 to 45 percent of agricultural field tasks in Colombia and Peru.
- Women constitute 53 percent of the agricultural labor in Egypt.
- Fewer than 10 percent of women farmers in India, Nepal, and Thailand own land.
- An analysis of credit schemes in five African countries found that women received less than 10 percent of the credit awarded to men smallholders.
- Only 15 percent of the world's agricultural extension agents are women.

Source: FAO 2007c.

presents some indicative statistics on women's importance in agriculture and crop production.

Women are not only vitally involved in crop production—their role is expanding. Development strategies will be compelled to address gender concerns very explicitly because the number of women involved in and responsible for crop production in developing countries appears to be growing so rapidly. Known as the “feminization” of agriculture, this sociodemographic trend is causing temporary as well as permanent shifts in women's responsibilities and tasks. An important factor behind this trend is the migration of young men in search of more lucrative employment off of the farm. The depredations of HIV and AIDS in sub-Saharan Africa have also encouraged this trend. In some areas the feminization of agriculture has altered the availability of labor for producing crops, which in turn may alter cropping patterns, tasks, and crop technology preferences (see Thematic Note 4, Module 7). An example from Bolivia (box 12.3) gives indications of these trade-offs.

Box 12.3 Bolivia: Adjusting Local Agriculture to the Loss of Rural Labor

In Sucre, Bolivia, the labor-intensive harvest and preparation of quinoa coincides with a seasonal migration of laborers to the nation's cotton-, sugarcane-, soy-, and wine-producing areas. In areas significantly affected by this migration, women often remain in charge of the farm but face an increasing lack of labor to process quinoa for home consumption and sale in local markets. It has been argued that if quinoa can be made a commercial crop, generating sufficient income to obviate the need for migration, then sufficient labor may become available for postharvest processing.

Source: Jonathan Hellin, International Maize and Wheat Improvement Center, personal communication, 2007.

A potential advantage of migration is that it provides additional cash to invest in crop agriculture and facilitate a move from subsistence to more commercially oriented agricultural systems. These shifts can offer new opportunities for women but can also imply cultural changes and a redefinition of gender roles in crop production. Gladwin and others (2001) observe that in “most parts of Africa, women consider farming for food as part of what makes them women and gives them a gender identity.” In other situations women themselves are the ones who migrate in search of employment, which again has significant consequences for crop production. These intrahousehold socioeconomic changes are important to understand and consider in any crop production intervention.

KEY GENDER ISSUES

The following discussion describes the key gender issues in crop agriculture and the potential benefits of addressing them.

Gender and crop choice

As pointed out earlier, cash and export crops are frequently regarded as “men's” crops and subsistence crops as “women's” crops.⁴ The standard explanation for this division of crops by gender is that women are responsible for feeding the family and thus prefer to grow subsistence crops for the household, whereas men are responsible for providing cash income and thus raise cash and export crops.

In general, however, it is difficult to tell whether women grow lower-value subsistence crops because they have different preferences and concerns or because they cannot access the land, inputs, credit, information, and markets that would permit them to do otherwise (Doss 1999). In Ghana, for instance, women farmers view maize production as a productive, income-generating activity yet refrain from growing maize because they lack the capital to purchase the required inputs (fertilizer, herbicide) or hire someone to plow the fields. Instead they continue cultivating cassava and yams, which require fewer external inputs. Moreover, the majority of women consider maize cultivation to be a risky enterprise because the crop is sensitive to drought (Adjei-Nsiah and others 2007; see also Thematic Notes 1 and 2).

Cultivation not only of different crops but also of different *varieties* of the *same* crop may also vary by gender. Maize, for instance, may be grown as a cash or subsistence crop. High-yielding maize varieties were introduced in many areas to generate a marketable surplus, but many of these varieties had different processing, cooking, and storage characteristics than the local varieties. The high-yielding varieties were often promoted as cash crops. Consequently in many places local varieties are considered “women’s” crops, and high-yielding varieties are considered “men’s” crops (Badstue and others 2007). To the extent that high-yielding varieties are grown for cash and local varieties for food, this gender-variety pattern may persist. However, as high-yielding varieties that meet the consumption preferences of smallholder farmers are developed, the distinctions between subsistence and cash varieties may become blurred. For instance, both hybrid maize and local maize can be viewed as either subsistence or cash crops, depending on a farmer’s circumstances and market opportunities. A case study in Tanzania (FAO 2008) showed that groundnut yields would determine whether the crop was controlled by men or women. If the groundnut harvest was good, men sold the produce in the market; if it was not, control would remain with the women.

Gender differentiation also occurs with respect to combinations of crop species and varieties. Commercial systems feature homogeneous varieties of a single crop species, whereas traditional cropping patterns are much more diverse. As noted, women tend to manage complex and species-rich production systems designed to ensure overall production stability and resilience. Some traditional crops determine the social status of men and women and are linked closely to traditional knowledge and culture. They are also integral to social capital because of their important roles in ceremonies and traditional meals. In this sense,

changes in crop diversity can alter social capital formation and power relations (Howard 2003).

The loss of crop diversity could also threaten poor people’s ability to adapt their agricultural enterprises to climate change. A recent study by Cline (2007), which reinforces the likely negative impact of global warming on crop agriculture, indicates that the combined effects on agriculture are likely to be seriously unfavorable in developing countries, with the most severe losses occurring in Africa, India, and Latin America. These rapidly emerging issues need to be taken into account in designing interventions in crop agriculture. Understanding women farmers’ production strategies with respect to crop stability and resilience will enable agricultural research and development interventions to strengthen farmers’ capabilities to adapt to climate change and improve family food security.

Gender and crop management tasks

In most parts of the world, men and women tend to work at different tasks. Numerous time allocation studies have examined which household members perform which farm tasks (for example, see Hirschmann and Vaughan 1984; McSweeney 1979; Pala 1983). These studies often identify some tasks as men’s tasks and others as women’s tasks. For example, in Kenya women reported that men were responsible for building the granary, and women were clearly responsible for hand digging, harvesting, and transporting the crops (Pala 1983). Although many tasks may be viewed as exclusively women’s or men’s, in practice the divisions are blurred, and both men and women are involved. Relatively few tasks are done only by men or only by women (Doss 1999).

That women throughout Africa tend to provide more labor for agriculture than men—and almost always provide more total labor—has implications for technology adoption. Even if they know they can increase productivity, women may be unable to increase the number of hours that they spend working. Simple comparisons of hours worked do not capture issues related to the type of work being done and the energy expended. The value of time will vary by season and task; thus, people will be interested in saving the time that is the most costly (Levi 1987). However, to the extent that the tasks vary by gender and the value of women’s time is lower, farmers may be more inclined to adopt technologies that save men’s time.

The gender division of labor appears to change in response to changing economic opportunities. As noted, when men leave agricultural communities in search of

higher earnings, women assume many traditionally “men’s” tasks. Men usually move into traditionally “women’s” crop activities when those activities are perceived as having become more productive or profitable. Women in Burkina Faso traditionally picked shea nuts, for example, but now that sales of shea nuts are profitable, men are becoming involved, often with the assistance of their wives. Another factor behind changes in labor allocation for different tasks is the adoption of new technologies. For instance, the mechanization of “women’s” tasks may cause men to take greater control of those tasks. The extent to which these changes benefit or disadvantage women and men is not always clear, and it is difficult to predict a priori what changes will occur (Doss 1999).

Seasonality further influences labor allocations. Compared to Asia, where irrigated agriculture is much more common, in Africa the seasonal demands for labor are more pronounced, because crop agriculture is mainly rain fed and the growing season is relatively short. In Africa, 50–70 percent of the labor is required within a four-month period; comparable figures for Asia are 40–50 percent (Delgado and Ranade 1987). If this seasonal demand coincides with migration by men, women’s burden of labor becomes even higher and negatively affects overall crop production, because women will have to prioritize labor allocation between food and cash crops.

Research and extension systems can become more effective in developing sustainable crop production systems if they adopt a gender perspective that heightens their understanding of the distinct roles, needs, and opportunities of different household members (see also Module 7).

Gender and knowledge differences

Men and women can accumulate very distinct and rich sets of agricultural knowledge and skills as a result of gender divisions in the tasks they undertake, such as seed management and conservation and pest and disease management. Many studies show that men and women have different preferences and criteria for choosing among crops and varieties and performing such activities as selecting seed, cultivating, harvesting, and processing (Howard 2003). Because women tend to manage complex farming systems, they have developed multiple assessment criteria for crop system performance, encompassing risk minimization, vulnerability, and other objectives that must be considered in promoting innovations.

Local knowledge of men and women farmers is an important asset in innovation and technology development,

especially for such key crop production issues as seed management, plant breeding, crop protection, and soil fertility management. Understanding gender differences in local knowledge and recognizing the contribution women can make in this field are important, because women are more frequently involved in traditional farming practices. Knowledge difference can reveal important opportunities to contribute to crop improvement or crop and variety selection (see the discussion of farmer innovation in Thematic Note 1 and seed management in Thematic Note 2). Knowledge differences must also be understood to improve the effectiveness of any technology dissemination or extension process (see the discussion of integrated pest management in Thematic Note 3).

Gender and access to information, organizations, and markets

Information—appropriate information, given and received on a timely basis—is critical to the development and use of technical innovations and improvements, yet women frequently cannot obtain such information. Agricultural research and development, including extension services, have been dominated by men and have largely ignored women’s role in crop production (Jiggins, Samanta, and Olawoye 1997) and have not focused on women’s needs for technology and information. Social norms and cultural practices can prevent women from participating in development interventions or information campaigns. Using more appropriate information channels is one way to address this situation (see Thematic Note 3). Another strategy is to provide more relevant information by specifically addressing gender aspects of crop production.

Over the last two centuries, societies have invested considerably in complex institutional arrangements to advance technological innovation in agriculture. Many of these institutions have overlooked women and have marginalized women farmers in terms of technology adoption. Gender-responsive actions should enable women farmers to take greater advantage of extension systems and increase the accessibility of new agricultural technologies and innovations. Organizational innovations, such as participatory research, farmer-extension linkages, and strengthening the linkages between formal and local seed systems, can improve women’s livelihood outcomes by ensuring that technologies meet their needs. These issues are discussed in greater detail in Thematic Notes 1 and 2, which describe potential complementarities between formal and informal organizations (see also Module 7).

Markets will continue to influence the choice of crop species and varieties in important ways. Markets can offer opportunities for women as well as men, and crop interventions must not fail to consider this point (examples include assessing the export potential for women's crops or facilitating women's participation in niche markets for organic or fair trade produce). Markets are also important for providing agricultural inputs. Because women so often lack the economic resources or mobility to reach input markets, improving access to local markets can be particularly important for them (see also Modules 5 and 8). For example, as discussed in Thematic Note 2, local seed markets are an increasingly important means for women to obtain improved crop species and varieties and exchange knowledge. Flourishing food markets for local consumption can render distinctions between cash and subsistence crops less obvious, and local markets give women an opportunity to become involved in crop commercialization.

KEY AREAS FOR INTERVENTION

Soil—specifically *soil productivity* and *fertility*—is a key asset for resource-poor women and men. The degradation of soil through overuse and erosion can severely limit people's livelihoods. Because sustainable soil management is fundamental to the future of crop agriculture, Thematic Note 1 discusses interventions specifically designed to help women sustain soil productivity.

Diversity—both in the types of crops grown and in the genetic makeup of specific crops—is another important asset, especially for resource-poor farmers. Farmers may select crops and varieties of crops that make it possible to pursue a greater range of livelihood strategies (which may vary by gender among household members), enhance household food security, and minimize risk. For example, the failure of one variety or crop may be mitigated by the survival of others. Strategies to understand and conserve genetic diversity must not overlook the fact that women often have different means of accessing and exchanging seed (Thematic Note 2).

Women and children are often directly or indirectly involved in *crop protection*, and their limited access to information about safe pesticide use imperils human health and poses an environmental hazard. Twenty to forty percent of the world's potential crop production is lost annually to weeds, pests, and diseases (CropLife International 2007). Crop protection strategies that may be particularly relevant to women are discussed in Thematic Note 3.

For each of these key areas for intervention, the following points should be kept in mind:

- Women and men, depending on their cultural and social backgrounds, perform different roles and have varying responsibilities in agriculture—in crop production as well as crop management. A better understanding of these differences will help to address the prevailing gender issues.
- In making decisions about their livelihoods, men and women have different perceptions of what is important. Men and women base their decisions on information from different sources.
- The unequal power relationships between rich and poor, men and women, must be understood to achieve equitable development and full participation of women.
- Interventions must be developed based on a comprehensive understanding of the needs that women and men identify to improve their situations. The strategic interests of women and the most disadvantaged groups need to be addressed to improve overall crop production and reduce poverty.

The adoption and use of new technologies and inputs are strongly affected by who controls and owns a given crop. Failure to understand and address these and other socioeconomic dimensions of crop production means that interventions are bound to fail. All interventions that aim to enhance the productivity of crop agriculture must take explicit account of gender. The principal concerns are well known; many are discussed specifically in this volume. As a matter of course, women farmers must have access to information, credit, and other inputs, as well as the organizations through which markets are accessed and policies are influenced. Years of experience confirm that these things are still easier said than done. At the same time, it is critical to acknowledge the “feminization” of agriculture (particularly in sub-Saharan Africa) and overcome the bias of associating women's farming exclusively with a food security agenda. Recognizing women's involvement in commercial crop production and ensuring that they benefit from research, extension, credit, land tenure rights, market access, and other elements of production, innovation, and participation still requires a significant organizational shift in many agricultural services. Without such a shift, it will be difficult to broaden the base of women farmers who can adopt crop technologies, and thus it will be difficult for agriculture to contribute to poverty reduction, environmental

sustainability, and economic growth as envisioned in many countries.

