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CLIMATE CHANGE IN MALI:

ORGANIZATIONAL SURVEY AND FOCUS GROUPS ON ADAPTIVE PRACTICES

AUGUST 2014

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ARCC



African and Latin American
Resilience to Climate Change Project



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AFRICAN AND LATIN AMERICAN RESILIENCE TO CLIMATE CHANGE (ARCC)

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ACRONYMS

| | |
|------------|--|
| AOPP | <i>Association des Organisations Professionnelles Paysannes</i> |
| ASDI | Swedish International Development Agency |
| ARCC | African and Latin American Resilience to Climate Change |
| CCAFS | Climate Change, Agriculture and Food Security |
| CEDRIG | Climate, Environment, and Disaster Risk Reduction Integration Guidance |
| CIRAD | <i>Centre de coopération internationale en recherche agronomique pour le développement</i> |
| CGIAR | Consultative Group on International Agricultural Research |
| CMDT | <i>Compagnie malienne pour le développement du textile</i> |
| CNOP | <i>Coordination National des Organisations Paysannes</i> |
| CORAF | <i>Conseil ouest et centre africain pour la recherche et le développement agricoles</i> |
| DNA | <i>Direction National de l'Agriculture (National Office of Agriculture)</i> |
| DNACPN | <i>Direction Nationale de l'Assainissement et du Contrôle de la Pollution et des Nuisances</i> |
| DRR | Disaster Risk Reduction |
| FEWS NET | Famine Early Warning Systems Network |
| FGD | Focus group discussions |
| FMNR | Farmer-Managed Natural Regeneration |
| GCoZa | <i>Groupe de Coordination des Zones Arides</i> |
| GoM | Government of Mali |
| HH | Households |
| ICRISAT | International Crops Research Institute for the Semi-Arid Tropics |
| IER | <i>Institut d'Economie Rurale</i> |
| ILRI | International Livestock Research Institute |
| IMOD | Inclusive Market-Oriented Development |
| Mali Météo | <i>Agence Nationale de la Météorologie (Malian Meteorological Agency)</i> |
| NGO | Nongovernmental Organization |
| ORM | Office Riz du Mali |
| PACJA | <i>Alliance Panafricaine pour une Justice Climatique</i> |

| | |
|----------|---|
| PMF/FEM | <i>Programme de Micro-Financement du Fonds pour l'Environnement Mondiale</i> |
| PRA | Participatory Rural Appraisal |
| SDC | Swiss Agency for Development and Cooperation |
| SECO ONG | <i>Secrétariat de Concertation des Organisations Non Gouvernementales maliennes</i> |
| SRI | System for Rice Intensification |
| UNDP | United Nations Development Program |
| USAID | United States Agency for International Development |

ABOUT THIS SERIES

ABOUT THE STUDIES ON CLIMATE CHANGE VULNERABILITY AND ADAPTATION IN WEST AFRICA

This document is part of a series of studies produced by the African and Latin American Resilience to Climate Change (ARCC) project that address adaptation to climate change in West Africa. Within the ARCC West Africa studies, this document is part of the subseries Climate Change in Mali. It also contributes to the subseries Agricultural Adaptation to Climate Change in the Sahel. In addition, ARCC has produced subseries on Climate Change and Water Resources in West Africa and Climate Change and Conflict in West Africa.

THE SUBSERIES ON CLIMATE CHANGE IN MALI

Upon the request of the United States Agency for International Development (USAID), ARCC undertook the Mali series of studies to increase understanding of the potential impacts of climate change in rural Mali and to identify means to support adaptation to these impacts. Other documents in the Climate Change in Mali series include: A Country Vulnerability Map; Impact Modeling of Selected Agricultural Adaptive Practices; Key Issues in Water Resources; Expected Impacts on Pests and Diseases Afflicting Livestock; Expected Impacts on Pests and Diseases Afflicting Selected Crops; and An Institutional Analysis of l'Agence de l'Environnement et du Développement Durable and l'Agence Nationale de la Météorologie.

ORGANIZATIONAL SURVEY AND FOCUS GROUPS OF ADAPTIVE PRACTICES

ARCC produced this report, *Climate Change in Mali: Organizational Survey and Focus Groups on Adaptive Practices*, to provide a description of the practices Malians use to adapt their farming systems to variations in climate. This document was also produced to demonstrate one step of a process developed by ARCC and described in the document *An Approach to Evaluating the Performance of Agricultural Practices*, which is found in the ARCC subseries on Agricultural Adaptation to Climate Change in the Sahel. The object of the ARCC process is to assess how climate change may impact the effectiveness of field-level practices currently employed by farmers the Sahel. It consists of three basic components: defining expected changes in climate; defining adaptation objectives and identifying the practices to be assessed; and conducting the evaluation of the defined practices. Along with the ARCC study *Profiles of Agricultural Management Practices*, the present document forms part of the second of these steps. While *Profiles of Agricultural Management Practices* contributes to the definition of adaptation objectives, this document identifies practices to be assessed. A final ARCC document, the study *Impact Modeling of Selected Agricultural Adaptive Practices*, demonstrates the implementation of the third step, the evaluation itself. That document describes the process and results of an effort to model the impact of climate change on the productivity of crops and agricultural practices in Mali.

EXECUTIVE SUMMARY

Farmers employ a wide range of strategies to reduce the impact of adverse weather conditions and increase the yields of their crops. This study describes a number of these strategies farmers use in their fields and gardens in Mali. In addition to presenting an inventory of practices, the study describes the conditions under which farmers use these practices. The study also describes efforts by external agencies to promote new practices to farmers.

The primary objective of this study was to identify field-level practices¹ commonly used in Mali, and thus implement one step in a larger ARCC effort to develop and implement an approach to understand the potential impact of climate change on crop productivity in the Sahel. To aid in the selection of practices for further study, information was collected on all field level practices cited by farmers, and the perceived benefits and barriers to their use. As a result, the study may also be read as a stand-alone document to inform agricultural and climate change programming of in Mali.

Research methods included interviews with the staff of 30 nongovernmental organizations (NGOs) in Bamako, the capital of Mali, and focus groups with men and women in 12 villages across four Famine Early Warning Systems Network (FEWS NET) livelihood zones.

The study presents an overview of the NGOs surveyed, including information on their budgets, networks, development approaches, and methods. The report then presents the proportions of NGOs promoting practices in four categories: improving soil fertility, water management, agro-forestry, and supplemental water.

The second section of the study provides an overview of the villages in which the focus groups were conducted, including details on their location, dominant livelihoods, the technical services they receive, and changes in agricultural systems over the past two to three decades. The report then presents farm management practices used in the communities, giving the proportions of villages and village men and women adopting each. Obstacles to adoption are then presented, as are adoption rates by livelihood zone.

Finally, the report compares rates of promotion by NGOs to rates of adoption by farmers of selected practices.

While the lists of practices presented represent the principal output of this study, review of these practices and the contexts in which they are promoted and adopted suggest a number of preliminary conclusions.

- The practices most promoted and adopted predate the recent emphasis on anthropogenic climate change, and address both climate- and non-climate-related objectives.
- NGOs follow a relatively conservative strategy for addressing climate change adaptation, one which builds on current practice, addresses immediate concerns, puts anthropogenic climate change in the

¹ For simplicity's sake, this study uses the term "practices" to refer to the full range of field level management strategies, technologies and methods employed by farmers.

context of historical shifts in climate, and integrates climate change adaptation into other development issues at the community scale.

- NGOs promote a wide range of practices that fall into the categories of soil fertility, moisture retention, providing supplemental water, or agroforestry. The greatest number of NGOs promote practices to enrich soil fertility. NGOs also help disseminate improved cereal, legume, and vegetable seed varieties.
- Villages differ with respect to the level of support they receive from government services, donor-funded projects, international and local NGOs, financial institutions, and private-sector-provided goods and services. Services fall generally into a few major categories, including the provision of technical support and advice regarding various agricultural practices or techniques, technical training, organizational capacity building, distribution (or sale) of agricultural equipment, plant materials and inputs (seed, fertilizer, and agro-chemicals), regulatory services such as those provided by the Office of Water and Forests to regulate cutting of trees, and agricultural credit.
- Villagers greatly appreciate the support they receive, but often indicate support is insufficient in terms of material assistance and the frequency with which service providers visit the village.
- Tentative conclusions regarding the relationship between livelihood zones and practices adopted include: 1) a higher level of use of manure and corralling livestock in the north due to the higher density of livestock in this part of the country; 2) higher rates of insecticide and pesticide use in the south due to the higher moisture levels; 3) higher rates of mulching of crop residue due to the greater availability of biomass and lower density of cattle in the south; and 4) higher rates of intercropping in the north due to the presence of the crops traditionally farmed together.
- Farmers balance trade-offs among many constraints when deciding to adopt a practice, with labor and cost frequently being critical. Some constraints tie more directly to climate than others.
- Farmers value practices that address a range of objectives. Practices adopted to address soil fertility often also improve moisture retention and vice versa.
- When adapting to climate change through crop variety selection, farmers also take non-climate factors into consideration, such as taste, adaptation to local soils, and low demand for fertilizer.
- Except for cotton, the most common reasons for discontinuation of specific varieties relate to decreases in the amount or duration of rainfall.
- Fewer farmers adopt practices that require higher levels of labor and technical knowledge, despite higher levels of NGO promotion. Farmers most frequently use known, low-input practices that fit a range of contexts.
- Several of the practices promoted by a high percentage of NGOs were among those with the lowest levels of adoption.
- Gender plays an important role in adoption, with women adopting different practices at significantly different rates than men.

INTRODUCTION

While this study focuses on practices that are expected to help farmers adapt to climate change, it examines them in the context of the larger set of practices NGOs promote and farmers employ to lower production risk and improve yields. Some of the practices described below clearly address changes projected by climate modeling; others have little direct link. While these differences are noted in the document, this study uses a broad definition of adaptive practice both because that definition is open to change and interpretation, and because it produced a wider range of examples of the two processes being considered, the adoption and promotion of adaptive practices.

Although this study goes beyond presenting two simple lists of practices, it is far from a thorough analysis of farming systems. Researchers have long studied why farmers in Africa develop and adopt specific field-level practices. The companion ARCC document *An Approach to Evaluating the Performance of Agricultural Practices* presents a number of the various approaches that have been developed to explore this challenging question. In the present document, many factors relevant to rural producer agricultural decision-making are left unexplored. Fieldwork did collect limited information on other strategies employed by farmers to address the climate variability and extremes of the Sahel. Farmers were asked questions regarding their use of weather information, and some mentioned receiving credit services. We present some of this information below. However, because the purpose of the study is to identify specific physical structures for a planned crop modeling exercise, these farmer strategies are not explored in depth. This study may nevertheless be used as a stand-alone document contributing to existing knowledge regarding the promotion and adoption of farm-level practices, technologies, and methods (globally referred to here as “practices”) crop farmers use to manage the impact of climate in the Sahel.

RESEARCH FRAMEWORK

The purpose of this study was to implement one step in the larger ARCC process of evaluation of the performance of agricultural practices under climate change in the Sahel. The role of this study in that process was to contribute to the definition of adaptation objectives and practices to be assessed through the analysis of the practices currently being promoted and employed in Mali. To this end, the following research framework was defined:

Study Objective: To produce two lists: 1) farm-level adaptive practices commonly promoted in Mali, and 2) farm-level adaptive practices commonly adopted in Mali.

Principal Research Questions

- What are the most commonly promoted practices by Mali’s NGOs to help farmers adapt to climate change?
- What are the most commonly promoted practices adopted by Mali’s farmers to adapt to climate change?

Additional questions posed to organizations and/or farmers to provide context to the lists and contribute to the analysis of practices promoted and adopted include:

Organizations

- Where are NGOs promoting adaptive practices?

- What is their approach to promoting climate change adaptation?

Farmers

- What is the farm context for the adoption of specific practices?
- What barriers do farmers perceive in adopting specific practices?

Both NGOs and Farmers

- How do rates of promotion and adoption of different practices compare?

METHODOLOGY

This report presents the results of two distinct field activities. The first consisted of surveys with organizations promoting agricultural practices, while the second entailed a series of focus groups with farmers employing various practices. Both activities were conducted by a team of six Malian professionals working with a locally based expat consultant and a team leader provided by ARCC.

Organizational Interviews

The design of the organizational interview guide follows the objectives of the study. A first section collects general background information regarding the organization, while the second section, which constitutes the bulk of the guide, is dedicated to cataloguing the adaptive practices the organization promotes. To quickly cover the range of possible practices, and insure consistency across organizations, rather than asking representatives to list the practices they promote, in administering this section, interviewers proposed specific practices for confirmation. Previous research in Mali, as well as a review of literature, informed the development of this list of practices. In an attempt to be inclusive, the list is broad. At the conclusion of each section of the interview, interviewers also offered informants the opportunity to report additional practices.

In addition to general questions regarding the organization, and detailed questions on practices promoted, the questionnaire included questions on the regions and circles in which the organization works, funding and partner organizations, the budget of the organization, and an estimate of the percent of the budget dedicated to climate change activities.² A consultant working with the team in Mali translated the guide into French. Annex 4 presents the English version of the questionnaire. Annex 2 presents the list of organizations interviewed.

Organizations were selected based on their inclusion in lists of members of different climate change networks. This initial list was refined through a literature review, discussions with local actors, and discussions with USAID/Mali. In the end, logistics and availability played a role in the organizations interviewed. Most important, representation in Bamako strongly influenced the selection, and likely led to under-representation of NGOs serving more distant regions including Tombouctou, Gao, and Kidal. The questionnaire was administered to 30 NGOs primarily between the dates of January 6 and January 18, 2014.

Also during this time, the team administered a shorter questionnaire to three donors and two international NGOs in Bamako to gain an overview of their perspective on promising practices to

² While these questions provided information concerning the region in which the organization works, and the budget dedicated to that work, a study of significantly greater rigor and duration would have been necessary to determine with confidence the number of organizations promoting a specific practice in a specific area, and the amount of funds dedicated to a particular practice over a period of time.

address climate change. The responses to these interviews are summarized in Annex 7. Team members also met with representatives of three government entities supporting adaptation to climate change and with one international research organization (the World Agroforestry Center).

Focus Groups

Resource and timing constraints limited to 12 the number of villages in which focus groups were conducted. Security constraints excluded the regions of Tombouctou, Gao, and Kidal, limiting the study zone to the five remaining regions. Discussions with NGOs at the time of the organizational interviews provided an initial list of possible sites for focus-group discussions. This initial list was refined to develop a final list that included villages from across the five southern-most regions of the country spanning five FEWS NET livelihood zones. Final selection took into account broad agro-ecological zones, village size, and the proximity of markets. Accessibility also had to be considered, given time constraints.

