Food and Agriculture Organization of the United Nations

Guidance note on gender-sensitive vulnerability assessments in agriculture

Guidance note on gender-sensitive vulnerability assessments in agriculture

Food and Agriculture Organization of the United Nations
Rome, 2018

This publication has been printed using selected products and processes so as to ensure minimal environmental impact and to promote sustainable forest management.

Cover photo: Farmers in Burkina Faso escaving mid-moon dams to save water.
©FAO/Giulio Napolitano

Contents

Acknowledgements

The *Guidance note on gender-sensitive vulnerability assessments in agriculture* was developed by Gayatri Koolwal, Natural Resources and Sustainability Analyst (Gender Statistics) International consultant, under the technical guidance of Ilaria Sisto, FAO Gender and Development Officer (Training and Capacity Enhancement) and Szilvia Lehel, Gender and Climate Change International Consultant, with the invaluable support of Vanya Slavchevska, Gender Economist International Consultant. The team would also like to thank Thomas Hofer, Senior Forestry Officer and Coordinator of the Major Area of work on Ecosystem Services and Biodiversity, Chiara Brunelli, Food Security and Nutrition Officer, Marco D'Errico, Economist, Sara Manuelli, Information, Advocacy and Resource Mobilization Specialist of the Mountain Partnership, and Beate Scherf, Programme Officer (Global delivery) Sustainable Agriculture Programme, for their guidance and support provided during the document preparation.

This Guidance was developed as part of the activities developed by the Gender team in the Social Policies and Rural Institutions Division to support the work of the Major Area of Work on Ecosystem Services and Biodiversity with the development of a methodology to measure the gender-differentiated perceptions of ecosystem services and biodiversity within the range of existing ecosystem valuation methods to help identify inclusive and participatory approaches that facilitate uptake.

1. The value of conducting gender-sensitive vulnerability assessments in agriculture

Ways to bolster agricultural productivity, and in particular food production, have become central policy concerns across countries amid rising food insecurity, population pressures and changes in climate. Rural households are faced with increasing risks from natural shocks (drought, temperature and rainfall variability, for example) as well as longer-run changes over time such as groundwater depletion, soil degradation, unexpected changes in growing seasons, and declining access to other natural resources. Climate change also has a magnified impact on earnings in small-scale and subsistence agriculture, an important policy issue since small-scale farming is becoming increasingly common across countries (FAO, 2015a). For this reason, women working in agriculture – who are heavily involved in subsistence farming across low-income contexts – have also become an important target group for policy-makers. Despite their diverse roles in agriculture across countries, women's livelihoods are often concentrated in temporary and/or own-production activities – including resource-dependent work such as water and firewood collection – potentially making them more vulnerable to short-term and long-term changes in agroclimatic conditions as well. Raising women's productivity in agriculture can improve their welfare and boost growth and adaptive capacity in the sector overall.

Land tenure, access to credit, infrastructure, markets, and other inputs and extension services are potential policy instruments that can boost agricultural productivity and help farmers to better adapt to climate change. However, these interventions are often targeted unequally across different types of farmers, including men and women, leading to gaps in agricultural productivity. Across developing countries, women who are self-employed in agriculture tend to have smaller landholdings and lower productivity, often stemming from poorer access to these same institutions and services. Such productivity differences can be magnified with decreased access to and quality of natural resources.

Investing in agriculture, as a result, requires a better understanding of the specific constraints different farmers face, including their access to natural resources, credit, markets, and infrastructure. These constraints affect farmers' choices, and in addition to gender can vary widely by individual landholdings, agroclimatic endowments, and policy environments. It is also important to analyze the specific situation of men and women in different ecosystems such as mountains and wetlands. Vulnerability assessments can therefore greatly inform policy-makers about the needs of the targeted population, and what policy interventions are likely to be more effective in helping both male and female farmers to better adapt.

This guidance note was developed to support development and humanitarian practitioners in carrying out a gender-sensitive vulnerability assessment, in order to identify and address the main sources of vulnerability of men and women in the agriculture sector. The note describes what are the main constraints that male and female farmers face in the agriculture sector, with a focus on climate change. It also provides an overview of available sources and methodologies to collect and analyze sex-disaggregated data. The specific aspects of climate change and targeted outcomes for men and women can vary widely across diverse areas, so this note discusses data sources and empirical approaches that can be applied across different contexts. Objectives of gender-sensitive vulnerability assessments are described in Box 1 below. Specific questions that these assessments need to answer – related to the target population and their constraints and planned outcomes and outputs, as well as relevant data and methodology, are outlined in Box 2. The following sections discuss these questions as well (constraints and outcomes, data, and methodology).