MEASURING CHANGE: GENDER-SENSITIVE MONITORING AND EVALUATION INDICATORS

It is important to be able to measure the impact that crop and soil initiatives have on men and women beneficiaries,

their families, and communities. Table 12.1 gives some ideas for indicators and sources of verification, though clearly modifications are required for each program.

Depending on the country or region, it may be relevant to also consider ethnicity and caste alongside gender (both as comparative indicators and when collecting data), because women of lower castes or ethnic minorities are usually in the most disadvantaged situation.

Table 12.1 Monitoring and Evaluation Indicators for Gender and Crops

Indicator	Sources of verification and tools
Over a set period, an increase of x percent in household incomes from crop-based activities among women-headed households and poor households in program areas	<ul style="list-style-type: none"> Household surveys Project management information system Socioeconomic data from statistics office
Changes over x-year period of project activities in household nutrition, health, education, vulnerability to violence, and happiness, disaggregated by gender	<ul style="list-style-type: none"> Household surveys, before and after Project management information system School records
Number of local farmers involved in fair trade production and marketing groups, disaggregated by gender	<ul style="list-style-type: none"> Sales records of group
Number of women and men holding management or treasurer positions in natural resource management groups	<ul style="list-style-type: none"> Bank account records Committee meeting minutes
Number of farmers using zero tillage, mulch, cover crops, and new innovations to decrease labor needs and increase soil fertility, disaggregated by gender	<ul style="list-style-type: none"> Agricultural extension records Interviews with stakeholders Observation
Changes in soil condition in farmland, before and after program activities (such as nutrient levels, percentage of ground cover)	<ul style="list-style-type: none"> Department of Agriculture surveys Farm records Participatory monitoring by villagers or herders
Number of women and men actively involved in participatory research and innovations	<ul style="list-style-type: none"> Agricultural extension records Interviews with stakeholders Observation Participatory monitoring
Percentage of men and women farmers who have access to high-quality, locally adapted seed	<ul style="list-style-type: none"> Agricultural extension records Interviews with stakeholders
Percentage of men and women farmers who implement seed saving and participate in local seed supply systems	<ul style="list-style-type: none"> Agricultural extension records Interviews with stakeholders Program records
Seed type preferences, disaggregated by gender and ethnicity	<ul style="list-style-type: none"> Agricultural extension records Interviews with stakeholders Seed sales records
Number of men and women participating in community seed bank management	<ul style="list-style-type: none"> Committee meeting minutes Program and project records
Number of women and men participating in training on integrated pest management	<ul style="list-style-type: none"> Training records
Awareness of safe practices for handling agricultural chemicals and access to appropriate protective equipment, disaggregated by gender and ethnicity	<ul style="list-style-type: none"> Focus groups Observation Posttraining assessment Stakeholder interviews
Adoption of recommended practices and technologies among men and women farmers, before and after program activity	<ul style="list-style-type: none"> Case studies Interviews of farmers Sample surveys

(Table continues on the following page)

Table 12.1 Monitoring and Evaluation Indicators for Gender and Crops (*continued*)

Indicator	Sources of verification and tools
Gender differences in workload as a result of introduced practices or new technology for crop production	<ul style="list-style-type: none"> • Case studies • Gender analysis (such as comparative time clocks of men's and women's activities) • Participatory rapid appraisal • Sample surveys
Percentage of women and men community extension workers and professional agricultural extensionists	<ul style="list-style-type: none"> • Department of agriculture records • Project records
Numbers of years of formal education of farmers, disaggregated by gender	<ul style="list-style-type: none"> • Household surveys • School attendance and examination records
Level of satisfaction among women and men with access to and quality of extension and training services	<ul style="list-style-type: none"> • Interviews of farmers • Sample surveys
Women or other disadvantaged groups actively participating in management committees and boards of producer groups and cooperatives	<ul style="list-style-type: none"> • Committee meeting minutes • Interviews with stakeholders • Local traditional authorities (such as a chief or local council) • Program and project records

Source: Authors, with inputs from Pamela White, author of Module 16.

Gender and Soil Productivity Management

WHY CONSIDER SOIL PRODUCTIVITY FROM A GENDER PERSPECTIVE?

Healthy, fertile soils are integral to the goals of sustaining agricultural livelihoods, attaining food security, and fostering agricultural development. Because most high-quality agricultural land is already in production, the marginal benefit of converting new land diminishes. In West Asia and North Africa, at least 87 percent of suitable land is already farmed; in South Asia, the corresponding figure is 94 percent (FAO 2006). Natural resources such as land and water are increasingly scarce, and their quality is declining. Growth in food production will depend primarily on further intensification of agriculture, mostly in high-potential areas (FAO 2005a). Yet unless considerable care is taken, intensification can exact a heavy toll on soil health, fertility, and productivity.

A recent report on how to meet the first Millennium Development Goal of halving hunger by 2015 argues that *improving soil health is the first entry point* for correcting soil nutrient imbalances, improving agricultural productivity, and thus reducing hunger, particularly in Africa (UN Millennium Project 2005: 13). Soil fertility is an important component of soil health, along with organic matter content and microorganism populations. Another critical entry point for improving soil productivity and reducing hunger is *the adequate, location-specific choice of crops and crop management practices*.

As population pressure increases in many areas, especially sub-Saharan Africa, traditional fallow and crop rotation systems no longer maintain and restore soil fertility. When soils become less productive, crop yields stagnate or decline, and farmers become more dependent on external inputs to maintain crop productivity. Although soil fertility losses are particularly worrisome in Africa (box 12.4), they are also severe in tropical Asia and Latin America, where soil nutrient losses are high in agricultural systems compared to

natural ecosystems (Hartemink 2004). Other factors, such as soil erosion and climate change (leading to more severe weather events), have further depleted soils and heighten the need for more holistic soil management approaches.

Women—especially if they are the main providers of staple food crops—are particularly affected by declining soil fertility. Men often control the best land with the best soil to produce commercial crops, and women more often farm marginal land. They have limited or no access to external inputs such as fertilizer. Often they have less access to land itself, because inheritance laws and other legal and cultural norms favor men (see also Module 4). When women own farmland, their plots are generally smaller than those owned by men. In Mexico, for example, women own less than 20 percent of all farmland (Korinek 2005), and in 2000, 56 percent of women farmers owned less than 2 hectares, compared to 35 percent of male farmers (White, Salas, and

Box 12.4 Africa: Consequences of Unproductive Soils

Agricultural production is the main source of economic activity in sub-Saharan Africa, where the declining health and productivity of the soil indicate that it is rapidly losing its value as a critical agricultural asset. Not only can less food be grown on unproductive soils, but the production of cash crops for export is endangered. It is essential that agricultural production and soils be managed in sustainable ways, so that the present generation is fed and soil conditions can improve to support future generations.

Source: “Sustainable Land Management and Soil Productivity Improvement in Support of Food Security in Sub-Saharan Africa,” www.fao.org.

Gammage 2003). In this respect women face a complex challenge: they have to produce their crops on poorer soil, often on smaller areas, and with fewer or no inputs.

EVOLVING APPROACHES TO GENDER-RESPONSIVE SOIL FERTILITY MANAGEMENT

Developing countries' approach to soil fertility management has evolved considerably over the last 50 years. Researchers have shifted from an almost exclusive focus on inorganic (chemical) fertilizer toward a broader range of approaches and nutrient sources (NEF 2006). At least in the research community, the value of integrated nutrient management—"the judicious manipulation of nutrient stocks and flows" (de Jager, Nandwa, and Okoth 1998: 37)—is now widely accepted.

The high climatic risks, uncertain markets, and poor infrastructure characteristic of many low-potential, isolated zones have challenged the economic wisdom of using high levels of external inputs and placed a premium on technologies that rely relatively little on such inputs (IFAD 2002). Many recognized alternatives to inorganic fertilizer are available. The use of animal manure, agroforestry, legumes, living mulch, compost, and other technologies that enhance soil fertility is traditional in many farming systems, especially systems that are managed and controlled by women. In other contexts, such technologies have been promoted actively (Uphoff 2002). The value of conservation agriculture has been established in many locations, with important lessons to be drawn (FAO 2005b).

Low-external-input strategies to improve soil fertility are often labor and knowledge intensive, however. Consequently they may be difficult for resource-poor farmers to adopt, given their limited access to labor and information, especially in remote areas where few formal institutions exist to strengthen human and social capital.

Despite the recognized importance of low-external-input strategies, chemical fertilizer remains the basis of soil fertility management in many farming systems and most intensification trajectories (NEF 2006). Chemical fertilizer is central to most extension messages, and the use of nitrogenous fertilizer continues to increase rapidly in the developing world (van Dam 2005). For a host of economic and logistical reasons, however, resource-poor farmers, including women, cannot apply fertilizer at high rates. The cost of fertilizer can represent a high proportion of the total variable cost of production, an investment that poor farmers can ill afford where there is a risk of crop failure (FAO 2006). Fertilizer is often sold in quantities too large for poor

women to buy. Fertilizer may be considered too risky to buy, especially when it will be used to produce food crops with little possibility of generating cash income. Even when farmers can afford fertilizer, they cannot always obtain it. Access is often directly limited by inadequate infrastructure and transport facilities.

Conventional soil improvement technologies based solely on the use of external inputs have widened the divide between better-off and resource-poor farmers. External inputs require cash and access to markets, so women engaged in subsistence agriculture have benefited least from their introduction. The vulnerability of resource-poor households often makes them averse to risk and discourages them from pursuing new activities or adopting new practices and technologies (ICAD 2004). The introduction and promotion of low-external-input technologies, which would rely on resources that are more easily available to women in small-scale production systems, could improve their soil fertility management capacities and address disparities between better-off and less-favored households, because these technologies are better suited to the latter.

As mentioned earlier, improving soil productivity is a key to improving food security. Women may benefit from improved crop production by selling surplus in the local market. Enhanced crop productivity could thus be a starting point for livelihood diversification. Increased soil productivity also increases returns to labor, which is especially important for labor-constrained women, because it may free time for additional activities. Zero-tillage systems, cover crops, and mulches, for example, can significantly improve soil productivity and at the same time reduce labor for weeding. These alternatives are often context specific; mulching, for instance, is more appropriate for small-scale farming.

Women farmers often apply different criteria to assess soil productivity, because they are more concerned with the overall output of the cropping system (often a mixed cropping system). Mixed cropping systems may yield as much or more food as monoculture systems, and often they are designed to foster overall crop stability and system resilience. Agricultural research and development interventions can be better targeted if they take these local strategies for managing soil productivity into account. Combining fertilizer use with other soil productivity management strategies, such as mulches, cover crops, or intercropping, could further improve the stability and resilience of cropping systems, characteristics that are gaining importance in light of the potential negative effects of climate change.

POLICY AND IMPLEMENTATION ISSUES

It takes time to improve soil productivity. The results of investments in soil productivity are usually not seen in the first years. The lag time between investment and results means that farmers may face a trade-off between meeting their immediate needs (which may lead to nutrient mining) and ensuring the longer-term sustainability of their land (DFID 2002). It also means that land tenure is a major influence, both on the maintenance of soil fertility and on the ability to intensify farming sustainably. Because women so frequently lack secure access to land, they may be reluctant to invest in soil improvement. “Secure access” to land refers not only to having legal title to the land but also to having the power within the household to make and influence decisions about how the land will be used. A possible scenario, for instance, is that men household members will start managing a formerly unproductive field once the women have invested labor and resources to enhance its soil productivity.

Extension systems continue to direct information on soil improvement largely to men (see also Module 7). The imbalance between men and women extension staff reduces the effectiveness of extension services for women farmers, and the apparent failure to focus on women’s crops and production systems renders many extension messages meaningless for them. Because fertilizer recommendations are usually designed for monoculture systems, they are difficult for women to apply in mixed cropping systems.

Extension systems supply limited information on alternatives to chemical fertilizers, partly because research systems

still have limited capacity for studying the synergistic effects of soil amendments (such as manure and compost) and inorganic fertilizers (DFID 2002).

In some countries the withdrawal of subsidies for inorganic fertilizer has reduced its availability for resource-poor farmers, including women. An alternative policy could be to adopt “smart” (targeted and time-bound) subsidies that increase the possibility that poorer farmers will use fertilizer, especially by making small packages of fertilizer available at a reasonable price (DFID 2002).

GOOD PRACTICES AND LESSONS LEARNED

Actions to address key gender issues in managing soil productivity can be clustered into three categories: (1) the use of chemical fertilizer; (2) the use of low-external-input technologies, including synergistic effects of fertilizer and other practices; and (3) the appropriate choice of crops and crop management practices to enhance soil productivity. The actions and corresponding lessons are discussed in the sections that follow.