No attempt was made to create a representative sample through random selection of study sites. In fact, a bias was consciously introduced. Because the study was to explore the promotion and adoption of practices, recommendation by an NGO served as a criteria for selection. This intentional sampling method increased the chances of focus-group participants having adopted practices they could discuss. It also had the more practical result of facilitating access and an introduction to participants. In most cases, NGO staff scheduled the event, introduced the research team to the village. NGO staff also attended the focus-group discussion. Although they were attended as silent observers, their presence may have also biased the responses.

Similar to the organizational survey, the village-level research was designed as a survey of practices. The focus-group sessions began by collecting general information concerning the village, the predominant livelihoods in the village, and observed changes in agricultural practices, natural resources, and climate across the past 20 to 30 years. Following this overview, in separate focus-group discussions with women and men, discussion focused on the specific agricultural practices employed in fields and gardens, obstacles to their adoption, and the advantages and disadvantages of their adoption. Unlike the organizational survey, in this context interviewers did not propose specific practices; responses were generated by the participants. This approach was taken to insure that all possible practices were identified, and because the discussions were designed to explore the relationship between practices and other changes in the farming context. The discussion followed the progress of an agricultural season, and for each step—field preparation, for example—asked how methods have changed over the past 20 to 30 years and, in particular, what practices had been adopted to address climatic factors such as erratic, deminishing, or late rains. Participants were not challenged in their responses; all practices were explored and recorded whether or not interviewers believed they related to climate change. Discussions concluded with questions concerning changes in crops cultivated over the past 20 to 30 years, and the reasons for such changes. Finally, male and female focus groups reunited to undergo a final phase of the survey during which a series of questions were posed to determine the extent of technical support services provided to the village, the frequency of visits, and the names of organizations providing these services. This session also included three brief questions concerning the sources, availability, and utility of weather information. See Annex 1 for a more thorough presentation of study methods. Annex 3 presents a list of the villages in which focus groups were conducted. Annex 6 contains the final interview guide in French.

1.0 PROMOTED PRACTICES

1.1 INTRODUCTION

Among the various factors that influence the specific practices organizations promote, the local context in which they work and populations targeted may be the most important. However, the resources available and the duration of project timelines impact the approaches organizations take, which may in turn influence the nature of the practices promoted; more involved practices take longer to extend as creating the conditions for their adoption takes time and resources. When promoting adaptive practices, organizational understanding regarding the nature of climate change—whether it is a new phenomenon, the nature and speed of change, and how it relates to other development challenges—also influences the approaches adopted, and thus the practices promoted. Finally, organizational experience and the toolbox of skills and methods available to NGOs may in part determine the practices promoted. For example, methods that rely on local knowledge, practice, and participation result in the promotion of different practices (or, at least, a different type of the same general category of practices) than those that derive from a centralized list of pre-defined technical solutions. We address each of these factors in turn below, and follow with a presentation of the specific practices the NGOs interviewed promote.

1.2 OVERVIEW OF THE NGOS

1.2.1 Funding

Levels of climate-change funding vary greatly across the NGOs interviewed. More than half of the organizations (18 of the 30) reported allocating the overwhelming majority of their budget, 75 percent or more, to climate-change-related activities. Five of the organizations reported allocating more than 50 percent, but less than 75 percent, to climate-change activities, while four allocate between 10 and 30 percent. Three of the NGOs dedicate no funding specifically to climate-change-related activities.

The NGOs interviewed receive their climate-change funding from a total of 76 different sources. The majority of these funding organizations are European. Funding also comes from North America, India, and the United Nations. Donors consist of bilateral and multilateral government agencies, other NGOs, and the private sector. Funding levels for individual projects range from \$50,000 for projects of up to two years, to interventions of three or four years with several million dollars in funding. In rare cases, funding partnerships have continued through multiple project phases, sometimes for as long as 20 years, although in these cases project objectives have evolved and not always focused explicitly on climate change adaptation. Among the NGOs interviewed, the most frequent donors are the Swedish International Development Agency, which distributes grants through the Mali Climate Network (*Réseau Climat*), the focal point of which is the Mali Folk Center; UNDP, working through the national network *Secrétariat de Concertation des Organisations Non Gouvernementales maliennes* (SECO ONG); and the Canadian International Development Agency. These leading donors were closely followed by the European Union and the Government of Norway. The NGOs interviewed also receive Global Environment Facility small-grant funds, administered by the UNDP, which has supported a total of 56 projects since 2009.

The Government of Mali coordinates climate-change funding. For example, the National Office of Agriculture (*Direction Nationale de l'Agriculture*) implements a \$2.8-million project jointly funded by UNDP through the Global Environment Facility, the Least Developed Countries Fund, and the Malian government in six communes covering three agro-ecological zones (Sudan, Sahel, and Sahara).

TABLE I: NGO FUNDING LEVELS

| Total Funding 2013 (USD) | % NGOs |
|--------------------------|--------|
| \$0–100,000 | 20% |
| \$100,000–500,000 | 40% |
| \$500,000–5,000,000 | 40% |

This mixture of funding sources results in a wide range of funding levels among the NGOs surveyed. Table I presents the 2013 levels. NGOs reported that these numbers reflect a significant drop following Mali's 2012 political crisis.

1.2.2 Geographic Coverage

The organizations interviewed conduct activities across Mali. However, they concentrate their efforts in the southern regions of the country. Fifty percent or more have activities in the regions of Koulikoro, Mopti, Kayes, and Sikasso. Almost half work in Bamako. A third or fewer implement projects in Mali's other regions. Only one of the organizations interviewed works in Kidal. If we assume that the number of NGOs working in a region reflects total levels of funding and support, these numbers indicate a strong bias towards the southern regions of the country. Given that the communities of northern Mali need development support as much as those in the south, it is likely that this skewed distribution stems largely from factors such as sparse population, distance and logistic challenges, and insecurity.³ (Table 2 displays the regions in which NGOs interviewed work.)

³ The bias towards the south among NGOs interviewed may also result from the fact that interviews were conducted in Bamako. However, even given that bias, it is significant that so few NGOs with representatives in the nation's capital work in the north.

TABLE 2: NGO PROGRAMMING BY REGION

| NGO | REGION | | | | | | | | |
|------------------|-----------|-----------|-----------|-----------|-----------|-----------|------------|-----------|----------|
| | Koulikoro | Mopti | Kayes | Sikasso | Bamako | Segou | Tombouctou | Gao | Kidal |
| AMCFE | | | | | | | | | |
| ADAF GALLE | | | | | | | | | |
| APROFEM | | | | | | | | | |
| GCOZA (Mali) | | | | | | | | | |
| AOPP | | | | | | | | | |
| ASIC | | | | | | | | | |
| Mali Folk Center | | | | | | | | | |
| GAE Sahel | | | | | | | | | |
| AMEN | | | | | | | | | |
| Sahel Eco | | | | | | | | | |
| ADESCOM | | | | | | | | | |
| STOP Sahel | | | | | | | | | |
| ACIAD 0 | | | | | | | | | |
| AMAPROS | | | | | | | | | |
| PACINDHA | | | | | | | | | |
| AMAPEES | | | | | | | | | |
| CTESA | | | | | | | | | |
| GRAPES | | | | | | | | | |
| CARD | | | | | | | | | |
| AFAD | | | | | | | | | |
| ODI Sahel | | | | | | | | | |
| GRIDAC I | | | | | | | | | |
| ASSAFEDE | | | | | | | | | |
| CERAD | | | | | | | | | |
| Care Mali | | | | | | | | | |
| ASEDS | | | | | | | | | |
| HDSI | | | | | | | | | |
| ADCOPS | | | | | | | | | |
| GRAT 10 | | | | | | | | | |
| AMADE PELCODE | | | | | | | | | |
| Total | 20 | 19 | 19 | 15 | 14 | 10 | 10 | 7 | 1 |
| Percent | 67 | 63 | 63 | 50 | 47 | 33 | 33 | 23 | 1 |

1.2.3 Target Populations

Almost all of the NGOs (97 percent) included farmers among their target populations, with a slightly smaller proportion (70 percent) including pastoralists. A little over half (53 percent) of the NGOs work with fisherfolk, and an equal proportion target female-headed households. Additional specific populations cited include youth and women’s groups, internally displaced persons, and HIV/AIDS-affected people.

1.2.4 Network Affiliations

The NGOs reported membership in 31 different Malian, West African, and global networks. Many of these focus on climate change and related issues such as *Réseau Climat Mali*, GCoZA (*Groupe de*

Coordination des Zones Arides), the West African Climate Network, and PACJA (*Alliance Panafricaine pour une Justice Climatique*). Annex 10 presents a complete list.

1.3 PRINCIPAL CONSIDERATIONS INFLUENCING NGO STRATEGIES TO IDENTIFY AND PROMOTE CLIMATE CHANGE ADAPTIVE PRACTICES

A common understanding of the process of rural development and the relationship between climate change and the other challenges facing farmers influences the approach NGOs take in promoting adaptive practices. Interviewees shared a set of perspectives that help shape their approach to adaptation, the specific practices promoted, and the methods used to extend them. Roughly characterized, this understanding entails an appreciation of the interdependence of household livelihood strategies; recognition of the extreme vulnerability of households and the immediacy of the threats they face; an awareness of the severity and diversity of risks producers face, and trade-offs they are forced to make between increased productivity and crop loss. The approach also highlights beneficiary engagement in the planning and implementation of activities. The result is a relatively conservative strategy toward addressing climate change adaptation, one which builds on current practice, addresses immediate concerns, puts anthropogenic climate change in the context of historical shifts in climate, and integrates climate change adaptation into other local concerns. In greater detail, these considerations, as described by the interviewees, are as follows:

1.3.1 NGO Perspectives on Promoting Climate Adaptation

Climatic variability and extremes influence programming. Most NGOs indicated that their activities are increasingly influenced by a growing awareness of climatic variability and extremes on the part of donors, implementing partners, and beneficiaries alike. On the other hand, they do not consider climatic variability and extremes to be new. Interviewees cited droughts in the past and noted that climatic unpredictability has long contributed to the vulnerability of agricultural communities in Mali.

Successful promotion of adaptive practices demands short-term, tangible benefits. Interviewees stressed that their experience shows that adaptation practices must lead to tangible benefits and be seen as directly relevant to farmers' lives if they are to be widely adopted. Practices must have short-term impact on local livelihoods if people are to invest valuable resources such as time, energy, and money into their implementation.

Improving resilience to climate change requires a whole livelihood approach. Organizations must focus not only on agricultural, technical, or financial activities, but also include the wider range of sociocultural activities that make up livelihoods.

Some practices may be mal-adaptive. Several organizations noted that, in some cases, newer agricultural practices make households more vulnerable than traditional methods. For example, mono-cropping may increase sensitivity to climate volatility by concentrating risk; if the single crop fails, all is lost. Over-reliance on cash crops can have a similar effect on resiliency when farmers heavily devote resources to these crops to the detriment of subsistence crops. Price volatility negates any guarantee that cash crops will provide sufficient income to buy food.

Emphasize improved weather information. Scientists seem unable to say whether the Sahel will get wetter or dryer in the long term as a result of climate change—only that there will be more uncertainty and more extremes. Because this uncertainty occurs in a context in which rainfall already varies unpredictably on both temporal and spatial scales, the emphasis should be put on improvements in the quality and communication of weather information. (A total of 23 out of the 28 NGOs interviewed stated that they would be willing to support the national weather agency, *Agence Nationale de la Météorologie* (Malian Meteorological Agency, Mali Météo), though this finding is tempered by the fact

that only one of the NGOs, AMEN, reported using weather information in their work. None reported actually funding Mali Météo or activities to complement this government agency's work.

Sociocultural trends affect resiliency to climate change. Several organizations mentioned that the recent trend of smaller household sizes can have a negative impact on adaptive capacity, as it reduces a household's ability to diversify livelihood sources. In particular, for small households, the decision to migrate is made at the expense of critical farm labor.

1.3.2 NGO Approaches to Identifying Practices to Promote for Climate Adaptation

Share and promote the best indigenous adaptive practices. Over time, people have developed practices and strategies to manage and reduce risks associated with climate variability. Recognizing their value, NGOs assist in sharing and promoting some of these strategies. These include planting fields in different places, planting a range of crops and varieties, and ensuring some family members are occupied in paid employment.

Focus on solutions that succeed in all climatic conditions. Organizations indicated that the best solutions are those that succeed in all climatic conditions (wetter-dryer/hotter-cooler) and build on traditional best practices to reduce risks. Farmer-Managed Natural Regeneration (FMNR), put forward as one of the best examples of this type of solution, is adopted by farmers because they have directly experienced the benefits of tree protection, including positive effects on crop harvests, more abundant firewood and fodder, and reduced soil erosion.

Improve communication and access to various types of information. One way of supporting farmer innovation is to improve information available to farmers. In addition to weather information, farmers also need accurate and timely information about markets, new agricultural techniques, and seed varieties. The use of mobile phones was cited as one innovative means of disseminating market information and helping agricultural buyers and sellers communicate effectively.

Make appropriate analytical tools available to farmers. Several NGOs noted that farmers also need appropriate analytical tools to better enable them to evaluate risks and benefits associated with various adaptive practices. Participatory rural appraisal (PRA) techniques provide a set of tools that can support such analyses. Other tools can be used to help farmers conduct their own cost-benefit and return-on-labor analyses that might lead to increased adoption of adaptive practices, based on a better appreciation of real impacts on their own livelihood.

Support an enabling environment for improved adaptation to climate change. Improving the local enabling environment requires appropriate finance, research, communication, and advisory services and policies. NGOs stressed that these elements must operate in synergy and be guided by regular communication among key actors at all levels, that they must be supported by appropriate participatory and academic research, and that they must include broad-based agricultural policies.⁴ NGOs are eager to contribute to advancement in these areas, working in collaboration with donors, partners, and various networks.

⁴ The Swiss Agency for Development and Cooperation (SDC) has developed the "CEDRIG," a Climate, Environment, and Disaster Risk Reduction Integration Guidance handbook that provides guidance on effectively integrating climate change mitigation, adaptation, and disaster risk reduction (DRR) into development cooperation. CEDRIG supports the systematic integration of climate and DRR into development cooperation and humanitarian efforts, and therefore contributes to more sustainable development activities and resilient livelihoods. See the following for more details: www.sdc-climateandenvironment.net/en/Home/Tools_Training/CEDRIG

I.4 SPECIFIC METHODS NGOS USE IN THEIR EXTENSION WORK

An awareness of climate change has strongly influenced how NGOs do their work in Mali. The organizations interviewed report having added a climate change perspective to many of their activities. Table 3 presents the percentage of NGOs that have modified specific methods to incorporate climate change adaptation. To generate this table, interviewees were given a list of methods, from which they selected those in which they now incorporate climate change adaptation activities. They also had the option to propose additional methods, but they reported an insignificant number of additional methods.

