AGRICULTURE GLOBAL PRACTICE DISCUSSION PAPER

GENDER AND AGRICULTURAL RISK

A Gendered Approach to Agricultural Risk Assessments and Management Strategies

April 2017

THE WORLD BANK
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ACRONYMS AND ABBREVIATIONS

ARM	Agricultural Risk Management
ASRA	Agricultural Sector Risk Assessment
FAO	Food and Agriculture Organization of the United Nations
GBC	Gender-Based Constraint
GDP	Gross Domestic Product
NGO	Nongovernmental Organization
UN	United Nations

CHAPTER ONE
INTRODUCTION

The objective of this paper is to develop an approach for integrating a gender dimension into Agricultural Sector Risk Assessments (ASRAs). The focus is on the approach because both agricultural risk and gender issues are contextual—thus the outcomes of a gender-based risk assessment are highly dependent on the social, cultural, geographic, and economic contexts of the setting in which the assessment is applied. Each ASRA must be tailored to capture gender differences that arise due to a country's unique combination of risks, cultural differences, institutional arrangements, and fiscal constraints. The target users of this approach are agricultural development practitioners in charge of making decisions about, planning, and/or conducting an ASRA and designing (and implementing) the corresponding risk management strategies.

For over 10 years the World Bank has assisted developing economies in designing agricultural risk management (ARM) products, tools, and strategies. A wealth of experience and lessons learned were gained over the last decade by conducting a number of ASRAs across several countries and agricultural commodities. This work extended and refined the understanding of agricultural risks, their impacts, and their transmission across the sector, and the efficacy of different strategies to manage them. Capturing this experience, the World Bank published in 2015 "Agriculture Sector Risk Assessment. Methodological Guidance for Practitioners" on how to assess risks and develop risk management solutions in the agriculture sector (World Bank 2015a). While development practitioners welcomed that guidance, it failed to address issues related to gender differences and their implications for risk management. This paper addresses that omission.

The conceptual framework and step-by-step illustrations presented herein are based on lessons learned by the World Bank and other institutions in assisting developing economies in conducting sector and key commodity supply chain risk assessments (World Bank 2015a). The paper also relies on recent work by international institutions and academic research that offer insights into the complexities of gender issues in relation to agricultural shocks. These experiences inform this paper's case for a gender-based approach to ARM and help to illustrate a practical, stepwise approach for conducting gender-based ASRAs.

Many ways exist to assess agricultural risk, with various degrees of sophistication and a variety of methods. The conceptual framework adopted in this paper is highly illustrative in nature. It (i) offers a checklist of issues to consider to identify and assess gender differences while prioritizing risk, and (ii) serves as the basis for formulating gender-smart solutions to agricultural risk.

The outcome of this work will complement the current operational ARM framework and toolkit applied by the World Bank, International Fund for Agricultural Development (IFAD), and other agencies, and will assist in focusing interventions aimed at strengthening agricultural systems' resilience. This work is part of a wider initiative led by the Agriculture Global Practice of the World Bank Group to develop analytical frameworks and tools for assessing agricultural risks and to design risk management strategies in developing countries. This paper should be considered a companion to the 2015 World Bank publication "Agriculture Sector Risk Assessment. Methodological Guidance for Practitioners."

The organization of the paper reflects the challenges of incorporating a gender dimension into ASRAs. Those challenges translated into answering the following questions: (i) Is there evidence of gender-differentiated impacts of agricultural risk and of gender-differentiated responses to agricultural risk? If yes, then (ii) Is there a justification for conducting a gender-based approach to risk management? If yes, then (iii) How should it be done?

As such, Chapter 2 offers a summary of the conceptual framework for risk management, including addressing why a gendered approach to ASRAs is essential. Chapter 3 shows the available evidence that agricultural risk has a gender-differentiated impact on farming households and that farming households adopt a gender-differentiated response to risk. This provides the justification for incorporating a gender lens in the operational approach to ASRAs. Chapter 4 describes a step-by-step operational approach for doing so, and includes guidance for formulating gender-smart policies and strategies for strengthening agricultural systems' resilience. Chapter 5 presents a summary of findings and concluding remarks.

CHAPTER TWO

AGRICULTURAL SECTOR RISK ASSESSMENT

Conventional analyses of agricultural value chains typically emphasize productivity and value addition, often through identification and removal of critical constraints or bottlenecks, and aim at efficiency gains and/or distributional purposes. This approach tends to ignore the issue of volatility in both production and markets and its effect on supply chain performance; it also does not address the incidence, allocation, or implications of risk or how incentives to add value among different actors (i.e., smallholders, women, and small and medium-size enterprises) might explicitly alter risk patterns. Whereas the definition of risk implies the presence of uncertainty and the probability of losses (e.g., from a pest outbreak), the definition of constraint implies a certain factor known to cause suboptimal performance in agriculture (e.g., poor soil) (Box 2.1). This is important because a risk management strategy aimed at reducing volatility will provide sustainability to agricultural investments targeting increases in productivity and efficiency. Both strategies are typically mutually reinforcing.

The World Bank's conceptual framework for ARM looks at risk from a broad sector perspective and considers it as a decision support tool for designing strategies to manage risks in the agriculture sector.

An ASRA is simply an orderly process to analyze, identify, and prioritize risk, and serves as the basis for the design of risk management strategies. The ASRA's primary

BOX 2.1. DISTINGUISHING BETWEEN RISKS, CONSTRAINTS, AND TRENDS

It is important to differentiate "risks" from "constraints" and "trends."

"Risks" are uncertain events that have the probability to cause losses. The element of uncertainty is present. As a symptom, yield volatility might be caused by a drought or a pest or disease outbreak.

"Constraints" are conditions that lead to suboptimal performance. For example, low yield (symptom) might be caused by lack of access to inputs or poor technology. The element of certainty is present.

"Trends" are longer-term or "chronic" patterns (reversible or irreversible) that provide context. For example, declining yield (symptom) might be caused by structural changes in agriculture or changes in climatic patterns (e.g., desertification).

Source: World Bank (2015a).

objective is to assist policy makers to simplify and better comprehend the complexity of ARM, by following a systematic approach to prioritize solutions to mitigate, transfer, and/or cope with agricultural risk. Highlighting the types and orders of magnitude of risks and targeting the most vulnerable stakeholders can improve planning and investments to strengthen resilience in agriculture.

2.1 THE RISK MANAGEMENT FRAMEWORK

A holistic perspective for assessing agricultural risk (Figure 2.1. Components of ARM) needs to:

1. Understand the different tasks in the risk management process
2. Consider the full range of risks—production, market, and enabling environment
3. Engage all stakeholders affected by agricultural risks—producers, commercial sector, and government
4. Analyze different strategies to manage risk—mitigation, transfer, and coping
5. Suggest an action plan—including policy reforms, pubic investments, and knowledge transfer.

More detailed explanations of these various components are presented in Chapter 4 in reference to the operational approach.

As risk management is not a single step but a process, and as its components are not linear, they are better illustrated as a cycle of tasks (Identification, Assessment, and Management) that interact with the other components in a more dynamic flow around the needs of various stakeholders, who are at the center of the process (Figure 2.2. ARM framework).

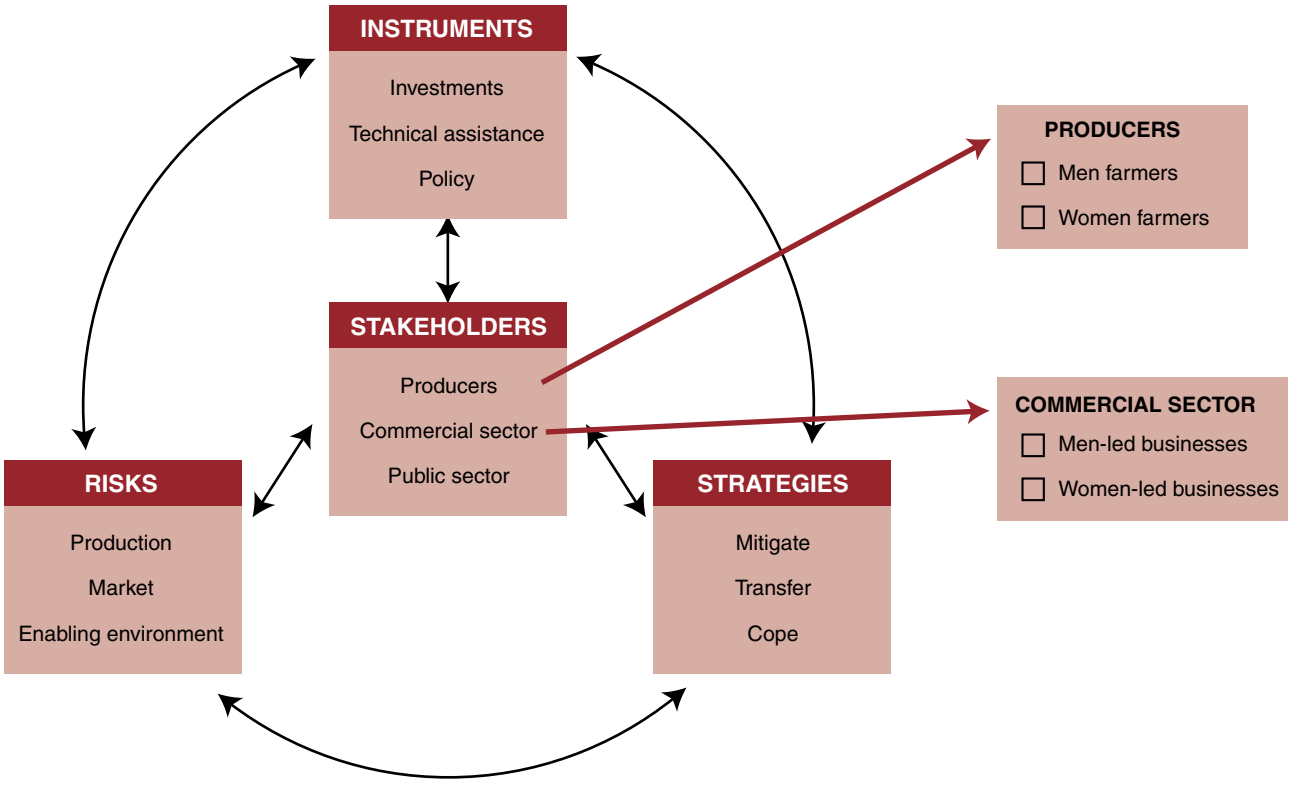
This conceptual framework has been applied in the conduct of risk assessment in various countries. However, it is imperative to disaggregate stakeholders, shown in Figure 2.2 as producers and the commercial sector, to capture gender differences in the analysis. The justification is based on the premise that distinctive gender differences arise in how agricultural risk impacts women and men, and in how women and men respond to risk (as shown in Chapter 3). Sex-disaggregated data can be captured, analyzed, and incorporated in the various steps of the ASRA, including how risk affects assets, livelihoods, and various stakeholders' capacity to manage and recover from external shocks. Developing gender-based solutions in agricultural supply chains is a necessary strategy to address an increasingly volatile global context and to open new opportunities for strengthening the resilience of smallholder supply chains. Annex A provides a more detailed explanation of integrated risk management strategies and instruments.

However, risks and the capacity to manage them vary a great deal across countries, commodities, and regions. In practice, ASRAs might involve greater or lesser attention to particular types of risk, depending upon the contexts and objectives of the work. The composition and structure of the various supply chains comprising the agriculture sector in a country and participation by gender in agricultural supply chains will determine the degree of risk exposure for women and men participating in agriculture—as producers, traders, input suppliers, and/or service suppliers.

FIGURE 2.1. COMPONENTS OF ARM

Source: World Bank 2015a.

FIGURE 2.2. ARM FRAMEWORK



Source: Adapted from World Bank 2015a.

2.2 WHY INCORPORATING A GENDER LENS IS IMPORTANT

A better understanding of gender differences while assessing agricultural risk can allow for more comprehensive and effective agricultural resilience policies and interventions, avoiding disruptions in rural livelihood strategies. Understanding the root causes of gendered differences when households are facing risk is essential if risk mitigation investments and risk coping programs are to reduce rather than reconstruct people's risk in future risk events.

Everyone operating in the agriculture sector faces many types of risk that are often interrelated, including those posed by markets and prices, policies, institutions, and production. Recent emerging evidence (discussed in Chapter 3) indicates that women farmers are more highly exposed to agricultural risks than men for many of the same reasons that farm productivity is lower for women than men—namely, women have fewer endowments and entitlements, they have less access to information and services, and they are less mobile. Likewise, women and men tend to cope with risk differently given their asset endowments, their use of income and wealth, and the responsibilities they adopt within the house and the community.

Understanding the different roles and situations of women in their participation along supply chains in terms of their access to and control of productive resources, services, and employment opportunities is critical for assessing and prioritizing agricultural risk and for identifying gender-smart solutions for managing risk and strengthening resilience. Resilience can be strengthened in many different ways and at different levels through political, economic, sociological, and technological interventions.

Women farmers typically have different constraints than men when facing risk, and the feasible options open to women also differ. In certain contexts, social norms or barriers increase the complexity of the challenge for women to mitigate risk or cope in a manner that preserves their agricultural and nonagricultural livelihood strategies. For example, social norms may prevent women from pursuing off-farm activities to diversify their sources of income in the aftermath of an exogenous shock—and

consequently influence women's level of vulnerability, incomes, and ability to pay for the cost of diversifying their farming practices. In some countries, only men have the right to cultivate certain crops or to access markets, leaving women marginalized in terms of diversification strategies and market opportunities essential for managing risk. Another consideration is that many agricultural practices that strengthen resilience require a high investment of time or labor (to build stone bunds and terraces, for example) and thus are often not prioritized if women's agricultural activities are undervalued.

Additionally, because of women's primary roles in both natural resources management and in family care, they also respond differently to shocks than men do. Women bear the greater burden of agricultural risk in smallholder farming, primarily through greater expenditures of effort: walking greater distances to fetch water, working harder in the field because of changing weather patterns, and developing diverse coping strategies to feed their families. Thus women should be key players in any strategy aimed at strengthening farming systems' resilience.

If these prevailing differences across gender lines are not taken into account when assessing agricultural risk, the potential for women to benefit from risk mitigation strategies could be overestimated, and the potential for men and households as a whole to benefit underestimated—providing a misleading indication of what ARM strategies can achieve. To truly capture and address agricultural risk, incorporating gendered-based impacts and responses, assessment of those differences must be an integral part of ASRAs and the findings incorporated in corresponding ARM strategies.

It is no longer justifiable to treat "farmers" as a homogenous group of stakeholders. It is imperative to analyze the differential impacts and differentiated responses that agricultural risks exert over women, affecting their livelihoods and their capacity to recover from external shocks. Interventions that are based on false assumptions or that disregard the gendered dimensions of agricultural risk will fail to strengthen the resilience of rural livelihoods. Recognizing these issues opens the possibility of designing ARM strategies that acknowledge who the most exposed and vulnerable are and how they may be affected. It ensures development of more targeted, relevant, and early responses for those groups of individuals.

CHAPTER THREE

GENDER-DIFFERENTIATED IMPACTS AND RESPONSES TO AGRICULTURAL RISK

ASRAs conducted by the World Bank to date have adopted an approach that places priority on high-value commodities and considers stakeholders in supply chains as the unit of analysis. The result is that greater attention has been devoted to the analysis of risk for high-value supply chains, which are mostly represented by men. Even when ASRAs focused expressly on domestic crops and livestock for reasons of food security, the emphasis was on farmers in general, without unpacking the differences that a gendered lens can provide.

Some efforts have been made in the design of ARM strategies and policies to identify and target specific exposed, vulnerable farmers. Farmers, however, are part of households made up of individuals, and an intervention may affect household members differently. It is important to understand how proposed interventions are likely to work and the contexts in which certain social, economic, or political factors may affect women and men differently, rather than affecting the household as a whole.

Understanding how exogenous shocks impact women and men is a key issue to address if risk mitigation measures and risk coping programs are to reduce rather than reconstruct people's risk in the agriculture sector. A review of the evidence shows that aggregate economic shocks do not have homogenous effects on farmers' households. Gender matters in explaining differential effects, in terms of both the direct (or first-round) effects of an economic shock and of households' response strategies (or second-round effects). Moreover, these effects vary across countries and stages of development.

Past empirical studies typically presumed that households behave as though they are single individuals, as the assumption of a "unitary household" is convenient and innocuous in many contexts (Udry 1996). However, a growing number of studies since the early 1990s have found strong evidence to the contrary (Strauss and Thomas 1994). These studies conclude instead that the aggregate demands generated by households

should be modeled as the outcome of some interaction between household members (women and men) with diverse resources, preferences, and responses.

Gender relations are socially constructed under different geographic, cultural, political-economic, and social conditions. Regarding agricultural risk, gender relations have complex social consequences for women and men that present elaborate challenges for analysis in a single model or framework. However, it is critical to assess the gender-differentiated impacts of agricultural risk as well as the clearly gender-differentiated responses for coping with it. The empirical evidence around gender differences associated with three fundamental issues bolsters this assertion: (i) asset endowment; (ii) the division of labor; and (iii) knowledge and information. Analysis of these three issues illustrates why and how women and men within farming households are impacted differently by and respond differently to agricultural risk under particular contexts. These three topics are the focus of the remainder of this chapter.

3.1 ASSET ENDOWMENT

Responses to shocks and the ability to cope with vulnerability are very much dependent on assets, and possession of or access to liquid assets is particularly important to avoid impoverishment.

Significant evidence on gendered vulnerability to shocks comes from studies that examine differences between male- and female-headed households. Kumar and Quisumbing (2014) found, for example, that in Ethiopia and Bangladesh, after controlling for numerous factors, female-headed rural households were more likely to report a reduction in living standards or asset holdings as a result of the 2007–2008 food price increases than male-headed households.

The next four subsections look more closely at the issue of asset endowment and its relationship to agricultural risk vis-à-vis: (i) context-specific differences; (ii) the amount and types of assets that men and women own; (iii) individual or joint asset ownership; and (iv) differentiated uses of income and wealth. All of these factors help to explain how men and women are impacted by agricultural risk and how they respond to shocks.