Chemical fertilizer use in gendered crop agriculture

The use of chemical fertilizer needs to be considered from a regional perspective (table 12.2). The African continent (including North African countries and South Africa) has consistently represented only 2–3 percent of world fertilizer consumption; the share for sub-Saharan Africa (excluding South Africa) is generally less than 1 percent (FAO 2005a).

Table 12.2 Regional Disparities in Chemical Nutrient Consumption, 2002/03–2003/04

Region	Nutrients (000 tons)		Change (%)	Percentage of world total
	2002/03	2003/04		
Africa	4,278	2,924	-0.7	2.1
Central Europe	4,086	3,528	-0.9	2.5
East Asia	50,612	51,751	1.0	36.3
Eastern Europe and Central Asia	3,660	3,887	1.1	2.7
Latin America	13,230	13,191	-1.0	9.3
North America	22,022	22,024	1.0	15.4
Oceania	3,162	3,233	1.0	2.3
South Asia	20,882	20,937	1.0	14.7
West Asia	4,607	5,678	1.2	4.0
Western Europe	15,142	15,436	1.0	10.8
World	141,681	142,589	1.0	100.0

Source: “IFADATA Statistics,” www.fertilizer.org.

Note: Bold faced entries are regional totals.

The regional averages hide considerable variation among countries. Whereas fertilizer use is increasing rapidly in southern Africa (Crawford, Jayne, and Kelly 2005), it is stagnant or declining elsewhere in Africa. The majority of Africa's farmers (many of them women) are smallholders with less than 2 hectares (Altieri 2002), and they grow most of their basic food crops with virtually no or minimal fertilizer. For example, 72 percent of millet, approximately half of all food legumes, and nearly all yams and cocoyams are produced in this way (Altieri 2002). In Tanzania and Uganda, the average use of chemical fertilizers is less than 1 kilogram per hectare per year, which implies that most land is never fertilized (Wynen and Vanzetti 2002).

Overall trends in fertilizer consumption can be summarized as follows (FAO 2006):

- Fertilizer consumption has increased substantially, although not consistently, in countries with rapidly increasing exports of agricultural commodities, such as Argentina and Brazil.
- Structural adjustment programs implemented to correct financial imbalances in certain developing countries in the 1980s and 1990s negatively affected fertilizer use among small-scale farmers.
- In countries where centrally planned systems, with their heavy support to agriculture and planned allocations of fertilizer, were superseded around 1990 by market-oriented systems, fertilizer consumption fell abruptly.
- In the few developing countries where governments continued to support fertilizer use, sometimes despite pressure to the contrary, fertilizer consumption continued to increase.

Unfortunately, no systematic national or global data sets compare fertilizer use by gender. Indirect evidence for the unequal use of inorganic fertilizer can be obtained by analyzing fertilizer use by crop species where data are available. According to FAO:

In Latin America seven crops (maize, soybean, sugar cane, beans, wheat, coffee and rice), plus vegetables and fruits, account for 88 percent of the total fertilizer consumption. A substantial proportion of the fertilizer is used on agricultural cash and commodity crops for the domestic commercial market and export. Although statistics are not available, it seems that little fertilizer is used in the subsistence/small-scale farming sector. In SSA the main crops to receive fertilizer include maize, millet and sorghum. In South Asia and Southeast Asia about 60 percent of fertilizers are used on cereals. In South Asia, crop production is oriented towards supplying domestic

demand, whereas Indonesia, Malaysia, Thailand and Viet Nam are also important exporters.

FAO (2006: 55)

The data suggest that the larger share of fertilizer is applied to commercial crops, which indicates that women use only a small proportion on their staple crops.

Many reasons account for women's limited use of fertilizer. As mentioned earlier, because fertilizer is mainly sold in large quantities, it is a big investment, especially for cash-constrained women. Women usually have less access to transport and find it more difficult to carry bags of fertilizer home. In remote rural areas, fertilizer is not usually readily available, and thus it is especially difficult for women, who have fewer opportunities to leave the village, to obtain. All of these constraints reveal strategic entry points for interventions that could improve women's use of fertilizer.

It is also important to emphasize that fertilizer is usually promoted in conjunction with other technologies, especially improved crop varieties. The long-term sustainability of such "packages" depends on the continued availability of their components. Box 12.5 illustrates the problems inherent in this approach and demonstrates why it is vital to address gender inequality in access to assets and services.

Alternative crop management practices for improved soil productivity

For resource-poor farmers engaged mainly in subsistence production, low-external-input technologies are usually a more affordable way to improve soil productivity. Crop rotations, improved fallows, agroforestry systems, integrated soil and water management practices, and the choice of suitable crops are some of the options. It is important to emphasize that the crop management practices described in this section as a means to enhance soil productivity *do not exclude* the use of external inputs. The use of these practices and the use of external inputs can be complementary, depending upon the resources and socioeconomic situation of each farmer.

As mentioned, low-external-input technologies are often based on local practices that have been adapted in light of additional knowledge and skills. Recognizing the beneficial effects of legumes on soil productivity, women farmers often grow legumes in combination with other crops such as tubers and cereals, but this practice requires, among other resources, farmers' time and knowledge. Because the lack of labor is often cited as a major constraint to the adoption of low-external-input technologies, it is essential to match the

Box 12.5 Ghana: Nuances of Success among Men and Women Farmers

The Ghana Grains Development Project is one of the few African success stories of long-term donor support to strengthen national research and extension for food production. Ghana is also one of the few African countries with sustained increases in per capita food production. The Ghana Grains Project focused primarily on increasing the output of maize and cowpeas through the development and adoption of well-adapted varieties and management practices for each of Ghana's agroecological zones. Graduate-level training was provided to about 50 scientists, nearly all of whom returned to the project. Annual maize production rose from 380,000 tons in 1979, when the project started, to more than 1 million tons by the project's end in 1998. Maize yields increased by 40 percent, from 1.1

tons per hectare to 1.5 tons. The project's bottom-up approach integrated farmers in all stages of the research and included a socioeconomic assessment of the technology. Large-scale extension programs to promote the varieties and practices, supported by Sasakawa Global 2000 (a nongovernmental organization [NGO]), enabled more than half of all maize farmers in Ghana to adopt improved varieties, fertilizer, and planting methods by 1998. After fertilizer subsidies were removed, fertilizer use dropped to 25 percent, challenging the approach's sustainability. Adoption was significantly lower among women farmers (39 percent) than men (59 percent), reflecting differences in access to assets and services, and especially the biases in extension.

Source: Canadian International Development Agency, personal communication 2006, cited in World Bank 2007.

labor demands of such technologies carefully with household labor availability. These issues are especially important for women farmers who have specific seasonal labor-use patterns and who have no recourse to assets and services (World Bank 2007).

Some low-external-input technologies require no more labor than current practices. Others, such as conservation tillage, are attractive precisely because they save labor. In some cases (such as stone bunds for soil conservation), the initial labor investment for establishing the technology is high, which can limit adoption if the work coincides with peak labor periods. In Burkina Faso, for example, stone bunds contribute to soil and water conservation, promoting higher yields and, eventually, higher returns to labor. Nevertheless, 48 percent of women involved in their construction claimed that the bunds added to their workload, and only 12 percent said the bunds lightened their work (Atampugre 1993).

A further criticism of the application of low-external-input technologies is their highly context-specific nature, which means that they must be adapted to particular agroecological and socioeconomic conditions. Although much of the responsibility for local adaptation is ultimately borne by farmers themselves, these technologies clearly imply an even greater burden for national agricultural research systems (Sumberg, Okali, and Reece 2003). A shift to participatory innovation development—a process that combines local and external knowledge and skills—is required, supported

by training and capacity building among researchers, extension staff, and participating farmers. The shift to participatory development of innovations has important positive consequences for the development of human and social capital, as seen in the following examples. For a range of cultural and socioeconomic reasons, women often must be specifically approached and encouraged to participate in such initiatives.

The examples also indicate the wide range of options available for integrated soil fertility management. Farmer-led research initiatives (Budelman and DeFoer 2000; DeFoer and Scoones 2001) have demonstrated the promise of complex responses to nutrient scarcities that include organic as well as inorganic nutrient sources. Rather than favoring one approach over the other, observations in the field indicate that farmers are interested in experimenting with organic and chemical fertilizers to better attune responses to local needs, a process that inevitably requires an integrated approach.

Involving women in soil fertility management innovations. It is widely acknowledged that the sustainability of projects and programs to develop technology is linked closely to the participation of the target audience. Such participation is especially important in projects that rely on the traditional knowledge of women farmers to develop soil fertility management innovations. Many promising experiences in promoting farmers' innovations in soil management have been

described, but two projects funded by the Netherlands offer examples that are especially pertinent for working with women farmers: (1) Promoting Farmer Innovations (PFI) and (2) Indigenous Soil and Water Conservation in Africa (ISWC). These projects, which operate in several African countries—including Burkina Faso, Ethiopia, Tanzania, and Uganda—aim to establish multistakeholder platforms for technology development and encourage women’s participation.

For instance, in all of Ethiopia, research and development related to land husbandry have usually ignored the potential of women’s knowledge and innovation. Women’s domestic work has low status in Ethiopian society, and their productive work in agriculture is seldom acknowledged. As a rule, women in rural families do not regard themselves as farmers and would not present themselves as innovators in land husbandry. This situation is not unique to Ethiopia. Among farm families in Kenya, Tanzania, and Uganda, the PFI also found that women did not come forward to show and explain their own innovations; instead, men household members assumed this task, even though they did not understand the innovations as well as the women did (Critchley, Ong’ayo, and Njoroge 2001).

Many factors can explain women’s lack of self-esteem with respect to their farming activities: traditional beliefs and attitudes regarding women’s role in rural society; women’s low levels of formal education; the limited mobility of women compared to men, who often migrate to towns or other countries to seek work; and women’s poor access to external information. In Ethiopia ISWC endeavored to recognize women’s innovation in land husbandry as a means of changing perceptions of this activity, including the perceptions of the women themselves, and of increasing the women’s self-confidence and capacity to contribute to development. The first steps were to gather evidence of innovation by women farmers (box 12.6) and to make these accomplishments more widely known through training, tours, and exchange visits.

Promoting the use of legumes as mulch and cover crops. The use of legumes to improve soil productivity is well established in traditional agricultural systems and in technologies developed more recently by researchers. Projects promoting the use of legumes as green manure have often achieved limited impact, however, because they ignored farmers’ multiple criteria for selecting suitable legume species. Women in particular resisted adopting species that people could not eat, even if they were the best choice for improving soils. Failing to involve men and women farmers in the selection of appropriate legume species may limit a project’s impact. An example from Malawi (box 12.7)

Box 12.6 Ethiopia: Women’s Innovations in Soil Fertility Management

A village study in Eastern Tigray, Ethiopia, revealed that women in different wealth classes pursued different types of innovation. Poorer women could take fewer risks, but this did not mean that they were less innovative—in fact, the opposite may have been the case. Poorer women felt that it was too risky to borrow money and preferred to find ways of using their current resources more efficiently. In improving soil fertility, for example, they tried to use animal manure whenever possible, but poorer households had few or no livestock and little access to this source of natural fertilizer. Some women who headed poorer households found alternative means of fertilizing their land, such as allowing animals of relatives or friends to graze their land in return for the dung. Many women used cooking ash as fertilizer; one, who had a particularly large amount of ash from kilning pottery, finds it to be an excellent soil enhancer. These practices are not new to the area, but they indicate women’s efforts to maintain soil fertility with the slim resources available. It is likely that a deeper study of fertility management would reveal innovative means developed especially by poorer women. Many of these women are reluctant to respond to the “encouragement” (through credit) of using artificial fertilizers, because they fear they will be unable to repay their debt if the rains fail.

Source: Haile, Abay, and Waters-Bayer 2001.

emphasizes the importance of placing farmers at the center of research and extension to improve the adoption of legume-based technologies.

Choosing new and more profitable crops

Soil fertility is only one component of overall soil productivity. Many more possibilities are available to enhance soil productivity. The selection of appropriate crops, in combination with soil-improving practices, is one alternative, as seen in Bangladesh (box 12.8).

The Bangladesh case highlights the importance of promoting innovations that mesh with the livelihood strategies of women across wealth categories, especially poorer and landless women whose prospects for participation may

Box 12.7 Malawi: Gender Dimension in Legume-Based Soil Improvement Technologies

Legumes are uniquely suited for enhancing soil productivity and providing nutrient-enriched grains and vegetables for farmers with few resources. Yet the substantial barriers to diversification with legumes, including their establishment costs and moderate yield potential, indicate a need for long-term engagement and farmer-centered research and extension.

A case study in Malawi illustrates that experimentation with legumes and their adoption can be fostered among even the most resource-poor smallholders. Multieducational activities and participatory research involving farmer research teams were carried out within 80 communities. Over five years, more than 3,000 farmers tested legumes and gained knowledge of their contributions to child nutrition and soil productivity. Legume systems expanded on an average area of 862 square meters in 2005 (772 square meters for women and 956 square meters for men, indicating a gender dimension to legume adoption). Farmers chose edible legume intercrops such as pigeon peas and groundnuts over the *Mucuna* spp. green manure system. Women in particular preferred the edible species to meet their combined goals of food security and soil improvement.

Source: Kerr and others 2007.

