

USDA Food for Progress Learning Agenda: Trade Expansion and Agricultural Market Development

Introduction

The Need for and Objectives of the Learning Agenda

The U. S. Department of Agriculture Foreign Agricultural Service's (USDA/FAS) Office of Capacity Building and Development (OCBD) commissioned the development of the *Food for Progress Learning Agenda on Trade Expansion and Agricultural Market Development* as a tool to identify relevant and timely research questions to inform evaluation and policy research in the area of expanding agricultural trade and markets. The key research and evaluation questions highlighted in the Learning Agenda are intended to elicit information to fill some of the identified gaps in the knowledge base within the existing literature. These gaps should be addressed as a matter of priority in order to inform and improve FFPr programming and policy, and to improve the design and implementation of agriculture interventions that ultimately lead to expansion of markets, increased trade, and overall improved outcomes for farmers. Therefore, the Learning Agenda is also designed to inform the FFPr Results Framework (RF) on Expanded Trade of Agricultural Products, as well as the broader agricultural markets and trade theory of change.

A substantial body of literature on agricultural trade and markets exists. Current literature demonstrates that interventions related to agricultural value chains, infrastructure, market linkages (domestic, regional and international), market information systems, and improved technologies have potential to increase market access, farmer income and trade volume, and to lower trade transaction costs through multiple pathways. However, there is limited evidence on interdependencies among these interventions and the contextual suitability of these interventions in a dynamic and evolving market. The Learning Agenda explores key knowledge gaps related to obstacles on the path toward agricultural trade expansion, the various interventions or combinations of interventions that have the greatest impacts on agricultural trade, and



The USDA-administered Food for Progress (FFPr) Program, authorized under the Food for Progress Act of 1985, has two objectives: to improve agricultural productivity, and to expand trade of agricultural products. To that end, FFPr assists developing countries, particularly emerging democracies, in their efforts to expand private enterprise in the agricultural sector. FFPr works to improve agricultural techniques, marketing systems, and farmer education. FFPr also works with farmers and businesses to develop associations and cooperatives, expand or improve processing capacity, and develop businesses related to agricultural inputs and outputs. This Learning Agenda focuses on FFPr's second objective of expanding trade of agricultural products, as this is where The USDA Foreign Agricultural Service's Office of Capacity Building and Development identified evidence gaps.

the features that lead to long-term benefits and sustainability of these interventions.¹ Addressing the gaps by gathering rigorous evidence will support USDA's prioritization of limited resources for agricultural interventions and better inform future FFPr interventions and policy research, especially since agricultural trade interventions widely vary in terms of costs, pathways, and outcomes by context.

FFPr will continue to evolve, build, and use the Learning Agenda to prioritize research and evaluation activities in the future. The Learning Agenda questions will be addressed through a variety of methodologies, including impact evaluations, policy analyses, performance evaluations, systematic reviews, literature reviews, and detailed case studies. FFPr also hopes that other governments, implementing organizations, international organizations, research institutions, and academics will contribute to and use the Learning Agenda to prioritize agricultural trade research with the aim of collectively closing the research gaps and improving the impact and sustainability of agricultural development and trade programs.

Following Social Impact's (SI) commitment to Utilization-Focused Evaluation (U-FE), the SI team has prepared this Learning Agenda with a focus on engaging key users and targeting their decision-making needs. While the intent of the Learning Agenda is to inform the work of the USDA Food for Progress program, the questions and content are relevant for the broader academic community and may be used to inform the work of researchers, academics, implementers, and policy-makers.

Development of the Learning Agenda

The Learning Agenda was developed through a review of existing literature and a series of consultations with researchers, academics, policy-makers, and agriculture practitioners in different regions from a wide range of organizations, research institutions, and universities.² Based upon this literature review and the consultations, the Learning Agenda is organized around three primary focus areas: (i) market

¹ The Learning Agenda topics are informed by desk research as well as consultations with experts. In terms of desk research, Social Impact conducted systematic reviews, including meta-analysis, on three types of agricultural interventions: information and communication technologies (ICT), roads and road transportation, and agricultural cooperatives. These systematic reviews assessed a number of outcomes related to agricultural trade and economic growth based on existing rigorous impact evaluations.