3.1.1 CONTEXT-SPECIFIC DIFFERENCES

In a revealing piece of work for Uganda and Bangladesh, Quisumbing, Kumar, and Behrman (2011) found that while many shocks are similar in both countries, commonly experienced shocks do not necessarily have the same effects across countries or on men's, women's, and jointly owned assets within countries. Land and assets in general are relatively well-insured against food price increases in Bangladesh, but jointly held assets and wives' assets in Uganda are negatively affected by food price increases. Weather shocks negatively impact husbands' assets in Bangladesh and wives' assets in Uganda. Reflecting differences in country and context, dowry and wedding expenses take their toll on wives' land in Bangladesh, and illness shocks also have a large detrimental impact on wives' assets there, while death negatively affects wives' assets in Uganda. The small impact of weather-related shocks on wives' assets in Bangladesh relative to Uganda's may reflect lower direct exposure to agricultural risk, as Bangladeshi women rarely cultivate land independently.

Differences in the relative impact of shocks, and their consequences for various assets depending on whether men or women own them, show that responses to shocks are context-specific, as are gendered responses to shocks.

3.1.2 ASSET OWNERSHIP

At the individual or household level, shocks such as the presence of a drought frequently result in asset sales. Therefore, information on ownership of and access to assets is important to assess stakeholders' capacity to manage risk. The findings can be integrated into risk management strategies to assist women's acquisition of and control over key assets that can be used for coping with agricultural risk.

An increasing body of literature shows that household welfare is not equivalent to the welfare of the individuals within it (Haddad, Hoddinott, and Alderman 1997; Duflo and Udry 2004; Sen 1990; Folbre 2001). Simply collecting information on total household assets and dividing the total by the number of adults in the household presumes that each individual has equal access to household wealth and will benefit equally from the fruits of that wealth. It implicitly assumes that ownership and control over assets

within the household will not affect decision making and outcomes. As numerous studies have shown, this is clearly not the case.

For women, a primary source of economic vulnerability is divorce or the death of a husband. Indeed, household dissolution—whether due to divorce, separation, or death—is increasingly common (World Bank. 2008). In many countries, widowhood and divorce are associated with female poverty (Dercon and Krishnan 2000). To the extent that assets provide economic security and a safety net, researchers have started trying to understand how ownership and control of property are distributed among women and men and which individual members are better positioned to cope with changes in household assets when facing agricultural risk.

Evidence reviewed shows that men and women use income and wealth in different ways. A few studies have shown that household expenditures differ depending on the assets brought to marriage by each spouse (Fafchamps and Quisumbing 2005; Quisumbing and Maluccio 2003) and that the current asset distribution by sex affects household expenditure patterns on food, health, education, and household services (Thomas 1999; Katz and Chamorro 2003; Doss 2006a; Quisumbing, Estudillo, and Otsuka 2004). Therefore, the impact of agricultural risk on household expenditures should be gender-differentiated based on asset ownership and asset control among the individuals composing a household. Based on this evidence, important efforts are already being made to systematically measure asset ownership from a gender perspective (Box 3.1).

Women in many countries are far less likely than men to own or control productive assets. In addition, women may not receive the benefits of assets held by men even when they live in the same household (Deere and Doss 2006). Government policy, social norms, intra-family arrangements, and the market determine ownership and accumulation of assets. Gender biases in each of these different institutions and practices limit women's ability to obtain and keep assets. Women face greater risk of poverty and economic vulnerability than do men, and women's lack of asset ownership exacerbates this situation.

A review of asset ownership worldwide provides an interesting picture of the distribution of asset ownership in various countries.[1] Box 3.2 offers the following global picture.

[1] Note that this is a rapidly evolving area of research and that these examples are for illustrative purposes to make the point of gender differences in asset ownership and control of assets. For more precise statistics, please refer to specialized agencies systematically evaluating these issues. In any case, ASRAs need to identify these differences within the context in which they are applied.

BOX 3.1. HOUSEHOLD SURVEYS AND ASSET OWNERSHIP

Despite the existing evidence on the gender gap in asset ownership and wealth, the required information is currently not available for the overwhelming majority of countries. This situation is in part due to knowledge gaps in preferred questionnaire design and respondent selection protocols for capturing individual-level data on ownership of and rights to assets. With this in mind, the United Nations Evidence and Data for Gender Equality (EDGE) project and the World Bank Living Standards Measurement Study (LSMS) program established a partnership in March 2014 to implement a randomized household survey experiment that documents the relative effects of different approaches to survey respondent selection and questionnaire design on individual-level measurement of ownership and control of assets.

The household survey experiment, known as the "Methodological Experiment on Measuring Asset Ownership from a Gender Perspective" (MEXA), was implemented by the Uganda Bureau of Statistics (UBOS) during the period of May–August 2014 with in-country training, survey management, field supervision, data processing, and quality control support from the LSMS. MEXA was conducted successfully using the World Bank's Survey Solutions Computer-Assisted Personal Interviewing (CAPI) software.

The MEXA analysis yields an extensive set of findings that underlie recommendations for survey implementers in specific areas of data collection on ownership and control of physical and financial assets at the individual level. Subsequent phases of this experimental survey design detailing the experience and its applications in household surveys promise the construction of large national databases that will be extremely useful for risk analysis.

Source: World Bank 2016.

BOX 3.2. REVIEW OF ASSET OWNERSHIP WORLDWIDE

Land Ownership. Most data on asset distribution by sex in developing countries refer mainly to land, not surprising since in developing countries land is the most important component of wealth, especially in rural areas. Across the world, women account for less than 20 percent of the world's landowners (UN Women 2012).

A sizeable gender gap in land ownership exists in Africa, though the data on land ownership in Africa are hard to interpret, since much land is held collectively or is untitled. Recent data in FAO's Gender and Land Rights Database show that women's land ownership is still irregularly dispersed. For example, women in Nigeria and Honduras own 4 percent of plots; in Nicaragua and Uganda, women's ownership is as high as 20 percent and 18 percent, respectively (FAO 2010–11). The categories of private, communal, and state-owned land include a range of overlapping rights that add layers of complexity to any analysis of land "ownership."

Livestock. Livestock offer women a path toward additional income and food security (FAO 2013). Sales of meat, eggs, and milk can increase women's decision-making and economic power, particularly important when coping with risk. In turn women frequently use the money to purchase food, household items, or medical treatment or to pay school fees that conceivably benefit the household (IFAD 2010). A general pattern is for men to own large livestock, particularly work animals, while women own smaller livestock and yard animals.

Women face several challenges specific to their gender that constrain their ability to succeed as livestock keepers. In addition to difficulties already discussed, access to training, extension services, markets, financial services, and occupational health hazards make it harder for women to improve quality of life by raising livestock (FAO 2013). Other inequalities include that women have less access to improved livestock species and enjoy fewer rights (ILRI 2010).

Pastoral women are further marginalized even as they account for a necessary part of agriculture, raising stock in parts of the world where conventional farming is impossible. They build homes, tend to livestock, raise and educate their children, and manage domestic tasks such as cooking and fetching water and firewood. Women's responsibilities prevent their mobility, so they are less likely to receive relief food or to venture out to look for work in towns (Anderson and Brouch 1999). In many developing countries women are responsible for milking and processing livestock products as well as selling them at market, but do not necessarily have control over money from sales. Methods to increase income and access must take into account the roles and responsibilities of women and men, social norms, and customary laws (IFAD 2012).

Nonfarm Business Assets. Business assets usually provide a stream of income that provides security to the owners. Microfinance programs throughout the world have focused on increasing women's access to business capital for purchase of business assets. Notwithstanding the large amount of international research on microenterprises and informal sector businesses, little of this research has focused on whether a gender gap exists in business assets. In an early study in Ghana, Doss (2006b) found that although women are more likely than men to own business assets, the mean value of business assets owned by men is much higher than that owned by women.

3.1.3 JOINT OWNERSHIP OF ASSETS

Most research clearly shows that men own the majority of individual assets. The data collected by International Food Policy Research Institute (IFPRI 2015) to identify lessons learned from eight worldwide projects show early interesting insights into the issue of jointly owned assets and reveal a considerable amount of joint ownership of different assets. A significant share of household land is under joint ownership, especially in Africa. It seems that joint ownership is even more important for livestock and consumer durables, with the share of jointly owned animals close to or even exceeding what is owned by men individually and always greater than that owned solely by women.

However, in general, it has been found that where men and women have different rights to the same asset, men tend to have more and stronger rights than women. For example, a wife often has the right to use her husband's land (van den Bold et al. 2013; Gilligan et al. 2013). Women control milk for home consumption, but men control income from milk sales to collection centers (Johnson et al. 2013). Women can use a pump but not loan it out to others without permission (Njuki et al. 2014). Even in examples where husbands and wives discuss what to do and make decisions together, when they cannot agree, it is almost always the man who has the final say. In most cases, men feel they own all household assets by virtue of

being heads of households. As one respondent in a focus group discussion for a Kickstarter project said, "Men have the right to sell all assets, even those owned by women" (Njuki et al. 2014). But in the project, when a man sold an asset without his wife's permission, she was able to appeal to a project authority for its return. When a woman's name was on a land title, it could not be sold without her permission. These cases were possible because women were aware of their rights and had access to a means of defending them.

Although societal norms govern the gendered distribution of assets, often embodied in a legal framework (Box 3.3), these are by no means immutable. ARM strategies can reinforce agriculture development strategies, thereby shifting the gendered asset distribution.[2]

3.1.4 GENDER-DIFFERENTIATED USE OF INCOME AND WEALTH

Assets can serve as a buffer when households face economic shocks. Assets can be used to smooth consumption and prevent households from potential long-term impacts of shocks. Therefore, asset accumulation is an important risk coping strategy. However, family members differ in their contributions to household revenue and in their control of its use. Where women and men have different preferences, household expenditures will vary depending on how control over income is distributed within the household.

A large body of evidence shows that in many parts of the world, men and women spend money differently: women are more likely to spend the income they control on food, health care, and education of their children (Haddad, Hoddinott and Alderman 1997; Lundberg, Pollak, and Wales 1997).

Using a longitudinal data set of 957 households in rural Bangladesh constructed with 10-year survey intervals between 1996–97 and 2006–07, Quisumbing (2011) found that within a household, men's and women's non-land assets are drawn down for different types of shocks: wives are responsible for paying for illness-related shocks, while husbands' assets are drawn down to pay for daughters' dowries and weddings. This study also looked at the impact of shocks on land held by men, by women, and jointly. Consistent with findings on non-land assets, husbands' landholdings are drawn down with wedding and dowry expenses, while wives' landholdings increase with deaths in the household (possibly due to inheritance). Jointly held household land—as opposed to individually owned land—appears to be better insulated from shocks.

[2] A specialized reference on gender legal constraints can be found on the World Bank's "Women, Business and the Law" website. The website collects data on laws and regulations constraining women's entrepreneurship and employment. The dataset illuminates how government policies limit women's full economic participation through unequal laws and a business environment that does not support the businesses in which women participate.

BOX 3.3. THE LEGAL FRAMEWORK FOR ASSET OWNERSHIP

National constitutions, civil codes, and legislation shape the policy context of women's de jure property rights. While most countries no longer deny women ownership rights over assets, many national laws are still inconsistent with international legal frameworks, including the Convention for the Elimination of all Forms of Discrimination Against Women (CEDAW), to which most countries are signatories.

The framework that determines women's property rights—particularly of married women—is the combination of legal marital and inheritance regimes, sometimes referred to as family law. The legal marital regime defines the property rules governing assets acquired prior to or during the marriage. Legal marital regimes can be differentiated as to whether: (i) the assets acquired prior to marriage remain individually owned or are pooled to form community property during the marriage; (ii) the assets acquired during the marriage (through wages, salary, rent, interest, etc.) are in fact joint assets or owned individually by the person generating the income; and (iii) the assets inherited during the marriage belong to the individual or the married couple. The right to marital assets extends beyond the marriage and determines what happens to the assets upon dissolution of the marriage through divorce or death of a spouse.

Source: IFPRI 2015.

More directly related to the rural context, evidence from Malawi and Uganda showed that women are likely to spend more of their income on food compared to men while men are likely to spend more of their income on assets than women. On average, women spend 23 percent of their earnings on food and 14 percent on assets while men spend only 8 percent of their income on food and 25 percent on assets (Njuki et al. 2011). In Côte d'Ivoire, better-than-average rainfall associated with high yields of women's crops shifts their bonus expenditure toward purchasing food (Duflo and Udry 2004). Asset ownership, in particular, is among the factors that may influence women's control over income and bargaining power in household negotiations (Doss 1999; Thomas, Contreras, and Frankenberg 2002; Quisumbing and Maluccio 2003).

Gender-based differences in responsibilities for coping with agricultural shocks have several implications for long-term asset accumulation. For example, men have a long time to accumulate the assets needed to pay for a dowry or wedding, which are anticipated events. In contrast, food shortages come on quickly and unexpectedly; dealing with them is the responsibility of women. As a response to agricultural risk, women are more likely to spend the income they control on food, health care, and education of their children, using wealth and income for smoothing consumption at the onset of crisis, whereas men's assets are not drawn upon until the severity of a catastrophic event merits their use. Thus men and women may have different capabilities and roles in managing risk and coping with shocks.

3.2 DIVISION OF LABOR AND RESPONSIBILITIES

In many parts of the world—for example, Sub-Saharan Africa and South Asia—although women are the main farmers or producers, their roles are largely unrecognized and often escape the objectives of public policy. The growing proportion of women in agriculture is one of the most striking trends of recent times, and a large body of literature has debated the "feminization" of labor markets. Women account for around 40 percent of Africa's agriculture labor force (World Bank and the ONE Campaign 2014), but this figure varies by country. For example, in Uganda, 75 percent of agricultural producers are women; in Ghana women make up 50–70 percent of the agricultural labor force, but earn less than 10 percent of its income (Aduamoah-Addo 2016). In areas where migration and HIV (human immunodeficiency virus) are affecting rural demographics, agriculture is becoming feminized, as women increasingly become major actors in the sector. In many countries, women also play active roles as traders, processors, laborers, and entrepreneurs, despite facing many obstacles (compared to their male counterparts) in market access and bearing heavy responsibilities in their reproductive roles. However, the design of many development policies and interventions continues to assume incorrectly that farmers and rural workers are mainly men, who thus become the main recipients of programs aimed at reestablishing agricultural productive capacity in the aftermath of exogenous shocks, leaving women as recipients of food aid.

The results of a study conducted by Wawire (2011) on gender roles and risk in the Turkana District of Kenya corroborated those of other studies on the gender division of labor: women's roles revolve around the homestead while those of men feature outside the house. However, Turkana women's roles go beyond the homestead to include roles in livestock production and cultural activities. The effects of drought and resultant famines pose challenges to both men and women in Turkana District, but as a result of their prolonged stay in this harsh environment, residents have devised coping strategies. Box 3.4 addresses some details of the findings to illustrate how men and women face risk in this particular context.

Evidenced gathered for a World Bank (2012a) report on the 2009 economic crisis showed that women continued to bear the burden of household responsibilities despite experiencing longer hours in paid work and income-generating activities. In many communities, interviewees noted that when the time women spent in income-generating activities was added to the time they spent cooking, cleaning, caring for children, and handling other household needs, women worked much longer hours than men. This was particularly apparent in the Central African Republic, where an interviewee noted, "It is the sleep which drags her away from her daily housework,"

BOX 3.4. GENDER-DIFFERENTIATED EFFECTS OF DROUGHT ON THE PERFORMANCE OF WOMEN'S TASKS IN PASTORALIST HOUSEHOLDS IN KENYA

Obtaining water: Interviewees revealed that obtaining water for household use and for drinking purposes is very difficult during the drought period. Lack of rain means the rivers dry up. This creates competition for the available water sources, which are usually so far that women and girls have to walk long distances to get to them. They walk up to 2–10 km in the Turkwell area and 30 km in the dry Kapua area. To beat the long queue at the water points, women start the trip before dawn. This poses security problems because they may be attacked by bandits or rapists on their way. To counteract this, women walk in groups. Transporting the water for long distances is also a problem because women carry the water on their heads in heavy traditional wooden troughs originally meant to be carried by donkeys, before the drought killed them. The few people using boreholes/shallow wells face similar shortages because the wells dry up due to too many users. If they break down, they are not repaired because the majority cannot afford the maintenance costs.

Provision of fuel: Women have to walk long distances to get firewood because of slow tree regrowth during the dry season.

Construction of houses: The construction materials (twigs and leaves) are from a wild plant called *egol* (dumb palm). Construction becomes tedious during the dry season. Women have to keep dismantling, loading, unloading, and reconstructing new houses as the migrations become more frequent.

Provision of food for the family: Food becomes scarce during the drought period. Women have to rely on alternative sources of food since the usual foodstuffs (milk, meat, and blood) are no longer easily available. Wild fruits are found in the fields while maize meal is bought at the markets or supplied by famine relief agencies. Even those living near the river are not better off because it dries up. Farming activities are reduced to small plots along the river where water forms pools (*amokolol*). Alternatively, people use boreholes. Consequently, only vegetables are grown on a small scale. Most women complain that cooking the "new" kinds of goods (maize and beans) is more time- and fuel-consuming compared to cooking milk, blood, and meat.

Provision/decision making: Men feel that their role as heads of households is adversely affected during the drought period because of reductions in family resources. There is no money to provide food, clothing, and even school fees for family members. There are therefore fewer chores to distribute and delegate. Most of the men interviewed feel that women's status in the family is uplifted because they receive famine relief food. Many men interviewed feel threatened by this because their role as providers is undermined by the relief food controlled by women. This creates conflict in some families.

Provision of water for livestock: Women are responsible for provision of water to livestock left at the homestead; they obtain this water from boreholes. During the dry period, the water table of the wells lowers and thus women have to scoop these wells almost on a daily basis. The wells are as deep as 10 meters. This task is laborious and dangerous because the wells may collapse. Apart from providing water for the stock left behind, women must take on additional roles because most of the time men migrate in search of livelihoods. Women have to perform the role of household heads.