TABLE 3: APPROACHES NGOS USE TO EXTEND PRACTICES

| Method | % NGOs |
|--|--------|
| Sustainable Livelihoods Framework approach | 90% |
| Community-based water resources management | 90% |
| Community-based forests management | 87% |
| Community-based land management | 87% |
| Community-based pasturelands management | 70% |
| Vulnerability assessment | 67% |
| Demonstration plots | 63% |
| Community-based seed systems | 63% |
| Farmer field schools/lead farmers | 57% |
| Participatory varietal selection | 37% |
| Food for Work | 17% |

I.5 PRACTICES PROMOTED BY NGOS

The tables below present the specific field- and garden-level practices NGO reported promoting in their project areas. We have grouped them into four categories, three of which suggest the intended purpose of the practice: improving soil fertility, managing moisture, and providing supplemental water. The fourth category, agroforestry, includes additional practices that may directly or indirectly meet one or more of these objectives. While the agroforestry practices listed may improve soil fertility and help manage moisture, they also address various other objectives, such as fencing, or serving as a wind or fire breaks.

With the possible exceptions of System for Rice Intensification (SRI) and Conservation Agriculture, all of the practices cited during interviews—both those included in the questionnaire itself and the additional ones mentioned by NGO staff—have been promoted in the Sahel for more than two decades. Some have their origins in the response to the Sahel droughts of the 1980s and earlier. While practitioners modify technical specifications and extension methods to adapt them to current and local conditions, in one form or another, all of these practices predate the recent increased escalation of climate change funding. One possible explanation for this is that NGOs extend practices that farmers have developed and proven useful. Farmers adopt practices that address current conditions, and thus far, they have not developed new “climate change” practices because the climate in Mali has not changed beyond historical natural variation and extremes.

All of the four categories have more than 70 percent of the NGOs promoting at least one of their practices. The greatest number of NGOs promotes practices to strengthen soil fertility enrichment, and, among these, the most common practices are composting and the application of manure.

Notes on the tables:

- The four categories used in the tables derive from the companion ARCC document *Profiles of Agricultural Management Practices*, which provides a full description of most of these practices, as well as citations to additional descriptive literature.

- NGOs were asked to report on the types of adaptation activities they promote or support. Interviewers allowed respondents to make the decision whether a particular practice truly functions to adapt to climate change.⁵ This resulted in an inclusive set of responses; as noted above, many of the respondents believe that climate change is not new, and that strengthening general resiliency in agriculture is a form of adaptation.
- Practices increasing soil fertility may be the least directly connected to climate change. However, though perhaps less obvious than its other impacts, climate change is expected to negatively affect soil fertility as rising temperature, drought, and more intense precipitation alter erosion rates, soil organic carbon, soil moisture, root growth, and plant phenology.
- Although they are grouped into categories, some of these practices serve one, several, or even all of these farm-management objectives. Respondents were given the opportunity to report the same practice under more than one category. As a result, the responses found in the different tables below are not exclusive. For example, the same NGO may have reported *Zai* holes as both a method to improve soil fertility and manage moisture.
- Practices and their labels are neither fixed nor discrete. Practices as extended may fall under different names, have broad technical specifications, or straddle two types of practices. For example, the distinction between rock lines, contour ridges, and *Aménagement en courbes de niveaux* (ANC) (contour farming) are often less clear in practice than they are as presented in technical documents. Similarly, practitioners make significant modifications to adapt conservation agriculture to their needs and context. We have tried to strike a practical balance between overly broad and overly restrictive labels for the practices. For example, we have combined “vegetative barriers” and “live fencing” under one label, as live fencing is often employed by Malian farmers as a vegetative barrier against erosion as well as livestock.
- The table titles report the percentage of NGOs that promote that category of practices. These tables reflect only a portion of the total set of activities in which the NGOs interviewed are engaged. Annex 9 presents a complete list of the technical areas in which NGOs reported working, with the percentage of NGOs working in each.
- The table reports only the percentages of NGOs promoting specific practices, not the amount of resources invested into their promotion. Some practices may require more resources to promote than others, and some practices may be commonly promoted as the focus of projects, while others are used as peripheral activities.

TABLE 4: PRACTICES TO IMPROVE SOIL FERTILITY (PROMOTED BY 93% OF NGOS)

| Practices Promoted | % NGOs |
|---|--------|
| Direct application of manure on fields and/or gardens | 87% |
| Composting | 80% |
| Reintegration of crop residue | 70% |
| Integrated soil fertility management | 43% |
| <i>Zai</i> holes | 33% |
| Conservation agriculture | 27% |
| SRI (system for rice intensification) | 23% |
| <i>Practices promoted by less than 20%: rock lines, mechanized micro-dosing (chemical fertilizers), crop rotation, fallowing, use of nitrogen-fixing trees and leguminous plants, FMNR, and dune stabilization.</i> | |

⁵ In the end, the answer is not obvious. The companion ARCC paper *Impact Modeling of Selected Agricultural Adaptive Practices* seeks to address this question quantitatively for one location in Mali, modeling the performance of various practices under projected climate scenarios.

**TABLE 5: PRACTICES TO ENHANCE MOISTURE CAPTURE/RETENTION
(PROMOTED BY 87% OF NGOS)**

| Practices Promoted | % NGOs |
|---|--------|
| Vegetative barriers/live fencing | 70% |
| Contour rock lines | 63% |
| Wind breaks | 50% |
| Contour plowing/ridges | 43% |
| ANC (<i>Aménagement en courbes de niveaux</i>) (contour farming) | 37% |
| Semi-circular bunds (<i>demi-lune</i>) | 33% |
| Zaï holes | 33% |
| <i>Practices promoted by less than 20%: mulching, terracing, FMNR, manure, composting, manual watering (for gardens), diguettes, and cross-ridging.</i> | |

TABLE 6: AGROFORESTRY PRACTICES (PROMOTED BY 77% OF NGOS)

| Practice | % NGOs | Species promoted |
|------------------------------|--------|--|
| Live fencing | 60% | Live fencing: <i>acacia senegalensis</i> , <i>acacia albida</i> , <i>acacia "spp,"</i> <i>ziziphus mauritiana</i> , <i>euphorbia</i> , <i>jatropha</i> Nitrogen fixing: <i>acacia albida</i> , <i>jatropha</i> , <i>curcas</i> , <i>shea</i> , <i>henna</i> , <i>tamarind</i> , <i>ziziphus</i> Wind breaks: <i>moringa</i> , <i>eucalyptus</i> , <i>fruit trees</i> Inter-cropping and alley-cropping: <i>leucaena</i> , <i>gliricidia sepium</i> , <i>moringa</i> Others promoted: <i>baobab</i> , <i>parkia biglobosa</i> (<i>nééré</i>), <i>khaya senegalensis</i> (<i>mahogany</i>), <i>gliricidia sepium</i> , <i>gmelina vetiver</i> , <i>anacardium</i> (<i>cashew</i>), <i>date</i> , <i>citrus</i> , <i>mango</i> , <i>goyave</i> , <i>papaya</i> , <i>jujube borassus</i> (<i>palm</i>) |
| Use of nitrogen-fixing trees | 47% | |
| Wind breaks | 47% | |
| Inter-cropping | 37% | |
| Alley-cropping | 30% | |
| Fire breaks | 30% | |
| Cover cropping | 23% | |

TABLE 7: SUPPLEMENTAL WATER SYSTEMS (PROMOTED BY 73% OF NGOS)

| Practices Promoted | % NGOs |
|---|--------|
| Pump systems | 50% |
| Drip irrigation | 27% |
| Lowland/ <i>basfond</i> development | 23% |
| Small dams (barrages) | 20% |
| Canal (gravity) irrigation | 20% |
| <i>Practices promoted by less than 20%: floodplain development, wide-diameter well construction, sprinkler systems, capture runoff water.</i> | |

I.6 PROMOTION OF CEREALS AND LEGUME VARIETIES

In addition to promoting field-management practices, NGOs disseminate crop varieties to farmers to increase their planting options. Different varieties are suitable to different climate and soil conditions. They differ in their susceptibility to disease and pests attacks and also vary in terms of the benefits they provide, such as yield, suitability as fodder, and level of nutrients. Eighty-three percent promote grain varieties, while 73 percent promote legume varieties. These include both recommended local varieties and varieties improved through research. Two promote improved tuber varieties, and two reported promoting improved vegetable varieties. Table 8 presents the varieties NGOs reported promoting.

To promote varieties, NGOs distribute seed and train farmers how to farm them. Some also help put in place systems to support future access to seed and other agricultural inputs. The *Association des Organisations Professionnelles Paysannes* (AOPP), a broad-based group of farmers associations from Bamako and all of Mali's regions excluding Gao, Kidal, and Tombouctou, was the only organization that said it has been directly involved in research on new varieties. The AOPP works in close collaboration with Mali's rural research institution (*Institut d'Economie Rurale*, IER). The organization reported that they have worked through their member groups to conduct initial trials of 32 different sorghum and millet varieties, from which the top six were selected for further dissemination. They then went on to assist in the dissemination of these varieties by training farmers on how to cultivate them through the use of demonstration plots developed with their affiliates.

TABLE 8: DISSEMINATION OF CROP VARIETIES (PROMOTED BY 83% OF NGOS)

| Crop | Varieties promoted |
|-----------|--|
| Sorghum | CSM 63, CSM-63E, CSM 388, kéniguénijèma, tièblén, sègifa, sangatigi, grinkan, gnochingoni, torognon, malisor |
| Millet | torogno, souna, indien |
| Rice | Nerica, gamiaka sourouni, adeni I I, wassa, gamiaka cokoun |
| Maize | Sotubaka, dembagnouman, djorobanna |
| Groundnut | GL24, JL24, Fleur I I, GL24, ICGV I2084, ICGV, Mossitiga |
| Cowpea | korobalen, korobalé, sangaraka, grorumdorum, jèmani, korobalé, gromgrom |
| Sesame | S42, puru, nassoubani |
| Fonio | kassamara, niatia, bancocoucountry |

2.0 ADOPTED PRACTICES

2.1 INTRODUCTION

Although limited in number, the villages in this study are distributed among several important livelihood zones, encompassing different climates and distinct arrays of soil types, vegetation, surface water, and other natural resources. Their populations range from 600 to 6,000, and their distances to larger cities vary significantly. In these different contexts, villagers cultivate different sets of crops and respond to different market signals. These multiple factors combine with others—such as education, expectations regarding the future, and the availability of labor and cash—to influence adoption rates of various agricultural practices. The following subsections describe the characteristics of the study villages, present changes in some of these characteristics as perceived by villagers, and then present the rates of adoption of different practices by village and livelihood zone. The section concludes by presenting farmer descriptions of the advantages and disadvantages of the adoption of different practices, and a brief note on adjustments farmers have made in the varieties of crops they cultivate.

2.2 OVERVIEW OF THE STUDY VILLAGES

2.2.1 Distribution of the Study Villages Among Mali's Livelihood Zones

As noted in the methods section above, the selection of the study villages took into account broad agro-ecological zones, village size, and the proximity of markets. For analysis, however, the villages were grouped according to their presence in FEWS NET livelihood zones. This regrouping allowed a more detailed description of the village context.⁶ Table 9 presents the villages by livelihood zone. Figure 1 displays their geographic location. Figure 2 includes profiles of selected villages and greater detail on local variation beyond differences in livelihood zones.

TABLE 9: VILLAGES AND THEIR LIVELIHOOD ZONES AND VULNERABILITY CATEGORIES

| Zone Code | Zone Description | # | Village Names | Vulnerability Category |
|-----------|--|---|--|------------------------|
| ML05 | Dogon plateau: millet, shallots, wild foods, and tourism | 1 | Sabe-Fatoma | Orange |
| ML09 | West and Central: rain-fed millet/sorghum | 5 | Bounguel, Soungalabougou, Fani Mpella, Diadjirila | |
| ML11 | South: maize, cotton, and fruits | 4 | Mpedegou, | Green |
| | | | Sebekoro, Sangarebougou, Donsela | Yellow |
| ML12 | South-West: maize, sorghum, and fruits | 2 | Bambala, Selingue | |

⁶ We initially considered basing analysis on the much less precise Anthropogenic Biomes, (Ellis and Ramankutty, 2008), which were used in the initial selection of villages. In this case three villages were located in the Sahel zone, one in the delta interior, five in the Sudan and three in the North Guinea zone. In the end, the more specific FEWSNET were used, which resulted in a roughly equivalent distribution of villages into categories. Annex 1 includes the Anthropogenic Biomes map of Mali.