Box 12.8 Bangladesh: Homestead Vegetable Production

In the Sataria region of Bangladesh, credit and training were provided for women to grow vegetables on small plots on or near their household compounds. The improved vegetable varieties, which could be purchased from a local NGO, included tomatoes, okra, Indian spinach (*pui shak*), red amaranth (*lal shak*), radishes, eggplants, amaranth (*data*), kangkong (*kalmi shak*), mung beans, and sweet gourds. Because the vegetables were cultivated on homestead land, it was easier for landless and land-poor households to participate, and their vegetable consumption increased.

A recent impact assessment found that the technologies were relatively easy to adopt. They required very little land and only a small cash investment. Women did not need to move beyond the homestead. The nutritional benefits for the household were high. Women could coordinate vegetable cultivation relatively easily and flexibly with their many other household tasks. The technologies were unlikely to increase vulnerability, because they were grown on homestead land where security was easily ensured. Nor were any other crops likely to be displaced, as homestead land is rarely used for cropping. Women and their families liked the fact that they could produce vegetables within the homestead without risking the harassment and loss of reputation they would suffer from working outside it.

Source: Hallman, Lewis, and Begum 2003.

initially appear bleak (Adato and Meinzen-Dick 2007). It also shows the potential for empowering women beyond the initial bounds of a project. In areas where market infrastructure is available, vegetable sales could empower women in the sense that earning money could increase their decision-making power within the household. In some areas it could create opportunities for women to move into public space, such as the market, to sell produce themselves. Women who become members of groups involved in NGO-sponsored development projects gain self-confidence from their solidarity with the group and the added status of being part of an outside organization.

Although the rapid expansion of horticultural crop production appears to hold considerable promise for poor people who depend on agriculture, including women, the

experience in Bangladesh shows that if interventions based on new and more profitable crops are to succeed among women, the interventions must operate on a scale that is accessible to them. Experiences from large-scale vegetable production, for example, are not only different but are probably more suited to (men) farmers with far greater resources. The production of horticultural crops increases the returns on land about 10-fold compared to returns for cereal crops (World Bank 2007). It generates considerable employment in the field—horticultural crops require about twice the labor input per hectare of cereal crops—and generates more off-farm jobs in processing, packaging, and marketing. Women hold many of these new jobs, although they often work under unfavorable conditions (see also Module 8).

Yet the possibilities for resource-poor farmers to invest in large-scale production of horticultural crops are limited. Horticultural crops are management intensive, a variety of crops are grown, the cash outlay is large, and the use of chemicals is heavy (inflicting considerable harm on the environment; horticultural crops account for 28 percent of global pesticide consumption; World Bank 2007). Horticultural enterprises are risky because of pest outbreaks and volatile prices. Fruit production requires an investment of several years to recoup costs. The production of high-value horticultural crops for export leads to labor shortages, which force women to reduce the time devoted to independent income-producing activities or crops under their own control, with potentially negative impacts on food security.

Organic production, with the corresponding practices to maintain soil fertility and soil health, may be a potentially more benign alternative to conventional, high-value horticulture. The organic food movement has been endorsed by FAO, which maintains in a recent report (FAO 2007) that organic farming fights hunger, tackles climate change, and is good for farmers, consumers, and the environment. Organic farming is now regarded less as a niche market within industrial countries and more as a vibrant commercial agricultural system practiced in 120 countries on 31 million hectares of cultivated land and 62 million hectares of certified wild harvested areas. The organic market was worth \$40 billion in 2006 and is expected to reach \$70 billion by 2012. The strongest benefits of organic agriculture are its use of resources that are independent of fossil fuels, are locally available, incur minimal agroecological stresses, and are cost effective (FAO 2007). Some have argued that women farmers, who already rely on few external inputs, may be well positioned to become organic producers and benefit from the rising interest in organic produce.

A report from the International Institute for Environment and Development in the United Kingdom (Datta and Kar 2006) examined 14 NGOs promoting ecological agriculture in Bangladesh. Most of the NGOs ran programs that encouraged poor women to grow vegetables using organic fertilizers and pesticides on homestead land. This practice was extended to larger farms, generally controlled by men landowners. Farmers received environmental education and training along with financial and technical support. The training in organic agriculture had a significant impact on homestead farming and commercial farming. The awareness of organic agriculture rose significantly, particularly among women, who used organic fertilizer and actively promoted these technologies outside the project boundaries.

Despite the promise of organic production practices, it must be remembered that organic agriculture shares many of the attributes of low-external-input agriculture. It is labor intensive and knowledge intensive and requires a range of local inputs, such as manure and compost, which are not always available. Yields of organic crops are often lower than yields of nonorganic crops. Conventional farming inputs, such as chemical fertilizers and pesticides, are easily available, and farmers can use credit to purchase them. Landless and smallholder farmers depend on sharecropping, which forces them to maximize short-term benefits from conventional farming, depend on the immediate returns gained from using chemical inputs, and forego the longer-term benefits from organic farming.

Finally, obtaining organic certification is a costly process that requires a good amount of organization, even among farmers with considerable assets. The successful establishment of organic production systems will therefore require targeted services and infrastructure, including transport and markets, especially if women and the poor are to benefit.

GUIDELINES AND RECOMMENDATIONS FOR PRACTITIONERS

The following guidelines and recommendations apply to practitioners:

- The lack of gender-disaggregated data on the use of fertilizer and other soil productivity technologies mirrors the lack of attention given to this subject and makes it difficult to analyze the impact of interventions from a gender perspective.
- Experiences thus far have focused either on using fertilizer to address short-term soil fertility problems or on the development and promotion of low-external-input technologies. Although the complementarity of these approaches is mentioned in the literature, there is little evidence of their combined use in farmers' fields. The judicious use of affordable doses of inorganic fertilizer, combined with other soil fertility technologies, may offer good prospects for women to improve overall crop production. A better understanding of the synergistic effects of soil amendments (such as manure and compost) and inorganic fertilizers is essential—along with improvements in research and extension capacity to develop and promote combined technologies.
- Support is needed for research to adapt existing methods of fertility management to specific agroecological zones and to cropping systems managed by women in those

zones, and for extension to promote these techniques in ways that include women. Research on fertility management technologies that specifically addresses women's resource constraints and livelihood strategies has been limited.

- Land tenure is a major influence on the maintenance of soil fertility and on the ability to intensify farming in a sustainable way. Given that farmers must have secure access to land if they are to invest in it, soil productivity initiatives must be accompanied by initiatives to secure women's access to land (see Module 4).
- Women's empowerment through participatory approaches to technology development is critical. Although projects seek to involve men and women, in practice women's participation in soil improvement projects is often limited. A systematic effort is often needed to increase women's participation.

A final lesson is that more holistic soil productivity indicators are needed for monitoring and evaluation, especially with respect to the gender effects of soil management interventions. Until soil productivity management interventions are monitored and evaluated in a gender-disaggregated way, meaningful conclusions on the gender equality of interventions will be extremely challenging to obtain (see also Module 16). Men's biases in adoption do not necessarily mean that a particular technology is inappropriate

for women; better targeting and institutional and policy support may be needed to make the technology more accessible for women.

Soil productivity management interventions need to be monitored and evaluated within a wider livelihood context. Measuring short-term, single-crop productivity gains will not capture the full picture. Direct and indirect impacts of interventions, both quantifiable (such as yields, incomes, and labor requirements) and qualitative (such as system resilience and stability or women's empowerment), need to be taken into account. Productivity gains in one crop do not translate directly into increased household income, and benefits are not equally shared between men and women household members.

Furthermore, a need is present to develop monitoring and evaluation criteria that measure the contribution of soil productivity technologies to minimizing the risk of adoption for women farmers. Questions that elicit information on women's reliance on and contribution to different livelihood assets, such as labor, knowledge, and local natural resources, are important for understanding the potential impact on women. This list, although certainly not comprehensive, nevertheless indicates the importance of assessing technologies on the basis of criteria that extend beyond simple production data and of relinquishing the "one-size-fits-all" approach in developing and promoting soil management technologies.

Gender in Seed Production and Distribution

Seed is one of the most crucial elements in the livelihoods of agricultural communities. It is the repository of knowledge passed from generation to generation, and the result of continual adaptation and innovation in the face of ever-greater challenges for survival. The potential benefits from the use of good quality seed of adapted varieties by farmers can be enormous, and the availability of quality seed of a wide-range of varieties and crops to farmers can increase productivity, reduce risks from pest, drought and disease pressure, and increase incomes. Production increases through the use of adapted varieties in a given area can create employment opportunities related to processing, marketing, and other activities generated through quality seed production.

ASBP (2006: 6)

A farming community's food security depends heavily on its seed security. Women's need to ensure good supplies of their preferred varieties of seed can be particularly acute, because women are often the main growers of food to feed the family. Although both men and women farmers regard seed as a key resource for food and livelihood security, it is crucial to remember that *important socioeconomic and gender differences in seed diversity, seed security, and food security must be understood to target any seed interventions effectively* (FAO 2008b).

Farmers participate in multiple seed systems that help them produce and obtain the seed they need. These systems (box 12.9) can be divided broadly into formal and local (sometimes called "informal," "traditional," or "farmer") systems. Commercial farmers rely mostly on formal systems, which are responsible for the flow of improved and hybrid seed. Subsistence farmers tend to rely more on local systems. Local systems are responsible for flows of seed of traditional as well as modern varieties, which enter the system through different processes (Sperling and Cooper 2003). Farmers may mix seed from different sources if they lack sufficient seed or if they wish to experiment with or

modify a traditional variety. Farmers may incorporate improved varieties and expose them to local conditions and management, fostering their local adaptation. Local knowledge of men and women farmers is important because they manage different crop species and varieties and may participate in different seed systems for different purposes.

Although much attention has been paid to the development of formal, national seed systems, their contribution to noncommercial production systems remains limited. One widely recognized problem in many countries is the extended time between the initial identification of new varieties and their eventual release, seed production, and sale, which considerably delays adoption. In many countries local seed systems provide by far the largest share of seed for noncommercial crops. An estimated 80 to 90 percent of all seed used to produce staple food crops in subsistence systems comes from local seed systems (FAO 2008b; GTZ and CGN 2000).¹ In local seed systems, farmers themselves produce, disseminate, and obtain seed directly through their own harvested crops or through sale, exchange, or barter with others in the local area (ASBP 2006; Sperling and others 2004).

For resource-poor farmers, especially women, the local seed system is not surprisingly the main and most reliable source of seed (FAO 2008b; Pionetti 2006; Smale and others 2007), but medium-scale and better-off farmers also rely on seed from this source (FAO 2008b). An important reason for relying on local seed systems is that small-scale farmers, especially women, often grow a diversity of crops to minimize the risk of total crop failure and food insecurity (box 12.10). Another reason is that women in many societies are in charge of selecting and storing seed of many traditional food crops. Often these crops are valued for specific attributes: they are cheaper, available in small quantities, better adapted to local conditions, and easier to obtain, and they possess other qualities (for food preparation, ceremonies, or

Box 12.9 What Is a Seed System?

Seed systems are often large and complex. A seed system generally encompasses a large number of individuals, organizations, and institutions involved in different functions related to seed, such as plant breeding research and the subsequent multiplication, processing, storage, distribution, and marketing of seed. Seed systems, very broadly defined, can be categorized as informal (or traditional) or formal seed systems.

Individual farm households are the foundation for informal seed systems, in which each household performs numerous seed system functions on its own. The formal sector, by contrast, consists of public and private organizations with specialized roles in supplying seed of new varieties. Different types of seed from organizations and individuals in one stage of the seed chain will flow to the next stage through informal and formal channels. Rules and regulations, such as procedures for releasing new varieties of seed to the public, intellectual property rights regimes, seed certification programs, seed standards, and contract law influence the structure, coordination, and performance of the seed system.

Source: Maredia and Howard 1998.

other uses) that are integral to cultural traditions. Seed of most of these crops and varieties is not developed or supplied through formal channels.

Although the local seed systems are well adapted to farmers' specific production environments, they often face numerous constraints. Traditional varieties have been and continue to be lost for a variety of reasons (including conflict, drought, change in preferences, and research and extension campaigns promoting modern varieties). Interventions to strengthen local seed supply systems, such as establishing seed banks and breeding and multiplying seed, are gaining popularity among NGOs and public institutions that supply seed. Often such initiatives enable formal and informal systems to work in complementary ways. Farmers also express demand for seed of new and improved crops and crop varieties and for improved seed management and processing technologies, which can be supplied by the formal seed system.

Small commercial seed enterprises might be a good means of serving these markets, which may not be attractive

Box 12.10 South India: Seed and Crop Diversity in Women's Livelihood Strategies

Women farmers in South India frequently point out that they could not grow such a wide range of crops if they did not have the seeds "in their hands." One farmer articulated the issues as follows: "Where would we get small amounts of seeds for our traditional crops if we did not save them ourselves?"

Small-scale farmers need relatively *small amounts of seed for a large number of crop varieties*: 100 grams of sesame, 500 grams of black gram, 1 kilogram of finger millet, and a handful of roselle seeds. Women farmers also want to grow very specific crops in addition to staples such as sorghum or maize. There is no guarantee that formal seed agencies can provide seed for all of these crops. Thanks to their carefully maintained seed stocks, the women can maximize the number of crops grown on their land and achieve a varied and nutritious diet.