² Consultations included three roundtable conferences with agriculture experts and three field visits to meet with USDA implementing partners. All conferences included brainstorming sessions and facilitated dialogues on the important issues in expansion of agricultural trade and research gaps. The first roundtable was held on October 23, 2015 with 35 USDA staff members from agencies including the Foreign Agricultural Service Office of Capacity Building and Development (FAS/OCBD) and the Office of Trade Programs (FAS/OTP), National Agricultural Statistics Service (NASS), Agricultural Research Service (ARS), and Economic Research Service (ERS). The second roundtable was held on December 3 and 4, 2015 with 50 participants including academic researchers, university professors, USDA staff members, and researchers from agencies such as IFPRI, IFAD, and the World Bank. The third conference was held on May 19 and 20 with USDA's Implementing Partners (including U.S.-based and international implementers) and USDA staff members. In an effort to "ground-truth" the Learning Agenda, the team additionally conducted field visits to three countries –Nicaragua, Senegal, and Mozambique –to examine case studies and elicit inputs from implementers working in the field.

systems (including value creation and market linkages), (ii) quality and standards, and (iii) risk and uncertainty.

In addition to the three focus areas, the Learning Agenda considers a number of cross-cutting areas described briefly below, such as culture, demographics, and sustainability, which are important to all agricultural actors at all levels of the market system. These cross-cutting areas are shown to influence the efficacy and outcomes of interventions. In keeping with the focus on utilization, SI has taken an integrative approach, incorporating important questions on the cross-cutting issues throughout the Learning Agenda.

Description of Terms and Cross-cutting Areas

Agricultural Actors: Recognizing that the key actors participating in markets vary based on location, context, and product, we use the term “agricultural actors” to describe all relevant actors including, but not limited to, producers (both smallholders and large-scale producers), intermediaries, processors, input sellers, service providers, investors, private sector partners, public sector partners, and consumers.

*Culture:*³ In the agricultural sector, local perceptions of gender, sex, family structure, ethnicity, and religion can shape the roles, responsibilities, authority, and personal interactions among agricultural actors. Much of the existing literature looks at data disaggregated by sex, but ignores the complex ways in which gender affects actors’ abilities to participate equally in the agricultural sector. Gender and sex constitute major research gaps; addressing them will better inform programs on what works and does not work in market development given the local cultural norms and constructs. For example, division of labor and efficient use of human capital are poorly understood, largely because in many societies labor is split informally within households. Gender and sex⁴ can play a large role in decisions regarding the division of labor, including who engages in sales and trade, who may join cooperatives and farmer associations, who may participate in processing or entrepreneurship, what specific crops family members tend to, etc. This leads to inefficient allocations of labor, responsibilities, and decision-making authority. Additionally, discriminatory practices and policies, based on gender or other cultural characteristics, are seen in many societies. These lead to imbalanced or unfair land title and property rights; access to information, markets, credit and other services; and decision-making power within the household.

Demographics: While an increasing global population places greater strain on agricultural resources, global trends toward urbanization lead to changes in the labor demographics of farmers, intermediaries, processors, and other agricultural actors. In many cases, the agricultural workforce is aging and not

³ As defined by UNESCO, “[culture] is that complex whole which includes knowledge, beliefs, arts, morals, laws, customs, and any other capabilities and habits acquired by [a human] as a member of society, and it could vary by local contexts.”

⁴ We use the term “gender” broadly to include all genders. We additionally use the term “sex” not interchangeably, but as another important factor that causes differential opportunities, access, and outcomes.

being replaced, particularly among smallholders, because youth tend to migrate away from rural areas and into cities. There is a lack of research on the effects of migration and changing demographics on agricultural market development. Filling these research gaps would help to inform stronger policies and programs that address future needs.

Sustainability: Program interventions can improve market development only if their effects outlive the program. The concept of sustainability encompasses longevity of intended benefits and unintended consequences attributable to a program, policy, or other action. Studies that examine sustainability of program outcomes several years after the program ends are rare. Additional research on sustainability would help to inform stronger frameworks and logic models that would, in turn, inform future programming.

The Learning Agenda

i. Market Systems

Market systems help to create, add value to, and foster market linkages by addressing all levels of the production, processing, marketing, and trade of agricultural products, including crops, livestock, and aquaculture. We use the market systems framework to explore how all actors understand and act upon their roles in order to efficiently and effectively bring agricultural products and services to market.