Procurement of pasture and water: This role is performed by men. Water and pasture become scarce during the dry season, which necessitates migrating to new locations and walking for long distances. Men's role as security providers intensifies during this period because insecurity mounts as the movements become frequent and long, especially from the neighboring Pokots. Even in homes, security needs intensify during drought.

Source: Wawire 2011.

and in Kenya, where rural women reported 18-hour working days.

3.2.1 COPING STRATEGIES

Reducing the quality of food and the number of meals is the most typical behavior-based coping response—and often the first one used—for households responding to an economic crisis. This specific coping response was observed worldwide in the various case studies conducted for the abovementioned World Bank report (2012a).[3] In Bangladesh, women commonly reported that they ate after everyone else was fed, even if it was not enough food

[3] During sudden food crises, women, children, and infants can become quickly malnourished, according to the World Food Programme (2016). Women and WFP. Helping Women Help Themselves. WFP website: https://www.wfp.org/our-work/preventing-hunger/focus-women/helping-food-assets.

BOX 3.5. ILLUSTRATION OF GENDER-DIFFERENTIATED RESPONSIBILITIES IN WEST AFRICA

In West African cocoa farm units, men and women earn separate incomes within the same household. Men control most high-income cocoa crops, while women cultivate smaller plots of consumption crops, which provide less income. Money collected from cocoa crops is not always shared equally among household members, but women and men have specific obligations to pay for ordinary expenses in support of the household. This varies within each home, but men (high earners) typically pay for large expenses and women (low earners) pay for smaller expenses. However, because women tend to have less income to apply toward necessary expenditures and therefore less excess money to retain, they have less power in decision making and bargaining, and household food security is negatively influenced.

Source: Kiewisch 2015.

for nourishment. Gender-based distribution of food is a coping strategy commonly used to handle food crises (Lambrou and Nelson 2010).

Reducing nonfood consumption (e.g., of soap and coal), working more hours, and diversifying sources of income (e.g., by entering a new informal occupation) are common reactions nearly everywhere. Migration is also prevalent, sometimes including reverse movement to the home area and migration of men toward urban centers as they seek work. Women respond in general by expanding their duties and reducing consumption.

Women's subordination and economic insecurity (e.g., contingent labor, home and care work, lack of credit and savings, etc.) are factors that explain not only their different vulnerability to risk but they also underlie how women respond differently to regain the initial pre-shock position. In many countries, women are often confined to the production of subsistence foods, left with little choice but to respond to risk by lowering consumption. Box 3.5 illustrates another example of gender-differentiated responsibilities within households in West Africa.

More specifically, in comparative studies across male- and female-headed households, Kumar (2014) showed that female-headed households are more susceptible to a shock like a rise in food prices and tend to eat less preferred foods and cut back on quantities served, because they are generally the member responsible for providing food.

Such coping strategies in severe situations, especially for pregnant and lactating women, can have adverse long-term consequences for children's nutrition and cognitive development as well as for economic outcomes, thus weakening households' resilience (Alderman, Hoddinott, and Kinsey 2006).

3.2.2 RISK-SHARING WITHIN THE COMMUNITY

The 2012 World Bank study found that assistance for women often comes from relatives, friends, and neighbors. Relief frequently comes from informal groups organized around mutual solidarity, often along occupational lines. The mere idea of belonging to informal community groups seems to make people feel stronger and helps them get through hardships. Moral and financial help from religious organizations is common, but help from nongovernmental organizations (NGOs) is less frequent. NGOs had a presence in additional study sites, but did not always aid in a form that the respondents perceived as important or helpful for coping. Government assistance was important for coping only in sites in the former socialist countries of Eastern Europe, Central Asia, and Mongolia—countries that had large national social protection programs in place prior to the crisis (World Bank 2012a).

Kumar and Quisumbing (2014) found that women look outside the household for insurance mechanisms. It is argued that women share their response to risk with other women in the village while men have a wider and less defined approach to risk-sharing. Indeed, cash transfers from the spouse and the extended family seem not to be responsive to shocks, but those from nonfamily friends are.

Women's behavioral responses to responding to shocks (tightening their household responsibilities and reducing consumption) place them in the most vulnerable of situations. To the extent that women often resort to these mechanisms, it is important to recognize that these coping strategies have long-term effects on the nutritional status of children, and thereby reduce resilience. The absence of appropriate social safety net policies and ARM strategies compounds this problem.

3.2.3 DEGREE OF LABOR MARKET PARTICIPATION

Shocks can induce rural household members to increase their participation in the labor market if household responsibilities and labor market conditions allow for it. In times of economic crisis, women typically enter the labor force (the "added worker" effect) in response to declining household income (a second-round effect). This effect appears to be particularly strong in lower-income households and in lower-income economies, where an informal labor market or a rural sector can absorb additional workers (World Bank 2012b).

Though much of the existing literature has focused exclusively on urban areas, Lim's (2000) study of the Philippines showed that women's entry into the labor force is much more marked in urban areas; however, in rural areas, women's overall labor force participation has not increased but their work hours have increased significantly. In fact, women's work hours seem to have replaced men's work hours in agriculture. Similarly, exploring state-level data in India, Bhalotra (2010) found that recessions are associated with an increase in rural women's labor supply. She argued that this result suggests the dominance of the added worker over the "discouraged worker" effect in rural India; that is, economic downturns increase household poverty.

Similarly, Kumar and Quisumbing (2014) reported that shocks can induce households to increase their labor supply to compensate for the increased expenditure or reduced income caused by the shock (Berloffa and Modena 2009). In some contexts, cultural and gender role barriers restrict women from entering the labor market. Even when women can enter the labor market, multiple factors do not work in their favor. A gender wage differential

exists in labor markets in the developing world (whereby women get a lower wage for the same job) and women are often subject to sexual and physical abuse (Garcia, Hernadez, and López-Nicolàs 2001; Hinks 2002). Increased labor supply by women in response to a shock, whether in the local labor market or outside, can have significant implications for children in these households, particularly for adolescent girls, who then have to take on domestic responsibilities (Holmes, Jones, and Marsden 2009).

In crises, women's small-scale trading networks can be damaged, thus reducing a principle 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, even exposing them to sexual violence and abuse.

In extreme cases, conflicts and shocks increase women's use of transactional sex as a risk-coping mechanism. Recent research in rural Tanzania showed that shocks lead to a tripled increase in paid sex and that as income goes down, sexually transmitted infections (STIs) surge (de Walque, Dow, and Gong 2014).

Gender-based violence is another form of bias limiting women's opportunities and how they respond to crises. Violence against a woman takes many forms. It includes but is not limited to physical, sexual, or psychological harm. Women can be subjected to violence within the family, from the larger community, or as state-sanctioned abuse (WHO 2009). Gender-based violence often results from unequal power relations between men and women.

Migration is a coping strategy often used if the local labor market opportunities are not sufficient or perceived benefits from migration outweigh the costs of entering the market locally. Migration may increase resilience for both origin households and migrants. People may move to pursue better opportunities but also to escape economic, political, or social distress. Migration benefits the origin household because of potential remittances, but more immediately because there is one less mouth to feed during hard times. The family's choice of a migrant is gendered, with families investing in different children's migration. Because women are more likely than men to leave their natal villages to marry in many countries, marriage, as well as marriage-related migration, has a prominent role in resilience (Kumar 2014).

3.3 KNOWLEDGE AND INFORMATION

The issues of knowledge and access to agricultural technology have been brought forward as key determinants of gender gaps in agricultural productivity, recently analyzed and summarized in a World Bank (2014) research publication for six Sub-Saharan African countries. The same reasons that explain the gender gap in agricultural productivity in that report can also explain women's lower capacity to manage risk. Although the intention is not to generalize the findings of one country to others, this subsection presents some highlights of the findings that are important for ASRAs.

The World Bank (2014) report maintains that knowledge and training on farming methods and techniques are critical for all farmers, but that it is particularly important to target women farmers. Women farmers tend to receive second-hand information from husbands and friends if they are not the head of their household, may not attend field training activities due to household responsibilities or mobility constraints, and may not be able to interact with male extension agents due to cultural norms.

For example, women farmers in Tanzania receive fewer extension services than men, and this difference contributes to the country's gender gap: women produce 14 percent less per acre than men. Similarly, extension services do not lead to the same returns for women farmers in Ethiopia, who produce 23 percent less per acre than men, or in Uganda, where women produce 13 percent less per acre than their male counterparts. This evidence suggests that these services are less effective for women or are poorly attuned to their needs.

Informal social networks play a critical role in the exchange of agricultural information and the adoption of agricultural technologies among farmers. Cultural norms, such as restrictions on women's interactions with

men outside the household, as well as time and mobility constraints may limit avenues for female farmers to access public extension and formal agricultural information services. Women's networks tend to differ from men's (for one thing, their networks are smaller), and research suggests that women may rely more heavily on them for accessing agricultural information, particularly from other women.

Across the countries profiled in the World Bank (2014) report, women's lower levels of education hamper both their access and returns to agricultural resources. The gender gap in human capital observed today is partly due to women's lack of access to education in previous decades. Although girls' school enrolment rates have increased markedly, offering the promise that future generations of women farmers will not face the same obstacles to productivity, today's adult female farmers continue to have lower education levels.

3.4 GENDER AND RESILIENCE

The World Bank (2012a) analysis of the 2009 economic crisis observed that women played a major role in shock absorption, possibly more so than during previous crises. Researchers offered two reasons for why women shouldered the consequences of the global crisis and helped foster community resilience. First, the financial crisis heavily affected the formal job sector, which employed a large portion of women. Women lost their jobs, and as the recovery started, those positions did not re-emerge.

Second, women in the roles of caretaker and food provider for their families adopted alternative strategies for food and goods resourcing and for childcare. Women spent longer hours obtaining items needed to sustain families, and bore the stress of helping children cope with the new reality. While not directly related to agriculture, this global analysis highlighted and recognized the central significance of women in enabling the "resilience" with which societies managed this crisis.

Existing surveys and monitoring mechanisms are not likely to routinely measure these pressures exerted on women. Thus policies and strategies need to recognize them and gender-differentiated interventions designed to strengthen the capacity of various members of a household to absorb shocks. In agriculture, strengthening women's resilience to shocks and economically empowering women need to be taken into account in key risk management policies and strategies, and gender-smart solutions to agricultural shocks must be implemented.

Overall, the main policy and operational implications are that gender-differentiated impacts to shocks, the causes of differentiated responses, and the effects on well-being and resilience need to be identified. A gendered assessment of agricultural risk will fill an information gap and help to inform policy and better target the operational tools and interventions designed to improve ARM practices in developing countries. These are precisely the objectives of a gender-based ASRA.

CHAPTER FOUR
AN OPERATIONAL APPROACH TO GENDER-BASED ASRAS

Chapter 4 provides practical guidelines on how to integrate gender issues into the process of conducting ASRAs as advised by the World Bank and other development partners in developing countries. It first identifies the existing gaps in taking into account gender differences in the agriculture sector. It then addresses the various entry points in the process of risk assessment where a gender lens could be introduced in a practical way. It next presents the issues of vulnerability and understanding capacity to manage risk. The chapter ends with examples of best practices related to gender-based solutions to risk management that illustrate the design of gender-based risk management strategies.

4.1 A GENDER-BASED APPROACH: WOMEN'S ROLE IN SUPPLY CHAINS

The end product (output) of the ASRA process is a set of actions that require special attention to reduce vulnerability to shocks associated with the identified key priority risks. As resources are scarce, decision makers need to see an explicit risk prioritization and strategy identification process. The risk prioritization helps justify the proposed interventions in terms of reduction of agricultural income volatility, consumption smoothing, food security, protection of vulnerable stakeholders, and agricultural resilience. The measures can then be incorporated into government plans and budgets as part of government agricultural policy and strategies.

Risks faced by agricultural stakeholders can be classified primarily into three categories: production, market, and enabling environment risks. Depending on the market integration of any particular supply chain and its context, each type of risk can be present, dominant, or absent. Each can also affect unique segments of the supply chain or the entire chain. Many women farmers are more vulnerable to agricultural risk compared to men for many of the same reasons that farm productivity is lower for women than men, as discussed in Chapter 3.

The types of risk that impact women and men most and their individual (or joint) capacity to manage them are best assessed in this framework by analyzing each agricultural supply chain individually. Women participate in various modalities along the different phases of value addition in agricultural supply chains, from farm to fork. Many face constraints and risk in ways that are very distinct from those of men. Recent research by the International Financial Corporation (IFC 2016) illustrates the dimension and diversity of activities performed by women in agricultural supply chains in developing economies, as follows.

Women comprise over 40 percent of the agricultural labor force worldwide as farmers, entrepreneurs, and laborers, and are significant contributors to agribusiness supply chains. In addition to women's roles and employment on large commercial farms, the perspective of women as small-scale farmers needs to be brought to the frontline of analysis. Women's activities in agricultural production vary greatly across commodities and regions. For example, Indonesian women provide the majority of the labor in rice farming, but less than one-third of the labor for rubber (IFC 2016). However, women are oftentimes paid less than men for the same work, and are overrepresented in informal, unpaid, part-time, and seasonal work. Because women are an important labor source in agricultural production, leveraging their potential and providing them with risk management tools like access to assets, as well as training, land, and inputs, can help the agriculture sector increase productivity and better manage risk.

The following subsections present an overview of the many ways women participate along supply chains, as producers, in post-harvest activities, and to a lesser extent, in transportation.

4.1.1 WOMEN IN PRODUCTION

Women play a variety of roles in input provision and use. They are active as small-scale farmers for own consumption, selling in the market, and providers of agricultural inputs to agribusinesses. They act as agro-input retailers and agro-dealers, and they are hired as extension workers and rural agro-agents. Women's activities are well-suited to assist input supply companies and enable an effective and wide reach of companies' products to large consumer markets. Women represent significant potential to upgrade value chain performance and build input markets, benefiting women and input supply companies at the same time.

4.1.2 WOMEN IN POST-HARVEST ACTIVITIES

While women are generally, though not universally, responsible for key processing activities, specific roles in post-harvest and storage seem to be highly variable across regions and supply chains. However, a few cross-cutting lessons emerge. Research has found that women are more likely to participate in processing activities as employees of larger firms, rather than as individual entrepreneurs. Also, where post-harvesting activities are not mechanized, they are more likely to be carried out by women.

Post-harvest processing is typified by high levels of variation between men and women in different commodities, even within the same region. For instance, in Bangladesh, women provide 5 percent of the labor in harvesting and threshing for rice, while in Assam, India, women provide 60 percent of the labor. For other post-harvest activities, Bangladeshi women provide 51 percent of the labor, while women in Assam provide 90 percent. A gendered supply chain mapping should pay particular attention to the division of labor within each stage.

As a rule, women's activities can be divided into (i) energy-heavy activities, with prominent ones including milling and de-hulling of grains and walking with loads, and (ii) time-heavy activities, with prominent ones including walking, waiting, and manual milling. In particular, the major staple crops (maize, paddy, sorghum, millet, and cassava) constitute a group of core crops for which production and manual processing are significant, with a high involvement of women in post-harvest activities. Also, as a rule women's access to storage tends to be lower than that of men because of the required access to transport and financing.

4.1.3 WOMEN IN TRANSPORTATION

Women in agribusiness are likely to be excluded from transportation of goods to market or from marketing or sales of goods, even when women are the main producers of those goods. Where women are involved, their

sales opportunities are more likely to be confined to local markets rather than regional or international ones. This results in poor access to networks and is reinforced by infrastructure and trade systems that tend to inadvertently disadvantage women.

4.2 THE RISK ASSESSMENT PROCESS FLOW

An ASRA is devised as a consultative and time-bound process to be carried out over an estimated 12-month period. This rapid assessment draws upon available quantitative data and qualitative information collected through stakeholder interviews and dialogue.

The ASRA is considered as the process of identifying and prioritizing the major risks that typically explain (depending on government objectives) agricultural gross domestic product (GDP) volatility, food insecurity issues, and vulnerability of the rural poor. In the past, this same process was established and applied to assess risk for agricultural enterprises in various countries. The approach proposed herein adapts the process to include gender-smart solutions as part of the formulation of ARM policies and interventions. Thus for each of the supply chains under assessment, it is important to:

1. Understand very well the institutional and socio-economic context of women participating in agriculture
2. Identify and assess women's and men's current risk management practices and their roles and constraints
3. Assess women's and men's capacity to manage risk
4. Identify a package of solutions in consensus with stakeholders that will strengthen stakeholders' current risk management practices.

The result of an ASRA should be a set of practical risk management measures that stakeholders agree upon and that will contribute to a more resilient agriculture sector. Early consultations with stakeholders will enhance ownership of the process and facilitate incorporation of the recommendations into government plans.

Risk analysis can be complex since it involves assessment of several stakeholder groups participating in various agricultural supply chains. Given the complexities of agricultural production, processing, and commercialization, there is no shortage of risks and potential solutions to manage them. Moreover, effective risk management generally requires close cooperation between the various actors involved in different political economy scenarios, who usually defend their particular vested interests. The facilitation process requires risk assessment teams to assume a neutral position and play the role of "honest broker" among parties, with the explicit mandate to answer the following questions in a gender-based approach:

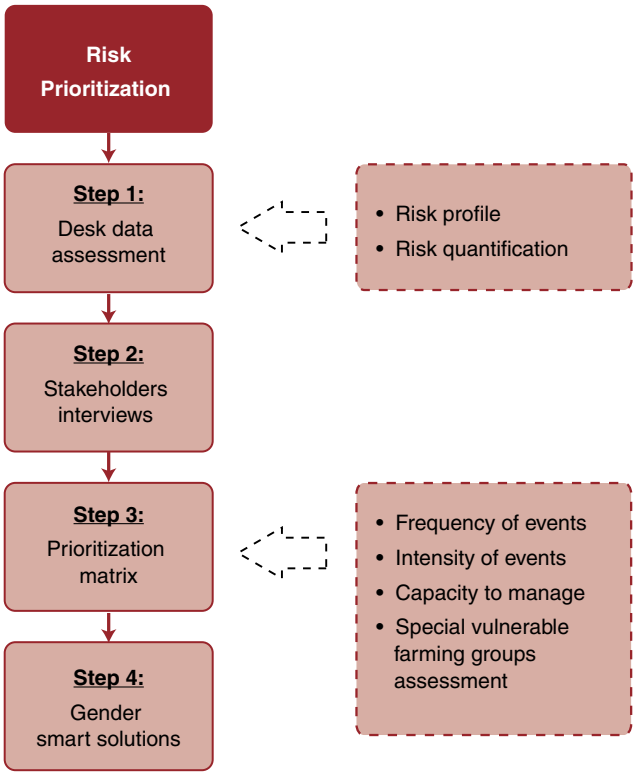
1. What are the key agricultural risks faced by women and men, and who is mostly affected?
2. What are the optimal and practical solutions to manage women's key risks?
3. What are the gender gaps in current ARM strategies?
4. What is the action plan to strengthen women's and men's resilience to shocks in agriculture?