Box 1. Vulnerability assessments on gender and climate change should address the following areas (also see Raemaekers and Sowman, 2015)

- Identifying key factors related to climate change that undermine the livelihoods of men and women in agriculture, focusing on planned outcomes
- Highlighting specific constraints faced by men and women farmers in adapting to climate change, as well as existing coping and adaptation strategies that are being used to address socio-ecological vulnerabilities
- Identifying the sub-groups that are most at risk, due to their limited capacity and resources
- Proposing adaptation measures to reduce vulnerabilities of men and women in these sub-groups, caused by climate change, to be integrated into policy planning

Box 2. Structuring gender-sensitive vulnerability assessments

Possible questions to structure the assessment:

(1) What is the **population of interest**, and the **level of targeting** (for example, specific sub-groups of men and women, or gender-sensitive policy targeting at the community level)?

(2) What are the **relevant constraints and outcomes** of interest for men and women in these sub-groups, related to climate change?

(3) What is the **timeframe** of the assessment (for example, projecting forward for the next 5 years, 10 years, etc.)?

(4) What is the **available data or data collection strategy** to understand both men's and women's constraints and outcomes with respect to climate change?

(5) What is the most **appropriate empirical methodology** to assess appropriate interventions and coping strategies for men and women, given the available data?

2. Constraints and outcomes related to climate change

As discussed above, women employed in agriculture in developing countries typically face insecure land rights, as well as poorer access to inputs, markets and credit compared to men. Credit markets may also treat men and women farmers differently, leading to lessened ability for women to be able to purchase inputs (Peterman et al, 2011). Women's decision-making capacity in agriculture therefore often remains limited, including in community decisions over the use of natural resources (World Bank, 2009; FAO/AQUASTAT, 2016). These constraints heighten women's vulnerability to external shocks, changes in climate and natural resource endowments, including their options for coping with shocks. Box 3 presents findings from recent research on major constraints faced by women in agriculture that affect their productivity, which would be valuable to consider in a vulnerability assessment.

On climate change specifically, three areas emerge where sex-disaggregated outcomes in agriculture can be examined. The first is **climate-smart agriculture** (CSA), which is defined broadly by FAO as **an approach that helps to guide actions needed to transform and reorient agricultural systems to effectively support development and ensure food security in a changing climate.** CSA covers three main areas: (a) sustainably increasing agricultural productivity and food security; (b) adapting and building resilience to climate change; and (c) reducing and/or removing greenhouse gas

Box 3. Factors affecting gender differences in agricultural productivity

Recent studies on gender gaps in agricultural productivity, relying on data from Sub-Saharan Africa (see Goldstein and Udry, 2008; Kilic, Palacios-Lopez and Goldstein, 2015) have identified several factors from which these gender gaps arise:

- different access to and use of productive resources and agricultural inputs between men and women
- tenure security and related investments in land and improved technologies
- market and credit access
- human and physical capital
- informal institutional constraints affecting farm/plot management and marketing of agricultural produce
- advisory and extension services, and training programs
- different access to information and knowledge

By controlling the factors mentioned above, the gender gap in agricultural productivity can be reduced, as shown in many studies. **Palacios-Lopez and Lopez (2015),** for example, use the 2011 Malawi LSMS-ISA survey to estimate gender differences in agricultural productivity, and find that agricultural labour productivity is, on average, 44 percent lower on female-headed plots than on those managed by male heads. Their study estimates that 34 percent of this gap is explained by differences in their labour market access and 29 percent by differences in credit access.

emissions, where possible (World Bank, FAO and IFAD, 2015). The second is conservation of local water and forestry resources, which are tied to **ecosystems and biodiversity** more broadly and have strong implications for women in rural, low-income contexts. Finally, the third relates to **efficient use of resources**, and men's and women's time burdens in both paid and unpaid activities, that affects their time allocation in agriculture. Box 4 below presents examples of quantitative gender-sensitive indicators, primarily at the individual/household level, that would be useful in tracking a gender-sensitive vulnerability assessment focused on the effects of climate change. Sex-disaggregated data collection in this area should also take into account how gender issues vary across specific ecosystems such as mountains, wetlands, and other areas. For example, a recent study by the Ecuadorian National Statistics Institute (INEC) in 2011–2012 showed that in higher-elevation areas, men tend much more to migrate elsewhere for work, and thus women are often left responsible for managing the household and farm (FAO, 2015b). It is therefore important to collect context-specific sex-disaggregated data to assess women's work burden and support them with increased access to specific resources and labour-saving technologies.