FIGURE I: STUDY VILLAGES BY FEWS NET LIVELIHOOD ZONE

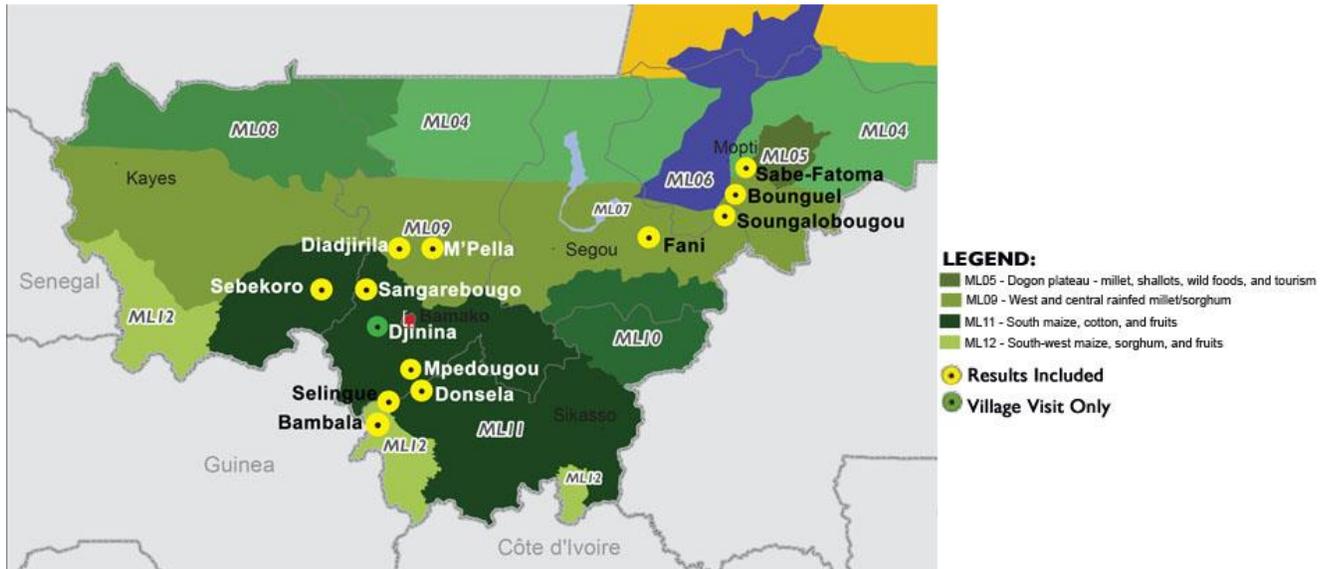
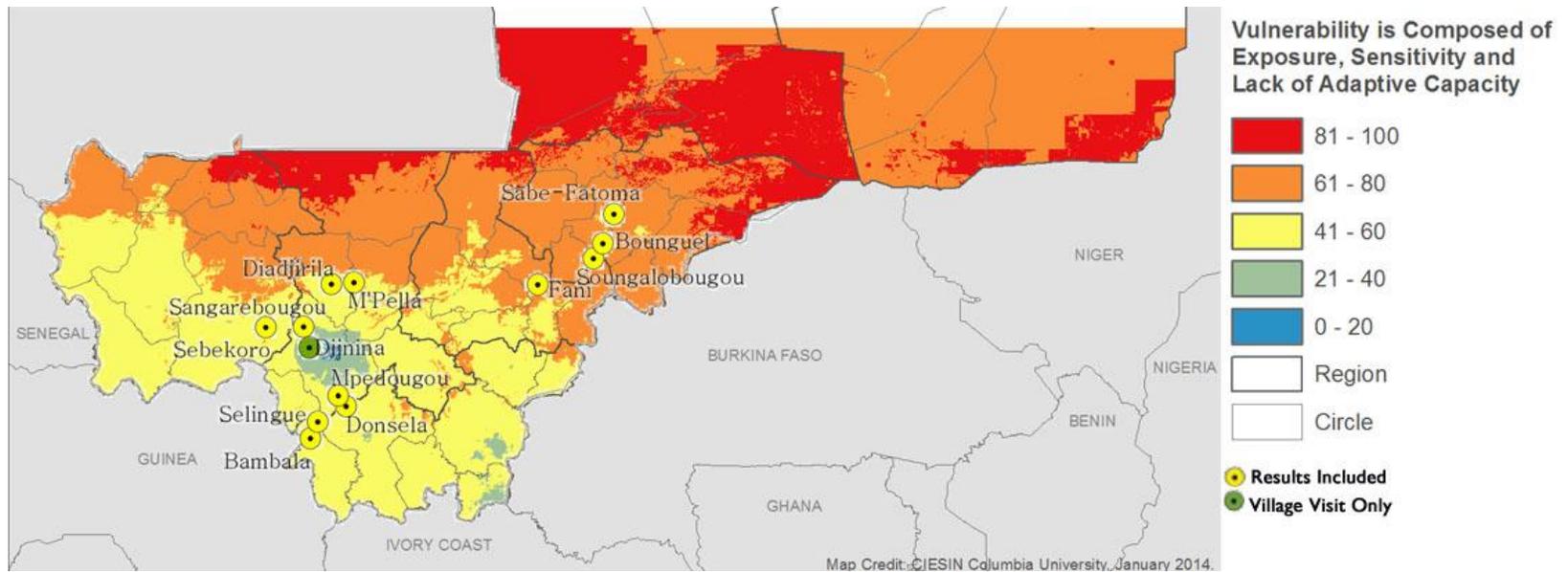


Figure 2 presents the location of the studied villages in the context of the Mali Climate Change Vulnerability Map. As might be expected, the different levels of vulnerability shown in this map do not align exactly with the FEWS NET livelihood zones, as is shown in Table 9. Four of the villages fall in the more vulnerable “orange” zone, with the rest in the less vulnerable “yellow” zone. The one exception, Mpedougou, in the least vulnerable zone (other than the capital), the “green” area, is found on the main Sikasso-Bamako road. When reviewing this map, it should be noted that these rankings encompass broad bands of overall vulnerability, and because the villages studied in this report were recommended by NGOs, they may have higher levels of support from external organizations, and thus lower levels of vulnerability. Further, because accessibility was a criterion of their selection, many are found near markets and urban centers. They are all likely among the less vulnerable in their vulnerability category.

FIGURE 2: STUDY VILLAGES IN CLIMATE CHANGE VULNERABILITY MAP



Map source: de Sherbinin, A., et al. (2014) *Mali Climate Vulnerability Mapping*. Produced for ARCC for USAID. Pg. 12.

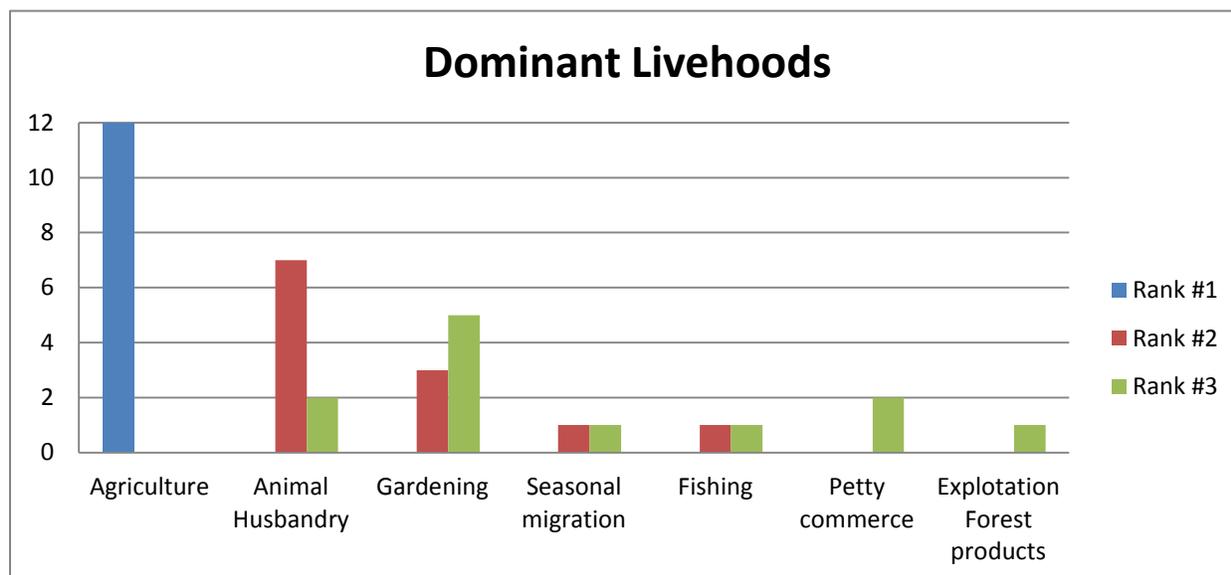
2.2.2 Dominant Livelihoods of the Study Villages

A large number of factors determine the dominant livelihood strategies employed in a village. In the villages studied here, geographic location and proximity to markets clearly stand out as significant. Facilitators asked village groups to list and rank the dominant sources of livelihood in their communities. All 12 villages visited ranked crop agriculture as their primary livelihood activity (Figure 3). All but one village, Fani in ML09, ranked gardening as among the top five livelihoods practiced. Seven ranked animal husbandry second, and two ranked gardens second. The two that ranked gardens second, Selengue and Bambala, are both in the ML12 livelihood zone in the south. Seasonal migration, fishing, and orchards/fruit production were ranked second by one village each. Donsela, which ranked orchards second, is also in the south, and falls in the ML11 livelihoods zone. Gardening was ranked third by six villages. Other productive activities that ranked in the top five include petty commerce, exploitation of forest products, beekeeping, artisanal gold mining, and arts and crafts.

Due to their proximity, several of the villages have relatively easy access to large markets or urban areas. These include the two villages that ranked gardens second in terms of livelihoods, Selengue and Bambala, which are also near fruit processing facilities. M’Pella and Diajirila are in close proximity to markets in Kolokani, while Sangareboungou and Sebekoro lie near the main road to Kati and Bamako. Only the village of Sabe-Fatoma breaks this pattern. It lies near the large markets of Mopti, but ranked gardening as fifth in terms of importance.

The dominant livelihood strategy followed in a community may influence the adaptive practices employed. However, since this study focuses on field-level practices and all of the villages reported that crop farming dominates their livelihood system, it is unlikely to play a significant role in the analysis here. In cases where synergies between livelihoods may be important, such as the importance of animal husbandry in the availability of manure, this is noted in the analysis.

FIGURE 3: RANKING OF LIVELIHOOD STRATEGIES



2.2.3 Technical Support Received

While all villages studied were selected in collaboration with NGOs, they differed with respect to the level of support services they received from the exterior. Villages receive technical training and advice, organizational capacity building, distribution (or sale) of agricultural equipment, plant materials and inputs, and credit. For the most part, villagers reported that they appreciate this support and indicate that they want more of it, more often. The frequency of visits ranges from daily or weekly (for credit services) to once or twice a year. For certain government extension services, agents visit only when specifically solicited and remunerated. A number of the villages receive more intensive service from state agencies. Participants in the seven southern most communities studied report appreciating the broad range of services provided by the state cotton agency (*Compagnie malienne pour le développement du textile, CMDT*), such as technical assistance, training, organizational development, the provision of inputs, equipment, and agricultural credit. Further, the three villages in rice production zones in the Mopti region (Sabe-Fatoma, Soungallobougou, and Bouguele) reported that the rice agency (*Office Riz du Mali, ORM*) constituted an important support structure. Many also come in contact with the Office of Water and Forests (*Eaux et Forêts*) which regulates the harvesting of forest products.

Focus group participants said that the practices that were not introduced to their villages by external organizations and agencies originated in “tradition,” or through communication with neighboring villages, returning members of their own villages, and migrants.

2.3 METEOROLOGICAL SERVICES

The study team asked survey participants a few brief questions concerning weather information, from which a limited number of conclusions may be drawn. All groups reported that they regularly receive daily information regarding rainfall, temperature, and wind speed and direction via radio and, for those that have them, television. They indicated that the most important use of such information is to help in making decisions regarding when to plant, weed, and harvest. Weather information was highly appreciated in all 12 villages visited (all rated rainfall, temperature, and wind speed as “highly important”). Respondents especially value radio and television announcements that suggest dates for planting various crops and specific varieties; they indicated that more of this type of programming would be helpful. Five of the 12 villages visited, scattered across the various livelihood zones (excluding ML05), indicated that they use rain gauges distributed to them by NGOs. Respondents in Sangarebougou (ML11) and M’Pella (ML09) indicated that local farmers use rainfall records for comparison between years while people in Selengue (ML12) admitted that they did not really know how to use them. The team was unable, through the brief interviews conducted, to determine the level of influence weather reports have in the various decisions farmers make, including those regarding the adoption of specific practices.

TABLE 10: INSTITUTIONAL SOURCES OF PRACTICES CITED*

| Organization | # Villages Citing |
|---|-------------------|
| <i>Compagnie malienne pour le développement du textile (CMDT)</i> | 7 |
| <i>Projet PGRN</i> | 6 |
| Office Riz Mopti (Government of Mali, GoM) | 3 |
| <i>Chambre d'agriculture locale (GoM)</i> | 2 |
| ASIC | 2 |
| GRAT | 2 |
| Sahel ECO | 2 |
| AMAPROS | 2 |
| <i>Épargne pour le changement (CAED)</i> | 2 |

*An additional 26 organizations were cited once.

2.4 CHANGES PERCEIVED IN VILLAGES

The changes in agriculture reported in the villages of the study resemble those experienced by villages across the Sahel. Increasing populations and low rates of crop productivity, due in part to climate volatility and extremes, have steadily increased land and vegetation exploitation. Studies elsewhere suggest that this declining productivity is one factor driving farmers to diversify into gardening and fruit trees, especially in contexts where growing urban populations and improved road networks have increased access to markets. Access to new technologies, such as animal traction, access to chemical fertilizers and herbicides, wells, and technical advice have also played a role in increasing the crop area planted and the land dedicated to gardens and orchards.

When focus-group discussions elicited participant observations concerning change in their villages and agricultural systems over the past 20 years, all groups reported a modest or high growth in population. They report that this has been caused by, in order of importance, high birth rates, improved health and reduced mortality rates, immigration, the opening of a local school, and the paving of a road.

Participants from all but one village also described a significant expansion of the amount of land they farm, and a modest or substantial increase in average field size. By and large, they attributed this expansion to larger families, though a number of common responses point to low productivity. Top reasons for increased crop area include change in rainfall (the second most common explanation), extensive agriculture, poor crop productivity, and soil infertility. Other factors reported as contributing to agricultural conversion of land are associated with agricultural development—increased use of animal traction, herbicide, and technical advice.

In addition to cropped land, all of the villages have increasingly dedicated more land to gardens, and, in all but one case (where no change was noted), to orchards. Markets play a big role in these changes. (Figures 4 to 6 present the reported reasons for changes in land use in graphic form.) Interestingly, none of the focus-group participants cited climate change as a driver of this diversification. A few groups did, however, cite environmental changes that have resulted, at least in part, from changes in climate, such as soil infertility.