An assessment team typically comprising between three to four agribusiness specialists is needed to conduct the overall ASRA. Each specialist is required to assess and prioritize risk and corresponding solutions in particular supply chains, including answering the questions stated above, and to follow the gender-based approach outlined in this paper. The team in a subsequent step aggregates the findings of individual supply chains into a sector-wide assessment. A gender specialist is needed as part of the core assessment team to lead and guide the various members of the team on the process and outcomes regarding gender.

The ASRA process is basically an approach whereby the risk assessment team establishes the guidelines and systematically facilitates the discussion among stakeholders to prioritize risks and corresponding solutions. This facilitation also includes the collection and processing of qualitative and quantitative information that informs the assessment process and forms the basis for discussions among stakeholders.

Figure 4.1 shows a simplified step-by-step version of an ASRA process. It starts with data assessment for identifying and assessing risks for major individual commodities' supply chains followed by interviews with key stakeholders. It uses the findings to build a risk prioritization matrix at an

FIGURE 4.1. THE SEQUENTIAL ASRA FLOW PROCESS



Source: Adapted from World Bank 2015a.

aggregated sector level at the end of the process. Individual supply chain risk assessments that are later aggregated at sector levels serve as the backbone of the approach. This process allows obtaining the information that is needed to identify and design solutions tailored to managing agricultural risk.

This sequential flow process has proven very practical in conducting ASRAs to date. It should be adapted to the particular circumstances of the country where it is applied and should incorporate a gender-differentiated approach to risk management in every step along the process flow. The step-by-step activities shown in Figure 4.1 are sequential: the findings of each step inform and serve as the basis for the next. Though the full description of activities in this process can be found in World Bank (2015a), the following subsections offer suggestions on how to incorporate a gender lens along the four key steps of the ASRA.[4]

4.3 STEP 1: DESK ASSESSMENT

The first step of the ASRA process is to gather background information on the agriculture sector, collect relevant data (quantitative and qualitative) for risk analysis, and conduct a desk-level assessment before stakeholder interviews in fieldwork. The main objective of this step is to understand the structure and dynamics of the agriculture sector, to identify major risks for agricultural supply chains, and to obtain the information to start unpacking and quantifying the causes of risk. A gender-based background assessment would include, among others:

1. An understanding of the relative weight, role, and structure of the sector within the broader economy
2. The composition of and stakeholders' participation in the main supply chains, differentiated by gender and region
3. Familiarization with agricultural policies, strategies, and programs—including those addressing vulnerability issues
4. Identification of historical agricultural GDP volatility and preliminary identification of key agricultural risks (by commodity, region, and stakeholder groups—including women and men)
5. Preliminary identification of levels of vulnerability among various stakeholder groups, differentiated by region and gender when possible.

This exercise allows the team to get familiar with the country context, the broader economy, and with the agriculture sector in particular.

4.3.1 THE OUTPUT OF THE DESK ASSESSMENT

A gender-based outcome of the desk assessment will highlight the main gender issues of the ASRA and deliver sex-disaggregated data when possible. The findings of this desk work serve as the basis for formulating preliminary hypotheses regarding risk prioritization and the potential solutions. The subsequent field interviews serve to confirm hypotheses and fill information gaps, particularly on the capacity of women and men participating in the agricultural supply chains to manage risk.

[4] See World Bank (2015a) for a full description of the ASRA guidelines.

By the time the desk study is complete, the team should be able to produce a gender-differentiated output of:

1. A timeline of major shock events that have caused volatility in the country's agricultural GDP or food imbalances
2. A list of risk events and their frequency of occurrence
3. Quantification of production losses for each commodity due to those risks in terms of yield losses (volume) and monetary value losses
4. An assessment of the importance of price volatility of agricultural commodities in terms of the magnitude of shock to the sector
5. An assessment of major current public and private sector interventions addressing risk.

The importance of the background assessment is that it sets the stage for the rest of the ASRA. It is at this early stage that most of the working hypotheses of risk, impact, and capacity to manage them start to be developed. The rest of the steps along this process use the assumptions and findings revealed in this initial background research. It is therefore imperative to properly integrate a gender dimension at the onset. If planning ahead during the background research and information-gathering phase is overlooked, the team will not capture the information needed for the risk prioritization and corresponding gender-smart solutions developed later in the process.

4.3.2 CROP SELECTION AND GENDER FOCUS

A developing economy's agriculture sector is often based on production of a wide range of agricultural products. Given the time limitations to assessing all crops, filtering criteria to choose representative crops can be useful. The team can rank commodities in terms of:

1. Their relative importance to export earnings
2. Their contribution to food security and
3. The participation of women and men.

A simple rule of thumb used in prior assessments to arrive at a representative group of commodities is that the final mix of commodities represents around 80 percent of agricultural GDP. Typically, the group of commodities will be composed of export commodities (i.e., coffee, tobacco, cocoa, cotton) and domestically consumed crops (i.e., maize, sorghum, millet, rice). The group of agricultural crops to be assessed should be representative of the sector as a whole. Women usually actively participate in one form or another along those supply chains. However, additional crops representative of women's agricultural activities and employment should be added to this group if necessary.

4.3.3 ANALYSIS OF EXISTING MATERIAL

Sources of information are numerous and vary from one country to the next. They include government agencies like Central Banks, Ministries (Finance, Agriculture, Environment, Livestock, Rural Development), and other government agencies like those involved in disaster prevention and early warning systems. Farmers' associations and commodity boards publish annual reports assessing performance, constraints, and risks. Similarly, regional and international development institutions and donor-supported research can prove valuable for this initial assessment. Issues that are thoroughly researched include: (i) demand conditions; (ii) supply chain structures; (iii) stakeholder roles; (iv) performance; (v) governance and coordination mechanisms; and (vi) public sector policies and interventions.[5]

More and more studies—either at the micro or macro level—examine the gender dimension of agricultural production, processing, and distribution. One reason why gender has not been a prominent part of the literature is lack of empirical information on individual ownership of land, housing, livestock, and agricultural productive activities. Moreover, most data are typically collected at the farm level, which gives a partial picture of individual-level productive agricultural activities, and fails to capture the information needed for analyzing issues concerning gender differences. As a result, policy makers have only a limited understanding of issues regarding women's participation in agriculture. However, an important effort has been made over the last decade to disaggregate the collection and processing of sex-disaggregated data that can be used to support the risk prioritization process and the design of risk management strategies. Box 4.1 presents

[5] An extended explanation of these analyses can be found in Annex B.

BOX 4.1. QUESTIONS AND CHECKLIST FOR BACKGROUND RESEARCH FOR A GENDER-DIFFERENTIATED ASRA

When conducting the background research for an ASRA, using a gender-focused checklist can help ensure that the assessment team collects the information it needs to incorporate a gender dimension from the start. These questions are for illustrative purposes and may vary from country to country depending on the circumstances and required depth of the risk assessment in question, but should generally be guided by two overarching questions:

- What constraints limit women's full involvement along all parts of the value chains in question?
- What are the differences between men and women in their capacity to manage agricultural risk?

Information from a gender perspective to gather during a background research should include, but is not limited to, the following:

- National and cultural policies around asset ownership (i.e., women's ability to legally own assets without men's permission, joint ownership, ability to make asset-related decisions)
- National and cultural policies and practices around women's access to land, mobile assets, and finance/loans
- National and cultural policies around inheritance
- Women's flexibility and possibilities to seek employment, attend trainings and meetings, and organize childcare
- Women's mobility to travel for jobs, trainings, market sales, milk delivery, etc.
- Women's ability to travel alone
- Gender differences in access to assets (physical and financial)
- Gender differences in access to technology and information
- Gender differences in roles played in the supply chains
- Gender differences in education and literacy and numeracy skills of participants in supply chains

Source: Authors.

a checklist for information gathering in the background research.

Descriptive statistics help explain the status of men, women, girls, and boys in a society. Increasingly, international statistical compendiums offer data disaggregated by sex and often by age.[6] However, when analyzing specific supply chains with clear geographical expressions, it is important to gather subnational data. Country statistical offices provide some information disaggregated by sex (e.g., farm ownership) in annual or quarterly reports, but it is necessary to dig deeper with ministry officials or to reach out to cooperatives and associations to obtain more nuanced information.

[6] They include: the World Bank's Gender Data, World Development Indicators, and Enterprise Surveys, and Women, Business, and Law; FAO's Agri-gender Statistics Toolkit; World Economic Forum's Annual Global Gender Gap Report; UN statistics on the situations of women and men; United Nations Development Programme International Human Development World Values Survey; surveys by Gallup and others as well as regional sources, such as the Southern African Development Community (SADC) Gender Protocol Barometer.

4.3.4 RISK QUANTIFICATION

The task of quantifying losses caused by different risk events is a key step in the ASRA process, but it is not straightforward. Financial losses attributed to agricultural risks are caused by a variety of shocks related to production, market, or enabling environment factors. The impacts of some risks can be complicated to quantify in monetary terms, whereas others cannot be quantified at all. Assigning proxy values can provide an estimate of the magnitude of financial losses to allow comparison of risks, providing the information needed for their prioritization.

Quantifying losses associated with a risk event enables comparison or risk ranking as an intermediate step in the risk prioritization process. Loss quantification provides an order of magnitude of the indicative losses in terms of agricultural GDP, which helps to justify investment in risk management solutions that reduce the impact of external shocks and strengthen resilience. In fact, losses are a key piece of information for any cost-benefit analysis for investing in agricultural resilience. Having loss estimations

per supply chain before the field interviews makes the fieldwork much more efficient and helps facilitate discussions with stakeholders over the causes of risk and their capacity to manage.

Several methods can be used to quantify risk losses, ranging from calculating the simple variation from a mean value to using sophisticated statistical software applications as is commonly done in the insurance industry. However, the focus herein is on conducting a simple time series analysis of crop yield volatility to arrive at an indicative value of direct losses caused by production risks. Market risks (price volatility) and enabling environment risk need to be assessed in different ways. A full description of risk quantification can be found in World Bank (2015a), but the subsections below present some suggestions vis-à-vis gender differentiation.

4.3.4.1 Production Risk

As strengthening resilience is a key policy objective in most developing countries, the estimation of production losses is an instrumental step to rank, prioritize, and identify the solutions to address risk in agriculture and achieve more resilience to shocks (see Annex C for a detailed methodological approach to estimate indicative loss values in supply chains). In this regard, loss estimations disaggregated by gender provide useful information to prioritize the attention of those risks that impact women in different degrees of severity. When historic estimated loss calculations are made individually for each supply chain under study and the results plotted in a matrix in accordance with severity and frequency of impacts, the results can be presented separately for men and for women. If sex-disaggregated production data are not available, the results of the calculations can be estimated for women by applying the proportion of women farmers in that supply chain.

However, to introduce a gender lens to this analysis, disaggregating the loss quantifications in terms of gender is informative, though not determinant. The reason is that the quantification of women's losses alone is not necessarily the best variable to capture the relative importance of risk impacting women because they typically participate in low-value crops, and the estimation based on yield losses does not necessarily represent the importance of their exposure and vulnerability to risk. Information about the number of women participating in each supply chain and their importance in terms of income and food security will also need to be used for risk prioritization, not just the estimated losses.

Stakeholder interviews will also provide important information for assessing the capacity of women and men in each supply chain to manage risk, a key variable for assessing and ranking the importance of risk. Having this information for every commodity under study is essential for the introduction of a gender lens in this approach to risk management.

4.3.4.2 Market and Enabling Environment Risk

Quantifying market (price) risk could become a complex exercise with no straightforward simple ways to assess the causes of volatility. For the risk prioritization process, the team needs to distinguish between internationally traded export commodities (i.e., cocoa, cotton, coffee, soybean) and those that are mostly traded domestically (i.e., food crops), as explained in World Bank (2015a). ASRAs also rely heavily on qualitative measures to evaluate price volatility, exposure, and stakeholders' capacity to manage risk.

Depending on the magnitude, price shocks affect income, consumption, and ultimately the livelihood of farming households. Women's capacity to cope with exogenous price shocks needs to be assessed at various levels of the supply chains, and differentiated from men's capacity to manage. Individual interviews and focus group discussions can prove useful for gathering the information needed to inform the overall ASRA and the risk prioritization in particular, as will become more apparent in the next section.

While many production, market, and enabling environment shocks have longer-term consequences and losses, for simplicity's sake, it is helpful to restrict the assessment only to the immediate direct impact. Identifying the net

multiplier effects in the economy requires general equilibrium models that go beyond the scope of the rapid assessment made in an ASRA.

4.3.5 UNDERSTANDING CAPACITY TO MANAGE RISK

Whereas understanding stakeholders' capacity to manage risk is of overall importance to the ASRA, it is a central point for a gender-based risk assessment. Depending on the size (by area cultivated or by value) of the supply chains, the magnitude of the impacts, and the frequency of occurrence, the assessment of aggregate losses can sometimes mask the importance and scope of impacts on women if data are not sex-disaggregated.

Even if sex-disaggregated data were to be used, the overall magnitude of losses in women's participation in agriculture might not appear prominent in terms of overall agricultural GDP volatility given women's participation in low-valued crops. Likewise, their risk will not rank high in a risk prioritization exercise based solely on these grounds.

Consequently, a separate assessment of women's capacity to manage risk can reveal gender-differentiated vulnerabilities to risk and the implications for income, consumption, and ultimately livelihoods. The assessment of women's capacity to manage risk (as is done for other groups of stakeholders) is therefore an important step to more fully capture and analyze the impact of risk and assess vulnerability.

Capacity to manage risk is used to inform the risk prioritization and the design and targeting of risk management interventions. Stakeholders with low capacity to manage agricultural risk are vulnerable. This capacity is assessed both during the background work prior to the field visit and mostly during the field visit through stakeholder interviews. Box 4.2 offers suggested questions to answer to identify risk profiles of women and their capacity to manage agricultural risk.

A risk profile of stakeholders in assessed supply chains can map stakeholders and the way they manage different agricultural risks. As an illustration, the risk profile summary shown in Table 4.1 lists the impacts of risk and risk management capacities for herders with different herd sizes for a hypothetical livestock supply chain. The introduction of a gender lens requires identifying women herders and assessing their capacity to manage risk, or identifying the role women play within a herding household and assessing how women are impacted by risk and how they cope. In this example, though women's herding units comprise only a small proportion of total livestock units, their low capacity to manage places those groups in a situation of high vulnerability. This information informs the prioritization exercise and final design of risk management policies and strategies.

BOX 4.2. GENDERED LINE OF ENQUIRY TO ESTABLISH CAPACITY TO MANAGE RISK

Understanding risk profiles entails (i) analyzing the roles of different stakeholders for each supply chain under assessment in a gender-disaggregated enquiry, and (ii) understanding their risk management capacities. To guide the assessment of stakeholders' risk profiles, the team should aim to answer the following broad questions:

- Who is involved in the value chain analyzed (different stakeholders, segments of population, gender roles, etc.)?
- What risks have the greatest impact on women?
- What is the differentiated exposure and impact of risk for women and men? Are there regional differences?
- What are women's current risk management practices in terms of risk mitigation, risk transfer, and/or risk coping strategies?
- How do women and men manage risks, and are their instruments effective? Why or why not?
- What are the limitations of women's current risk management practices? Why are some risks not being managed?
- What is the capacity of supporting institutions to manage key risk predominantly faced by women?

The assessment team needs to address those questions during the field interviews with stakeholders along each supply chain. For smallholder women farmers, who are often the most vulnerable and least vocal, focus group discussions are an important technique to discuss their risks and vulnerabilities, mitigation strategies, and coping mechanisms.

Source: Authors.

TABLE 4.1. ILLUSTRATION OF STAKEHOLDERS' VULNERABILITY MAPPING IN LIVESTOCK

Category of Herders/ Animals	Characteristics	Share of Herding Household	Risk Management	
			Men (85% of Pastoralists Units)	Women (15% of Pastoralists Units)
Larger-scale herders (>20)	These units provide full-time employment for family members and adequate incomes. Good access to pastures and inputs.	6%	Can move livestock long distances if necessary; winter preparation with hay and fodder production	No women participate in this group
Medium-scale herders (15–20)	These units have adequate incomes to support herding households but units are of middle or lower wealth levels and have limited access to capital.	25%	Some capacity to prepare hay and fodder but vulnerable to dzuds[7] in extreme event years	Limited capacity to prepare fodder but vulnerable to dzuds even in mild years
Small full-time herders (<15)	These herding units are poor, without alternative sources of income, and are often dependent on state support. Would like to exit the sector if possible.	No data	Highly vulnerable to dzuds of moderate to extreme magnitude	Highly vulnerable to dzuds of any magnitude
Periodic herders (often <15)	This group enters and exits livestock production depending on economic circumstances. For this group, herding is a safety net.	No data	Highly vulnerable to dzuds of any magnitude	Highly vulnerable to dzuds of any magnitude

Source: Authors.