The indicators below examine different facets of production and productivity in agriculture, which allows one to better understand the main underlying factors that lead to differences in output and productivity between men and women plot owners. These could be related to available resources, culture or inheritance laws in the country, or more likely a combination of these different factors. Understanding as many of these dimensions as possible is therefore important to identify the underlying causes of vulnerability of rural men and women. As discussed in the next section, however, construction of these indicators relies on available data, and nuances in some concepts (such as how land ownership and management are defined across contexts) also needs to be considered.

Box 4. Examples of quantitative indicators related to gender and agriculture

1. Climate-smart agriculture

Land ownership/management:[1] *(could be disaggregated to look at joint or partial ownership as well; also see Doss et al., 2015 for additional discussion)*:

- Share of female plot owners and male plot owners that have a formal certificate of title issued by and registered with government authorities, by sex
- Share of female and male plot owners that have the right to sell land and/or use land as collateral
- Share of plots owned by women and men (and jointly owned), relative to total number of plots
- Land area owned by women and men (and jointly owned), relative to total land area

Input use/access:

- Share of male and female producers that purchased/received (a) improved seeds/fertilizer/other agricultural technologies, (b) agricultural extension services that are climate-smart, (c) credit (by source of credit: formal/semiformal/informal)
- Share of male and female producers that own productive assets for agriculture (can be specified depending on the type of agricultural activity)
- Share of male and female producers than can access input and output markets, and average time required for men and women to reach the nearest market and source of transportation

1 For land ownership/management, the shares of female and male plot owners could be interpreted relative to different reference groups. As examples, these shares could be calculated by dividing the number of female and male plot owners by (a) total number of adult men and women, or (b) the total number of reported plot owners, which would not reflect how widely land ownership is distributed across all men and women (See Doss et al, 2015).

Natural resources/endowments:

- Average plot soil quality, by sex of plot owner
- Main source of water access to plot (irrigated/rain-fed, for example), by sex of plot owner
- Agricultural shocks faced in the last cropping season or year (drought/flooding/soil erosion/pests, for example), and coping strategies (borrowing, reducing saving, reducing consumption, other help sought, for example), by sex of plot owner
- Share of farmers who use weather/climate information services, by sex
- Share of farmers actively involved in community associates for natural resources management, by sex

2. Ecosystems and biodiversity (related to water and firewood collection)

Water:

- Main source of water, separately for household and agricultural use, by sex of plot owner
- Share of adults and children engaged in collecting water, separately for household and agricultural use, by sex
- Among women who collect water: walking time to the nearest water source (minutes, one way)
- Share of farmers who use water conservation methods, separately for traditional and improved methods, by sex
- Share of farmers who use irrigation methods (traditional and improved), by sex of plot owner
- Number of water shortages experienced in the last two weeks, separately for household and agricultural use, by sex of plot owner
- Perceptions of water access and quality for household/agricultural use, by sex of plot owner
- Share of adult men and women who are members of, and participate actively in, local institutions and community associations on the management of water resources

Forestry:

- Share of adults and children engaged in collecting forestry and wild products, separately for household and agricultural use, by sex
- Among women who collect forestry products: walking time to the nearest forestry source (minutes, one way)
- Share of adults who earn income from agroforestry, by sex
- Share of adults who use forestry products for own consumption, by sex
- Share of adults who face constraints in accessing forestry resources, both physical/natural and social, by sex
- Share of adult men and women who are members of, and participate actively in, local institutions and community associations on the management of forestry resources

3. Efficient use of resources/time use

- Average hours spent on unpaid domestic work (housework and childcare), by sex (IAEG-GS minimum set indicator)
- Average hours spent on paid and unpaid work combined (total work burden), by sex (IAEG-GS minimum set indicator)
- Share of adults in temporary or seasonal paid work, by sex
- Share of adults in subsistence agriculture, by sex
- Share of adults who feel their unpaid work burdens are too high to engage in paid work, by sex

3. Available data at the household and community levels

Depending on the type of analysis (discussed in Section 4 below), vulnerability assessments can rely on case studies, primary data collected in the field (including participatory approaches such as focus groups, and structured quantitative surveys), and/or existing household surveys and censuses. Among traditional household surveys conducted by international agencies, significant gender data gaps persist across countries – including a lack of sex-disaggregated data on land tenure, vulnerability and coping with climate-related shocks, as well as improved practices related to management of land and water resources, soil, crops, and livestock. Preferences and decisions over improved inputs for crop and livestock activities can also vary substantially between men and women as well, and can inform policy-makers on adaptation and coping strategies, but data on preferences is also very limited across standardized cross-country surveys. This section briefly describes different cross-country data sources and surveys that, for the most part, are nationally representative or have modules that could be integrated into nationally-representative surveys – which can inform gender-sensitive vulnerability assessments as well as primary data collection as part of these assessments.