FIGURE 4: REASONS FOR INCREASED CROP AREA

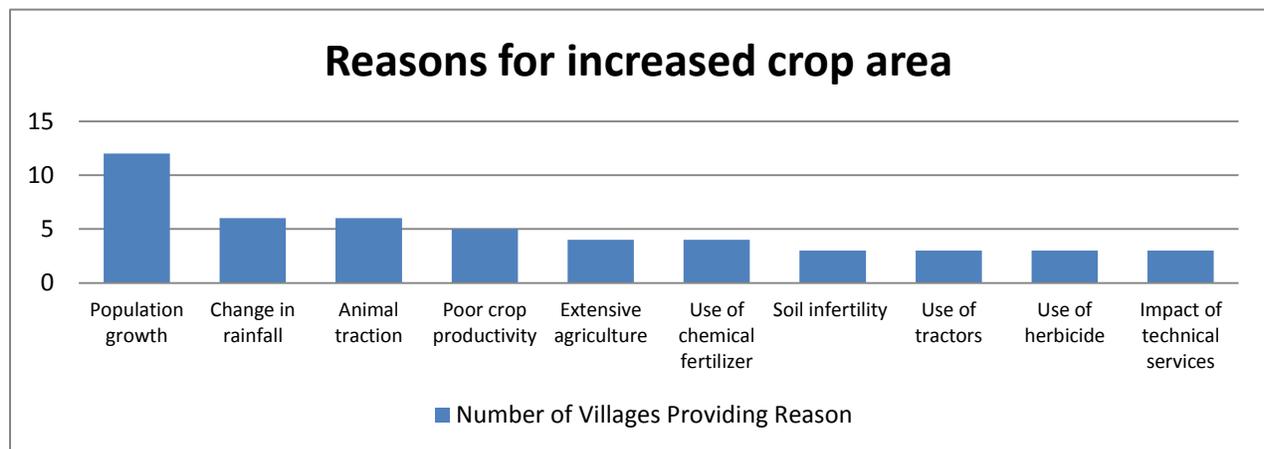
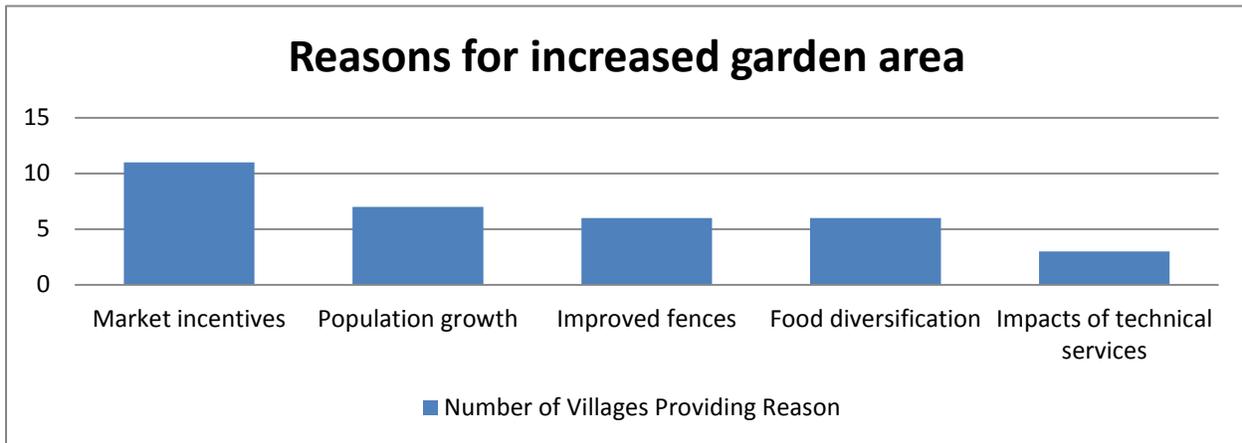
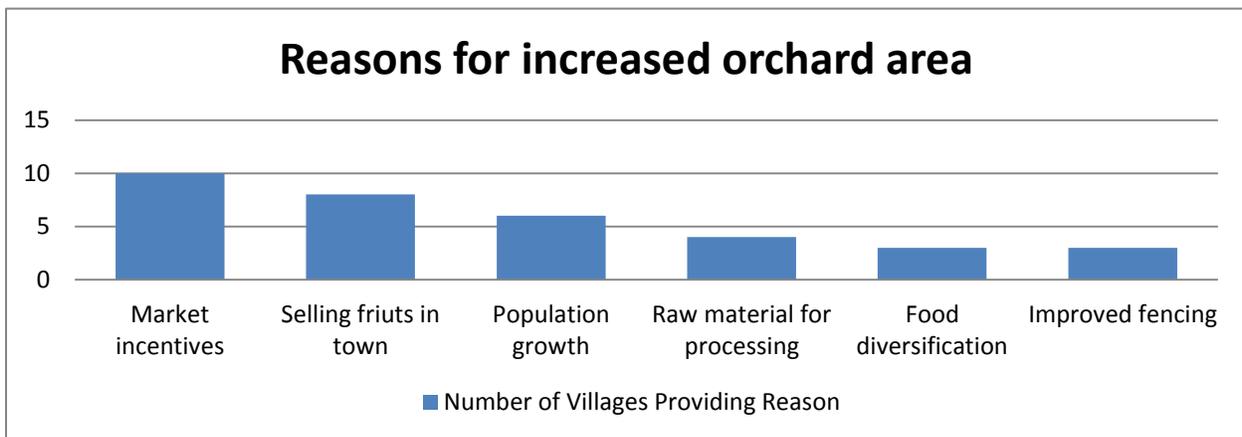


FIGURE 5: REASONS FOR INCREASED GARDEN AREA



Additional reasons for increased garden area cited by fewer than three villages: use of herbicide, soil infertility, and water availability.

FIGURE 6: REASONS FOR INCREASED ORCHARD AREA



Additional reasons for increased orchard area cited by fewer than three villages: poor productivity of orchards, soil infertility and lack of water.

In another change parallel to growing population and increased use of land, participants described a general deterioration of the natural resources available to them. All but two of the villages reported that the level of water in rivers and tributaries has moderately or significantly decreased over the past 20 years. Changes in rainfall and higher temperatures were the most common reasons cited for the decreased water levels. Others include deforestation, erosion, and sand infiltration. The new dam in Talo, completed in 2011, has raised the level of rivers that serve the study villages of Fani and Bounguele. As a result, these villages reported an increase in the flow of rivers near them.

Participants also reported a dramatic reduction in the quality and quantity of vegetation near their villages. All but a few cited a substantial decrease in forests as well as a substantial increase in desertification. They attributed these changes in forest cover to the clearing of land for cultivation, and the over-harvesting of wood for firewood, charcoal production, and artisanal purposes.

Lack of rainfall is considered the principal cause of desertification. Almost all of the villages reported that they have experienced higher temperatures accompanied by stronger winds over the past 20 years, and

all reported that winds are some combination of stronger, hotter, and dustier. Five villages reported significantly higher temperatures, six modestly higher, and one indicated that temperatures have not changed. Four villages reported a substantial decrease in rainfall, while seven described the decrease as modest. One reported that rainfall has decreased only slightly.

All of these changes impact the level of use of different field-management practices. Agricultural expansion increases production on marginally less fertile lands, and may result in deforestation and erosion, which also reduce the quality of land farmed. Loss of surrounding vegetation may result in increased winds and evapotranspiration. It is changes such as these that push producers to adopt soil fertility and moisture management practices. They also result in other changes in agricultural practices less commonly associated with climate change adaptation, such as the increased use of chemical fertilizer and herbicides.

2.5 ADAPTIVE AGRICULTURAL PRACTICES

2.5.1 Overview of Practices Adopted

Through a discussion of changes in agricultural practices over the past 20 to 30 years, facilitators and participants produced a list of adopted practices. Farmers were not asked to solely name practices that address climate change. This process resulted in a broad list. This approach was taken because climate changes are so intimately linked to other environmental changes, such as loss of vegetation. Secondary impacts of climate trends tend to be easier to observe than longer-term climate trends, and many of these secondary impacts are similar to environmental changes occurring for other reasons. For example, improper cultivation of land can change soil structure in ways that reduce its capacity to retain moisture. Absence of windbreaks can result in high evaporation rates. Farmers may adopt moisture retention methods in response to these more concrete changes, rather than the less easily perceived but potentially more important changes in rainfall trends. This study reports on all the changes in field-level practices identified by focus-group participants, yet discussion focuses on those described in the literature as more directly addressing changes in rainfall and temperature.

Figures 7 to 9 present practices reported by focus groups across all 12 villages for the types of practices most clearly related to climate change. As farmers use some practices for multiple objectives, a number of practices appear in more than one figure. These include compost, spreading of manure, rocklines, and *Zai* holes. Practices reported as being used primarily to improve soil fertility include chemical fertilizer, reintegration of crop residue, fallowing, and inter-cropping. Practices cited as being used to manage moisture are: FMNR, live fencing, plowing with animal traction, the use of dikes and bunds, cross-ridges, and irrigation.

Men typically play a greater role in producing field crops than women. As a result, overall, men reported adopting field practices in more villages than did women. However, in villages where women have adopted a practice, they often use it at a higher rate than do men. For example, women report a larger use of composting and FMNR, manure, chemical fertilizer, and reintegration of crop residue.

Farmers do not adopt practices uniformly. Some villages adopt some practices at a higher rate than others. For a practice to be adopted, it needs to not only address the agro-climatic conditions in which it is used; it must also require only resources to which producers have access. Even seemingly ubiquitous inputs, such as available rocks or manure, may limit village-wide adoption. Further, some practices target more specific conditions. While manure or compost can be used on almost any field or garden plot, rock lines function on a certain range of slopes; *Zai* holes produce the greatest increase in productivity on hardpan soils. The following section describes constraints identified by focus-group

participants. (The companion ARCC document *Profiles of Agricultural Management Practices* describes the technical specifications for the application of most of these practices presented here.)

Focus-group participants also cited a number of practices used to control pests and weeds, in addition to those used to improve soil fertility and soil moisture retention. While less immediately related to the impact of climate change, these practices affect productivity levels and may reinforce resiliency. Further, their relevance to climate change could be direct and critical if new climatic conditions greatly impact the prevalence of pests or weeds. In general, men and women report adopting these practices at similar levels. Women in four villages and men in five reported an approximately 70-percent pesticide adoption rate in their fields. Crops on which these products are commonly used include maize, rice, sorghum, millet, groundnuts, cowpea, and watermelon. Participants reported using chemical herbicides in all but one village.

The use of “multi-cultures” (three pronged animal-powered tillers) was mentioned by men in only three villages (and by women in four), but with high adoption levels. SRI was cited, only by men, in three villages of the Mopti region, an area known for rice production, and was said to be employed by all rice farmers in each of these villages.