The market systems framework goes beyond a singular value chain and “aims to catalyze a process that results in a market that is able to adapt as needed over time to deliver a sustained flow of benefits to various agricultural actors, including the poor and otherwise disadvantaged or excluded.”⁵ Thus, a market system framework is based on understanding interconnectedness and complexity across numerous value chains, agricultural actors, households, communities, and other interacting, external market and non-market-based systems.

In this Learning Agenda, we investigate market systems under two subsections: Value Creation and Market Linkages. The value chain approach is largely represented under Value Creation in that agricultural products and services must add value at each market stage to maximize utility and produce benefits for a variety of supporting actors. This added value primarily takes the form of trade expansion and market development, but may also refer to intermediate or otherwise relevant outcomes, such as product quality improvements, nutritional outcomes, and improvements in social well-being. Market linkages provide the foundation for adaptability and innovation in a market system by allowing for informed and coordinated partnerships amongst various agricultural actors.

Value Creation

Barriers to expanding agricultural markets and trade exist at every level of the value chain, ranging from inputs and production to marketing and sales. Value creation is concerned with producing solutions to overcome these challenges and advance increasingly complex market systems.

Inefficient or restrictive government policies can create a negative enabling environment for the value chain. For example, a 2010 study showed that the Ethiopian government subsidized fertilizer and strongly encouraged use of a standard fertilizer package irrespective of the needs of farmers, leading to

⁵ ACDI/VOCA. (2015). *Value Chain and Market System Development*. Retrieved from <http://acdivoca.org/our-approach/cross-cutting-approaches/value-chain-and-market-system-development>

inefficient allocation.⁶ Furthermore, failure of government to provide strong infrastructure, such as roads or cold storage, can also hinder trade expansion.

Value creation can take the form of agricultural actors modifying their behavior. At times, farmers continue to produce traditional crops, even when there is greater demand for alternative crops. For example, a 2015 IFAD study demonstrated that Kenyan farmers in arid regions continued to produce water-intensive maize due to longstanding traditions, rather than hardier sorghum for which there was demonstrated demand because of local breweries' need for this more climate-appropriate crop.⁷

While there have been many assessments in the past that have helped to identify specific constraints, few examine the most effective and efficient ways to address such constraints. Further investigation would help to inform our understanding of how to increase the efficiency and effectiveness of both individual value chains and overarching market systems.

Priority Learning Questions:

1. What point in a value chain should be targeted and with what type of interventions, in order to have sustainable impact on value creation? What cultural and demographic factors most affect whether a value chain intervention is effective and sustainable?
2. What are the key differences in market system operations between local, regional, and international trade? How do the differences in size, structure, key actors, and performance affect value creation?
3. Which policies enhance value chains and improve enabling environments? What models of collaboration among local and international actors, including donors, private sector partners, academic institutions, and NGOs, are effective in supporting policy change?
4. How can improved transportation and post-harvest facilities such as cold storage, roads, etc., help in value creation to expand trade and markets?
5. What is the minimum level of national or local government support for a program that is necessary for that program to be effective in pursuing trade and market goals? What policies and regulatory or governing mechanisms are necessary to lay the groundwork for market expansion?
6. What are the long-term outcomes, both direct and indirect, of interventions related to roads and other key infrastructure components in creating strong market systems?
7. What are the impacts of interventions related to cash crops on improving nutrition security and altering producers' tendency to grow subsistence crops? What methods of combining market goals and nutrition goals are effective in ensuring nutritional security while expanding and

⁶ Yamano, Takashi and Arai, Ayumi. (2010). Fertilizer Policies, Price, and Application in East Africa. *National Graduate Institute for Policy Studies, Discussion paper 10-24*. Retrieved from http://www.grips.ac.jp/r-center/en/discussion_papers/10-24/. pp. 6-7.

⁷ International Fund for Agricultural Development. (2015). *Kenya and IFAD join with development partners to enhance cereal production in semi-arid counties* [Press release]. Retrieved from https://www.ifad.org/en/newsroom/press_release/tags/y2015/7874223

improving markets? Given that nutritional decisions are frequently made within the household, what role do gender and family structure play in improving nutrition?