4.3.6 PROACTIVELY ASSESSING SPECIFIC VULNERABLE GROUPS

In some cases the risk assessment team will need to undertake particular (ad hoc) assessments in reference to policy concerns about vulnerable population groups. Certain risks may have relatively low impacts on the sector or a geographical region, but relatively high impacts on a particularly vulnerable group of stakeholders. This means that applying prioritization filters of high impacts and low capacity to manage (as described above) might not capture those policy concerns. For example, losses in Region A may outweigh those of Region B in terms of monetary value, but if a great majority of the country's rural food insecure population lives in Region B and is dependent on low-value crops prone to risk-related production losses, policy makers may want to prioritize risk management interventions in Region B to address food security concerns, rather than the magnitude of value lost. Special assessments of vulnerability driven by policy concerns will need to be undertaken as part of the ASRA, and the findings incorporated in the final sector-level risk prioritization.

Similarly, identifying those supply chains with high participation of women merits special (ad hoc) risk assessments to influence the design of the relevant risk management policies and strategies. In countries where the initial background research shows that women farmers in certain communities or regions are in vulnerable positions, efforts need to be deepened with auxiliary secondary research or information that can identify them more precisely. This will enable targeted interventions designed to assist those groups of households even when the impacts of risk appear marginal at the aggregate sector level. Even small shocks to the livelihood of vulnerable farming communities can

[7] A dzud is a Mongolian term for a severe winter in which a large number of livestock die, primarily due to starvation due to being unable to graze, in other cases directly from the cold.

have a catastrophic impact for large groups of households, but these impacts are usually masked at the cumulative sector level.

In this way, the results of the risk prioritization process will incorporate not only strategies to manage the major risk of magnitude of losses, but also the policy angle of gender considerations.

4.4 STEP 2: STAKEHOLDER INTERVIEWS

During the fieldwork for stakeholder interviews, the team establishes direct, one-to-one contact with various women and women's groups participating in the assessed supply chains. This is done to obtain the narrative and fill the gaps left during the desk assessment. Moreover, it is useful for identifying the storyline. The team seeks to:

1. Corroborate the timeline of events for each supply chain as it affects women and men
2. Confirm or identify the causes of risk events
3. Test whether the estimated losses can be validated against actual losses
4. Assess stakeholders' capacity to manage risks (both women and men).

Box 4.3 shows a checklist of issues for team members to address during the fieldwork.

The main activities typically covered during the fieldwork include:

1. *Data mining.* This is a valuable opportunity to fill gaps regarding sex-disaggregated data. Some pieces of information exist only in hard copy and only by visiting local institutions can the team access them. For example, commodity boards' annual reports have valuable information about supply chain dynamics reported on an annual basis, including causes for drops in volume, and logistics and market issues. Agricultural colleges and NGOs undertake research on agricultural supply chains that can be differentiated by gender. Local offices of international development institutions (some of which have gender as a priority policy theme) sponsor and/or undertake research on agricultural productivity, supply chains, climate change, and food security. Similarly, disaster risk management agencies collect data on vulnerable populations, design coping strategies, and deliver relief programs. These latter entities usually disaggregate data by sex.
2. *Individual interviews.* The team typically interviews representatives of each level of value chain participant for each supply chain under assessment. This means a high volume of interviews, since the ASRA will cover farmers, processors, input

BOX 4.3. GENDER-BASED LINE OF ENQUIRY FOR ASRA FIELDWORK

The following activities are part of the line of enquiry for team members participating in the ASRA. These can be used as a checklist for interviews and focus group discussions:

- Identify the causes of losses and women's attribution of them (single or multiple causes)
- Assess how losses affected women participating in the supply chains
- Corroborate the frequency of those events
- Determine if losses were evenly distributed by area, by farmer groups, and/or by gender
- Establish how different stakeholders (women and men) managed risks
- Find out how shocks were absorbed by women and men
- Determine if any women's enterprises went out of business
- Get a sense of long-term threats to livelihoods
- Assess capacity to manage risks by existing institutions (any gender bias)
- Test if magnitudes of losses estimated during the desk assessment are correct
- Analyze government's current strategies to respond to shocks
- Elicit women's perceptions of risk priorities
- Identify women's suggested solutions

Source: Authors.

suppliers, government agencies, financial intermediaries, service providers, traders, and exporters. Some value chains are clustered around particular regions and it is possible to efficiently meet most stakeholders by travelling to the region. Most government agency representatives can be met in the national or provincial capital cities. The story on risk for each supply chain can be identified by interviewing both women and men entrepreneurs and assessing their exposure and individual capacities to mitigate, transfer, or cope with agricultural risk.

3. *Focus groups.* Group discussions are useful for addressing particularly large, homogenous groups (i.e., women farming rice, women in drought-prone areas, women in export crops, etc.). Focus groups facilitate identification of groups' and communities' exposure to risk and capacities to mitigate and cope with risk collectively and individually. Local gender specialists could be very helpful in advising the team for each supply chain where it will be more critical to interview women, men, and different kind/sizes of agricultural enterprises, as well as how to choose the more representative groups, and the way to convene for focus group discussions (as women may have restricted mobility). Early planning is imperative. Annex D presents guidelines for conducting focus group discussions with farmers.
4. *Validation workshops.* During the fieldwork, the team holds workshops with key stakeholder representatives of each supply chain under study to validate the findings of the ASRA, as well as to advance a list of potential solutions. This step's value is in smoothing out any subjective views held by the assessment team by sharing the methodology and findings with stakeholders. The conclusions of these workshops for each supply chain will later serve as the basis for the sector risk prioritization (see next step on risk prioritization).

By the end of the field mission each team member has a partial view of agricultural risk because the team has focused on analyzing specific commodities in selected territories. The preliminary findings of these exercises for each supply chain can be summarized in a matrix by plotting risks in terms of: (i) the level of intensity (capacity to produce losses), (ii) frequency of occurrence, and (iii) the distribution of impacts across stakeholders. Table 4.2. illustrates a summary risk identification matrix for a hypothetical supply chain.

TABLE 4.2. ILLUSTRATION OF RISK IDENTIFICATION IN A COTTON SUPPLY CHAIN

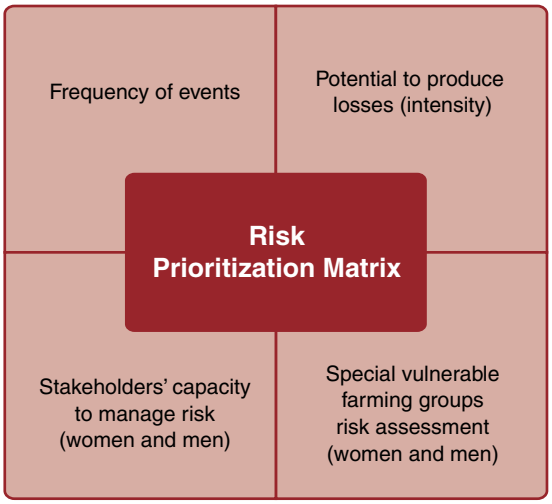
Identified Risks	Frequency of Events	Intensity of Losses	Who Suffers Most
Production risk			
• Pest and diseases	Medium	High	Women farmers
• Weather risk	High	High	Farmers (women and men), ginners
• Chemical poisoning	High	High*	Women pickers
Market risk			
• International price volatility	High	High	Ginneries and exporters
• Exchange rate	Low	Low	Ginneries
• Ginners credit default	Low	Low	Bank
• Farmers credit default	Low	Medium	Bank
• Domestic price volatility	High	High	Women farmers and pickers
Enabling environment risk			
• Port delays	Low	Low	Exporters
• Sudden changes in orders of chemicals	Low	High	Women farmers**
• Carrying large quantities of cash	Low	Low	Ginners

*High in individual terms as idiosyncratic risk
**As with less access to alternatives to manage
Source: Authors.

4.5 STEP 3: RISK PRIORITIZATION

The prioritization process is a team and stakeholders' exercise. As a result of the desk assessment and fieldwork, the team has already identified the risks for each commodity in terms of: (i) frequency of occurrence; (ii) severity of impact (intensity); and (iii) stakeholders' capacity to manage the identified risks; and has reviewed (iv) special ad hoc risk assessments of vulnerable farming groups (women and men) that might have been conducted. Figure 4.2 illustrates the components of risk prioritization.

FIGURE 4.2. COMPONENTS OF RISK PRIORITIZATION



Source: Authors.

4.5.1 PRIORITIZATION MATRIX

Team members can plot the results of the prioritization exercise for each supply chain in a gender-differentiated fashion, as illustrated in Table 4.3 for men and Table 4.4. for women. The plotting of risk in these tables should consider stakeholders' differential capacity to manage the identified risks. For example, if the team finds that stakeholders already have high capacity to manage a particular identified risk, this particular risk will not be ranked among the most important to cause high impact.

While women face the same risks in this example, their risks are concentrated more in the upper right corner of the matrix. These women's enterprises are more vulnerable to risk than are men's, mostly because women have less capacity to manage risk in this example. This can be because their farming is less technologically advanced, they are not recipient of extension services, and lack the knowledge and/or financing for improved animal health care. The use of gender-differentiated prioritization matrices helps enormously in prioritizing risks for each supply chain under assessment.

If team members use these tables in a standardized manner, results can be shared and discussed among the team members and among stakeholders in an easy-to-understand fashion, and adjustments can be quickly made accordingly.

TABLE 4.3. ILLUSTRATION OF RISK PRIORITIZATION FOR MEN IN LIVESTOCK

Impact/Probability of Event	Low	Moderate	High
Highly probable (1 in 3)	Milk contamination Drug and inputs contamination and adulteration risk	Foot and mouth disease	
Probable (1 in 5)	Drought		Power cuts
Occasional (1 in 10)		Glut (price risk)	
Remote (1 in 20)	Maize feed shortages	Aflatoxins	

Source: Authors.

TABLE 4.4. ILLUSTRATION OF RISK PRIORITIZATION FOR WOMEN IN LIVESTOCK

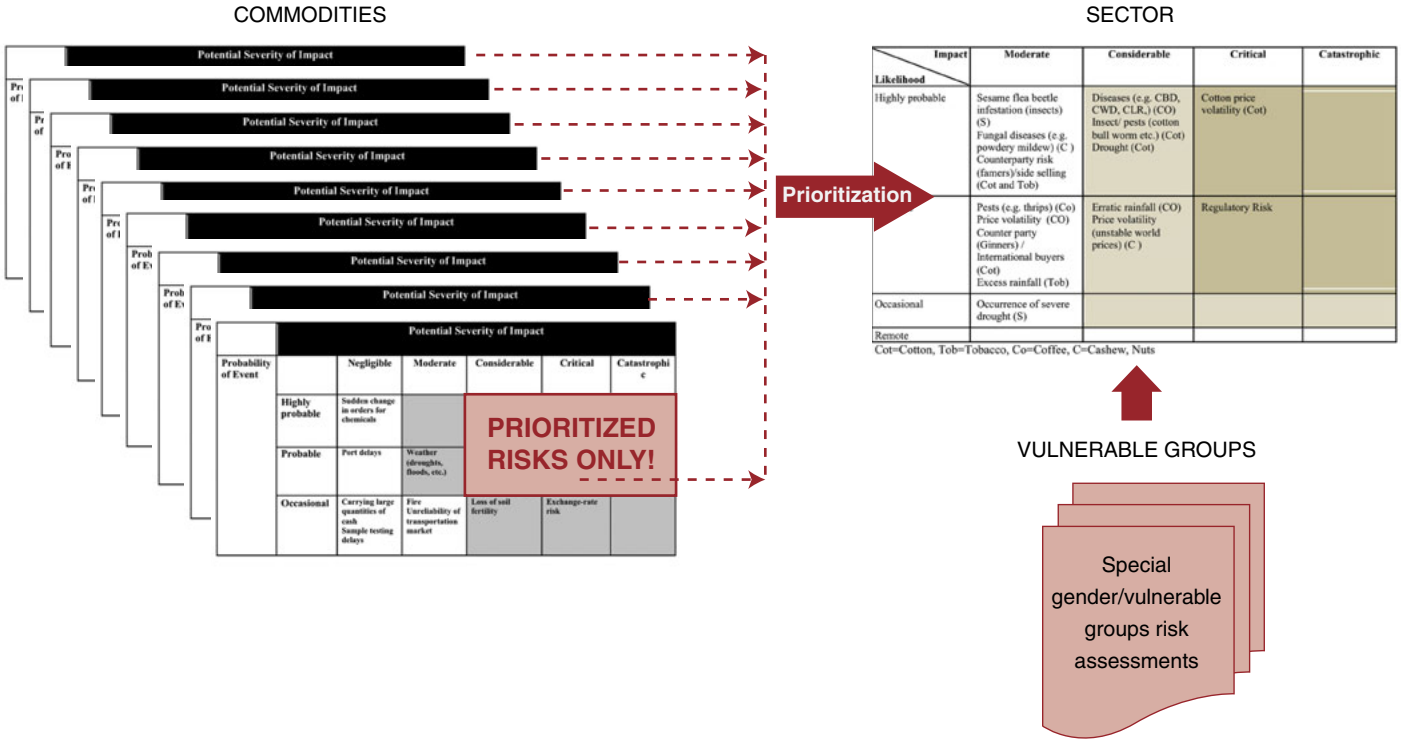
Impact/Probability of Event	Low	Moderate	High
Highly probable (1 in 3)		Foot and mouth disease	Milk contamination Drug and inputs contamination and adulteration risk
Probable (1 in 5)	Power cuts	Maize feed shortages	Drought Aflatoxins
Occasional (1 in 10)			Glut (price risk)
Remote (1 in 20)			

Source: Authors.

4.5.2 FROM COMMODITY RISK TO SECTOR RISK

Translating individual commodity risk prioritization into an aggregate sector risk prioritization is also a collective exercise. Prior to this stage, team members have assessed risks for individual commodities but have not yet established a broader sector perspective. After completing an individual prioritization matrix for each commodity, the team proceeds to reclassify those risks in terms of frequency, severity of impact, and capacity to manage from a sector perspective. This involves choosing only the risks located in the right upper corner of each commodity's risk prioritization matrix and relocating them in a single sector-aggregated risk prioritization matrix. This process involves not just familiarization with the risk assessment done for each commodity, but a change in perspective from the commodity supply chain to a broader agriculture sector perspective. Figure 4.3 illustrates the process of risk aggregation and reprioritization from the commodity level to the sector level.

FIGURE 4.3. REPRIORITIZATION OF RISKS FROM COMMODITY TO SECTOR LEVEL



Source: Authors.

As mentioned earlier, the findings of any special risk assessment on women and/or vulnerable farming groups motivated by policy considerations need to be accounted in the final sector prioritization matrix to inform policies and strategies to strengthen resilience of vulnerable farming systems.

The final outcome of the aggregated risk prioritization process is a list of key priority risks that can explain the causes of agricultural GDP volatility, food insecurity, and livelihoods disruptions; it is these risks that must be addressed to reduce the overall impact of risk in the agriculture sector. The highest priority risks are those located in the boxes in the upper right corner of the aggregated risk prioritization matrix. As with individual commodity risk, separate sector prioritization matrices for men and women can facilitate the design of gender-smart solutions to agricultural risk.

An illustration of such prioritization matrices is shown in Table 4.5 and Table 4.6 for men and women, respectively. Though these are simplified illustrative matrices, they need to be adapted to the context of every country, and can be designed as complex as needed. In this hypothetical example, women are concentrated in primary activities in food crops and as laborers in export crops with virtually no participation at other levels of the supply chains. Also, a high concentration of unmanageable production

TABLE 4.5. ILLUSTRATION OF SECTOR-LEVEL RISK PRIORITIZATION FOR MEN

Impact/Probability of Event	Low	Moderate	High
Highly probable	Flea beetle infestation (S) Maize streak diseases (M) Fungal diseases (e.g., powdery mildew) (C)	Ginners counterparty risk/ side selling (Cot) Bull work outbreak (Cot)	Cotton price volatility (Cot) Coffee price volatility (Co) Yellow moto virus (R)
Probable	Aflatoxin (M)	Erratic rainfall (R) Regulatory risk (Co)	Drought (R)
Occasional	Counter party risk (Ginners)/International buyers (Cot)	Pests (Rodents, army worms, quealea birds) (R)	

Note: Cot = Cotton, Tob = Tobacco, Co = Coffee, C = Cashew nuts, R = Rice, M = Maize, S = Sesame.
Source: Authors.

TABLE 4.6. ILLUSTRATION OF SECTOR-LEVEL RISK PRIORITIZATION FOR WOMEN

Impact/Probability of Event	Low	Moderate	High
Highly probable	Brown stick disease (Ca)	Flea beetle infestation (S)	Drought (M) Aflatoxin (M) Mosaic disease (Ca)
Probable	Wild animals (Ca)	Insects and pests (e.g., beetle, army worm) (B)	Excess rainfall (Ca)
Occasional		Diseases (B)	

Note: Cot = Cotton, Ca = Cassava, Tob = Tobacco, Co = Coffee, M = Maize, S = Sesame, B = Beans.
Source: Authors.

risk appears in the upper right corner, revealing very low capacity to manage, exposing high vulnerability to food insecurity. This information can be extremely useful for designing gender-smart solutions to agricultural risk, informing government policy and interventions.

4.6 STEP 4: GENDER-SMART SOLUTIONS

Whereas the ASRA is a simple-to-understand, logical process to prioritize risk, it is more complex to standardize the process to identify and prioritize the solutions into a single approach. This is mostly because every country has a unique way of decision making that depends on public policies, institutional strengths, fiscal constraints, and the political economy. However, risk management does not start from zero. Stakeholders in all countries already have interventions and instruments with various temporal and spatial features to incorporate risk management activities. The design of a strategy and an action plan therefore requires focusing on identifying the gaps of current interventions and designing a package of solutions that addresses the main underlying causes of risk. The next subsections present some guidelines to complement the ASRA approach outlined in World Bank (2015a).