Source: Pionetti 2006.

to large private seed companies and poorly served by public seed agencies. Partnerships between public and private agencies (for example, a public research organization could supply seed for multiplication and sale to small, private entrepreneurs) may be another means of catering to these markets. Because women are responsible for selecting and saving seed in many traditional farming systems, commercial seed production presents good opportunities for including them as entrepreneurs, as contract farmers to multiply seed, and as marketers as well as employees.

KEY GENDER ISSUES

The following sections describe the key gender issues in crop agriculture and the potential benefits of addressing them.

Seed sources and access to information differ by socioeconomic group and gender

As mentioned earlier, an apparent gender bias exists in access to formal seed systems. Men, who are generally more involved in growing commercial crops, seem to access and benefit more easily from formal systems. Women, in turn,

rely more heavily on local systems to obtain seed for staple and minor crops. A resource endowment bias has also been observed. Resource-poor farmers—men or women—generally lack the cash to purchase seed of modern varieties from formal seed suppliers. In Bangladesh access to irrigation was a significant determinant of whether a farmer would adopt modern rice varieties (Hossain 1988). A study in Ghana revealed that farmers preferred different rice varieties depending on whether they would be grown under high-input or low-input conditions (Stirling and Witcombe 2004). Gender-responsive action in the local seed sector should increase the availability of adequate seed and thus increase food and livelihood security for resource-poor farmers—especially for crops that are less interesting to commercial seed suppliers.² Encouraging local seed banks, establishing small-scale seed enterprises, and facilitating local seed exchange through an enabling policy environment are some measures to consider.

Based on their different portfolios of crop species and varieties, men and women can contribute different knowledge of seed characteristics

Aside from multiplying and distributing seed, local seed systems are important sources of knowledge of seed characteristics and management. Gender differences in local seed knowledge and skills are an important asset for strengthening links between the local and formal seed systems. Given women’s traditional roles in selecting and saving seed, they can be strategic partners for forming liaisons between formal and informal seed systems. The formal system can play a more significant part in developing and supplying seed if it adopts a gender perspective—in other words, if it succeeds in understanding and addressing the seed needs of different household members.

Women’s role in local markets and small seed enterprises

Local markets are often a crucial link in local seed systems. Local markets bring in grain, which farmers can subsequently sort and use for seed. These local “seed-grain markets” differ from formal outlets selling seed that is specially produced as seed, on specialized fields, within the framework of a seed business enterprise.³ In many African and Latin American contexts, vendors of local seed and grain are to a large extent rural women. Farmers are sourcing less and less seed from their “classic” informal source (their own stocks) and depending more on local seed and grain markets (Smale and others 2007).⁴

Women increasingly participate in the formation and management of small seed enterprises (World Bank 2005). These more recent experiences need to be monitored and evaluated carefully to better understand their contributions and impacts on improved seed security and overall livelihood security. Applying a gender perspective to analyze and improve seed systems will help to overcome or at least reduce existing biases in access to, availability of, and use of adequate seed.

POLICY AND IMPLEMENTATION ISSUES

The following sections detail critical policy and implementation issues.

Public versus private seed enterprises

Seed provision is at an important crossroads in many developing countries. Donor support to public seed enterprises has diminished because these enterprises have been inefficient. Strategies for supporting the private seed sector are still evolving. A major challenge for public and private seed enterprises is to ensure repeated seed sales, because farmers may purchase seed once and then save it from their harvest. The emergence of a private seed industry is almost always based on sales of hybrid seed, which must be purchased anew each season or yields will decline, or on seed that farmers find difficult to save, such as vegetable seed. Seed of many other crops (particularly self-fertilizing crops with a low seed multiplication factor that are grown mainly for home consumption) is less likely to be available through a nascent private seed industry based on large, centralized seed enterprises—a vision that shows the formal seed sector’s bias toward men and commercial farmers. Opportunities may present themselves for including such crops in small, locally operating seed enterprises with lower transport and overhead costs, however. The development of small, local enterprises could be a means for women to break into seed markets and supply the local and improved seed of crops and varieties that are neglected by large commercial seed companies.

Seed regulations and crop and variety protection

Numerous national and international policies influence the development and operation of formal and local seed systems. In many countries the regulatory and legal framework for the national formal seed system limits the development of local seed systems and directly affects women’s position within them.

National seed regulations are usually based on international standards that are often incompatible with the reality of farmers' lives.⁵ They restrict the free exchange and marketing of seed. The combination of compulsory variety registration and seed certification, as practiced in countries in Europe and elsewhere, heavily constrains the efficient functioning of the formal seed sector (notably the development of small-scale seed enterprises) and the development of alternative seed systems (GTZ and CGN 2000). The same constraint arises from the implementation of strong intellectual property rights regimes (World Bank 2006) and arrangements restricting access to genetic resources (Louwaars 2007).

The development of small-scale seed enterprises and local seed markets requires an enabling policy environment. A clear recognition of the roles and contributions of men and women farmers to seed development and management will necessitate a review of farmer's rights, access and benefit-sharing regulations, and intellectual property rights.

GOOD PRACTICES AND LESSONS LEARNED

Past experiences highlight the need to look at both local and formal seed systems, their linkages, and the policy environment that affects them.

Interventions focusing on the local seed system

An analysis of the local system is the starting point for any strategy that aims to strengthen and build on the existing system. A blueprint approach to seed system development will not work; a thorough analysis of the limiting factors of each existing system is vital. Within a household, for example, interests or priorities with respect to seed management may vary by gender and age group. Within a community or region, wealth status or ethnocultural differences can affect knowledge, preferences, and access to critical resources such as seed (FAO 2008b). Projects operating at the community level must be aware that stakeholders are likely to have different needs and priorities (GTZ and CGN 2000). The identification of weaknesses or gaps in seed security will help to define activities that can improve household and community seed security. For example, community seed banks (box 12.11) and community seed fairs (box 12.12) both help to strengthen local seed systems. Managed successfully, they can foster seed exchange networks and establish local institutional mechanisms to supply seed, especially of traditional varieties, within a community. National seed security will improve when local seed security is increased.

Interventions strengthening the formal seed system

The formal seed sector's achievements have been summarized as follows:

Since the 1960s, scientific plant breeding that developed improved varieties suited to smallholders in subtropical and tropical areas—the green revolution—has been one of the major success stories of development. Initially spearheaded by semi-dwarf varieties of rice and wheat and improved varieties of maize from international agricultural research centers of the Consultative Group on International Agricultural Research (CGIAR), public breeding programs in developing countries have released more than 8,000 improved crop varieties over the past 40 years. In the 1980s and 1990s, improved varieties are estimated to have accounted for as much as 50 percent of yield growth, compared with 21 percent in the preceding two decades.

World Bank (2007: 160)

Because these achievements have not been uniform across regions or socioeconomic groups, formal seed systems must develop better strategies for developing and disseminating seed of improved varieties to reach resource-poor farmers.

Plant breeding interventions. Countless breeding interventions aim to address the nutritional and production constraints of resource-poor farmers and significantly improve household food security. Perhaps the most controversial of these interventions is the development of GM crops. Even more than conventional hybrids and other modern varieties, GM crops face significant barriers to dissemination and adoption. Most GM crops in developing countries are currently produced in large, commercial production systems, as they require inputs, knowledge, and management skills that are not available to all farmers. The private sector is the main force behind the development of these crops, and many questions arise about their suitability for poor, small-scale producers.

Attempts are being made—often by public organizations in collaboration with private enterprises—to develop GM crops that tolerate unfavorable crop production conditions common in developing countries, such as poor soils or drought. Vitamin- and micronutrient-enhanced crops, as well as crops that produce vaccines and other pharmacological products, are also envisioned in plant-breeding strategies to improve health and reduce poverty. Despite these efforts, numerous challenges remain in developing and approving GM crops that can be considered to benefit poor people. The accessibility and suitability of such crops, including the potential ecological and socioeconomic risks for resource-poor households, must be assessed further (see Thematic Note 3).

Box 12.11 Enhancing Local Seed Systems through Community Seed Banks

Community seed banks help to meet the complementary goals of improving local food security and recognizing and maintaining the contributions of local crop diversity. Seed of traditional varieties frequently cannot be obtained in the market. Instead, rural people exchange seed within their villages or with people from neighboring villages. This kind of seed exchange is an important instrument for seed supply and diffusion; it is usually based on kinship, traditional relationships, and cultural practices. The establishment of a community seed bank empowers local people to select and multiply seed of traditional crops and varieties of their choice. By facilitating access to seed, especially among women, seed banks often encourage and sustain cultivation of traditional varieties and household seed security. The banks also help farmers to contribute and communicate their knowledge of seed storage technologies. Two examples of community seed banks follow.

- In *Paraíba, Brazil*, frequent droughts and farmers' small landholdings mean that families often cannot produce enough grain to use as food and to save as seed for the next year's crop. Genetic diversity has also been eroded by the preference for seed of commercial rather than local varieties. Commercial varieties are grown to meet market demands and are also used for distribution in government seed programs. Community seed banks help to reverse this trend through participatory, collective efforts to grow and supply seed. In addition to conserving biodiversity, the banks enable

farmers to be self-reliant by supporting the timely provision of seed.

- In *Jeypore, India*, interested households contribute a specific quantity of seed to the community seed bank. Seed is mixed with powdered neem (*Azadirachta indica*) and karanja (*Pongamia pinnata*) leaves to preserve it from storage pests. The village committee (*palli samithi*) forms the seed bank management committee, which consists of three men and women who share the responsibility of managing the bank. The bank records the names and quantities of seed required by needy farm families, and it distributes the seed. The involvement of women has strengthened the seed bank and the seed exchange system. The women perform vital tasks such as periodically monitoring seed quality. About 200 farmers (men and women) are actively involved in the program. The seed bank primarily stores seed of 15 traditional paddy cultivars, along with some millet, oilseed, and vegetable varieties. In 2000 about 700 kilograms of seed were handled.

Apart from their impact on food security, seed banks can improve socioeconomic conditions in rural communities, especially the status of women. By establishing self-help groups to operate seed banks, women can become more active in decision making and more self-confident, and can communicate more easily with government officials or outsiders. Men can become more supportive of women, and conflict between men and women can be reduced.

Sources: Authors; FAO 2002 (India example); FAO 2008a (Brazil).

Seed distribution interventions. Farmers like to experiment with new crops and varieties, and innovative distribution strategies could facilitate poor women's access to improved seed. Packaging seed in small and affordable quantities could be one way of increasing women's access. It is also important to recognize that seed of improved varieties and hybrids often gives the best yields when grown in conjunction with fertilizer and improved crop management strategies (following specific spacing, irrigation, and weeding practices, for example). The availability of these additional resources can be a crucial precondition for successful adoption of improved seed, yet many women lack access to cash and irrigated land.

A detailed analysis of available resources is therefore necessary before promoting such varieties among women.

Interventions strengthening links between local and formal seed systems

In developing countries, farmers' demand for seed is complex and diverse. It would be unrealistic or inefficient for the public, formal seed sector to attempt to meet total seed demand; nor would private, commercial seed providers be able to address all of the seed requirements of resource-poor farmers (Almekinders, Louwaars, and de Bruijn 1994).⁶

Box 12.12 Increasing Seed Diversity and Local Knowledge through Community Seed Fairs

Community seed fairs have shown positive results, especially for women farmers. Community seed fairs offer a venue for displaying and freely sharing seed of different crops and varieties. Seed fairs also offer a good opportunity for knowledge to be shared across generations, between farmers, between communities, and with research and extension staff, thus contributing to expanding farmers' social networks (FAO 2006). Experiences from a range of organizations indicate that these informal settings encourage women's participation.

In China, for example, participants in seed fairs promoted by the Center for Biodiversity and Indigenous Knowledge (CBIK) included 80–150 farmers, local agricultural technicians, officials, scientists from the Yunnan Academy of Agricultural Sciences, CBIK staff, and other guests. Often the share of women participants was as high as 70 percent, because women are closely involved in farming and are the key decision makers when it comes to choosing new varieties. Farmers in each area have their own seed exchange networks but rarely have access to new species and varieties from outside their network. The seed fairs, which were relatively new for participating farmers, served to improve the flow of seed and information within and among communities and to promote the conservation of a wide crop genetic resource base. Experts were invited to give speeches on topics of interest, such as marketing organic produce. Yao and Hani traditional healers took the opportunity to exchange knowledge about medicinal plants.

Sources: Authors; CBIK (China example): www.cbik.org.

A recent World Bank evaluation of the Seed Systems Development Project (SSDP) in Ethiopia, a project ongoing for over 10 years, rated its outcome as moderately unsatisfactory (DEReC 2007). The SSDP achieved its main objective of decentralizing and strengthening the government seed-producing agency (the Ethiopian Seed Enterprise), but it failed to achieve its secondary objective of promoting seed production by private firms and fostering local seed production by farmers.

Recognition is growing that stronger links between local and formal seed systems can lead to the development of an

Box 12.13 Decentralized Participatory Plant Breeding

Decentralized and participatory plant breeding approaches allow farmers to select and adapt technologies to local soil and rainfall patterns and to social and economic conditions, using indigenous knowledge as well. Participatory plant breeding and varietal selection have reduced the development and dissemination of new varieties in some cases by 5 to 7 years, which is half the time (10–15 years) taken by conventional plant-breeding programs.