8. What opportunities exist to capitalize on the role of binding regional platforms, such as Regional Economic Communities (RECs), to promote trade harmonization and the development of agricultural market systems within and across borders?
9. What discriminatory practices – whether political, legal, or cultural – obstruct the path toward efficient and equitable market expansion? What mechanisms are effective in incentivizing policy change in the case of political or legal discrimination, and behavior change in the case of cultural discrimination? (Discriminatory practices may include discrimination based on gender, ethnicity, religion, minority status, or other cultural characteristics.)
10. What incentives work well to encourage agricultural actors to allocate labor based on efficient use of resources instead of expectations based on gender or other cultural norms and practices? How sustainable are such incentives?

Market Linkages

Market linkages refer to the relationships – including formal and informal partnerships and contracts – between various agricultural actors in a market system. Market linkages are vital to obtain access to markets and to develop viable and efficient market systems.

Impediments to finding or maintaining reliable market access include distance, underdeveloped infrastructure, unreliable transportation, lack of market information, and insufficient understanding of the role of intermediaries. For instance, poor infrastructure can increase transaction costs, which can lower profit margins; lack of market transparency and limited access to communication technology can prevent sellers and buyers from connecting with each other or from receiving reliable and consistent information on the price of goods in different locations.

Cooperatives, unions and farmers' associations are recognized forms of market linkage arrangements that provide their members with services designed for greater market access. Although there is evidence that many cooperatives successfully improve farmer outcomes, there is little research on how these types of linkages are formed and maintained, and the pathways through which such linkages specifically enhance various outcomes. There is a need for additional evidence on which collective action or member-based models are most beneficial and how governments can create enabling environments for these organizations to link farmers and traders to domestic, regional or international markets.

Understanding the relationship between agricultural actors, including but not limited to producers, buyers, intermediaries, processors, and sellers, is also a key component of understanding market linkages. The role of intermediaries in expanding trade is a vital, though not well-researched, area. Upstream, intermediaries may provide inputs, or services such as information and financing. Downstream, intermediaries may trade agricultural products or provide other services such as storage facilities. Due to the transitory existence of many intermediaries, it has historically been difficult to collect data on their operations. Understanding how to effectively engage with these actors is therefore a key gap in the literature.

Another research gap relates to small and midsize enterprises (SMEs) in agriculture. There is a large body of research on smallholders and microenterprises engaged in the agricultural sector, but there is a gap in research pertaining to agricultural SMEs. The vast majority of agricultural SMEs operate in rural areas in the informal sector, and their survival rates have been very low.⁸ While a vast amount of literature exists on microenterprise and finance for smallholders, research on financial constraints of agricultural SMEs and the impact of access to formal financial resources has not been well-examined.⁹ Furthermore, studies on SMEs generally focus on SMEs in urban areas, in industries such as manufacturing; very few focus on agricultural SMEs.¹⁰ As leveraging the potential of SMEs could serve as a pathway toward expanding markets, this is an important area for research.

Lastly, research is lacking on the most effective ways to link farmers with higher levels of the value chain, such as large-scale domestic processors and multinational corporations. Leveraging the private sector could help add value and expand markets. Recent studies have shown that contract farming can be an effective means to improve farmer outcomes,¹¹ but additional research on engaging the private sector is needed to inform future interventions.

Priority Learning Questions:

11. To what extent does increasing horizontal and vertical market linkages among agricultural actors at various levels, such as companies, SMEs, smallholders, and intermediaries, promote economic benefits for actors and market expansion overall?
12. What value do intermediaries bring in expanding markets? What methods of engaging intermediaries to expand markets through the services and trade they provide are effective?
13. What are efficient and effective ways, including use of ICT, to increase agricultural actors' access to critical market information and incentivize them to act on this information?
14. What are the best linkage models to help small and medium sized producers, traders and post-harvest market actors, who frequently lack collateral, registration and credit history to access loans or other financial instruments to effectively expand their businesses?
15. Do cooperatives, associations, federations, or collectives impact producers' abilities to optimize sales to markets at the local, regional, or international level? What particular services provided

⁸ International Finance Corporation. (2012). *Innovative Agricultural SME Finance Models*. Retrieved from <http://www.ifc.org/wps/wcm/connect/55301b804ebc5f379f86bf45b400a808/Innovative+Agricultural+SME+Finance+Models.pdf?MOD=AJPERES>. p. 25.

⁹ International Finance Corporation. p. 59.