Nationally representative household/ plot-level surveys

Currently, agricultural censuses and surveys are still lacking in their collection and analysis of sex-disaggregated data. Greater progress has been made among household surveys – following the momentum set by the FAO/World Bank Global Strategy and the recent adoption of the Sustainable Development Goals. International agencies have worked to bridge gender data gaps in agriculture through household survey improvements targeted at the household and agricultural landholding levels. These improvements can greatly inform policy by providing richer data on agricultural outcomes for men and women that can also be compared against data on demographics, education, other forms of employment and welfare aggregates such as consumption. FAO has developed guidelines targeted towards national statistical offices towards NSOs and ministries of agriculture on how to mainstream gender in agricultural surveys, with a focus on large-scale agricultural surveys and agricultural modules in household and other surveys. The guidelines, which will also draw from field experiments conducted in Uganda and Indonesia in late 2016, will cover several thematic areas including decision-making (going beyond the holder and looking at who manages/controls decisions on plots), assets, financial resources, time use and work of household members, external labor, and training/extension services/participation in groups. For each thematic area, these guidelines will identify key gender indicators for the agricultural sector, and providing guidance on sources, data collection, calculation of the related indicators, and analysis.

The Living Standards and Measurement Study-Integrated Surveys on Agriculture (LSMS-ISA) in Sub-Saharan Africa have made the greatest headway on sex-disaggregated data on land ownership and management, and are revealing important insights into how women's land ownership and productivity in agriculture differs from men. The LSMS and other national household consumption and expenditure surveys are also increasingly including household or community GPS coordinates that can be linked with other geocoded weather and climate data, as well as detailed modules on health, vulnerability and perceptions of food security, as well as shocks encountered (natural, social, household) and coping strategies. For the most part, however, these modules still tend to be focused at the household level, making it difficult to understand how men's and women's consumption and coping strategies vary, particularly amid uncertainties related to climate change. This is an area that needs further development in surveys and gender-sensitive vulnerability assessments.

Box 5. New efforts on household survey design among international agencies

Nationally representative surveys that can shed light on gender differences in agricultural productivity, by socio-economic and demographic characteristics:

- **World Bank Living Standards Measurement Study-Integrated Surveys on Agriculture (LSMS-ISA):** along with standard modules on individual demographic and socioeconomic characteristics, also has detailed agricultural modules on men's and women's plot ownership, management, input use, production, and other agriculture-related activities. The survey also has a community module that covers such topics as institutions and other initiatives serving the community, recent events including shocks, and market prices. Currently, LSMS-ISA covers panel surveys in eight countries across Sub-Saharan Africa (Burkina Faso, Ethiopia, Malawi, Mali, Niger, Nigeria, Tanzania, and Uganda).

  Available at: http://econ.worldbank.org/WBSITE/EXTERNAL/EXTDEC/EXTRESEARCH/EXTLSMS/0,,contentMDK:23512006~pagePK:64168445~piPK:64168309~theSitePK:3358997,00.html

- **Agricultural and Rural Integrated Survey (AGRIS):** New survey designed by FAO that is still in the pilot and development phase, and will begin to be implemented over the next year or two. AGRIS will have detailed individual data on agricultural holdings, management, and production, as well as household demographic and socieconomic characteristics that could be correlated with these outcomes.

Additional efforts to design household survey modules that highlight gender differences in management and decision-making over agricultural input use and production:

- **Women's Work and Employment (WWE) partnership**: FAO and the World Bank are also collaborating with ILO and the UN Foundation's Data2X project on how to better measure women's and men's work in subsistence agriculture across own-production and market-based activities.

  Available at: http://data2x.org/partnerships/womens-work-employment/

- **Women's Empowerment in Agriculture Index (WEAI)**, the result of a recent partnership between Feed the Future, IFPRI, USAID, and the Oxford Poverty and Human Development Initiative, measures men and women's relative autonomy and decision-making roles in agricultural production. FAO and IFAD have also modified a version of the WEAI for the UN Joint Programme survey on Rural Women's Economic Empowerment (UNJP-RWEE), discussed below.