FIGURE 7: TECHNIQUES TO IMPROVE SOIL FERTILITY

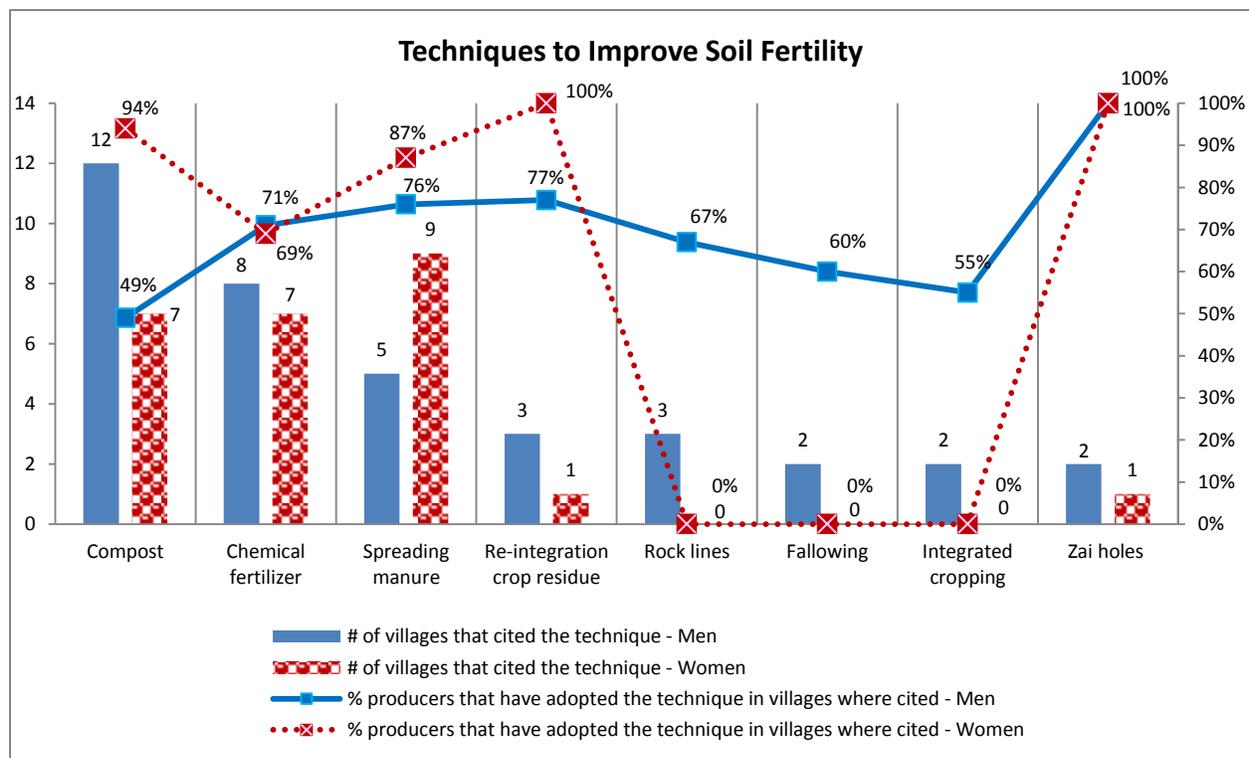


FIGURE 8: TECHNIQUES TO RETAIN SOIL HUMIDITY

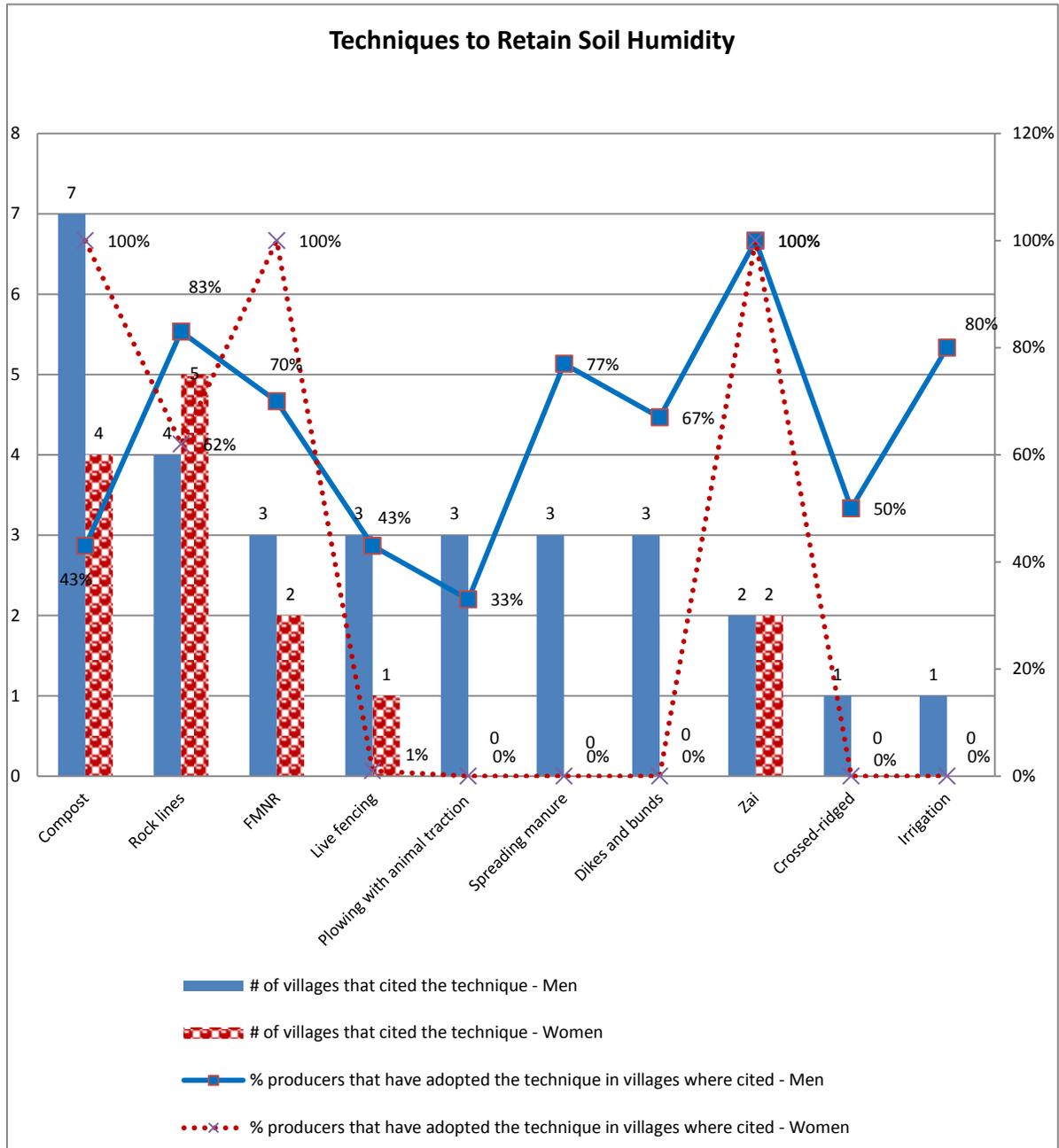
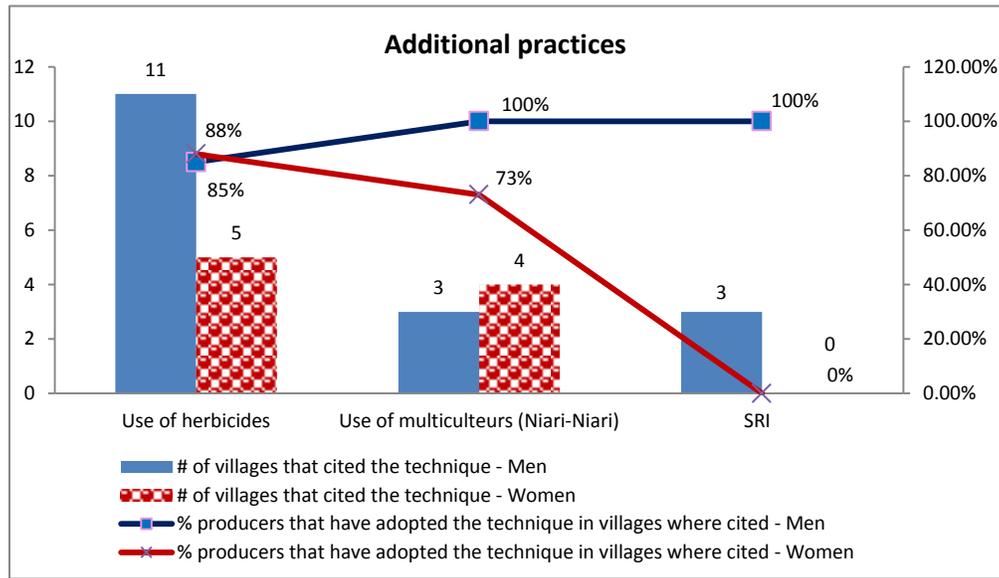


FIGURE 9: ADDITIONAL PRACTICES



2.5.2 Practices Adopted by Livelihood Zone

Geographic location may be one of the most important factors determining the practices adopted by farmers, because it determines the agro-climatic zone and influences the dominant livelihood strategies employed. To explore these correlations, we calculated the prevalence of practices in the 12 villages studied by livelihoods zone. The few villages presented here are by no means representative of either their livelihood groups or Mali as a whole. Their selection was not random, and reflects the biases of the methods NGOs use to select the villages they work in. Further, as noted in the methodologies section above, the manner in which they were selected is likely to have resulted in a sample which over-represents the degree to which extended practices have been adopted by their members. The results below nevertheless serve to illustrate the levels of reported adoption and challenges to adoption in villages in which NGOs are working. They also illustrate differences among villages of different climates and livelihood zones.

- LIVELIHOOD CODES**
- ML05: Dogon plateau – millet, shallots, wild foods, and tourism
 - ML09: West and central rain-fed millet/sorghum
 - ML11: South maize, cotton, and fruits
 - ML12: South-west maize, sorghum and fruits.

The few villages presented here are by no means representative of either their livelihood groups or Mali as a whole. Their selection was not random, and reflects the biases of the methods NGOs use to select the villages they work in. Further, as noted in the methodologies section above, the manner in which they were selected is likely to have resulted in a sample which over-represents the degree to which extended practices have been adopted by their members. The results below nevertheless serve to illustrate the levels of reported adoption and challenges to adoption in villages in which NGOs are working. They also illustrate differences among villages of different climates and livelihood zones.

Farm-management practices need to be appropriate to the farming system and agro-ecological zone in which they are applied. Village location and crops farmed may also help explain whether or not members of a particular village adopt a practice. Table 11, on the following page, presents practices employed in fields (but not gardens) reported in focus groups conducted with men. The values represent the average of the number of villages in the zone that reported employing a practice.⁷ They are organized by livelihood zone, arranged roughly north to south from left to right, and from most- to least-common practice from top to bottom. The green shading of table cells reflects rates of adoption. Higher rates appear darker.

⁷ The table does not reflect rates of adoption within villages. However, in all but three cases, more than half of a village's men employ the practice listed. Villages reporting 2 to 20 percent use (four cases) were excluded from the calculation.

TABLE II: PERCENTAGE OF VILLAGES PER LIVELIHOOD ZONE IN WHICH MEN ADOPT FIELD PRACTICES

| Practice | North | | | South | All |
|------------------------------------|------------|------------|------------|------------|------------|
| | ML05 | ML09 | ML11 | ML12 | |
| | N=1 | N=5 | N=4 | N=2 | N=12 |
| Herbicide | 100% | 80% | 100% | 100% | 92% |
| Compost | 0% | 100% | 75% | 100% | 83% |
| Chemical Fertilizer | 0% | 100% | 75% | 50% | 75% |
| Contour Rock Lines | 0% | 40% | 100% | 100% | 67% |
| Animal Traction | 0% | 80% | 50% | 0% | 58% |
| Manure | 100% | 60% | 75% | 0% | 58% |
| Reintegrating Crop Residue | 0% | 20% | 60% | 50% | 42% |
| FMNR/Allow Trees to Grow in Fields | 0% | 40% | 75% | 0% | 42% |
| Insecticide/Pesticide | 100% | 20% | 25% | 50% | 33% |
| Small Dikes, Bunds, and Half-Moons | 0% | 80% | 0% | 0% | 33% |
| Inter-Cropping/Crop Rotation | 100% | 20% | 0% | 0% | 25% |
| Live Fencing | 0% | 0% | 75% | 0% | 25% |
| SRI | 100% | 40% | 0% | 0% | 25% |
| Corralling Livestock in Fields | 0% | 40% | 0% | 0% | 17% |
| Fallowing | 100% | 0% | 25% | 0% | 17% |
| Slash and Burn | 0% | 40% | 0% | 0% | 17% |
| Zai | 0% | 40% | 0% | 0% | 17% |
| ANC | 0% | 20% | 0% | 0% | 8% |
| Irrigation (all types) | 0% | 0% | 0% | 50% | 8% |
| Tied Ridges | 0% | 20% | 0% | 0% | 8% |
| Wind Breaks | 0% | 0% | 25% | 0% | 8% |
| Fire Breaks | 0% | 0% | 0% | 0% | 0% |
| Nitrogen Fixing Trees | 0% | 0% | 0% | 0% | 0% |
| Column Average | 26% | 37% | 30% | 20% | 33% |

Focus-group discussions with women produced similar responses with regard to the most frequently used practices. However, women reported using practices in a smaller number of villages overall. Their estimates of percentages of people using them were also smaller, with the exception of manure and insecticides and pesticides. For these, women reported a higher adoption rate per village than did men.

TABLE 12: PERCENTAGE OF VILLAGES PER LIVELIHOOD ZONE IN WHICH WOMEN ADOPT FIELD PRACTICES

| Practice | North | | South | All |
|--------------------------------------|------------|------------|------------|-------------------|
| | ML09 | ML11 | ML12 | N=10 |
| | N=4 | N=4 | N=2 | N=10 ⁸ |
| Manure | 80% | 75% | 100% | 90% |
| Herbicide | 40% | 100% | 100% | 80% |
| Chemical Fertilizer | 80% | 75% | 0% | 70% |
| Compost | 60% | 25% | 100% | 60% |
| Contour Rock Lines | 60% | 75% | 0% | 60% |
| Insecticide/Pesticide | 80% | 50% | 0% | 60% |
| FMNR/Allow Trees to Grow in Fields | 40% | 0% | 0% | 20% |
| Slash and Burn | 40% | 0% | 0% | 20% |
| Zai | 40% | 0% | 0% | 20% |
| Improved Variety Seeds | 0% | 0% | 50% | 10% |
| Live Fencing | 20% | 0% | 0% | 10% |
| Tied Ridges | 0% | 25% | 0% | 10% |
| ANC | 0% | 0% | 0% | 0% |
| Corralling Livestock in Fields | 0% | 0% | 0% | 0% |
| Fallowing | 0% | 0% | 0% | 0% |
| Fire Breaks | 0% | 0% | 0% | 0% |
| Inter-Cropping/Crop Rotation | 0% | 0% | 0% | 0% |
| Irrigation (all types) | 0% | 0% | 0% | 0% |
| Mulching, Reintegration Crop Residue | 0% | 0% | 0% | 0% |
| Nitrogen-Fixing Trees | 0% | 0% | 0% | 0% |
| Small Dikes, Bunds, and Half-Moons | 0% | 0% | 0% | 0% |
| SRI | 0% | 0% | 0% | 0% |
| Wind Breaks | 0% | 0% | 0% | 0% |
| Column Averages | 23% | 18% | 15% | 22% |

The small sample size limits the confidence with which these results may be interpreted. For example, the fact that the men of Sabe-Fatoma, the sole example of Mali Livelihood 05, did not report using compost, chemical fertilizer, or rock lines should not be taken as representative of all the villages of the Dogon zone, which by itself includes plateaus, escarpments, and lower planes. Nor is livelihood zone necessarily the most critical factor in the adoption of a practice. For example, it is very likely that the natural resources and local climate necessary to practice SRI were alone not sufficient without the support of the *Office Riz du Mali*. At best, these tables suggest a few hypotheses that align with common understanding of the use of these practices, but would need to be further researched for a more definitive understanding. These hypotheses include: 1) a higher level of use of manure in the north due to the higher density of livestock in this part of the country; 2) higher rates of insecticide and pesticide use in the south due to the higher moisture levels; 3) higher rates of reintegrating crop residue in the south due to the greater availability of biomass and lower density of cattle; and 4) higher rates of inter-cropping in the north due to the presence of the crops traditionally farmed together, e.g., millet and cowpeas.

⁸ The women of two villages, Sani-Fatoma (ML05) and Fani (ML09), deferred to their husbands to respond to this set of questions regarding field practices.

2.6 OBSTACLES AND ADVANTAGES TO THE ADOPTION OF PRACTICES

As focus-group participants listed the field-level practices they have adopted over the past 20 to 30 years, they were asked why some people adopted a practice and not others, as well as the advantages and disadvantages of each practice. Tables 13, 14, and 15 present their responses regarding practices that improve soil fertility, enhance moisture retention, and control pests and weeds. Each table presents obstacles to adoption, added advantages, and any disadvantages of employing each practice.

TABLE 13: BARRIERS TO ADOPTION: SOIL FERTILITY PRACTICES

| Practice | Factors Most Often Limiting Adoption | Advantages of Adoption (in Addition to Soil Fertility) | Disadvantages of Adoption |
|-------------------------------------|---|--|---|
| Compost | manure, equipment, labor, transportation, knowledge | improves soil structure, retains moisture | not long lasting, burns crops if inadequate rains |
| Chemical Fertilizer | cash/credit, knowledge, availability | less labor than organic fertilizer | creates dependency, harvest conserves poorly, bad for soil, burns crops if inadequate rains, health hazard. |
| Fallowing | access to adequate land | none reported | none reported |
| Plowing with Animal Traction | draft animal labor, equipment | improves soil structure, reduces labor, enables cultivation of more land | requires adequate rains, cost of maintaining animals |
| Integrated Cropping | land, seed | diversifies climate risk | none reported |
| Leave Trees in Fields/FMNR | none reported | retains moisture | shades crops |
| Manure | transportation, adequate manure | retains moisture, reduces need for chemical fertilizer | none reported |
| Rock Lines | transportation, rocks, labor, knowledge | promotes infiltration, reduces erosion | risk of injury |

TABLE 14: BARRIERS TO ADOPTION: SOIL HUMIDITY RETENTION PRACTICES

| Practice | Factors Most Often Limiting Adoption | Advantages of Adoption (in Addition to Retention of Soil Humidity) | Disadvantages of Adoption |
|-------------------------------------|---|--|---|
| Compost | manure, equipment, labor, transportation, knowledge | soil fertility, increased productivity | not long lasting, burns crops if inadequate rains |
| Contour Planting | knowledge | soil fertility | none reported |
| Cross-Ridges | draft animals and equipment | soil fertility, limits runoff | none reported |
| Dikes and Bunds | labor, transportation, equipment | soil fertility, limits soil erosion | none reported |
| Plowing with Animal Traction | draft animal labor and equipment, transportation, cost of draft animals | soil fertility, permits deep cultivation, enables cultivation of more land | cost of maintaining animals |
| Live Fencing | knowledge, appropriate seed/cuttings | soil fertility, sale of jatropha seed, protection against fire and animals | none reported |
| Manure | manure, equipment, transportation | soil fertility, increased productivity | not long lasting |
| Mulching | knowledge, labor | limits burning of plants | none reported |
| Rock Lines | transportation, rocks, labor, knowledge | limits soil erosion, soil fertility | risk of injury |
| Zai | labor, lack of land | soil fertility | none reported |

TABLE 15: BARRIERS TO ADOPTION: PEST AND WEED CONTROL

| Practice | Factors Most Often Limiting Adoption | Advantages of Adoption (in addition to Pest and Weed Control) | Disadvantages of Adoption |
|-------------------------------|---|---|--|
| Pesticide /Insecticide | elevated cost, unavailability of products in village, adulterated products | saves time, reduces labor, increases productivity | not always effective, health hazard, risk to environment |
| Herbicide | elevated cost, unavailability of products in village, adulterated products, knowledge | saves time, reduces labor, facilitates cultivation of large areas, improves production and productivity | not always effective, health hazard to people and fauna |

Paradoxically, some focus groups reported that lack of knowledge constrained the adoption of some practices also described as being of local origin, such as composting, rock lines, and mulching. This is explained in part by the fact that this study presents results of discussions across numerous villages; participants may know of methods practiced (and seen as “traditional”) in other villages, but are less familiar with them, or have been unable to adapt them to their conditions. In some cases, extension agents or associations promote modified versions of practices that have indigenous origins. For example, while composting may be known, organizations promote pit composting, a more elaborate procedure that some villagers have not figured out how to adapt effectively to their context.