¹⁰ Piza, Caio, et. al. (2016). The Impact of Business Support Services for Small and Medium Enterprises on Firm Performance in Low- and Middle-Income Countries: A Systematic Review. *Campbell Systematic Reviews*, 2016 (1). doi: 10.4073/csr.2016.1. Retrieved from <http://www.campbellcollaboration.org/lib/project/284/>

¹¹ Bellmare, Marc and Novak, Lindsey. (2015). *Contract Farming and Food Security*. Retrieved from Munich Personal RePEc Archive (MPRA): <https://mpra.ub.uni-muenchen.de/65817/>

by cooperatives lead to results? What types of cultural environments are best for these different models to thrive?

16. What types of market linkages best enable multinationals to collaborate with emerging agricultural markets to increase efficiency and effectiveness along the value chain in a mutually beneficial manner?
17. How can market-driven public/private partnerships help ensure long-term sustainability of programs?
18. What types of market linkages help reduce the obstacles in value chains that hinder agricultural actors from benefiting from existing infrastructural facilities?
19. What are the most high-impact opportunities to expand markets in developing countries through South-South trade?
20. How can SME capacity and market linkages be developed through business incubators and business development services in order to expand agricultural markets?

ii. Quality and Standards

Standards for agricultural products vary widely by country, market, and product, but international markets follow standards that are often the most stringent in protecting consumer health and promoting fair practices in food trade. Most of these standards are led by the Codex Alimentarius, the international food standards-setting body established in 1963 by the Food and Agriculture Organization (FAO) and World Health Organization (WHO). While markets with higher standards can offer higher value, small-scale producers, processors, intermediaries, and other actors often lack information on standards required to enter new, niche, and emerging markets. Even with information, farmers face challenges in accessing safe, affordable storage, refrigeration, and transportation to preserve quality post-harvest. Improving post-harvest infrastructure as well as policies and innovations that support efficient and effective information flow among agricultural actors are key means of improving an enabling environment for producers to meet high standards and engage in international trade.

Additionally, issues related to adulteration of inputs can lower product quality for the entire supply chain. This is particularly problematic as markets expand, because in larger markets, sellers and traders often cannot trace the sources of all their products. This can compromise food safety. For example, the World Fish Center, in implementing the USAID Feed the Future aquaculture project in Bangladesh, found that adulterated product existed in Bangladesh's shrimp and prawn value chain.¹² Because Bangladesh is a large exporter of seafood to the US and Europe, this type of adulteration puts the entire Bangladeshi industry at risk of not meeting international standards and losing status as an exporter. In other cases, counterfeit seeds, fertilizers and other inputs have harmed entire value chains in terms of product quality and therefore sales potential.

¹² Innovision Consulting Private Limited. (2012). *Value Chain Analysis: Shrimp, Prawn, and Tilapia from the Southern Region of Bangladesh*. Retrieved from http://aquaticcommons.org/12703/1/WF_3575.pdf. pp. 50-51.

Private sector actors play a large role in setting quality standards through their purchases of products. Low quality products often stay in the local markets, while high quality goods are sold in domestic high value supermarkets or exported regionally or beyond. It is therefore important to consider each segment of the market for a product, tailoring interventions to the level of trade (regional, domestic, or international) and standards expected in particular markets. Many programs fail to disseminate information to producers about certification requirements to enter high value markets, even while working with them to grow a product specifically for an international market. New developments in ICT show potential to improve effective dissemination of information and help link producers with buyers.

In developing domestic markets, it can be beneficial to promote international standards to prepare farmers to scale up and sell internationally. However, programs promoting adherence to standards should be specifically tailored based on the intended buyer(s).

Furthermore, while aesthetic standards are relevant for exports, food safety and nutritional standards are important for all markets. Donors, private investors, and program implementers have a role to play in working with governments to create a strong regulatory environment for enforcing food safety and nutrition standards for agricultural products. Governments should work with a variety of actors, including producers, traders, processors, and exporters, to ensure these standards are met.