4.6.1 UNDERSTANDING GENDER-BASED CONSTRAINTS

Earlier chapters argued and showed evidence indicating that the fundamental reasons for women's lower capacity to manage agricultural risk are the same as those for women's lower levels of agricultural productivity (even operating under similar conditions as men in some cases). Therefore, in addition to the solutions to agricultural risk informed by the ASRA (World Bank 2015a), the risk management strategy needs to remove gender-based constraints (GBCs) to risk management. In this way, the risk solutions can be integrated with overall policies and strategies to reduce the gender gap and increase resilience for smallholders in agricultural systems.

Chapter 3 demonstrated that the ASRA methodology basically utilizes supply chains as the focus of risk assessment and prioritization. It is therefore practical and logical to also use supply chains as the entry point for identifying GBCs to risk management and incorporating the findings into the overall sector risk management policies and strategies.

Table 4.7 summarizes the most critical GBCs to risk management in agricultural supply chains as identified in earlier chapters.

TABLE 4.7. SUMMARY OF GENDER-BASED CONSTRAINTS IN AGRICULTURAL SUPPLY CHAINS

Productivity and Vertical Linkages	Empowerment and Horizontal Linkages	Business Enabling Environment
Access to assets, including: Land Labor Capital Inputs Technology Information Education	Active participation, including: Membership Decision making Leadership in decision making	Laws, policies, and institutions: Formal discrimination in law and policy Cross-sectoral or cross-jurisdictional inconsistencies Unequal enforcement

Source: Authors, partly adapted from USAID 2013.

The assessment of GBCs aims to link gender issues to the ASRA by identifying GBCs and incorporate appropriate measures in the government policies and investment plans.

4.6.2 IDENTIFYING GENDER-SMART SOLUTIONS

Gender and agricultural risk are contextual, so gender-based solutions to agricultural risk also need to fit the context of the country and situations to which they are applied. This subsection provides some key references for illustrative purposes to guide the identification of key gender-smart solutions when designing risk management strategies based on the findings of the previous steps.

Sex-disaggregated data in countries as diverse as Kenya, Senegal, Uganda, and Bangladesh show that both men and women are taking up new agricultural practices that are likely to enhance their resilience to the effects of drought (World Bank 2015b). These practices must be reinforced if agriculture is to withstand the effects of climate change while bringing about improved productivity and food and nutrition security, and increased economic growth.[8] Policy changes are particularly critical for adopting an effective and sustainable gender-based approach to risk management. For example, securing women's right to own land (and to thus protect their investments in agriculture) may require efforts to address laws regarding property rights; in areas where the definition of a household excludes women from participation in farmers' groups, women's inclusion in risk management initiatives will be restricted.

Lessons from development partners suggest that participatory, inclusive approaches aimed at building adaptive capacity, such as farmer-to-farmer extension or farmer-led innovation, are scalable. But individual innovations—including some that are particularly attractive to women—are difficult to scale out because they are suited to highly specific environments and contexts. Moreover, it is valuable to recognize that women make an active and important contribution to climate adaptation based on their local knowledge and capacity, and that it is limiting and simplistic to view them as passive victims of climate change (Otzelberger 2011). Successful adaptation projects increase women's opportunities to add value to their agricultural activities—for example, through agricultural processing and marketing—and diversify their income-earning opportunities (Njuki et al. 2011). In other words, they promote transformational change in agriculture, acknowledge women's role in that process, and strengthen resilience of farming systems.

Opportunities for women are not equal where legal gender differences are prevalent. Since 2009, Women, Business and the Law at the World Bank has collected data about legal restrictions on women's entrepreneurship and

[8] Such as modifications in planting dates or changes in crop varieties, but also practices that lead to more transformative change, such as diversified livelihoods and an increase in assets.

employment to inform policy discussions and promote research on the linkages between the law and women's economic opportunities.[9] The data focus on seven indicators: (i) accessing institutions, (ii) using property, (iii) getting a job, (iv) providing incentives to work, (v) going to court, (vi) building credit, and (vii) protecting women from violence. New areas covered within these indicators include legislation on issues such as nondiscrimination in access to credit, care leave for sick relatives, the legal age of marriage, and protection orders for victims of domestic violence.

Equality of opportunity allows women to make the choices that are best for them, their families, and their communities. However, opportunities for women are not equal where legal gender differences are prevalent. Such restrictions constrain women's ability to make economic decisions in a variety of ways, and can have far-reaching consequences. Moreover, they are associated with real economic outcomes. Many laws remain restricting women from taking certain actions. Women, Business and the Law examines 11 areas where women may face constraints on their legal capacity to act or ability to conduct transactions. Each action or transaction is examined separately for married and unmarried women.

Many laws continue to prevent women from improving their own well-being and that of their families by working or running a business. Datasets such as the World Bank Group's Enterprise Surveys and Doing Business have led the way in providing information on the challenges confronting firms and entrepreneurs in starting and expanding their businesses and creating jobs. But women often face additional constraints in starting businesses and navigating the workforce. How can governments improve women's access to entrepreneurial and employment activities? Answering that question requires understanding many factors—from access to education and health care, to social and cultural norms, and many things beyond. One important factor is how laws, regulations, and institutions differentiate between women and men in ways that affect women's incentives or capacity to work or to set up and run a business.

A growing global consensus recognizes the intrinsic and instrumental importance of securing rights to land and other productive resources in the eradication of poverty and reduction of gender inequality (World Bank 2014). Women's ability to exercise agency over land and housing is determined by the interplay of laws—including statutory, customary, and religious laws—and social norms. Control over land and housing has instrumental value. Women who have more control over land—whether through inheritance, land titling, improved documentation, or stronger communal rights—tend to have greater economic opportunities, mobility outside of the home, and decision-making power. (See Box 4.4 for illustrations of the importance of land ownership as a contributor to gender disparities.) The World Bank's (2010) "Toolkit for Integrating Gender-Related Issues in Land Policy and Administration Projects" provides guidelines for a gender analysis of the socioeconomic and cultural conditions in a project area, including with regard to statutory and customary property rights, land policies and legislation, land administration institutions, and land market transactions.

Approaches based on information and communication technology (ICT), including radio, TV, cellphones, and social media, promise to enhance women's access to risk mitigation practices and weather and climate information, reduce the perceived risks, and strengthen women's participation in commodity value chains. Like many other studies, a 2011 World Bank study found a high demand for extension information among women farmers; that level of demand presents an opportunity to train agricultural extension officers to use ICTs to reach an increased number of women farmers more cost-effectively. The study provided a useful step-by-step guide to introducing ICT-based solutions with a gender focus in agricultural projects (World Bank 2011).

Promoting associativity and identifying key interventions along the supply chain could be another approach to identify strategies aiming at assisting women in removing gender-based constraints to ARM tools. Figure 4.4 illustrates one such approach for identifying entry points for removing GBCs in agricultural supply chains at various levels.

[9] Women, Business and the Law 2016: Getting to Equal is the fourth in the series. http://wbl.worldbank.org/~/media/WBG/WBL/Documents/Reports/2016/Women-Business-and-the-Law-2016.pdf

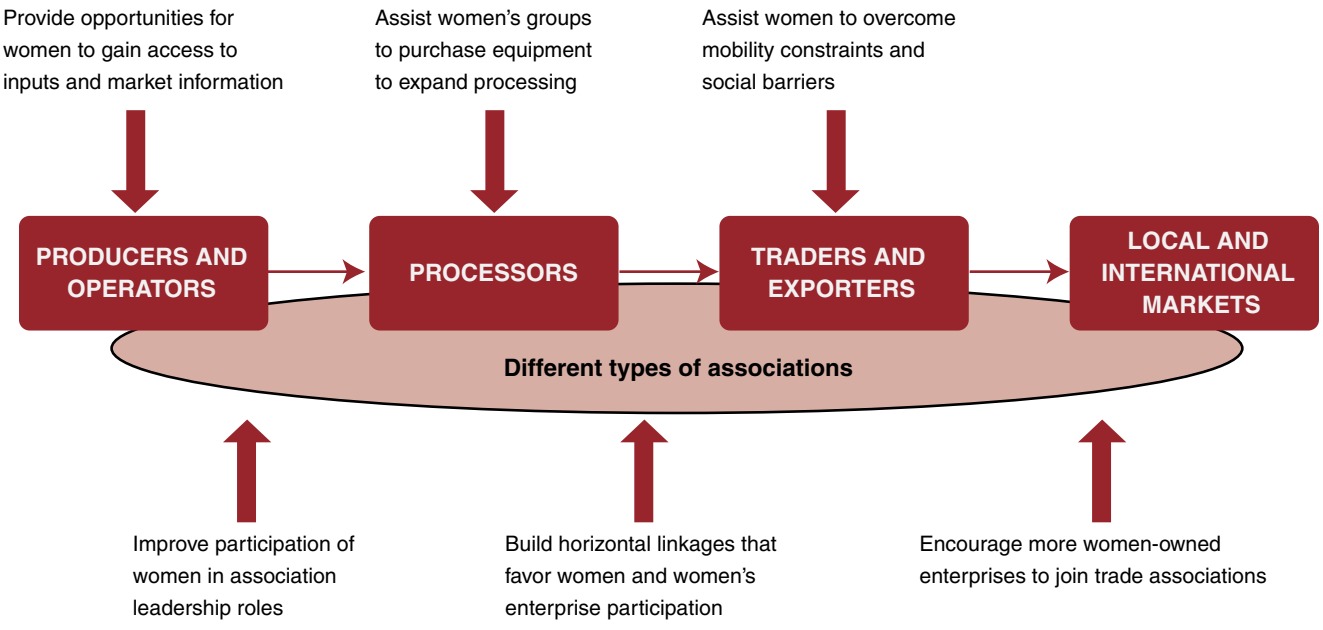
BOX 4.4. GAPS IN LAND OWNERSHIP AND CONTROL

Twenty years ago, Argawal's study of rural South Asia identified gaps in land ownership and control as the most important contributor to disparities in economic well-being, social status, and empowerment (Agarwal 1994). More recent studies reinforce and extend this finding with the following associations:

- In Vietnam, women with a joint title are more aware of legal issues, are more likely to proactively seek a Land Tenure Certificate, have more say in the use and disposition of land, and are more likely to earn independent incomes than women who are not on the title (World Bank 2008).
- In Peru, squatter households given property titles experienced a 22 percent reduction in fertility rates, and women who received a joint title were two times less likely to have a child than women in families in which the title was in the male partner's name only. Receipt of titles also allowed women to seek paid work instead of spending time safeguarding their land against property invasion (Field 2007).
- In Nepal, women who own land are significantly more likely to have a final say in household decisions, and children of mothers who own land are less likely to be underweight, with associated benefits for almost all maternal and child nutritional outcomes (Allendorf 2007).
- In Ecuador, joint land ownership increased women's participation in household decisions about crop cultivation (Deere and Twymen 2012a, 2012b).
- In rural Karnataka, India, ownership of land and housing improved women's mobility outside the home and their ability to make decisions about their work, health, and household spending (Swaminathan, Lahoti, and Suchitra 2012).
- Expanding women's ownership of land and housing is not a panacea, nor is land legislation alone. Access to credit, markets, education, extension services, technology, personal mobility, and public voice all influence women's ability to claim and make use of property rights (Spichiger et al. 2013).

Source: World Bank 2014.

FIGURE 4.4. ILLUSTRATIVE VALUE CHAIN AND POSSIBLE ENTRY POINTS FOR REMOVING GENDER-BASED CONSTRAINTS



Source: USAID 2013

4.6.3 APPLYING CRITERIA TO PRIORITIZE GENDER-BASED CONSTRAINTS TO ARM

The term GBC includes both the factors (i.e., discriminatory land laws) and the measurable disparities that result (i.e., women hold only a small fraction of land titles). The team can use gender analysis guidelines to identify GBCs, drawing on information collected in the background research. These include: (i) identifying conditions of gender disparity; (ii) identifying the factors that cause the gender disparities; and (iii) formulating a "cause and effect" hypothesis.

To prioritize activities aimed at removing GBCs to risk management, a set of criteria can be applied to the list of identified GBCs to risk management. Criteria include:

1. Those that restrict a more efficient response to shocks or place disproportionate costs or weights on women in the face of risk
2. Those that exclude women's access to (and disposal of) assets
3. Those that discriminate against women's participation in technology, information, and higher-value markets
4. Those that interfere with the achievement of more livelihood resilience to shocks.

4.6.4 INTEGRATING ARM AND SOCIAL PROTECTION

While ARM focuses on strengthening stakeholders' resilience along agricultural supply chains, when the intensity of exogenous shocks reaches catastrophic levels, agricultural measures can only achieve so much. Recognizing those limitations, the team will need to integrate ARM strategies with broader disaster risk management and social protection policies and activities. Box 4.5 illustrates the justification for doing so.

The findings of the ASRA process will inform the final package of ARM strategies that are suggested in any particular country. The factors that will influence the choices of risk management strategies are usually based on (among others): (i) practicality of implementation; (ii) affordability; (iii) potential impact (short, medium, or long term); (iv) complementarity with public policies; and (v) the political economy. A gender-differentiated risk management strategy will need to incorporate specific programs and projects that address the vulnerabilities of stakeholders arising from gender differences. The risk management assessment process discussed herein should capture the relevant information and prioritize the solutions that will remove GBCs and allow all stakeholders access to risk strategies and tools.

BOX 4.5. ARM AND SOCIAL PROTECTION

In many countries, a policy priority is to keep households from losing their asset base below a certain threshold, and to likewise ensure consumption is not destabilized after a disaster (Carter et al. 2006; Heltberg et al. 2009). Doing so is only possible if social protection interventions can be scaled up or introduced rapidly after a shock. Clarke and Hill (2013) investigated the case of Ethiopia and Malawi and found that the cost of a drought to households increases from zero to about US$50 per household if support is delayed by four months after harvest and to about US$1,300 if support is delayed by six months or more. This rapid increase is due to distress sales and loss of assets (especially livestock).

Acting rapidly implies: (i) scaling up social protection immediately after a disaster; (ii) targeting the affected population; (iii) enhancing livelihoods to make them more resilient to shocks, and (iv) having stronger institutions for managing risks and crises (Kuriakose et al. 2013; World Bank 2013). In a world in which climate change makes such disasters more frequent or intense, the effect on poverty could increase significantly, making policies to support affected vulnerable households even more important.

Source: World Bank 2015b.

CHAPTER FIVE
REPORT FINDINGS AND CONCLUSIONS

This paper examines the conceptual basis and available empirical evidence sustaining the thesis that agricultural risk has a differentiated gendered impact on rural households involved in agricultural activities. The emerging research strongly suggests that this area deserves more attention to enable practitioners to effectively incorporate those effects into agricultural policy and risk management strategies. Review of the evidence shows that aggregate economic shocks do not have homogenous effects on farming women and men. Gender matters in explaining differential effects, in terms of both the direct, or first-round, effects of the economic shock, and of households' coping strategies, or second-round effects. Moreover, these contrasts vary across countries and stages of development.

Women farmers typically face different constraints than men when facing risk, and the feasible options open to women also differ. In certain contexts, social norms or barriers increase the complexity of the challenge for women to mitigate risk or cope in a manner that preserves their agricultural and nonagricultural livelihood strategies.

If these prevailing differences across gender lines are not taken into account when assessing agricultural risk, the potential for women to benefit from risk mitigation strategies could be overestimated, and the potential for men and households as a whole to benefit underestimated—providing a misleading indication of what Agricultural Risk Management (ARM) strategies can achieve. To truly capture and address agricultural risk, incorporating gender-based impacts and responses, assessment of those differences must be an integral part of Agricultural Sector Risk Assessments (ASRAs) and the findings incorporated in corresponding ARM strategies.

Understanding the different roles and situations of women in their participation along agricultural supply chains in terms of their access to and control of productive resources, services, and employment opportunities is critical for assessing and prioritizing agricultural risk and for identifying gender-smart solutions for managing risk and strengthening resilience. And recognizing the root causes of such gender differences is essential if risk mitigation investments and risk coping programs are to reduce rather than reconstruct people's risk in future risk events.

This paper shows why and how gender-differentiated considerations can be included in agriculture sector risk assessments and strategies. A single blueprint for a risk management roadmap is not feasible because of the diversity of risks, cultural and social contexts, supply chain structures, and overall country contexts. Nonetheless, despite the diversity of approaches, some systematic processes and checklists can be adopted by all risk management approaches.

The step-by-step approach described in this paper intends to fill the operational gap of integrating a gender dimension into ASRAs. The focus is on the approach because both agricultural risk and gender issues are contextual—thus the outcomes of a gender-based risk assessment are highly dependent on the social, cultural, geographic, and economic contexts of the setting in which the assessment is applied. Each ASRA must be tailored to capture gender differences that arise due to a country's unique combination of risks, cultural differences, institutional arrangements, and fiscal constraints.

The gender-based approach to agricultural risk is simply an orderly process to analyze, identify, and prioritize risk, and serves as the basis for the design of policies and interventions to manage agricultural volatility and food security and to strengthen farming systems' resilience to shocks. The primary objective of a gendered approach to agricultural risk is to assist development practitioners to simplify and better comprehend the complexity of gender-based ARM by following a systematic approach to prioritize solutions to mitigate, transfer, and/or cope with agricultural risk. Highlighting the types and orders of magnitude of risks and targeting the most vulnerable stakeholders can improve planning and investments to strengthen resilience in agriculture.

Risk management does not start from zero, fortunately. Stakeholders in all countries already have interventions and instruments with various temporal and spatial features to incorporate risk management activities. The design of a strategy and an action plan therefore requires identifying the gaps of current interventions and designing a package of solutions that addresses the main underlying causes of risk. A gender-differentiated risk management strategy must thus incorporate specific programs and projects that address the vulnerabilities of stakeholders arising from gender differences. The risk management assessment process discussed herein should capture the relevant information and prioritize the solutions that will remove gender-based constraints and allow all stakeholders access to risk strategies and tools.