  Available at: http://www.ifpri.org/publication/womens-empowerment-agriculture-index

Global Environment Facility (GEF)

Under the Global Environmental Facility's Integrated Approach Pilot on Fostering Sustainability and Resilience for Food Security in Sub-Saharan Africa (IAP) sets out the management of natural capital – land, soil, water, vegetation and genetic resources – as a priority in the transformation of the agriculture sector for food security. This program targets agro-ecological systems where the need to enhance food security is linked directly to opportunities for generating global environmental benefits. A main priority of this program is to monitor ecosystem services and the human, agricultural and ecological aspects of food security and resilience. The Self-Evaluation and Holistic Assessment of Climate Resilience of Farmers and Pastoralists (SHARP) tool is designed as a survey instrument to assess the resilience of farmer and pastoralist households to climate change. In the context of the IAP, FAO as a GEF executing agency has adapted its SHARP survey questionnaire to incorporate a range of topics related to IAP (land degradation, sustainable land management, agro-biodiversity, resilience, and gender/decision-making) measurable through indexes, scores and scales. This adaptation of the SHARP questionnaire is currently known as HH-BAT (Box 6). A pilot survey and analysis has been conducted in Uganda, with another survey planned in Burundi.

Overall, the HH-BAT is a rich survey tool for understanding different aspects of households' agricultural activities, their vulnerability to shocks, water and land access issues, and food insecurity, as well as climate-related factors affecting production. Efforts are also underway to better address gender issues. The HH-BAT can be a useful template for primary data collection as part of vulnerability assessments, as well.

Box 6. Topics covered in Global Environment Facility HH-BAT survey questionnaire

- Basic characteristics of the household respondent (gender, age, relationship to the household head, area of residence, main agricultural practice – farmer/agropastoralist)
- Production systems and practices, including labor allocation of household members across different agricultural activities and other income-generating activities
- Within agriculture, several modules detailing input use (labor/seeds/fertilizer/pesticides/other technology) and related practices, and the extent to which each activity was important to their farm system and sufficient for providing income to the household
- Perceived changes in climate, access to water and land, as well as soil quality and land degredation
- Food consumption and insecurity, and exposure to other shocks
- Household decision-making roles across individual health care, major and daily household purchases, and other financial decisions
- Major productive assets and income sources

FAO databases that present sex-disaggregated statistics in agriculture

Aside from household surveys, some sex-disaggregated data (at the country level) on food security, access to water, and land ownership/tenure can be revealed from databases housed within FAO. Four main databases within FAO present data that can, for some topics, be sex disaggregated – FAOSTAT, the Rural Livelihoods Monitor (RLM), and the Gender and Land Rights Database, and AQUASTAT. Box 7 provides some detail on each of these databases.[2] A main shortcoming, however, is that greater breadth of data across outcomes, particularly plot-level outcomes, is needed across countries. Going forward, as household and agricultural surveys continue to disaggregate agricultural outcomes by sex, the span of information within these databases will continue to grow.

Box 7. FAO databases with different sex-disaggregated statistics in agriculture

- **FAOSTAT:** presents data for 245 countries and 35 regional areas from 1961 to the present. Statistics on population (men and women in agriculture) are available, and indicators of food security (for example, share of food consumption in total income, or of dietary energy consumption from different food sources) are disaggregated by sex of the household head.

  Available at: http://faostat3.fao.org/home/E

- **Rural Livelihoods Information System:** platform that will be launched in 2017 by FAO that presents indicators on rural livelihoods and welfare, disaggregating data by sex of the individual on employment, health, education and land ownership (the latter depending on data availability).

- **Gender and Land Rights Database:** launched in 2010 to highlight factors (political, legal, cultural) that affect women's land rights across countries and as of 2016, 84 country profiles are available. The GLRD also contains sex-disaggregated statistics on land ownership from household surveys and on land management (proxied by the agricultural holder) from agricutural censuses.

  Available at: http://www.fao.org/gender-landrights-database/en/

- **AQUASTAT:** FAO's global water information system, developed by the Land and Water Division. Based on examining data collected through the WCA and other censuses, the AQUASTAT database now has two indicators related to women's use of irrigation (percentage of area equipped for irrigation managed by women, and percentage of agricultural holdings with irrigation managed by women). These data are currently available primarily among European countries, with the intent as well to collect this information in standardized manner in developing countries.

  Available at: http://www.fao.org/nr/water/aquastat/data/query/index.html?lang=en

2 FAO also houses the Agri-Gender Database, a toolkit to provide guidance on collecting sex-disaggregated data in agriculture, across nine areas: (1) agricultural population and households, (2) access to productive resources, (3) production and productivity, (4) destination of agricultural produce, (5) labour and time use, (6) income and expenditures, (7) membership of agricultural/farmer organizations, (8) food security, and (9) poverty indicators.