In very poor areas of South Asia where rice is produced without irrigation (and where the Green Revolution never took hold), participatory plant breeding is now paying off, with strong, early adoption of farmer-selected varieties that yield 40 percent more grain in farmers' fields. The approach must be tested more widely in the more heterogeneous rain-fed environments of Africa, where involving farmers, especially women, in selecting varieties has shown early success for beans, maize, and rice. The cost effectiveness of the approach for wider use also needs to be evaluated.

Source: Adapted from World Bank 2007: 160–61.

integrated seed system in which formal and local actors each play a role. This approach does, however, require collaboration between the many actors involved—breeders, genebanks, and seed projects operated by the formal sector; farmers; and NGOs. Experience with participatory plant breeding initiatives offers some insight into the potential for fostering an integrated approach (box 12.13).

Traditional breeding approaches tend to focus on one characteristic (such as higher yields, more stable yields, or disease resistance). Although the results may be impressive with respect to that particular characteristic, farmers, especially women, may not like the accompanying changes in other characteristics (such as grain color, taste, and ease of processing). In this instance, the knowledge and criteria that men and women use in selecting seed and in their other crop improvement efforts offer the opportunity to strengthen links between local and formal seed systems.

Enhancing communication between local and formal seed systems. Food and livelihood security can increase significantly when shortcomings in local seed systems are resolved. For example, in areas of Bangladesh where CABI's Good

Seed Initiative used videos to outline techniques to improve rice seed quality, seed yield rose an estimated 10 percent. This initiative (supported by the Swiss Agency for Development and Cooperation) aims to strengthen farmers' ability to guarantee food security and improve their livelihoods. The approach, which combines local technologies with those developed by formal research organizations to help women produce quality seed, is now being tested in Africa. CABI, WARDA (Africa Rice Center), and their partner organizations in West Africa and Uganda seek to reach as many as 10,000 farmers. Additional videos will be produced locally as the value of the approach spreads.

Introducing new varieties into the local seed system. Farmers' experimentation with new varieties and the subsequent introduction of adapted and accepted varieties can potentially strengthen cropping systems by increasing yields, improving drought resilience, boosting resistance to pests and diseases, and capturing new market opportunities (Sperling and Remington with Haugen 2006), all of which could widen women's livelihood options. It is important to realize, nevertheless, that not all "improved" varieties will benefit farmers in all agroecological and socioeconomic situations. A careful gender-disaggregated analysis of demand for particular varieties is warranted. Sperling and Remington (2006) discuss key steps for ensuring that characteristics demanded by farmers are considered in introducing new varieties.

Local seed and grain markets, discussed earlier, can offer a good venue for introducing new varieties. These markets, which are frequently visited by rural women, have virtually no formal access to new varieties, to basic (foundation) seed as an input, or to seed quality control services. Even so, there are dramatic examples of how quickly new varieties (including beans in western Kenya and green gram varieties in eastern Kenya) can move through local markets, as farmers spread the word that the new varieties on offer really do perform.⁷

Because the buyers and sellers in local markets are frequently women, the opportunity to support both groups of women by linking new varieties to local seed and grain markets appears substantial. The following actions are necessary to further strengthen women's capacity and access in this context:

- Greater support needs to be given to increasing the quality of seed for the crops and varieties in greatest demand in the markets (these may be local varieties or new ones). Suppliers of large quantities of seed and grain to the market require training to produce better seed

(which does not need to be certified). Most training is concentrated in small community-based groups, often funded by development projects, but general knowledge on how to improve seed quality must be mainstreamed in farming communities.

- The capacity to produce high-quality seed is not enough; farmers and farmer groups require much more training in agroenterprise development. Seed enterprises need to yield profits on a continual basis. The commercial sector has shied away from selling seed of subsistence and open-pollinated crops because the profits are limited. To stimulate consistent demand for this kind of seed, communities must diversify seed production by crop and variety and, crucially, ensure that they have a sustained supply of new and appreciated seed.
- In reference to the point above, direct links need to be forged between those who breed new varieties and those who can multiply and distribute seed at a decent price. Right now, new varieties filter through to communities at an unacceptably slow rate. Research systems have to deliver new materials not only to seed parastatals and commercial producers but directly to important community-based nodes throughout a country.
- Traders and farmer groups need continued access to advice on quality control that is enabling and not threatening. A trader who becomes known for truly good seed should eventually be able to garner worthwhile price margins.

Encouraging the formation of small-scale seed enterprises.

The formation of small-scale seed enterprises—that is, farmer seed enterprises—meets dual objectives: to distribute and promote sustainably modern crop varieties and to establish a regular source of "clean" seed of local or modern varieties. Yet experience indicates that a certain level of resources (such as labor and land) is required to manage farmer seed enterprises successfully; the resource requirement could exclude or discourage women from participating. Some alternative strategies may be better suited to the limited resources controlled by poor people.

For example, the Malawi Smallholder Seed Development Project established by ActionAid in 1995 uses two seed production strategies. The less-poor farmers are encouraged to produce certified seed and operate independently, although they still face marketing problems, for which new approaches, such as the use of stockists, are being investigated. The poorer farmers (many of whom are women) are organized into community groups to produce and distribute seed on a communal basis using group revolving funds (box 12.14). The second strategy has provided encouraging

Box 12.14 Malawi: Community-Based Seed Production

Through the Malawi Smallholder Seed Development Project, groups of smallholders produce improved seed as a means of enhancing household food security. The project has organized 5,405 smallholders into 235 community-based groups to produce seed. Group members are selected through a participatory rural appraisal to identify and assess needs of poor households. The project's concentration on the poorest households has ensured that many more group participants are women, who also perceive greater advantages in belonging to groups than men do. About 70 percent of group members are women, and over 80 percent of the seed-producing groups are composed entirely of women. Women's groups are better organized and their revolving grants for seed production have higher repayment rates than those of men's groups. Women get higher seed yields, generate better savings, and sustain more cohesive groups.

Source: Musopole 2000.

evidence that women's skills and scarce resources can be mobilized to strengthen seed systems and enhance family seed and food security.

Interventions to foster an enabling policy environment

All of the initiatives discussed earlier could benefit from complementary efforts to foster a favorable policy environment, such as the development of seed legislation that protects breeders' rights, interventions that strengthen farmers' rights, and more flexible interpretation of seed laws to support local seed systems. To stimulate the private sector and at the same time support local seed systems for crops that are often ignored by the private sector, well-designed seed and intellectual property rights laws will need to go hand in hand with the recognition of farmers' rights—a balance that is not necessarily easy to attain. Policies for plant variety protection and intellectual property rights must also be gender sensitive. In some instances formal seed interventions and policies can be counterproductive, especially for women's participation in the seed system (box 12.15).

Box 12.15 Southern India: The Role of Gender-Sensitive Policies for Plant Variety Protection and Farmers' Rights

In the dryland farming systems of South India's Deccan Plateau, women's roles in maintaining seed and crop diversity enable rural families to cope with the region's many environmental demands. Here seeds and their management form an economy all of their own, whereby self-reliance in seed, crop diversity, and nutrition are closely intertwined.

But as seed increasingly becomes the "property" of private seed-producing enterprises, this self-reliance is undermined. Plant variety protection enables private companies to cover the cost of breeding new varieties, but it can restrict the scope for farmers to save their own seed through a mix of technological, legal, and economic strategies. These strategies include reducing the genetic variability of new crop varieties through pure line breeding methods; intellectual property rights regimes, such as breeders' rights and patents, which make it illegal for farmers to reuse seed; variety registration and seed certification schemes backed by economic rules; and gender-blind laws that provide no scope for enhancing women farmers' practices, choices, and concerns in the realms of biodiversity and seed production.

Source: Pionetti 2006.

KEY IMPLEMENTATION ISSUES

The guiding principle in any seed intervention is that seed security is a key component of food security. Women are the main food producers in farm households, and so their seed security—in other words, their access to reliable supplies of good seed—is of the highest priority.

A clear assessment of seed demand should be the first step in designing any seed-related intervention. The precise nature of the demand for seed will significantly determine the appropriate seed supply response. It is important to understand exactly why farmers seek seed off the farm:

- Are farmers (men and women) searching for new varieties (which may simply require an initial introduction of seed)?
- Are men and women farmers purchasing hybrids (which can be supplied by a commercial enterprise)?

- Do farmers have seed quality or management problems (which require specialized seed enterprises or extension advice to improve farm-level seed management)?
- Do seed purchases indicate a poverty-induced seed shortage (which will not be addressed by conventional seed provision)?

As formal and informal seed systems focus on different crop species and varieties and seem to serve different clienteles, they should be considered complementary. Both systems have strengths and weaknesses on which development interventions can be based. As seen earlier, women farmers are already active in local seed markets and informal seed systems, and they could make important contributions to emerging small-scale seed enterprises.

The formal seed system can enhance the quality and functioning of the informal seed system by, for example, implementing capacity-building activities addressing both men and women, strengthening community seed banks, and improving seed selection and storage.

These activities require multistakeholder interventions targeting the following actors (GTZ and CGN 2000):

- Individual farmers and farmers' groups, especially women farmers
- Small seed enterprises
- NGOs and development agencies
- Researchers and technicians of national systems
- Policy makers
- Public and private seed companies.

Seed policy should create a framework that enables public and private resources to be used to meet gender-specific demand for seed and that fosters an enabling environment for the synergistic development of the formal and informal seed system. This enabling policy environment will take into account such issues as secure tenure rights for women farmers and improved access to resources, such as inputs or irrigation.

Gender and Crop Protection

Some 20–40 percent of the world’s potential crop production is lost annually because of the effects of weeds, pests, and diseases (CropLife International 2007). New pest problems continue to develop. Attempts to control agricultural pests have been dominated by chemical control strategies, but the overuse of chemicals has adversely affected human health, the environment, international trade, and farm budgets. All of these concerns justify giving high priority to crop protection in development interventions.

Agriculture ranks among the three most hazardous occupations in developing and industrial countries, alongside mining and construction (World Bank 2007). The leading cause of injury on the farm is the improper use of chemicals. Poor awareness of safe practices for handling chemicals and a lack of appropriate protective equipment also contribute to injuries.

Crop protection strategies—the management of pests, diseases, and weeds—have changed dramatically over time. The intensification of agriculture alters agricultural practices significantly. For example, in intensive agricultural systems, more traditional and labor-intensive physical and biological crop protection measures are superseded by pest-resistant varieties and more capital-intensive use of pesticides.¹ In marginal areas, the generally small returns to these expensive chemical inputs make them difficult for farmers to use (IFAD 2002). The recent development of crops that are genetically modified to resist specific pests and diseases presents yet another crop protection alternative to farmers, but the benefits and risks of this technology are still poorly understood in many settings, especially with respect to gender differences.

Pesticides can increase agricultural productivity, but when handled improperly, they are toxic to humans and other species. Aside from the health concerns posed by pesticide residues in food, unintentional poisoning from exposure kills an estimated 355,000 people each year, two-thirds

of them in developing countries.² The costs of medical treatment, lost labor, and reduced long-term productivity can be high. Many farmers in developing countries overuse pesticides and do not take proper safety precautions because they do not understand the risks and fear smaller harvests. Making matters worse, developing countries seldom have strong regulatory systems for dangerous chemicals: pesticides banned or restricted in industrialized countries are used widely in developing countries. Farmers’ perceptions of appropriate pesticide use vary by setting and culture.

Additional negative environmental effects and socioeconomic costs include the debt incurred by farmers to purchase these inputs, the loss of local knowledge and practices once used to protect crops, and dependence on external sources of inputs.

As with so many capital-intensive technologies, the poor, including women and children, are the ones least able to benefit from their use. Recent research in India, for example, shows that small-scale and marginal farmers take loans from private finance corporations to purchase inputs and then, unable to pay their debts, become answerable to moneylenders (Mancini and others 2005). Ultimately farmers may be forced to sell their land to cover their debts, thereby losing their only economic asset. The same study also found marginal farmers to have a 10 times greater risk of severe pesticide poisoning than large-scale farmers.

A study by FAO, WHO, and UNEP (2004) broadly estimates that between 1 million and 5 million cases of pesticide poisoning occur each year, resulting in several thousand fatalities. Pesticide fatalities are overwhelmingly a developing country phenomenon. Although developing countries use just 25 percent of all pesticides produced, 99 percent of deaths from pesticide poisoning occur in developing countries. Children and women are especially at risk. In Egypt, for example, more than 1 million children who help to manage cotton pests are exposed to pesticides.

An agricultural production model is urgently needed that starts to internalize the external costs of pesticide use and incorporates the prevention of ill health, environmental contamination, and the conservation of biological capital into production processes and markets. This goal is specified in the Rio Declaration on Environment and Development. Agenda 21, Chapter 14, deals with promoting sustainable agriculture and rural development, and section I covers “Integrated pest management and control in agriculture” (UN 1992). The Agenda explicitly mentions women as a specific target group for interventions.

KEY GENDER ISSUES

The following sections detail the key gender issues in crop protection and potential benefits of addressing them.