Priority Learning Questions:

21. In what context is it profitable for agricultural actors, particularly producers and processors, to adopt higher product quality standards for sales in higher-value markets, including international markets?
22. What policies or actions are effective in enforcing food safety standards to ensure public health and nutrition security? What role can various actors, including government, exporters, processors, and the private sector, play to enforce food safety standards to ensure public health and nutrition security?
23. What models of communication from buyers on requirements in terms of quality, standards, and aesthetics will support better partnerships with producers, suppliers, traders, and processors?
24. What types and applications of technology can support linkages between producers, traders, and consumers in meeting required quality standards in a collaborative and mutually beneficial manner?
25. Does educating consumers on nutrition and food safety impact product sales or incentivize improvements in production and processing?
26. Can marketing and branding effectively influence consumer preferences in order to benefit both product quality and/or nutrition priorities? How can existing cultural frameworks, such as family structure and community roles, be leveraged to encourage long-term prioritization of nutrition?
27. What innovations to improve traceability, including those utilizing technology or working through cooperatives and associations, have been most efficient and effective in identifying low quality or adulterated products?

28. What are the best methods to improve the post-harvest stage of the value chain, in order to maintain quality and value of crops after the harvest? What aspects of production before harvest, such as ensuring input quality and limiting pests and diseases, are most important to reduce post-harvest losses?
29. What technologies, infrastructure components, and services need to be accessible for agricultural actors to consistently meet quality standards?
30. What is the price premium for agricultural actors who meet more stringent requirements or certifications such as organic or Fair Trade?

iii. Risk and Uncertainty

Agricultural risk and uncertainty remove safeguards, reduce individuals' resilience to shocks and disturbances, and pose formidable challenges to the agricultural sector, especially when adequate safety nets and mitigation tools are limited or absent. Therefore, several governments, donors and agricultural development program implementers seek to improve risk management and coping abilities of agricultural actors, especially small and medium actors.

The bulk of available literature focuses on designing and delivering insurance and financial products such as loans, as well as savings and loan guarantees, to help actors cope with individual and systemic production and price risks arising from temporary weather-related factors. Climate-smart agriculture is particularly important to address long-term risks by encouraging production that is sustainable, resilient, and reduces greenhouse gas emissions. New technologies, including those related to climate-smart agriculture, can present both opportunities and risks. More information is needed on the nature of risks along the value chain; the ways in which various actors manage risks; efficient methods to mitigate, manage and cope with risks; and ways to utilize real-time information to spur adoption of innovative practices to minimize risks. Additionally, while contracts mitigate market-related risks, there is little research on specific contractual terms and conditions that can effectively bind parties including buyers, sellers, and traders in a way that is enforceable.

In addition, sustainability of program outcomes is a critical, but frequently overlooked, aspect of programming. By instituting stability, sustainable program outcomes can help to reduce some of the uncertainty that agricultural actors face. However, there is very little research pertaining to how to build lasting achievements. Most often, project designs lack built-in sustainability mechanisms, and often beneficiaries lack capacity to independently sustain or monitor the project or project outcomes. The average life of most projects is five years, and it is logistically difficult to monitor projects for an additional 15 or 20 years. Sustaining achievements after the withdrawal of donor support, as well as evaluating sustainability of outcomes, remains a challenge. Additional research is needed on how to mitigate risk of achievement dissolution after the completion of the project.

Priority Learning Questions:

The research questions below may apply to the following risks: price risks, production risks, weather uncertainty, and climate change uncertainty.

31. What is the nature and degree of agricultural risk and uncertainty for agricultural actors, i.e., farmers, suppliers, and intermediaries throughout and at each stage of the value chain? How are these risks mitigated and managed?
32. What interventions are effective in reducing risk to encourage adoption of innovative methods, practices, technologies and climate-smart agriculture?
33. What are the most effective methods to educate and train agricultural actors on risk management?
34. What types of incentives are effective in encouraging the adoption of risk reduction and mitigation products and practices (i.e., insurance, loans, crop diversification, new technology) among agricultural actors?
35. To what extent can informal and/or formal contracts be effective at reducing risk among farmers, suppliers, and traders? To what extent does formalizing the utilization and enforcement of binding contracts reduce the risks to farmers, suppliers, and traders?
36. What are the benefits of investing in seed banks to protect against climate and weather-related risk and uncertainty?
37. What are the most effective tools and technologies to disseminate reliable, timely information about pertinent risks and uncertainty to farmers, suppliers, processors, and traders to reduce incomplete and asymmetric information?
38. What are the best methods and mechanisms to reduce risks related to sustainability of intended outcomes and minimize unintended effects?
39. What is each agricultural actor's greatest vulnerability to climate risks? What are the best models for agricultural actors to protect their livelihoods against these risks?

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