4. Capturing and measuring vulnerability – methodologies for vulnerability assessments

Vulnerability assessment methodologies typically fall into two areas: (1) Top-down or quantitative methodologies, and (2) Bottom-up or qualitative methodologies. In recent years, a combination of both approaches has also become more common (Brugère and De Young, 2015); given the varied but complementary contributions of both quantitative and qualitative data, ideally both can be integrated to provide a more complete assessment of vulnerability in a population. Quantitative approaches rely on the types of standardized household surveys discussed earlier. Qualitative methodologies often involve a mix of different approaches, including focus groups and vulnerability mapping exercises to identify areas or communities that are most in need.

Quantitative methodologies

Approaches using household survey data will depend on the availability and quality of information on the specific constraints and outcomes of interest across men and women, as well as the available information on climate-related shocks and events. As discussed above, many quantitative studies are also combining traditional household surveys that have GPS data of households/communities with other geocoded data on rainfall, soil quality, and other agroclimatic characteristics (Asfaw and Maggio, 2016; McCarthy and Kilic, 2015). Asfaw and Maggio (2016), for example, use the LSMS-ISA household and community data from Malawi to find that weather shocks significantly reduce consumption and nutritional outcomes, with more pronounced effects where the share of land area owned by women is higher. The study links household GPS coordinates in the household survey with climactic data on historical rainfall and temperature. The results point towards the hypothesis of a gender-differentiated impact of drought shocks, suggesting that, in the case of high climate variability, women involved in agriculture are much less able to cope with shocks – and highlighting the need for policy to examine more closely how different vulnerable groups cope with increased climate variability.

Using both socio-economic and spatial data can shed light quickly on areas and communities that are hit hardest by depletions of natural resources, as well as other variations in climate (vulnerability mapping). Typically, this would involve visual as well as traditional regression-based approaches that can also shed light on whether women's outcomes in agriculture are more at risk to changes in climate. Regression-based decomposition

techniques can also reveal the extent to which gender differences in agricultural productivity and adaptation strategies can be explained by different constraints, whether access to credit, markets, and. or infrastructure (Kilic et al, 2015). Household panel data, when available, can also reveal the progression in outcomes and adaptive strategies over time stemming from climate change.

Qualitative methodologies: participatory framework

Focus groups, while limited to small samples, can be an important tool for understanding differences in perceptions among men and women on coping strategies, views on technology adoption, and conservation of natural resources. This information can be valuable at the household as well as community levels, and also shed light on gender gaps in decision-making in agriculture in both spheres. Differences in priorities between men and women on their time use, and tradeoffs in other productive work within and outside agriculture, can also be examined. Finally, in-depth discussions can also clarify the different channels – social, economic, and environmental – affecting men's and women's choices and constraints in agriculture, as well as their responses to changes in climate. For example, qualitative indicators on female plot managers' perceived costs and benefits of new technologies can help in understanding quantitative indicators on the share of these women who adopt new technologies, compared to male managers. Box 8 provides some examples of qualitative indicators that can help guide vulnerability analyses. In general, having qualitative information through focus group discussions can be an important complement to quantitative analysis. Box 9 below also presents some recent country studies that have combined both quantitative and qualitative approaches.

Box 9. Examples of qualitative gender-sensitive indicators in agriculture

Qualitative indicators: describe individual perceptions, and other traditional practices and institutional factors at the community level, affecting outcomes. Generating data for qualitative indicators calls for participatory methodologies such as focus group discussions, individual interviews, and surveys measuring perceptions and opinions of both men and women. Examples include:

Farm issues

- Men's and women's perceptions of the importance of extension knowledge and their effects on productive outcomes
- Men's and women's perceptions of the importance of climate change on how they manage their plots, as well as productivity

Community issues

- Community norms that affect men's and women's landownership and rights over land, water, and forestry resources, as well as access to input and output markets
- Discussion with focus groups to identify the main time constraints faced by men and women at the household level, implications for their work in agriculture, and possible ways of overcoming these constraints

Box 10. Examples of recent studies that combine quantitative and qualitative approaches

The following examples highlight the role of quantitative data in tracking key individual, household and community outcomes in the midst of weather-related shocks – as well as the importance of qualitative data, through focus group discussions, on examining which institutions and policy channels are important for building resilience in the community.