Gender and pesticide exposure

It is important to gain a better understanding of how women are exposed to pesticides in agricultural production, as well as the differential patterns of pesticide use between women and men. Marginal farmers are often engaged in professional pesticide spraying and therefore subject to continuous exposure. Women and children are specifically at risk because they are frequently employed in mixing pesticides and refilling pesticide tanks (Rother 2000). Women and children also perform secondary activities that have been neglected in studies dealing with direct exposure. Extremely time-consuming operations such as weeding are often performed by women and children during the peak spraying season, when residue levels in fields are high (Mancini and others 2005) and can cause secondary poisoning. Women are also exposed to pesticides in the home, for example, by washing pesticide-soaked clothing and disposing of (or using) empty chemical containers.

Women’s involvement in piecework and seasonal labor, and the unfavorable conditions associated with such work (such as less training and protective equipment), increase their risk of pesticide exposure. Women are particularly vulnerable to pesticides at certain times of their lives, especially when they are pregnant. Growing evidence of associations between pesticide exposure, women’s reproductive health problems, and health problems passed on to offspring adds to the concern over pesticide poisoning in women (London and Bailie 2001).

Gender and knowledge of pesticide risks

Compared to men, women are usually less informed about safe pesticide practices and the dangerous side effects of

pesticide use. High levels of pesticide poisoning among resource-poor farmers, especially women, are often reported to be linked to low levels of literacy and education. In many cases, the husband is responsible for buying pesticide from the cooperative, market, or storekeeper, and no information is passed between the husband and wife about safe use—with the result, for example, that women reuse pesticide containers for storing or transporting their crops or cooking supplies. Often pesticide products are not labeled, but even if they are, many women cannot read the information. Although educating people in proper pesticide management is extremely important, education alone will not prevent poisoning. Other factors also require attention, including difficulties in obtaining protective gear, which may be costly, may not be supplied by employers, or may be inappropriately designed for hot climates (London and Bailie 2001; Mancini and others 2005).

Pesticide use is costly and unsuited to women’s cropping strategies

Pesticide use is capital intensive: the pesticide, sprayer, and protective gear all must be purchased. Women’s limited access to productive resources often makes them more reluctant than men to purchase inputs such as pesticides to use on their crops (which are usually food crops). The blanket recommendations commonly provided by extension units or displayed on pesticide labels may be inappropriate for women’s complex mixed-cropping systems. To benefit women, pest control mechanisms must be tailored to the pests encountered in staple and minor crop production.

Inconsistent benefits of alternative pest control technologies across socioeconomic groups

“The distribution of benefits from commercial genetically modified crops is uneven. Although these crops are now grown more widely in developing than in developed countries, to date the benefits have been uneven, concentrated in developed countries and a few commercial crops.”³ The challenge remains to develop and win approval for GM crops that are suited to the agricultural preferences and constraints of poor women and men. In the near term, the application of new molecular biotechnologies and new breeding strategies to crops that are specifically relevant to smallholder production systems in developing countries will probably be constrained for a number of reasons: the lack of reliable longer-term research funding, inadequate technical and operational capacity, the low commercial

value of the crops, the lack of adequate conventional breeding programs, and the need to select the relevant production environments (FAO 2004: 24).

POLICY AND IMPLEMENTATION ISSUES

Many governments have inadequate legislation overseeing problematic pesticides and herbicides. Where the legislative framework is in place, enforcement capability is often weak. The viability of occupational health and safety structures and functions in developing countries is also a primary concern. Agriculture tends to be excluded from many national labor laws and is not subject to any comprehensive international standard. Where regulations exist, they are often sporadically applied because of inadequate legal provisions, low levels of unionization, and insufficient labor inspection. As women form a large percentage of agricultural laborers, they are directly affected by this lack of oversight (see also Module 8).

The chemical industry heavily promotes the use of pesticides for crop protection. In developed countries, on the one hand, the industry markets “new-generation” pesticides that have high efficiency ratios (small doses achieve maximum results) and limited adverse effects on people and the environment. In developing countries, on the other hand, significant quantities of outdated pesticides remain in circulation, and extension agencies and pesticide sellers may not necessarily promote “new-generation” pesticides, which in any case are expensive. Instead, farmers buy older, cheaper, and more hazardous products. As much as 30 percent of the pesticides sold in developing countries do not meet international quality standards. FAO has recently expressed concern about the proliferation of cheap unlabelled pesticides in Africa (FAO/WHO 2001). Many are adulterated, unauthorized, or illegal.

The current drive for economic growth and agricultural trade promotes an approach to food production that emphasizes agribusiness, land consolidation, and contract farming (IIED 2003), in which pesticides play an established role. Although these production systems are important in some segments of the farming community, they do not address the specific circumstances and priorities of resource-poor women farmers, who risk becoming even more marginalized if agriculture increasingly presents alternatives that they cannot adopt. The discussion of GM crops needs to take this issue into account.

Experiences with crop protection in developing countries suggest policies and other interventions that could support crop protection strategies that do not further exclude and endanger the poor, especially women and children.

These strategies include promoting alternatives to hazardous chemicals; improving training and information for women and others in agriculture; and reducing access to dangerous agrochemicals.

Promoting alternative to hazardous chemicals

Crops can be protected from pests in ways that preclude the use of hazardous chemicals, including integrated pest management (IPM), organic crop production, the use of less toxic chemical products, and the promotion of GM crops (although the risks, costs, and benefits of this last option are still imperfectly understood in many settings).

Integrated pest management. IPM (box 12.16) has been implemented successfully across a wide range of crops and agroclimatic zones. Many aid and development agencies have adopted IPM as the model for the agricultural development they support, and the OECD Development Assistance Committee encourages its member states to support IPM.

IPM should go hand in hand with appropriate pesticide management to allow for pesticide regulation and control, including trade, and for the safe handling and disposal of pesticides, particularly those that are toxic and persistent. Cumulative evidence shows that farmers trained

Box 12.16 Integrated Pest Management Defined

The Systemwide Program on Integrated Pest Management of the Consultative Group on International Agricultural Research offers a concise synthesis of IPM principles:

Integrated Pest Management is an approach to enhancing crop and livestock production, based on an understanding of ecological principles, that empowers farmers to promote the health of crops and animals within a well-balanced agro-ecosystem, making full use of available technologies, especially host resistance, biological control and cultural control methods. Chemical pesticides are used only when the above measures fail to keep pests below acceptable levels, and when assessment of associated risks and benefits (considering effects on human and environmental health, as well as profitability) indicates that the benefits of their use outweigh the costs. All interventions are need-based and are applied in ways that minimize undesirable side-effects.

Source: SP-IPM In Brief, www.spipm.cgiar.org/Brief/spIPMbrif.htm.

in appropriate methods of pesticide use suffer lower exposure and can achieve higher net returns than those who are not trained.

IPM has shown positive results in a wide range of socio-economic and ecological conditions (FAO 1999, 2000; FAO and World Bank 2000; Tripp, Wijeratne, and Piyadasa 2005). An important advantage of IPM is that it *builds on the knowledge of women and men farmers* about crop, pest, and predator ecology to increase the use of pest-resistant varieties, beneficial insects, crop rotations, and improved soil management. It combines local knowledge with external knowledge in the search for improved management strategies. The success of IPM depends largely on how well farmers understand and combine knowledge of biological and ecological processes with their farming experience to develop and select options that reduce losses to pests, increase agricultural productivity, manage risk, and meet the demands of local and global markets. As men and women often possess different types of knowledge, applying a gender perspective to IPM is integral for understanding farmers' perceived pest management needs.

IPM is thus knowledge intensive and builds on available human and social capital. By addressing women as well as men, IPM programs and projects can help to invest more equitably in developing human and social capital—two crucial assets for sustainable livelihoods. When women attended farmer field schools to learn about IPM, they reported that the schools helped them gain recognition of their personal skills and abilities. Mancini, van Bruggen, and Jiggins (2007) showed that the personal growth stimulated by participation in field schools was particularly relevant to women and confirmed the importance of increasing women's access to these and other educational programs.

Because IPM is not capital intensive, it is suited to family food production systems, including the production of traditional crops and varieties. Whereas pesticides are more commonly used in commercial production systems, IPM, if developed from a gender perspective, can contribute to increased food security.

Even in these cases, the wider promotion of IPM practices must overcome a number of limitations. IPM can be a time- and labor-intensive strategy, with potential constraints for women, who often lack surplus labor to invest in such initiatives. These factors are highly context specific and must be understood thoroughly before making any decision to promote IPM. For example, in some cases women have had to walk long distances to fetch water to prepare pesticides for cotton production, and switching to IPM based on biological pest control lightened women's labor.

Because IPM is knowledge intensive, it requires an intensive educational approach, which is more challenging to scale up (as farmer field schools and training-the-trainer approaches have shown) as well as demanding of human and financial resources (Feder, Murgai, and Quizon 2004).

The policy environment can also constrain expansion of IPM programs. Policies inhibiting the expansion of community IPM (Fakih, Rahardjo, and Pimbert 2003) include inequitable property rights over land and other natural resources (see also Modules 4 and 10), which commonly affect women more than men.

An important lesson of IPM projects in various countries is that women have continued to be underrepresented (Fakih, Rahardjo, and Pimbert 2003). Often IPM projects rigidly impose criteria for selecting participating farmers, which include the completion of lower secondary school, some farming experience, and the ability to communicate knowledge to others. Although useful in themselves—especially where ensuring the dissemination of knowledge is concerned—these criteria, if formally and rigidly applied, restrict women's access. Other external constraints on women's full participation in farmer field schools and training-of-trainer courses, as well as on their ability to be active farmer trainers, include the following (Nhat Tuyen 1997):

- In many cultures women need permission from their husbands or fathers to attend schools and courses, especially if all or most participants are men. In some cultures it is simply unacceptable for women to participate in group activities with men who are not their husbands or close relatives.
- It may be difficult to schedule activities so that they do not clash with the wide range of family support tasks for which women bear primary responsibility.
- The extent to which men farmers accept having women as part of a group or as trainers must be determined.
- Village leadership, including village administration and cooperative management, plays an important if not essential role in organizing IPM training courses. These leaders interpret and apply the selection criteria. If men dominate village leadership, as is often the case, this domination can easily lead to men's bias in selection.
- The trainers' role is critical in organizing training events in ways that meet the requirements of men and women farmers. When introducing a training course to local leaders, trainers often lack information about how gender operates in the local division of labor. For this reason, they do not have the capacity to negotiate fair representation of women in field schools or other training events, and

often trainers themselves are not convinced that equality of representation is important. The degree to which women have participated in field schools, until now, has depended on the perceptions and initiatives of individual staff and trainers.

- For these newer training approaches to succeed among men and women, a shift in attitudes must occur. The customary preference for working with men farmers must not be transferred from conventional research and extension approaches to new training approaches.

These constraints should be taken into account in future interventions. The IPM farmer field school literature provides a good starting point for reviewing ways of overcoming gender bias.

Other approaches to reduce hazardous chemicals. Other approaches to reduce pesticide use are the promotion of less toxic pesticides, the promotion of organic farming (discussed in Thematic Note 1), and the development of pest- and disease-resistant crops, including GM crops. Scientists, development practitioners, civil society organizations, and politicians have long debated the benefits and constraints of genetically modified crops. Recent conclusions with respect to these issues have been summarized as follows:

The scientific consensus is that the use of transgenic insect-resistant Bt crops is reducing the volume and frequency of insecticide use on maize, cotton and soybean (ICSU [International Council for Science]). These results have been especially significant for cotton in Australia, China, Mexico, South Africa and the United States. The environmental benefits include less contamination of water supplies and less damage to non-target insects (ICSU) . . . As a result of less chemical pesticide spraying on cotton, demonstrable health benefits for farm workers have been documented in China. . . and South Africa. . . Herbicide use is changing as a result of the rapid adoption of HT [herbicide-tolerant] crops (ICSU). There has been a marked shift away from more toxic herbicides to less toxic forms, but total herbicide use has increased. . . . Scientists agree that HT crops are encouraging the adoption of low-till crops with resulting benefits for soil conservation (ICSU). There may be potential benefits for biodiversity if changes in herbicide use allow weeds to emerge and remain longer in farmers' fields, thereby providing habitats for farmland birds and other species, although these benefits are speculative and have not been strongly supported by field trials to date. . . . There is concern, however, that greater use of herbicides—even less toxic herbicides—will further erode habitats for farmland birds and other species (ICSU). . . . Scientists agree that extensive long-term use of Bt crops and glyphosate and gluphosinate, the herbicides associated with HT crops, can promote the development of resistant insect pests and weeds.

FAO (2004, Section B, Chapter 4: 68–71)

Aside from their environmental consequences, GM crops have important socioeconomic consequences. The adoption of Bt cotton can be cited as an overall success for increasing yields, improving farm incomes, and significantly reducing pesticide applications, but these effects have varied depending on the context (World Bank 2007). Some farmers in India experienced losses following the adoption of Bt cotton. In some parts of India, Bt cotton yields less than traditional cotton varieties. The reduced yields, together with rising seed costs, increased farmers' indebtedness.⁴

The distribution of benefits from commercial GM crops has been uneven, concentrated in industrial countries and a few crops. The largest share of GM crops is found in highly commercial production systems (FAO 2004), and the strong commercial interest of the private sector largely determines the kinds of GM crops and traits that are developed. A few promising initiatives aim to develop and promote GM crops with traits that are relevant for developing countries. New Rice for Africa (NERICA), a high-yielding, drought- and pest-resistant type of rice developed specifically for African conditions, is one example. IFAD has provided \$2 million to WARDA to promote the use of NERICA in West Africa and is now designing a series of grants to accelerate NERICA seed multiplication activities in Côte d'Ivoire, the Democratic Republic of Congo, and Guinea (IFAD 2007). The lack of gender-disaggregated data on the adoption and benefits of GM crops makes it impossible to draw gender-specific conclusions, apart from pointing out the gender-specific constraints encountered with other interventions in crop protection and in plant breeding more generally (see Thematic Note 2 on seed systems, for example).