Overall, the main policy and operational implications are that gender-differentiated impacts to shocks, the causes of differentiated responses, and the effects on well-being and resilience need to be identified. A gendered assessment of agricultural risk will fill an information gap and help to inform policy and better target the operational tools and interventions designed to improve ARM practices in developing countries. These are precisely the objectives of a gender-based ASRA.

Introducing a gender-differentiated approach to ARM is a key issue for development effectiveness. In the face of multiple risks, the resilience of farming households is critical for collective action, coordination, and public intervention. One cannot understand the current and future potential of the agriculture sector in developing countries without understanding the differential ability of women and men to anticipate and respond to agricultural shocks.

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ANNEX A
RISK MANAGEMENT STRATEGIES AND INSTRUMENTS

The vulnerability of individual stakeholders and the agriculture sector as a whole depends on the nature of the risks (i.e., their correlation, frequency, timing, and severity) and the effectiveness of the risk management instruments in use. It is unrealistic to suppose that all risks can be managed, as one solution or product cannot serve as a "silver bullet" for all risks in all circumstances. Indeed, a complex variety of strategies are discussed at length within the existing literature. Rather than reviewing all possible risk management strategies, the strategic framework used in these guidelines presents a simplified approach for risk management strategy development for illustrative and practical purposes. The conceptual framework can be adapted to be as complex or as simple as needed given a country's circumstances.

Following the assessment of risks and analysis of stakeholder vulnerability, risk management strategies can be proposed. A practical way to identify solutions is by classifying possible risk management strategies into three categories: mitigation, risk transfer, and coping. The appropriate set of strategies depends in part on participants' capacity to effectively use them.

1. **Risk mitigation *(ex-ante)*:** Risk mitigation strategies are actions taken prior to a risk event to reduce the likelihood of risk or the severity of losses. They are particularly useful for risks that occur with relatively high frequency but with lower impact intensity. Risk mitigation options are numerous and varied. Examples include: adoption of improved agronomic practices such as soil drainage and mulching, conservation farming, and the use of short duration and disease- and stress-resistant cultivars; irrigation and flood control infrastructure; soil and water conservation measures; changes in cropping patterns; crop and livestock diversification; income diversification; improved early warning systems; and modern information and decision support systems.
2. **Risk transfer *(ex-ante)*:** As not all effects of realized risks can be mitigated, risk transfer tools and mechanisms transfer the potential financial consequences of particular risks from one party to a willing third party, usually for a fee or premium. These mechanisms usually trigger compensation in the case of a risk-generated

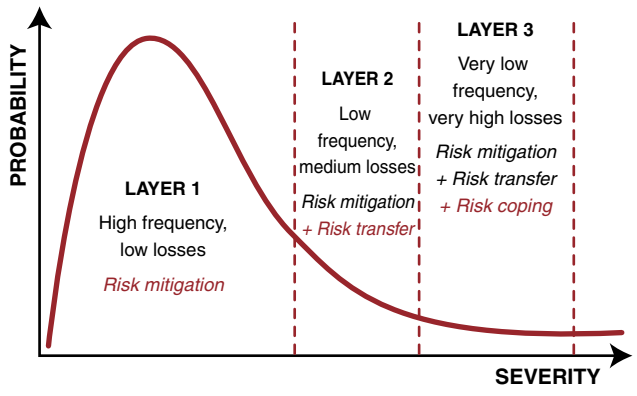
loss (e.g., purchasing insurance, re-insurance, financial hedging tools). While insurance and hedging are well-known forms of risk transfer, in developing countries the use of informal risk transfer within families and communities is also extremely important.

3. **Risk coping *(ex-post)*:** Some risks cannot be mitigated or transferred, so risk coping strategies are needed to help stakeholders better absorb and recover from their impacts. These instruments improve the affected population's resilience to withstand and cope with events through *ex-ante* preparation to sustain production and livelihoods following an event. Examples include some form of compensation (cash or in-kind), social safety net programs, buffer funds, savings, strategic reserves, and livelihood recovery programs (e.g., government assistance to farmers, debt restructuring, contingent financing). Such interventions are often financially beneficial, and the ability to quickly respond to events often reduces losses.

Figure A.1 illustrates these risk management strategies in the context of increasing layers of risk depending on the probability of occurrence (frequency) and the intensity or potential to cause losses (severity).

The combination of different activities selected to manage risk ultimately depends largely on the findings of the ASRA, the characteristics of the identified risks, various actors' existing capacity to manage risk, and the fiscal constraints to implementing an integrated strategy. This framework can be applied to prioritize risks and interventions in a country with many risk management practices already in place, whereby stakeholders identify priorities and gaps in their current risk management strategies to enable them to adapt to a changing risk landscape.

FIGURE A.1. RISK MANAGEMENT LAYERS



OUTPUT AND PRIORITY MEASURES

The end product (output) of the ASRA process is a set of actions that require special attention to reduce vulnerability to shocks associated with the key priority risks. Moreover, resources are scarce and stakeholders need to see an explicit risk prioritization and strategy identification process in which the proposed interventions provide the clear returns in terms of agricultural growth, poverty reduction, food security, or other objectives pursued by a country's agricultural policies. The measures can then be incorporated into government plans and budgets.

Risk management strategies are operationalized by three main categories of instruments that can be planned, budgeted, and implemented for:

1. **Policy reform:** Improved risk management often entails policy reforms (e.g., legal or regulatory reforms to improve access to agricultural inputs; changes in information policy to make agricultural information easily accessible to all; changes in government policy related to price formation, government procurement, or strategic grain reserves).
2. **Agricultural investment:** While policy reforms mainly require political will, other risk mitigation measures can be costly. Examples are financial investments in irrigation infrastructure, research into drought- and disease-resistant and pest-tolerant cultivars, soil and water conservation, weather infrastructure, or updated agricultural services (e.g., agricultural extension systems or disease surveillance systems). Some of these measures may already be part of a government program, with the ASRA simply calling for additional investments to strengthen capacity in those areas more vulnerable to external shocks.
3. **Technical assistance:** Technical assistance is geared towards building local stakeholders' capacity (e.g., training in price risk management; feasibility studies for various instruments; flood risk modeling work; development of early warning systems). Recent developments in information systems addressing agricultural risks can be easily transferred to public and private institutions that can adapt the instruments to a country's specific conditions.

ANNEX B
ANALYSIS OF EXISTING MATERIAL

Preliminary analysis of agricultural supply chains often entails a comprehensive review of existing material (reports of agriculture sector reviews, studies, research theses, major news items, trade reports, etc.). Issues to be thoroughly researched include:

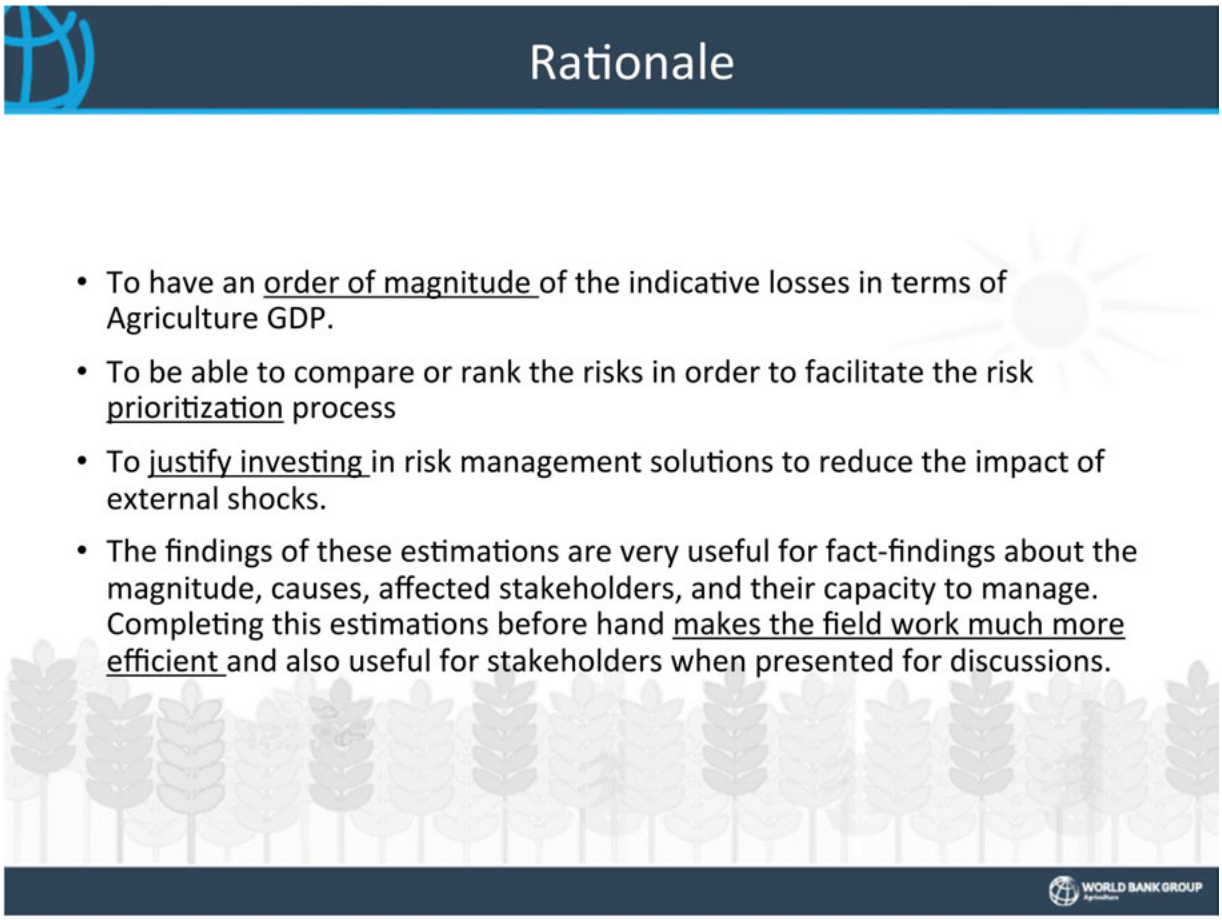
- *Demand conditions.* Identification of major markets of the commodities under study (export, regional, and domestic), end use of the commodity, characteristics of the commodity, quality attributes, demand and supply dynamics, and market trends.
- *Supply chain structures.* The current structure of supply chains, which includes the flow of goods, information, and finance, and the degree of concentration of different operators (in terms of volume or value). Agricultural supply chains for a single commodity can be composed of various sub value chains with distinct and different participants, depending on market demand. Different levels of technology, integration, women's participation, and risk can be present.
- *Stakeholders and their functions*. Identification of the various actors in the agricultural supply chains (those directly affecting the flow of goods, as well as those providing support services) and their functions. A disaggregation of the various stakeholders in terms of relative size and gender.
- *Performance*. Analysis of time-series data of yields, area, and production for each of the agricultural commodities under study. This analysis includes disaggregation in terms of gender and region (provinces). Understanding the frequency, intensity, and causes of yield volatility for the various crops revealed in the analysis of time-series data is one of the key activities to support the findings of the risk assessment.[10]
- *Governance and coordination mechanisms*. The dominant governance structures and coordination mechanisms and how they promote or inhibit the flow of information, risk sharing, and risk management across the sector.

[10] Illustrations of risk timelines for the agriculture sector as a whole and for commodities can be found in Annex C in World Bank (2015a).

» *Public sector policies and interventions*. The national and regional enabling environments (e.g., national/regional agricultural policies, discriminatory gender regulations, level of trade cooperation/integration, etc.). Public investments and donor-funded programs in the agriculture sector and their implications in terms of gender participation and risk management. Typically, government programs in agriculture are not necessarily designed with the objective of risk management in the first place, but addressing risk is oftentimes implicit in their activities. Also oftentimes implicit are issues of gender discrimination to access government programs. Understanding the existing risk management landscape lays the groundwork for the team to begin identifying gaps. Once the literature review is concluded, a gap analysis can be completed during the field visits.

ANNEX C

METHODOLOGY FOR ESTIMATING INDICATIVE VALUE OF PRODUCTION LOSSES IN AGRICULTURAL CROPS



Estimating production losses per crop: Estimating losses below threshold line (black line)

WORLD BANK GROUP

Step-by-step methodology using YIELD data

	CALCULATE INDICATIVE VALUE of LOSSES for INDIVIDUAL CROPS
1	Get time series for yields of a commodity from in-country data or FAOSTAT
2	Derive linear trend for yields using OLS and associated predictive values
3	Calculate Standard Deviation (SD) for linear trend
4	Derive threshold = Trend value - (0.33 * SD)
5	Calculate loss below threshold = Trend value – yield value for each year where yields are lower than threshold
6	Calculate total output loss = yield loss * total area harvested
7	Get yearly prices of commodity convert them from nominal to constant value
8	Calculate value loss of output = Total output loss * price (at constant value)
9	Convert to $US using annual exchange rates
10	Calculate annual average losses = Sum of value loss for years below threshold divided by total number of years in series.

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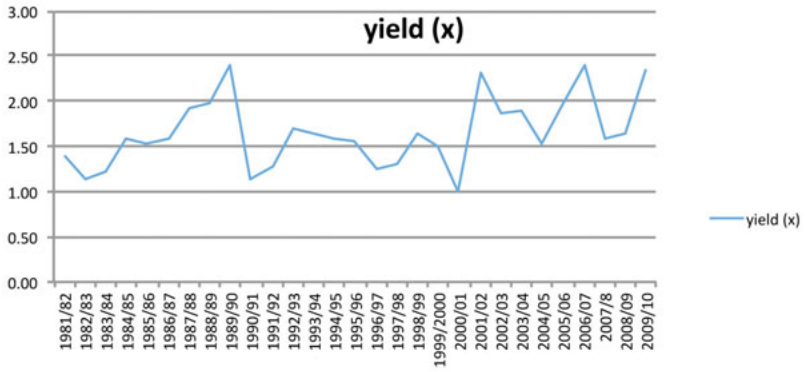
Step 1: Get Data .. Then plot yields

C21

	A	B	C	D	E	F	G
2							
3		1981/82	1982/83	1983/84	1984/85	1985/86	1986/87
4	**Area**	220.97	224.11	271.21	236.54	273.66	346.69
5	Production	308.46	254.80	328.28	375.55	417.80	549.77
6	yield (x)	1.40	1.14	1.21	1.59	1.53	1.59



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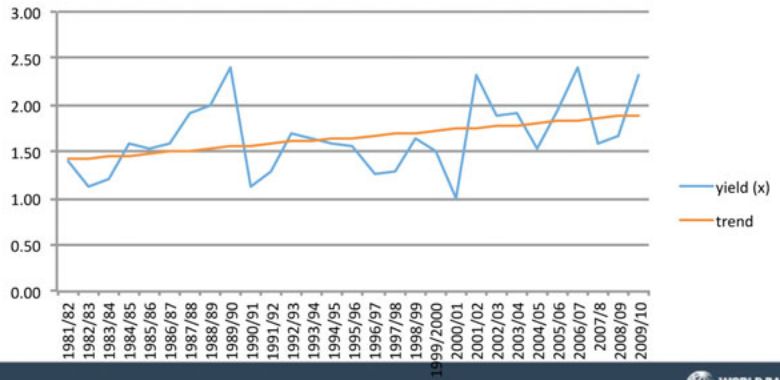
Step 2: Derive linear trend

B18 =TREND(B6:AD6)

	A	B	C	D	E	F
2						
3		1981/82	1982/83	1983/84	1984/85	1985/86
4	**Area**	220.97	224.11	271.21	236.54	273.66
5	Production	308.46	254.80	328.28	375.55	417.80
6	yield (x)	1.40	1.14	1.21	1.59	1.53
7	trend	1.4132	1.4304	1.4475	1.4647	1.4818

TREND(B6:AD6)=	1.4132
LINEST(B6:AD6)=	0.0171



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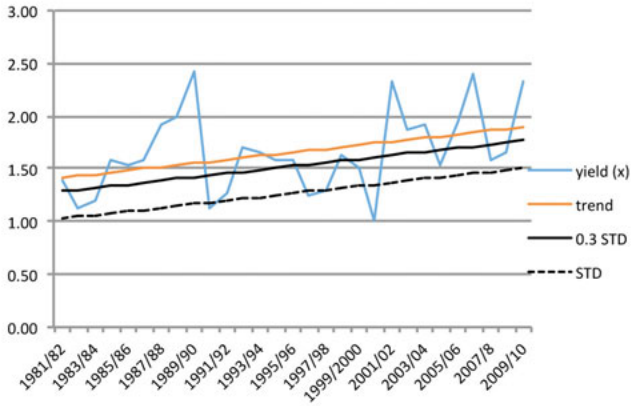
Step 3: Calculate standard deviation & threshold (one third of standard deviation)*

B22 =STDEV(B6:AD6)

	A	B	C	D	E	F	G
3		1981/82	1982/83	1983/84	1984/85	1985/86	1986/87
4	**Area**	220.97	224.11	271.21	236.54	273.66	346.69
5	Production	308.46	254.80	328.28	375.55	417.80	549.77
6	yield (x)	1.40	1.14	1.21	1.59	1.53	1.59
7	trend	1.4132	1.4304	1.4475	1.4647	1.4818	1.4990
8	Standard Deviation (SDT)	1.0267	1.0438	1.0610	1.0781	1.0953	1.1124
9	0.3 STD	1.2857	1.3028	1.3200	1.3371	1.3542	1.3714

Standard Deviation (SDT)	0.3866
0.33 std	0.1276



* It assumes that yields falling below the threshold line are losses due to a realized production risk.