In general, participant responses reflect the advantages and obstacles reported elsewhere in research literature describing the use of specific practices. One theme reflected here is that farmers value practices that address multiple objectives. Participants reported that many of the practices adopted to address soil fertility also improve moisture retention. Virtually every practice adopted to retain humidity also improves soil fertility. Participants listed manure, compost, and rock lines among the most widely used practices in Tables 11 and 12, as means to directly address both soil fertility and retain moisture.

Decisions concerning the adoption of practices regard trade-offs among many factors. For example, among constraints to adoption, labor appears frequently, and participants reported that a reduction of demands on labor is an important benefit. However, while chemical fertilizer addresses this need, and its use is widespread, farmers also recognize numerous serious limitations to its adoption.

Transportation appears as a significant challenge to adoption of a number of practices, while some constraints tie more directly to climate; the effectiveness of compost and chemical fertilizer, depends on rainfall amounts and patterns. On the other hand, none of the groups reported “wash-outs” as a limitation of moisture retention practices. This potential limitation may become more important in the future if climate change projections prove correct and the Sahel experiences an increase in the frequency of concentrated rainfall events.

2.7 ADAPTATION BY CHANGING CROPS AND VARIETIES

In addition to employing specific field-level structures and practices, farmers adapt to climate change through changes in the mix of crops and varieties they plant. Focus-group participants were asked to identify the crops and varieties that perform best under poor rainfall years and good rainfall years. These “good year” and “bad year” crops are listed, using the names provided during focus groups, in Table 16. Respondents were often not aware of the formal or scientific names for these varieties.

Participants were also asked to list the other characteristics that make these varieties desirable. For both “good year” and “bad year” crops, taste ranked high on the list. Other valued traits include adaptation to local soils and low demand for fertilizer. “Good year” crops ranked more highly as a “hungry season” crop, presumably because these longer maturing varieties are harvested later in the year. One secondary reason for why only the “good year” crops are valued is that they are considered a profitable “cash crop.” That is to say, the crops that perform well in years of good rainfall are also those that produce a harvest farmers can sell. Highly valued cash crops include rice, cowpea, groundnut, maize, and pepper.

The focus-group discussions also produced a list of crops that have been abandoned, or virtually so. These include varieties of maize (kabala, russikaba, kabadaba, kabatemimani, and foulakaba), and certain varieties of millet (segetene, douaba, and sonyogirima), groundnut (tigadjan and dorogmba), rice (maloba, lingue, gamabo, and fossa) and fonio in general. Cotton has also been abandoned, either partially or completely, in many villages. The primary reasons given for the discontinuation of these crops relate to the amount or duration of rainfall; these were abandoned because they were long-cycle varieties (requiring four to five months to maturity) or required higher rainfall levels. Rainfall requirements for maize, for example, are higher than those for sorghum and millet. In the case of cotton, cost of production was cited as the most important factor.

TABLE 16: ADAPTATION THROUGH CHANGING CROPS VARIETIES

| Crop | Good Year | Bad Year |
|--|--|---|
| Finger Millet | Baroba, Kalonani | Baroba, Segunyoni |
| Pearl Millet (<i>petit mil</i>) | Sonyogirima, Toronun | Ngombacou, Sonikoura, Souna, "90 days" |
| Sorghum | Bimbiri, Gende, Kenegeba, Kente, Samako, Seguifa, Soumalen | Gadiaba, Kenegeteli, Séguéré, Sokolika, Soninkou, Télima, Telimen |
| Maize | Dembagnouma, Sojibaka, Sonikoura, Sotubaka | Cheblekeni, Fulakaba, "hybrid," Sakolika, Séguéré, Tessema |
| Rice | Adni, Filimalo, Gambiaca, Local, Nerica | Fima, "IER," Kaca, Maloba, Wassa |
| Groundnut | Kalosaba, Tigaba, Tigablen, Tigajeni | Tigaje, Tigajeni, Tiganeteli, Tigateleni |

3.0 UPTAKE OF PROMOTED PRACTICES

The process of extending new or improved practices must balance the old with the new. The practices being promoted must be within the reach of the receiving population; if practices require unattainable levels of labor, capital, or knowledge, producers will not adopt them. Building on existing practices may be the most practical means to ensuring a “fit” with local productive resources. As noted above, identifying and building on existing knowledge and experience is critical to NGOs’ approach to selecting the practices they extend.

In this section, we compare the rate at which NGOs promote specific practices with the level of their adoption by the communities interviewed. Considerable differences exist. Table 17 (see page 40) presents the percentage of NGOs that reported promoting practices alongside the percentages of focus groups that reported using practices. Unlike previous tables, practices promoted/used in both fields and gardens are included. The green shading of table cells reflects rates of promotion and adoption. Higher rates appear darker. Contrasts between dark and light cells in the first two columns indicate differences in promotion and adoption rates; the final column, by which the table is sorted, presents this difference (NGO promotion rates minus adoption rates reported by all focus groups.). Thus, the top of the table presents the practices with highest rate of promotion relative to levels of adoption; NGOs promote them at much higher rates than they are used. The middle, lightly shaded, section of the table includes practices promoted and adopted at roughly equal levels. Toward the bottom of the table are those practices that are least promoted relative to their use by villages — the heavily adopted but not promoted practices.

Of those practices promoted by more than a third of the NGOs interviewed, (the top section of the table) several were not adopted by any of the villages studied. Similarly, among the practices less-heavily promoted by NGOs, (the second group in the table) three are not used in any of the villages. In all of these examples, the discrepancy between promotion and adoption rates is surprising, since these villages were selected based on recommendations by NGOs (though not necessarily those NGOs that promote these specific practices). Except for terracing, these practices could be useful in virtually any village in Mali; “fit” with the local biophysical context does little to explain this discrepancy. Further, they are known practices in the development literature; none of them are particularly new or innovative.

A closer examination of those practices that are heavily promoted but poorly adopted helps explain these differences. These practices are among the most input-intensive cited. Further, while they may draw on traditional experience, in the form extended to the villages they are little known in traditional agriculture in Mali. These include: alley-cropping, integrated soil fertility management, conservation agriculture, terracing, and windbreaks.

A relatively higher, but still low, percentage of people employ the two remaining practices in the upper section of the table—vegetative barriers/live fencing and reintegration of crop residue. They are both labor intensive. Low adoption rates of these practices may result from the persistence of the traditional systems of open livestock access to fields, fallow/shifting plots, and burning of crop residue, which these practices do not support.

Among the practices found in the middle of the table, those that villagers adopt at a rate closer to the promotion rate, the most widespread are mulching, contour rock lines, and composting. (Manure, found in the third section of the table, also has very high adoption and promotion rates.) Unlike some of the practices noted above, women employ these practices in their gardens. In addition to their evident utility in both fields and gardens, their widespread use and probable local origin may help explain the presence of these practices in a high proportion of villages, despite the obstacles reported in Tables 14 and 15 above. Although NGOs promote these practices, it is unlikely that NGO efforts are the sole reason for their adoption in the study villages. Even in study villages in which NGOs introduced these practices, the characteristics of the practices described in these tables themselves have facilitated the adoption process.

About a third of the men's focus groups, roughly equal to the rate of promotion, employ inter-cropping. It is unclear why focus groups did not report inter-cropping at a higher rate. A large percentage of farmers historically intercrop millet with cowpeas in the semi-arid millet systems in Mali. While farmers in the southern villages in this study do not cultivate millet and cowpeas and might not be expected to use this practice, only one of the five villages in the millet/sorghum livelihood zone of the study (ML09) reported using intercropping.

Regarding other practices promoted at approximately the same rates they are used, about a third of the men's focus groups employ water-management structures, such as dikes and demi-lunes. Because these practices are not appropriate for all village contexts, their lower promotion and adoption rates stand to reason. A quarter of the men's focus groups, reported using the System for Rice Intensification (SRI). This approach, which is resource-intensive and relatively new to West Africa, is used by men in the three villages in which *Office Riz du Mali* conducts its extension activities.

Among the final eight practices, practices adopted by villagers at a higher rate than promoted, no NGOs reported promoting five. It is possible that NGOs assume that farmers will adopt some of these locally developed, widespread, low-input practices on their own, as necessary or possible. They include double plowing⁹, fallowing, and corralling animals on fields. Other practices may fall in this category because farmers were asked to report all field practices, and included both chemical fertilizer and herbicides, which they use at very high rates. NGOs may not promote these because they don't see the need, as farmers adopt them on their own and/or government services, such as CMDT, promote them. NGOs may also have omitted to mention them in interviews because they are not considered to be climate change adaptation practices.

A higher percentage of focus groups, both men and women's focus groups, reported "leaving trees in fields" than NGOs reported promoting this practice, or the slightly more involved practice of Farmer-Managed Natural Regeneration (FMNR). While further, more targeted research would be necessary to verify this finding, it may represent an opportunity, a case in which NGOs could build on a recognized and appreciated local practice.

It is a truism that "fit" with existing systems facilitates the extension of practices; the greater the similarity to what exists, the greater the potential for adoption. The question is: What innovations are both acceptable and beneficial?

In this study, rates of adoption are associated with the resource intensity of practices. Fewer farmers have adopted practices that require higher levels of labor and technical knowledge, despite higher levels

⁹ Double plowing before planting consists of an initial plowing prior to the first rainfall to loosen up the soil and increase the absorption of water from the first rain. Farmers double plow on compacted clay soils.

of NGO promotion. Existing farming systems are very low-input, and the uncertainty of markets and weather dissuade further investment in new, untested approaches. Farmers most frequently use known, low-input practices that fit a range of contexts—such as composting and manure. Although this study included only 12 villages, those villages were identified by NGOs, making the low levels of adoption of practices promoted by a high percentage of NGOs, and well known in the development community, all the more surprising.

At the other end of the extreme, chemical fertilizer, herbicides, and pesticides are not promoted by NGOs, but are highly employed in both fields and gardens. These cash- and knowledge-intensive practices were all identified in focus groups as “non-traditional.” The presence of CMDT and *Office Riz du Mali* in the study villages goes a long way in explaining their widespread use. Regarding CMDT, which is present in seven of the study villages, participants reported that the agency provides inputs and technical assistance to gardeners as well as farmers cultivating cotton.

TABLE 17: PRACTICES PROMOTED VS. PRACTICES ADOPTED

| Practice | % NGOs | % All FGDs | % Male FGDs | % Female FGDs | NGO-FGD |
|--------------------------------------|--------|------------|-------------|---------------|---------|
| Vegetative Barriers/Live Fencing | 79% | 18% | 25% | 8% | -62% |
| Wind Breaks | 55% | 0% | 0% | 0% | -55% |
| Nitrogen-Fixing Trees | 52% | 5% | 8% | 0% | -47% |
| Reintegration of Crop Residue | 72% | 27% | 42% | 8% | -46% |
| Integrated Soil Fertility Management | 45% | 0% | 0% | 0% | -45% |
| Contour Planting/Plowing/Ridges/ANC | 48% | 9% | 17% | 0% | -39% |
| Alley-Cropping | 31% | 0% | 0% | 0% | -31% |
| Mulching | 55% | 26% | 25% | 25% | -29% |
| Conservation Agriculture | 28% | 0% | 0% | 0% | -28% |
| Cover Crops/Green Manure | 24% | 0% | 0% | 0% | -24% |
| Zai | 34% | 17% | 17% | 17% | -17% |
| Dikes, Bunds, Demi-Lunes | 34% | 18% | 33% | 0% | -16% |
| Inter-Cropping | 38% | 22% | 33% | 8% | -16% |
| Terracing | 14% | 0% | 0% | 0% | -14% |
| SRI | 24% | 14% | 25% | 0% | -11% |
| Contour Rock Lines | 66% | 57% | 75% | 33% | -8% |
| Compost | 86% | 83% | 92% | 67% | -3% |
| Crossed-Ridges/Tied-Ridges | 0% | 5% | 8% | 0% | 5% |
| Corralling Animals on Fields | 0% | 9% | 17% | 0% | 9% |
| Double Plowing Before Planting | 0% | 9% | 17% | 0% | 9% |
| Fallow | 0% | 9% | 17% | 0% | 9% |
| Manure | 90% | 100% | 92% | 100% | 10% |
| FMNR/Leave Trees in Fields | 10% | 26% | 25% | 25% | 16% |
| Chemical Fertilizer | 3% | 78% | 83% | 67% | 75% |
| Herbicide | 0% | 83% | 92% | 67% | 83% |

4.0 CONCLUSIONS

When asked to identify field-level management practices, methods, or technologies that serve to strengthen adaptation to climate change, both NGOs and farmers in Mali respond with long lists of practices, none of which were specifically, and solely, developed to address changes in climate expected to result from an increase in greenhouse gases. While every practice listed addresses field-level technical constraints on agriculture, and many may have their origins in efforts to address natural shifts in Sahelian climate, such as the lower rainfall levels of the 1970s and 1980s, only a few target the specific climate threats that are expected to increase over time—higher temperatures, decreased annual rainfall, greater rainfall variability, and increased frequency of extreme rainfall events. Both NGOs and farmers recognize the importance of moisture management structures, such as contour rock lines, *Zai* holes, vegetative barriers, and live fencing. Yet the practices that are most commonly promoted and used have broader application, often related to improving soil fertility and structure, such as the use of manure, compost, and crop residue.

SPECIFIC FINDINGS:

Regarding location of NGO activities: The organizations interviewed conduct activities across Mali, yet concentrate their efforts in the southern regions of the country. Given that the communities of northern Mali need development support as much as those in the south, it is likely that this skewed distribution stems largely from factors such as sparse population, distance and logistic challenges, and insecurity. It is nevertheless striking that so few NGOs with representatives in the nation's capital work in the north.

Regarding the selection of practices being promoted: Of the various factors that influence the specific practices organizations promote, the local context in which they work and the populations targeted may be the most important. Organizational understanding regarding the nature of climate change—whether it is new, the nature and speed of change, and how it relates to other development challenges—also influences the approaches adopted, and thus the practices promoted. NGOs described a relatively conservative strategy toward addressing climate change adaptation, one which builds on current practice, addresses immediate concerns, puts anthropogenic climate change in the context of historical shifts in climate, and integrates climate change adaptation into other local concerns.

Regarding the specific practices promoted: Virtually all of the practices cited by NGO staff have been promoted in the Sahel for more than two decades. While practitioners modify technical specifications and extension methods to adapt them to current and local conditions, in one form or another, all of these practices predate the recent increased escalation of climate change funding.