Improving training and information for women in agriculture

Only safe, correct management will minimize the negative consequences of pesticides for human and environmental health and foster their sustained, positive impact on crop production and farmers' overall livelihoods. Given rural women's generally poor access to information and extension exposure, it remains a challenge to convey messages about safe pesticide use to them. Government, the chemical industry, and NGOs have undertaken various campaigns to promote safe pesticide use, but their lasting impact on women's knowledge and on resulting levels of pesticide poisoning is not well documented.

Some of the innovative communication strategies developed in IPM projects could help to convey this important message to rural communities, specifically to women. Aside

from the farmer field schools and training-of-trainers initiatives described earlier, these strategies have included radio programs, audio cassettes, and local “resource centers” with exhibits and educational material, including videos of local people’s experiences with IPM, comic books, leaflets, and posters. These alternatives might be better alternatives for reaching women.

Important subjects for an awareness campaign include the following:

- *Delineating the links between chemical exposures, the effects on human health and the environment, and gender differences in risks and impacts.* In most communities, people are unaware of their routine, even daily, exposure to toxic chemicals in the workplace, at home, and in the general environment. Raising awareness of the immediate health risks of toxic chemicals used in agriculture in developing countries is an intervention that informs work at all subsequent stages of the policy process.
- *Explaining the different toxicity classes of pesticides and the meaning of their corresponding labels.*
- *Describing the physiological effects of pesticide poisoning (short and long term).* Interesting lessons may be learned from participatory self-assessments of pesticide poisoning among men and women farmers (box 12.17).

Providing access to information, knowledge, and technology that promote new and less hazardous methods of using pesticides is another approach that has shown benefits. Box 12.18 describes how the development of appropriate equipment for applying seed dressings helped to reduce

pesticide exposure and its ill effects among women in eastern and southern Africa.

One must emphasize that educational strategies alone cannot protect farmers from the harmful effects of pesticides. Sherwood, Cole, and Murray (2007) note that research financed by the Novartis Foundation—the single largest study ever conducted on pesticide safety concerns—concluded that it was unrealistic to expect poor people in developing countries to manage pesticides safely. Major causes of poisoning in developing countries are the improper labeling, storage, and use of chemicals. Unintentional poisonings account for an estimated 50,000 deaths of children aged 0–14 every year.⁵ Sherwood, Cole, and Murray (2007) report that the Novartis Foundation study concluded that “any pesticide manufacturer that cannot guarantee the safe handling and use of its products should withdraw those products from the market”—a scenario difficult to envision in countries where government and industry capacity to enforce standards is severely limited (see the next section). Other factors, including the lack of appropriate protective gear (discussed earlier), the lack of facilities for washing, and the lack of health services, favor the continued unsafe use of pesticides (London and Bailie 2001; Mancini and others 2005).

Reducing access to hazardous chemicals through regulation and enforcement

Access to the more dangerous agrochemicals could be reduced by strengthening and enforcing laws against exposure to hazardous chemicals. Although regulation and

Box 12.17 Farmer Self-Monitoring of Pesticide Use in Cotton in India: A Tool to Create Awareness

In 2003 the Integrated Pest Management Program for Cotton in Asia (a joint effort by the European Union and Food and Agriculture Organization) designed a participatory project to assess the frequency and severity of acute pesticide poisoning among cotton growers in Andhra Pradesh, India. Through farmer field schools, the program educated farmers about the adverse effects of pesticides on human health and the environment and presented sustainable alternatives to pesticide use. The assessment of acute pesticide poisoning was conceived as a complementary activity to be undertaken in three

Source: Mancini and others 2005.

villages that had farmer field schools. The idea was to measure the health effects of pesticide exposures in real time (over the course of the cropping season) through direct documentation by farmers. Because previous studies focused on men farmers who applied chemical products, this effort concentrated on women as respondents (for themselves and for their men relatives). The assessment’s primary aim was to raise farmers’ awareness of the seriousness of the pesticide poisoning occurring in the villages. It also aimed to quantify the problem through direct reporting by farmers.

Box 12.18 Tanzania and Zambia: Testing a Seed Dressing to Reduce Pesticide Problems

Women in small- and medium-scale farming suffer the worst health problems from pesticide use because they spray the fields themselves, usually without safety precautions. To assist them, the United Nations Industrial Development Organization (UNIDO) has developed a new way to coat seed with a minimal amount of pesticide (“seed dressing”). Seed dressing has proved to be one of the most effective and economic forms of protection. It can control a wide variety of fungal and bacterial diseases, in addition to soil-borne insects and nematodes. The much lower amount of pesticide used also greatly reduces the environmental and human health impacts.

Seed dressing is already used in many areas, but it is usually restricted to large-scale farmers who can afford

Source: UNIDO 1995.

the large, expensive, imported machines that are required. UNIDO developed a mobile seed dressing applicator to meet the needs of women in small-scale farming, initially focusing on Arusha in Tanzania and Lusaka in Zambia. Men and women were trained to use the seed dressing equipment and to handle treated seed safely. Trials of the technology were conducted from 1992 to 1994, and the groundwork was laid for commercial implementation. Farming women were very pleased with the new approach, which would not only enable them to increase their yields, food supply, and incomes, but would also dramatically reduce their exposure to pesticides and reduce pollution in the local environment.

enforcement have no explicit gender component, men, women, and children alike would benefit if countries strengthened and enforced the pesticide regulatory framework to conform to best practice as laid out in the FAO Code of Conduct on the Distribution and Use of Pesticides (FAO 2003). The cooperation of the private sector is crucial to the success of such efforts.

Highly hazardous pesticides (Class I) are still common in many smallholder farming systems. Because patents on many of these products expired long ago, chemical companies can market them at bargain prices, which are attractive to farmers. Farmers are also reluctant to stop using them because the pesticides are often highly efficient, and farmers do not know about their serious health and environmental risks. Farmers may also believe that yields will fall if they stop using these chemicals, especially if no alternatives are introduced. Restricting access to highly hazardous pesticides appears to have no measurable negative effect on rural economies, aside from a decline in pesticide sales (Sherwood, Cole, and Murray 2007). Farmers identify alternatives, “proving that these pesticides can be substituted by switching to non-chemical pest control or less toxic pesticides. The latter are usually more expensive than highly toxics, but judicious use leads farmers to use them economically” (Sherwood, Cole, and Murray 2007: 32). Sherwood and coworkers also report that knowledge-based methodologies, including farmer field schools, successfully assisted growers

in abandoning highly hazardous chemicals without suffering reduced yields. They conclude that “despite the claims of governments and industry, the problem with eliminating highly toxics never has been a lack of alternatives, but rather the political will to place the interest of the public over those of influential private actors” (Sherwood, Cole, and Murray 2007: 33).

There is growing recognition, based on ever-more evidence, that Class I pesticides negatively affect health, especially of women and their unborn babies. The rapid physiological changes experienced by women during pregnancy, lactation, and menopause render them more vulnerable to toxins. Exposure to pesticides can cause miscarriage, premature birth, birth defects, and low birth weight (WHO 2006). A substantial portion (up to 33 percent) of a woman’s chemical burden can be passed on to an unborn child during gestation and to a baby through breastfeeding.

In light of this and other evidence, FAO encourages the early withdrawal of highly toxic pesticides (FAO 2006). Use of such pesticides is prohibited or severely restricted in OECD countries, and in line with the International Code of Conduct, FAO would like to see them banned at the earliest date in developing countries, where it is virtually impossible to guarantee their safe use. A growing number of developing countries, including China, Thailand, and Vietnam, have already prohibited the use of methyl parathion, monocrotophos, and several other Class I pesticides.

GUIDELINES AND RECOMMENDATIONS FOR PRACTITIONERS

Pest control is undoubtedly essential for commercial and subsistence farming systems to meet the growing demand for food and contribute to other development goals, but evidence is mounting that the sole reliance on pesticides to achieve such objectives is unsustainable. The high environmental and human costs of pesticide use must now be taken into account, along with the considerable gender effects of pesticide use, which despite their seriousness have been largely ignored.

The strategies discussed in this Module to reduce the use of harmful pesticides can be promoted in parallel. To succeed, they will need supportive policies, and they will also need to be devised with a full understanding of women's circumstances. Several actions must be considered:

- *Government and institutional support:* Alternatives to pesticide use must be promoted actively. Structural factors that encourage the inappropriate and unnecessary use of pesticides—including direct or indirect subsidies; pro-pesticide biases in research, extension, and training; or credit linked to pesticide use—should be removed. Research and extension services require institutional support to conduct work with a clear gender focus.
- *Technical solutions:* Farmers require solutions to their crop protection problems that take account of gender-specific needs. Researchers must work with farmers, recognizing gender divisions of labor, to develop appropriate solutions. This collaboration is particularly important in the promotion of genetically modified crops, because no gender-disaggregated data on risks and benefits are currently available.
- *Farmer participation:* Participatory field schools or their equivalents are good channels for providing information on safe crop protection strategies to farmers, for strengthening many good farmer practices, and for recognizing farmers' expertise. A focus on the gender differences in expertise for different crops and production systems is important. Farmers who use pesticides need to acquire the knowledge and confidence to use sustainable alternatives.
- *Explicit inclusion of women:* Unless women are specifically identified and included in project planning and implementation, and encouraged to assume leadership roles, they are likely to remain invisible. Training, information, and extension to reach these women are essential, or else they will continue to bear many of the consequences of unsafe pesticide use.
- *Messages developed to reach women:* Pest control messages have conventionally been targeted at men farmers,

a bias that must be addressed to ensure that women benefit from information campaigns. Messages designed to improve women's awareness, knowledge, and skills with respect to safe pesticide use must be designed to overcome the barriers that are often raised by women's lower socioeconomic status, more limited education, and other constraints. The use of alternative communication channels should be explored.

NOTES

Overview

This Overview was written by Sabine Gündel (Consultant) and reviewed by Ira Matuschke, Mary Hill Rojas, and Catherine Ragasa (Consultants); Regina Laub (FAO); Maria Hartl (IFAD); Robert Tripp (ODI); Eija Pehu (World Bank); and Niels Louwaars (WUR).

1. Although there is not scope in this Module to discuss urban agriculture, recent studies document its benefits among women who are responsible for family food provision (Anosike and Fasona 2004; Ba Diao 2004). Women use urban agriculture as a primary strategy to maintain livelihoods and protect household income through subsistence production. Urban agriculture requires an investment of household resources, such as land, labor, and capital, that can motivate women to go beyond acquiring food for domestic use. Urban food enterprises represent an avenue through which unskilled and uneducated women potentially gain entry into the business milieu (Hovorka and Lee-Smith 2006).
2. For a discussion of broader natural resource management issues in relation to gender, see Module 10.
3. For example, crops with greater amounts of micronutrients that promote human health, such as betacarotene, iron, and zinc.
4. Among many examples, see Adato and Meinzen-Dick (2007).

Thematic Note 1

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Thematic Note 2

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1. See also International Center for Agricultural Research in the Dry Areas, "Contributions from Seed Programs and Projects," *Seed Info: Official Newsletter of the WANA Seed Network* 33, www.icarda.org.

2. Examples of such crops include self-pollinating crops (common beans, groundnuts, rice), vegetatively propagated crops (potatoes, sweet potatoes, cassava), and crops with limited seed demand (indigenous vegetables, forages, open-pollinated maize) (Scott and others 2003).

3. Louise Sperling, "Finding the Seeds of Recovery Close to Home," *CGIAR News* (March), www.cgiar.org.

4. See also *ibid.*

5. N. P. Louwaars, "Seed Laws: Biases and Bottlenecks," www.grain.org/seedling_files/seed-05-07-2.pdf.

6. Niels P. Louwaars, "Seed Laws: Biases and Bottlenecks," *Grain* (July): 3–7, www.grain.org/seedling_files/seed-05-07-2.pdf.

7. See note 3 above.

Thematic Note 3

This Thematic Note was written by Sabine Gündel (Consultant) and reviewed by Ira Matuschke, Mary Hill Rojas, and Catherine Ragasa (Consultants); Regina Laub (FAO); Maria Hartl (IFAD); Robert Tripp (ODI); Eija Pehu (World Bank); and Niels Louwaars (WUR).

1. Pesticides are chemicals, including insecticides, herbicides, and fungicides, that are used to control insects, weeds, and other pests and diseases.

2. "Global Occupational Health," <http://globalhealthedu.org/Pages/Default.aspx>.

3. "Brief 37-2007: Executive Summary Global Status of Commercialized Biotech/GM Crops: 2007," www.isaaa.org.

4. "Indian Cotton Farmers Betrayed," press release, www.i-sis.org.uk.

5. World Health Organization, "What Happens When Children Live in Unhealthy Environments?" Fact Sheet 272, www.who.int/mediacentre/factsheets/fs272/en.

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