- **Asset-based framework to understand vulnerability and coping in Kenya and Nicaragua (Moser et al, 2010)**

  An associated participatory methodology was implemented in two urban sites in each country, based on a framework which analyzes the assets of poor households, small businesses and community groups, both in terms of their vulnerability to severe weather events, as well as how asset-based adaptation strategies have helped them cope with severe weather events. Focus groups were asked in each site to identify institutions that were important for the community in adapting or responding to severe weather. Survey tools and training for staff conducting the focus group discussions were the same, so that quantitative data on institutions could be developed and compared across areas from these discussions.

  The quantitative data revealed that the most important asset reported by the urban poor was housing, and that weak tenure rights prevented them from accessing other public services required to better cope with weather-related shocks (garbage disposal and sewage/drainage, for example). Community efforts to mobilize against weather shocks were also analyzed in the qualitative component of the pilots, including construction of water passages and concrete walls to protect against flooding, and seeking assistance from donors. From these pilots, the study developed recommendations on how policy and institutional systems can best be informed to help poor households in urban areas, including better land administration and management, and highlighted the importance of implementing policies collaboratively with communities to ensure that their priorities are being addressed.

- **Understanding the effects of, and rebuilding, following a natural disaster: Study of the Tsunami Aftermath and Recovery (STAR) in Indonesia, http://stardata.org/index.html**

  The STAR project aimed at understanding the short-term and long-term effects, coping strategies, and institutional needs following the 2004 tsunami in the Indonesian provinces of Aceh and Northern Sumatra. A longitudinal survey was conducted covering both individual and household outcomes, and existing infrastructure and facilities in the communities. The survey was conducted first in 2005 (with Indonesia's 2004 National Socioeconomic Survey as a baseline), and five follow-ups with the latest round conducted in 2014. The main short-term outcomes examined included mortality, trauma and loss of resources, while longer-term outcomes comprised mental health, demographic changes (family structure and fertility, for example), education, housing and migration. GPS data on households (including those that migrate), health facilities and schools were also recorded to understand migration and available services.

  Alongside the quantitative data, communities' needs and experiences with reconstruction were also collected through discussions with community leaders and women's groups. Relevant institutions identified by these groups were also visited and their GPS locations recorded by survey administrators, to better understand changes in reported service delivery/disruptions over time.

5. Conclusions and recommendations

A growing emphasis on collecting sex-disaggregated data in agriculture across countries has given policy-makers and researchers a view into the different institutional and social constraints men and women face in the sector – particularly amid disruptions in climate and declining access to natural resources. Vulnerability assessments are important for understanding which groups are more at risk, due to their limited capacity and resources, as well as how to better target these groups. On climate change specifically, better policy targeting also requires identifying key factors related to climate that affect outcomes of interest for men and women farmers, including different constraints they face in coping with and adapting to climate change. Vulnerability assessments can therefore provide the groundwork for an evidence base and design of gender-responsive policies and strategies.

However, data availability and quality (both quantitative and qualitative) are integral to such assessments. Momentum for collecting better sex-disaggregated data in agriculture has increased considerably in recent years across international agencies, although gender data gaps remain, including on how men and women farmers cope with and adapt to variations in climate. A few new survey efforts, including within FAO, are aiming to shed light on men's and women's outcomes in this area, but greater efforts are needed to harmonize these efforts and also engage countries on the need to collect this data. As mentioned earlier, FAO has developed guidelines for countries on how to mainstream gender in large-scale surveys that have a focus/modules on agriculture.

Ultimately, understanding what interventions help different types of farmers cope with changes in climate is still an evolving area of research, and in particular for women, who have more limited access to productive assets, inputs, services, and rural employment opportunities. Context also matters – gender-sensitive data collection in this area should also take into account how issues vary across different types of ecosystems, such as mountains, wetlands and agro-ecological zones, which has a direct bearing on the local economy and thus how access to resources and institutions vary for men and women. As data continue to improve on men's and women's relative outcomes in agriculture, gender-sensitive vulnerability assessments will also be able to identify more precisely what interventions (and combinations of policies) are most effective at addressing the multi-faceted and gender differentiated effects of CC.

©FAO/Giulio Napolitano

Glossary

Climate change: A change in climate attributed directly or indirectly to human activity that alters the composition of the global atmosphere and which is in addition to natural vulnerability observed over a comparable period of time.

Climate change adaptation: Initiatives and measures to reduce the vulnerability of natural and human systems against actual or expected climate change effects. Various types of adaptation exist, for example anticipatory and reactive, and autonomous and planned adaptation.