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Step 4: Calculate loss below threshold

B10 =B6-B7

	A	B	C	D	E	F	G
3		1981/82	1982/83	1983/84	1984/85	1985/86	1986/87
4	**Area**	220.97	224.11	271.21	236.54	273.66	346.69
5	Production	308.46	254.80	328.28	375.55	417.80	549.77
6	yield (x)	1.40	1.14	1.21	1.59	1.53	1.59
7	trend	1.4132	1.4304	1.4475	1.4647	1.4818	1.4990
8	Standard Deviation (SDT)	1.0267	1.0438	1.0610	1.0781	1.0953	1.1124
9	0.3 STD	1.2857	1.3028	1.3200	1.3371	1.3542	1.3714
10	losses yields (tonn/ha)	(0.0173)	(0.2934)	(0.2371)	0.1230	0.0449	0.0868

B11 =B4*B10*1000

	A	B	C	D	E	F	G
3		1981/82	1982/83	1983/84	1984/85	1985/86	1986/87
4	**Area**	220.97	224.11	271.21	236.54	273.66	346.69
5	Production	308.46	254.80	328.28	375.55	417.80	549.77
6	yield (x)	1.40	1.14	1.21	1.59	1.53	1.59
7	trend	1.4132	1.4304	1.4475	1.4647	1.4818	1.4990
8	Standard Deviation (SDT)	1.0267	1.0438	1.0610	1.0781	1.0953	1.1124
9	0.3 STD	1.2857	1.3028	1.3200	1.3371	1.3542	1.3714
10	losses yields (tonn/ha)	(0.0173)	(0.2934)	(0.2371)	0.1230	0.0449	0.0868
11	total losses in MT	(3,822.0)	(65,762.0)	(64,302.9)	29,097.2	12,286.6	30,095.5

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5. Calculate INDICATIVE VALUE loss

B14 =B13*B10

	A	B	C	D	E	F	G
1							
2							
3		1981/82	1982/83	1983/84	1984/85	1985/86	1986/87
4	**Area**	220.97	224.11	271.21	236.54	273.66	346.69
5	Production	308.46	254.80	328.28	375.55	417.80	549.77
6	yield (x)	1.40	1.14	1.21	1.59	1.53	1.59
7	trend	1.4132	1.4304	1.4475	1.4647	1.4818	1.4990
8	0.3 STD	1.2857	1.3028	1.3200	1.3371	1.3542	1.3714
9	losses yields (tonn/ha)	(0.0173)	(0.2934)	(0.2371)	0.1230	0.0449	0.0868
10	total losses in MT	(3,822.0)	(65,762.0)	(64,302.9)	29,097.2	12,286.6	30,095.5
11	Producer prices (Tshs/Kg, countrystat)	952.7	952.7	952.7	952.7	952.7	952.7
12	price per MT	952700	952700	952700	952700	952700	952700
13	Price in MT/US$	676.15	676.15	676.15	676.15	676.15	676.15
14	**TOTAL VALUE LOSS US$**	**(2,584,243.673)**	**(44,465,202.176)**	**(43,478,587.837)**	**19,674,155.778**	**8,307,639.935**	**20,349,185.240**

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Summarizing results: Estimating average annual losses (paddy rice)

Years	Loss (MT)	Loss (US$)
1982/83	65,762	44,465,202
1983/84	64,303	43,478,588
1990/91	161,252	109,031,104
1991/92	94,242	63,722,253
1996/97	184,113	124,488,936
1997/98	255,477	172,741,869
2000/01	239,066	161,645,055
2004/05	191,871	129,734,130
2007/8	250,504	169,379,182
2008/09	176,671	119,456,593
Annual average	**58,044**	**39,246,307**

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ANNEX D
GUIDELINES FOR ASSESSING RISK AND CAPACITY TO MANAGE IN FOCUS GROUPS WITH FARMERS[11]

Basics. A *focus group* comprises people who have attributes in common, and who are able to provide information and opinions about the topic or subject that is the focus of discussion. Focus groups may be homogeneous or heterogeneous depending on the purpose of the focus group meeting (e.g., to identify a pattern, a homogeneous group is more appropriate, whereas to ascertain perceptions of risks affecting a whole supply chain, a heterogeneous group is more appropriate). Both ways are valid for assessing gendered differences in risk management.

Although the Ministry of Agriculture staff assisted in the selection of focus groups for the risk assessments, the team should:

- Be careful that there are no significant power differentials among group members, as this often results in influential people (often men, or better-off individuals) dominating the discussion.
- Aim to cover a mixed sample of representative farming entities covering (i) small and (ii) medium farmers. Within this continuum there may still be considerable differentiation within groups, which should also be accounted for. For example some small farmers (possibly in different regions) may have low input (e.g., limited inputs, family labor) versus high input use (e.g., moderate input use, hire labor). The level of commercialization may also vary among medium/large enterprises and regions in the country.
- Keep the size of the focus group manageable. A focus group is most effective with 10–15 participants.

The team could conduct a minimum of three (3) farmers focus group discussions: on the major cash crop, on all food crops, and one more cash crop at the consideration

[11] Adapted from World Bank 2015a.

of the field team member. In supply chains where women participation is high, the team needs to organize specialized focus groups with women farmers.

Purpose. A focus group discussion is one of the tools (alongside literature review, secondary data collection, key-informant interviews, etc.) to help assess risk. Its purpose therefore is to help the team:

- Identify risks (three principle types of agricultural risk: production, market, and enabling environment risk)
- Analyze and quantify risks (primary stakeholder; losses; frequency; underlying causes; risk transmission); prioritize risks (frequency of occurrence and severity of impact); and
- Identify current capacity to manage and vulnerability (i.e., sale of assets, borrowing, sale of labor, reduce consumption, government handouts, migration, etc.).

The purpose of the focus group discussions with farmers is to assess their capacity to manage by: identifying farmers' perceptions on the risks that they face in the supply chain, examining how these risks have negative impacts, and identifying gaps in how these risks could be managed more effectively.

STAGE ONE: PREPARING FOR A FOCUS GROUP DISCUSSION

Prior to engaging in a focus group discussion, the field team needs to:

- Identify and focus on the key purpose of this discussion, and key questions (please see guide/script below)
- Appoint a facilitator/moderator who will guide the content and the process of the discussion
- Appoint a note-taker to record the focus group feedback (the facilitator/moderator can take notes, too, but should be careful that it does not negatively affect the flow of the discussion if the facilitator stops to write things down)
- Develop a facilitator's/moderator's guide, or script
- Confirm whether a translator is needed (a field team member should be able to assume this responsibility too, if he/she is capable of doing so)
- Have sufficient stationery, including copies of all report formats (to be developed), notebooks, focus on clipboard (for drawing, writing, or posting), tape, pens, pencils, markers, post-its.

Developing a facilitator's/moderator's guide, or script. The script is a guide for the facilitator to explain to individuals the purpose of the group, review the focus group rules, and other information that may be important to provide to the participants. *Suggested script/guide template for all field teams to follow:*

Opening (10 Minutes):

"Hello. I will introduce myself and then I would like each of you to tell us your name, what you do, and whether you have participated in a similar discussion before. My name is (. . .). [Have the focus group members introduce themselves]. Today we would like to have a conversation with you about risks in your agricultural activities, how they impact you, and how you manage. We have been asked by the government to assess the risks affecting the agriculture sector and suggest measures to better manage them. We have selected major food and cash crop supply chains across the country, and just like we are here today with you, there are other teams in other parts of the country doing the same with farmers in [list some commodities and some of the other regions]. What we are trying to accomplish before we leave here today is to get a better understanding of the risks that you face in the supply chain, to asses what is your capacity to manage these risks, and how they could be managed more effectively. We plan that this will take us approximately two hours. Are there any questions?" [Respond to participant questions]

"Before we continue, let's agree on the rules of the discussion *[decide together on whether you want focus group members to participate by raising their hands to speak; write their ideas on a piece of paper, etc.]* I would like to tell you that everything we discuss here will be kept confidential. We are not here to check on licenses or for tax collection purposes. We will summarize the things you tell us and combine it with other focus groups we are meeting across the country. My job here today is to make sure we discuss all of the issues we planned to discuss, and my colleague here will help us by taking notes.

"Let's begin." (40 minutes)

[All discussions should cover four main areas: (i) livelihood profile; (ii) risk exposure; (iii) capacity to manage risk; and (iv) gaps and opportunities to address risk, and be structured: first a question, then a probe. Please see Stage Two].

Closure (10 minutes)

"Are there final questions? *[Respond to questions]* Let me re-iterate what I think we heard the risks that you face in the supply chain are, and how these risks and negative impacts could be managed more effectively *[re-iterate]*. Thank you for participating in our focus group today. We will be collecting feedback from all the focus group discussions undertaken across the country, and together with other analysis included it in our discussion with the Government."

STAGE TWO: CONDUCTING FOCUS GROUP DISCUSSION

Since we are aiming to understand what risks and participants capacity to manage them, it might be worth *at the beginning of the discussion to have the focus group participants engage in wealth breakdown:* the group can be asked to consider 2 sized groups, ranging from the small poorest to the larger-farm units. Visually this could be represented with colored stickers or similar. This differentiation can probably help us at the end of the process identify easier how important are the expected losses for different participants in the chain, relative to their assets, livelihood/enterprise strategies, and performance outcomes.

Proceed with the opening *according to the script*, and start the discussion with the agreed method of participation.

All field teams should *be prepared to discuss the five main areas* identified above as *(i) livelihood profile; (ii) risk exposure; (iii) risk management; and (iv) gaps and opportunities to address risk.* Below is a table with indicative questions under each area. This is not a questionnaire to be strictly followed and completed. It is meant to help the facilitator/moderator to keep the discussion organized. Questions asked should in general be open-ended to stimulate both individual contributions and group interaction. Questions should not elicit "yes/no" answers.

Agricultural/Livelihood Profile

Question: What are the main crops you produce for own food consumption; for cash; for export.	*Probe: % area of value, total area farmed & owned (ha), rank them in importance.*
Question: Is livestock important for you?	*Probe: Do you consume livestock products that you produce? Do you derive income from livestock products? What percentage of income?*
Question: What percentage of your household income is from crops, livestock, other? Is your average level of production and revenue in a given year? What has been the trend in recent years?	*Probe: Try to find out what role agriculture plays in the household livelihood.*
Question: What inputs do you use? Where do you source inputs from?	*Probe: Fertilizer, seeds, pesticides. Check for reliability, quality, and utilization.*
Question: Do you have regular input procurement arrangements? With whom? How effective are existing input arrangements?	*Probe: Timely provision of inputs, cost factors, logistics issues. Formality of arrangements.*
Question: Do you have fixed selling (contract) arrangements with processors or other intermediaries? How often are these negotiated?	*Probe: Formality of contracting, length of trading relationships. Logistics.*
Question: Is there any type of irrigation used? What type of irrigation is in use?	*Probe: Furrow, drip, overhead, etc.*
Question: What are the factors that motivate planting of crop? What are the alternatives?	*Probe: Return to assets v. risk management, substitute, complementary goods.*
Question: What access do you have to local markets and traders? What is the distance to the nearest trading center?	*Probe: Formal v. informal markets.*
Question: What access do you have to financial resources?	*Probe: Formal v. informal finance (credit, trade finance, personal).*
Question: Are you a member of a cooperative/organization? What are the primary benefits of this relationship?	

Risk Exposure	
Question: In broad terms, what are the main sources of risk you face in: *Sourcing inputs?* *Production?* *Sales/Marketing of goods?*	*Probe: Nature of risk (production, market, enabling environment). Probe against specific risk factors impacting on farm kevel e.g.: weather, price, environment, labor standards, logistics, operational, trade policies.*
Question: What is the magnitude of the direct negative impacts that potentially arise from these risks?	*Probe: e.g., High, medium, or low impacts on: income, food consumption, indebtedness, wellbeing. Temporal impacts?*
Question: What crops are more vulnerable to risks?	*Probe: Probe against specific production risks (weather, SPS), market risks (prices),and enabling environment.*
Question: What are the three main sources of risk that most concern you?	*Probe: Ranking of potential problem "areas."*
Question: Of the risks identified, what is their frequency?	*Probe: Seasonal, annually, 1 in 2 years, 1 in 5, 1 in 7.*
Question: How would you describe the potential severity of impact and expected losses arising from major risks?	*Probe: Expected loss—minimal, low, medium, high, very high.*
Question: Overall, are conditions in the supply chain, and your position in particular, deteriorating/improving in recent years?	*Probe: Get a sense of long-term threats/opportunities to participants.*
Note: You may wish to probe specific risk aspects related to seasonality dimensions, contracting arrangements, direct impact of weather and environmental factors. You are trying to corroborate frequency of risk events; identify the causes of losses; could be single cause, or multiple causes (percentage).	

Risk Management	
Question: What is done to address problems in advance of a risky event? How long have these actions existed?	*Probe: Ex ante risk management strategies—investments in infrastructure, technology, management practices, financial instruments, organizational arrangements.*
Question: What is done to address problems after a risky event?	*Probe: Ex post risk management strategies—reallocation or sale of assets (livestock), seek employment/migration, transfers, resort to savings, borrow from friends or family, etc.*
Question: How effective have these actions been? What actions have been most effective? Least effective? Why?	*Probe: Ex ante and ex post risk management strategies.*
Question: Who typically provides these actions?	*Probe: Self-made decisions, decisions by farmer organizations, formal v. informal mechanisms.*
Question: What interventions have been supported by public sector "agents" (including donors/NGOs) to manage problems?	*Probe: Role of public sector/Government agencies v. market-based actions v. community-level. Ex ante v. ex post risk.*
Question: How effective have public interventions been? Which are more/less effective?	*Probe: Timing, targeting, delivery aspects.*
Question: What has recent experience illustrated about farmer capacity to withstand major deviations, disruptions, and disasters in the supply chain?	*Probe: Ability to manage risk on own v. need for external "partners."*
Question: What information sources, if any, are used to predict/assess the potential frequency/magnitude/severity of problems?	*Probe: Early warning information, price tracking, local knowledge.*
Question: How would you describe overall access to credit and insurance? What are the benefits/costs from credit and/or insurance?	*Probe: Availability, affordability or credit and timely/"fair" payment of insurance.*
Note: You are trying to understand impact of events (short term, medium term); how losses are transmitted upstream and downstream along the supply chain; how different stakeholders manage these risks; how small/medium/larger farmers manage in terms of mitigation, transfer or coping; how shock was absorbed; were there any stakeholders out of business.	

Gaps and Opportunities to Address Risk	
Question: What are the main lessons learnt from past experiences in risk management?	
Question: What options could be explored to manage risks affecting farmers better?	*Probe: Production/Market/Enabling environment. Opportunities and constraints.*
Question: What are the perceived potential options for managing problems jointly with other supply chain entities?	
Question: What roles could others play?	*Probe: Community; Public sector/Government; Private sector, NGOs, Donors.*

Remember:

You are taking time out of focus group members' busy schedules. Keep it within the time limit you promised it will take!

ENDING FOCUS GROUP DISCUSSION

Proceed with the closure *according to the script*, and debrief with focus group discussion participants immediately after each focus group when information is fresh. It is a good opportunity to double-check major findings, and also identify top-of-mind patterns and themes.

STAGE THREE: REPORTING FOCUS GROUP DISCUSSION

As soon as possible after ending focus group discussion (ideally that same evening with the team) proceed with reporting the results of the focus group discussion, using this format (copies of the report format should be provided to all field teams).

Focus Group Discussion No. _____

Region Name: _____ City/Village Name: _____

Livelihood zone: _____

Date: _____ Team Member Names: _____

Livelihood Profile

Main Food Crop Production (Rank Importance of Contribution to Diet)	Small Farmers	Medium Farmers	Comments
1			
2			
3			
4			
5			

**Rank from 1: Most important to 5: Least important*

Main Cash Crop Production (Rank Importance of Contribution to Income)	Small Farmers	Medium Farmers	Comments
1			
2			
3			
4			
5			

Livestock (Types/Size Held)	Small Farmers	Medium Farmers	Comments

Narrative description of supply chain segment interviewed: Explain main characteristics of supply chain segment (participants, interactions) and general trend.

Risk Exposure

Food Crop (Rank Exposure to Risk)	Small Farmers	Medium Farmers	Comments (Impact: Moderate, Considerable, Critical, Catastrophic)
1			
2			
3			
4			
5			

**Rank from 1: Most exposed/Most vulnerable to risky event to 5: Least exposed/Least vulnerable to risky event*

Food Crop (Rank Frequency of Risk)	Small Farmers	Medium Farmers	Comments (Impact: Moderate, Considerable, Critical, Catastrophic)
1			
2			
3			

**Rank from 1: High Probability to 3: Low Probability*

Cash Crop (Rank Exposure to Risk)	Small Farmers	Medium Farmers	Comments (Impact: Moderate, Considerable, Critical, Catastrophic)
1			
2			
3			
4			
5			

**Rank from 1: Most exposed/Most vulnerable to risky event to 5: Least exposed/Least vulnerable to risky event*

Cash Crop (Rank Frequency of Risk)	Small Farmers	Medium Farmers	Comments (Impact: Moderate, Considerable, Critical, Catastrophic)
1			
2			
3			

**Rank from 1: High Probability to 3: Low Probability*

Risks for Food Crops	Frequency	Impact	Risks for Cash Crops	Frequency	Impact

Current Risk Management Practices

Cash Crop Risk Event (e.g., Drought, Output Price, etc.)	**Mitigation** (e.g., Drought Tolerant Seed Varieties, etc.)	**Transfer**	**Coping** (e.g., Borrowing, etc.)	**Capacity to Manage Risk with These Strategies (It Would Be Good to Have This by Small and Medium Farmers)**

Food Crop Risk Event (e.g., Drought, Output Price, etc.)	**Mitigation**	**Transfer**	**Coping**	**Capacity to Manage Risk with These Strategies (It Would Be Good to Have This by Small and Medium Farmers)**

Suggested Gaps and Opportunities to Address Risk

Cash Crop Risk Event	Gaps	Opportunities for Public Sector/ Government	Opportunities for Private Sector	Opportunities for NGOs/Donors

Food Crop Risk Event	Gaps	Opportunities for Public Sector/ Government	Opportunities for Private Sector	Opportunities for NGOs/Donors

Narrative description: A sense of prioritization?

Let's discuss the dynamics of the format of interaction. Options: (i) written questions with closed answers to fill in by farmers like multiple choice; (ii) Open questions in a group and farmers raise their hands for suggested answers; (iii) Open questions to the group and open answers and team just take note; (iv) etc.

AGRICULTURE GLOBAL PRACTICE DISCUSSION PAPER

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