Climate change mitigation: Implementation of technological changes (such as cultivation practices), or substitution of technologies (such as substituting fossil fuels) to reduce greenhouse gas emissions and enhance greenhouse gas sinks.

Climate-smart agriculture: Integrates the three dimensions of sustainable development by jointly addressing food security and climate challenges. It is composed of three main pillars: (1) sustainably increasing agricultural productivity and incomes; (2) adapting and building resilience to climate change; and (3) reducing and/or removing greenhouse gas emissions, where possible.

Gender: refers to socially constructed attributes and opportunities associated with being male and female. It has to do with how society defines masculinity and femininity in terms of what is appropriate behavior for men and women, and both play a crucial role in the social construction of gender.

Gender equality: it is reached when men and women enjoy equal rights, opportunities and entitlements in civil and political life, in terms of access, control, participation and treatment.

Vulnerability: the characteristics and circumstances of a community, system or asset that make it susceptible to the damaging effects of a hazard.

References

Asfaw, Solomon, and Giuseppe Maggio. 2016. "Gender, Weather Shock and Welfare: Evidence from Malawi." Working Paper, Food and Agricultural Organization.

Brugère, Cecile, and Cassandra De Young. 2015. "Assessing climate change vulnerability in fisheries and aquaculture: Available methodologies and their relevance for the sector." FAO Fisheries and Aquaculture Technical Paper No. 597.

Doss, Cheryl, Chiara Kovarik, Amber Peterman, Agnes Quisumbing, and Mara van den Bold. 2015. "Gender inequalities in ownership and control of land in Africa: myth and reality." *Agricultural Economics* 46: 403–434.

Food and Agricultural Organization (AQUASTAT). 2016. *The role of women in agricultural water management – Phase 2: Mainstreaming gender in data on agricultural water management.*

Food and Agricultural Organization. 2015a. *World Programme For The Census of Agriculture 2020, Volume 1: Programme, concepts and definitions.*

Food and Agricultural Organization. 2015b. *Mapping the vulnerability of mountain peoples to food insecurity.* Romeo, R., Vita, A., Testolin, R. & Hofer, T. Rome.

Food and Agricultural Organization. 2011. *The State of Food and Agriculture: Women in Agriculture: Closing the Gender Gap for Development.*

Goldstein, Markus, and Chris Udry. 2008. "The profits of power: Land rights and agricultural investment in Ghana." *Journal of Political Economy* 116(6): 981–1022.

Kilic, Talip, Amparo Palacios-Lopez and Markus Goldstein. 2015. "Caught in a Productivity Trap: A Distributional Perspective on Gender Differences in Malawian Agriculture." *World Development* 70: 416–463.

McCarthy, Nancy, and Talip Kilic. 2015. "The nexus between gender, collective action for public goods and agriculture: evidence from Malawi." *Agricultural Economics* 46: 375–402.

Moses, Caroline, Andrew Norton, Alfredo Stein, and Sophia Georgieva. 2010. "Pro-poor adaption to climate change in urban centers: case studies of vulnerability and resilience in Kenya and Nicaragua". Report No. 54947-GBL, Social Development Department. World Bank.

Palacios-Lopez, Amparo, and Ramon Lopez. 2015. "The Gender Gap in Agricultural Productivity: The Role of Market Imperfections." *Journal of Development Studies* 51(9): 1175–1192.

Peterman, Amber, Julia Behrman, and Agnes Quisumbing. 2011. "A review of empirical evidence on gender differences in non-land agricultural inputs, technology, and services in developing countries." ESA Working Paper No. 11-11, Food and Agricultural Organization, Agricultural Development Economics Division.

Raemaekers, Serge, and Merle Sowman. 2015. "Community-Level Socio-Ecological Vulnerability Assessments in the Benguela Current Large Marine System." FAO Fisheries and Aquaculture Circular No. 1110.

World Bank, FAO & IFAD. 2015. "Gender in climate-smart agriculture: module 18" for *Gender in Agriculture Sourcebook*. Agriculture global practice, World Bank.

World Bank. 2009. *Gender in Agriculture Sourcebook.* Washington, DC. Please review this reference as the sourcebook was developed with FAO and IFAD.

This guidance note was developed to support development and humanitarian practitioners in carrying out a gender-sensitive vulnerability assessment, in order to identify and address the main sources of vulnerability of men and women in the agriculture sector. The note describes what are the main constraints that male and female farmers face in the agriculture sector, with a focus on climate change. It also provides an overview of available sources and methodologies to collect and analyze sex-disaggregated data.

I7654EN/1/02.18