The NGOs interviewed promote a wide range of practices. More than 70 percent of the NGOs promote at least one of practices addressing soil fertility or moisture retention, providing supplemental water or agroforestry. The greatest number of NGOs promote practices to strengthen soil fertility enrichment, with direct application of manure and composting most common. NGOs also help disseminate cereal, legume, and vegetable varieties.

Regarding agricultural change in the study villages: Agricultural expansion, natural resource degradation and other broad changes in context impact the adoption of new or different field-management practices. They “push” producers to adopt soil fertility and moisture management

practices, in particular. They may also result in other changes in agricultural practices less directly associated with climate change, such as the increased use of chemical fertilizer and herbicides.

Regarding livelihood zones and practices adopted: Given the small sample size, this study produced hypotheses regarding correlations between livelihood zones and practices that need to be verified through further research. These include: 1) a higher level of use of manure and corralling livestock in the north due to the higher density of livestock in this part of the country; 2) higher rates of insecticide and pesticide use in the south due to the higher moisture levels; 3) higher rates in the south of mulching of crop residue due to the greater availability of biomass and lower density of cattle; and 4) higher rates of inter-cropping in the north due to the presence of the crops traditionally farmed together.

Regarding adoption and constraints to adoption: Farmers value practices that address multiple objectives. Practices adopted to address soil fertility also improve moisture retention and vice versa. Farmers also balance trade-offs among many constraints when deciding to adopt a practice, with labor and cost frequently being critical. Some constraints tie more directly to climate than others. The effectiveness of compost and chemical fertilizer depends on rainfall amounts and patterns. On the other hand, while climate change projections indicate an increase in the frequency of concentrated rainfall events, no group reported “wash-outs” as a limitation of moisture retention practices.

Regarding adaptation through changes in crops and varieties: Farmers take a number of characteristics into consideration when deciding which crops to plant. In addition to adaptation to climate, producers interviewed identified taste as important. Other valued traits include adaptation to local soils, low demand for fertilizer, and the degree to which yields increase with rainfall. Farmers have also abandoned a number of crops. The most common reasons given for discontinuation relate to the duration in the crop cycle (days to maturity) and decreases in the amount or duration of rainfall. In the case of cotton, cost of production was cited as the most important factor.

Regarding uptake of promoted practices: In this study, rates of adoption were associated with the resource intensity of practices. Fewer farmers have adopted practices that require higher levels of labor and technical knowledge, despite higher levels of NGO promotion. Farmers most frequently use known, low-input practices that fit a range of contexts, such as composting and manure. As the study villages were identified by NGOs as villages they work in, it is all the more surprising that many of the practices promoted by a high percentage of NGOs were among those with the low levels of adoption. At the other end of the extreme, a number of cash- and technical-knowledge intensive practices identified by focus group participants as “non-traditional”—chemical fertilizer, herbicides, and pesticides—are not promoted by NGOs, but (extended by national agencies present in these villages) are highly employed in both fields and gardens. Finally, within villages, gender plays an important role in adoption, with women adopting different practices at significantly different rates than men.

ANNEX I: METHODOLOGY

ORGANIZATIONAL INTERVIEWS

The design of the organizational interview guide follows the objectives of the study. A first section collects general background information regarding the organization, while the second section, which constitutes the bulk of the guide, is dedicated to cataloguing the adaptive practices the organization promotes. Rather than asking representatives to list the practices they promote, in administering this section, interviewers proposed specific practices for confirmation. Previous research in Mali, as well as a review of literature, informed the development of this list of practices. In an attempt to be inclusive, the list is broad. At the conclusion of each section of the interview, interviewers also offered informants the opportunity to report additional practices.

In addition to general questions regarding the organization and detailed questions on practices promoted, the questionnaire included questions on the regions and circles in which the organization works, funding and partner organizations, the budget of the organization, and an estimate of the percent of the budget dedicated to climate change activities.¹⁰ Annex 5 presents the English version of the questionnaire. Annex 2 presents the list of organizations interviewed.

A consultant, working with the team in Mali, translated the guide into French.

To identify the most appropriate organizations to interview, ARCC first obtained a list of members of two of the most widely known Mali-based climate change networks, *Reso Climat Mali* and *Groupe de coordination des Zones Arides (GCoZA)*, and a list of bilateral donors supporting climate-change-related activities in the country. This led to the development of a list of nearly 80 organizations, donors, research organizations, and government entities for possible interview. The team then conducted desk-study research, inquired and networked with prominent local actors working in the country on climate change activities, and communicated with USAID Mali to produce a short list of approximately 50 organizations, which the team began contacting to schedule interviews. Ultimately, the NGO interview guide was administered to 30 local NGOs and associations.

Interviews took place between January 6 and 18, 2014.

Wherever possible, interviewees included the executive director (or equivalent thereof) of the organization, senior technical personnel best placed to provide information regarding the organization's activities and objectives regarding climate change adaptation, and the organization's chief financial officer to ensure accurate budgetary information was provided.

The team leader, Brent M. Simpson, in collaboration with ARCC home-office staff and the assessment team in Mali, developed the interview guide. It was tested in the field prior to making final revisions. This guide was used during interviews with all selected national and international NGOs. Given greater time constraints of donor and government interviewees, and the nature of information expected to be obtained, a separate guide was developed for interviews with donors and government entities.

¹⁰ While these questions provided information concerning the region in which the organization works, and the budget dedicated to that work, a study of significantly greater rigor and duration would have been necessary to determine with confidence the number of organizations promoting a specific practice in a specific area, and the amount of funds dedicated to a particular practice over a period of time.

In almost all cases organizations, donors and government entities were visited by a team of two interviewers, one of whom led the interview while the other recorded information either directly onto a laptop or by hand onto the guide itself. Interviews with NGOs took on average 90 to 120 minutes, while those with donor and government entities took somewhat less, 60 to 90 minutes. Blank examples of the interview guides are provided in Annex 5.

The team interviewed 39 organizations, 30 of whom were national NGOs. Nine donors, government entities, and research organizations were also interviewed. The team administered the shorter questionnaire to three donors and two international NGOs in Bamako to gain an overview of their perspective on promising practices to address climate change. The responses to these interviews are summarized in Annex 7. Team members also met with representatives of three government entities supporting adaptation to climate change, and with one international research organization (the World Agroforestry Center). By design, NGOs were prioritized given the fact that they are most often the first line of contact with local communities and those most directly involved in providing technical services to rural farmers.

While the assessment was limited to only a portion of technical support service providers promoting the adoption of agricultural adaptive practices and techniques in Mali, the assessment team feels that the groups interviewed represent most of the techniques presently being promoted in Mali, and certainly in the regions targeted. That said, there may be regionally based NGOs in the northern part of Mali (Tombouctou, Gao, and Kidal) that promote techniques that are more particular to the Saharan bioclimatic zone, which we were not able to capture.

FOCUS GROUPS

Similar to the organizational survey, the village-level research was designed to concentrate on practices. The team leader, in collaboration with home-office ARCC technical advisors and the assessment team in the field, developed a village visit and focus-group discussion guide that incorporated the key questions of the study utilizing participatory rural appraisal (PRA) techniques where appropriate to actively engage villagers throughout a long day of inquiry. In Mali, the assessment team thoroughly reviewed the initial guide for their own understanding and conducted role-playing activities to pinpoint areas where targeted participants may not comprehend what is being asked of them or understand the methodology used. The team also underwent training on the PRA tools included within the guide to ensure all were comfortable with their implementation. Following recommendations resulting from this exercise, the guide was revised.

The team of six Malian consultants and two expats piloted the guide in the village of Djinina, located about 60 kilometers northwest of Bamako in the Koulikoro region (Sudanian zone). For test purposes, the nearly 80 individuals that met the assessment team were divided into three separate groups (men and women combined) and each group was assigned to a facilitator/note taker pair of team members that implemented the entire guide with the group. As such, the single pilot village served to test the tool with three separate groups of individuals. After pilot-test completion, the assessment team met back in Bamako to debrief, address various points of confusion noted, discuss the strengths and weaknesses of differing approaches used by the facilitators and note takers, make final revisions to the guide, and standardize the approach used by all facilitators, note takers, and supervisors (group leaders). In addition, final logistics of the village visits were discussed and necessary preparations for the field trip were made.

The team then split into three groups that conducted village visits to Koulikoro and Kayes (Group 1), Sikasso (Group 2), and Segou and Mopti (Group 3). Groups 1 and 2 each included a primary facilitator and note taker plus one of the two expats who oversaw activities as they unfolded and were responsible for reviewing, clarifying, and typing up results into the guide after the visit was completed. Group 3

consisted of a two-man team—an experienced PRA facilitator and technical (agriculture) expert, and a monitoring and evaluation specialist also experienced in the agriculture sector.

The final village visit guide was organized in three phases. Phase I was conducted at the outset of the visit, with a group of 40 to 50 adult participants, more or less evenly distributed across gender with individuals ranging from 15 to 70 years of age (most between 25 to 60 years of age). During this phase, the team first used direct inquiry to collect information on and rank the top five livelihood activities in the village. The team then employed the PRA “historic matrix” tool to explore villagers’ perceptions of various environmental changes that have occurred since the time that Alpha Oumar Konare was President of Mali (1992 to 2002) compared to the time during which Amadou Toumani Touré (ATT) was President up until today (2002 to 2014). The historic matrix was used to determine participants’ perceptions of changes that have occurred over the course of the past 20 to 30 years relative to population; the area of land cultivated for crops, gardens, and occupied by orchards (fruit trees); river water levels (or number of rivers); forests/bush; desertification; rainfall; temperature; and winds. In addition, the tool inquired about changes in average distance to farmers’ fields, average size of fields, and land tenure systems. This process effectively put participants in the mindset of making comparative subjective (temporal) observations and set the stage for delving into agricultural practices employed today and in the past.

For Phase II, participants were divided by gender into two groups for separate focus-group discussions. Phase II, the most intensive part of the guide, was broken down into three distinct parts. During Phase II, Part I, focus-group participants were asked a series of questions to:

- Determine and record agricultural practices or technologies used by villagers to certain technical ends specified (such as to maintain or improve soil fertility, to retain soil humidity, or to control pests).
- Estimate the percentage of the population that has adopted each practice or technology, and determine why others have not.
- Determine the origin of the practice or technology.
- Gather and record information regarding the advantages and disadvantages of each practice or technology.
- Record any additional inconveniences or constraints to adopting the practice or technology.

The above information was collected separately pertaining to practices applied to crop production and to gardening activities. In general, groups of women first answered these questions regarding gardening, and then revisited the same questions regarding crops. Conversely, groups of men first cycled through the questions in relation to crops before revisiting them in relation to gardening. In some cases where men or women did not garden at all, the questions regarding gardening were left unanswered. All groups replied to the above questions regarding crops.

During Phase II, Part II, focus-group participants (still separated by gender) were asked to list and rank the top five crop/variety combinations that are most successful under ideal agricultural climatic conditions (defined as ideal timing of the onset of rains, ideal quantity and distribution of rains throughout the rainy/cropping season, and ideal temperatures and other climatic conditions necessary for agricultural production). They were then asked to list the five crop/variety combinations that are most successful under “bad” agricultural climatic conditions. This exercise required significant clarification regarding, in particular, the combination of crop/variety. Some groups tended to want to rank different crops 1 to 5 and then, within those rankings, list all varieties grown, while others understood the task correctly and listed and ranked only the top five crop/variety combinations (one per ranking). In the end, team members were able to resolve this inconsistency and extract viable information.

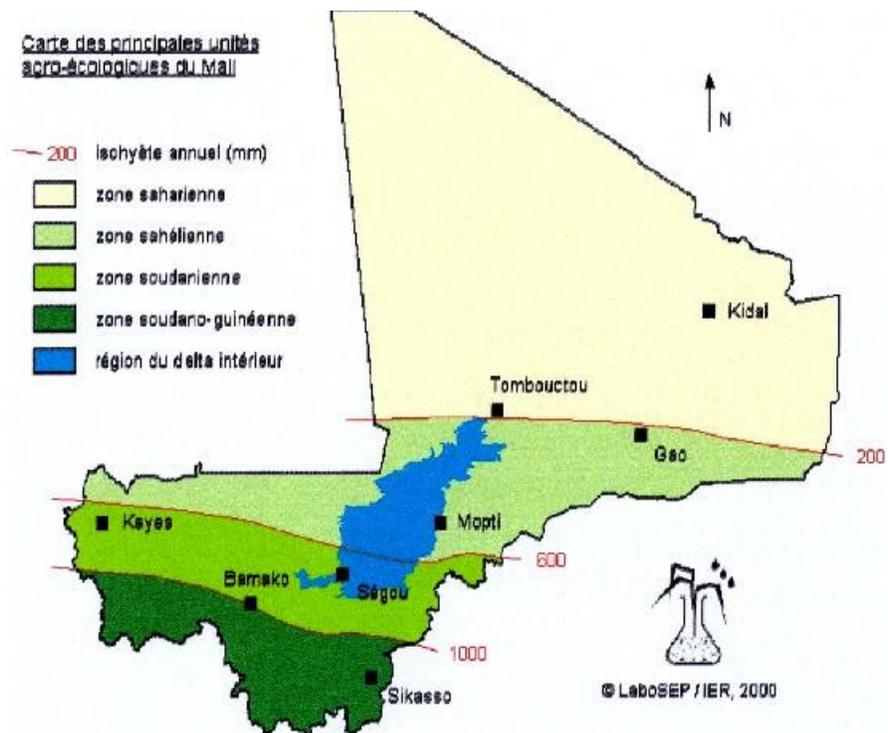
During Phase II, Part III, focus-group participants were asked to revisit the crop/variety combinations they had named, answering additional questions about each regarding whether or not the crop/variety was cultivated during the time of Alpha (i.e., If not, why is it cultivated today and/or what problem did the introduction of this new crop or variety strive to resolve? If yes, why is it still cultivated?). In addition, participants were asked to list and describe the inconveniences, challenges, or difficulties faced when producing each of the crop/variety combinations mentioned. Finally, participants were asked to list crops/varieties that were grown in the past but are no longer produced today, and to explain why they are no longer grown.

For Phase III of the village visits, the groups of men and women were brought back together first (Phase III, Part I) to participate in a Venn Diagram PRA activity whereby the group depicted and described the various agriculture- or climate-related internal and external entities that support the village and detailed the services each provides. This included internal groups and associations such as farmer associations, women’s gardening groups, and the like, as well as external entities such as national and international NGOs, government services, savings and credit service providers, and the like. Finally Phase III, Part II, explored through direct inquiry participants’ awareness and appreciation of weather services provided by Mali Météo (and other weather-service providers) serving the village.

In total, 13 villages (including the test village) were visited over the course of a seven-day period. Village visits took on average six to eight hours to implement (from approximately 10 a.m. to 4 or 6 p.m.). This included a short break for a communal lunch provided by ARCC.

Resource and timing constraints limited to 12 the number of villages in which focus groups were conducted. Security constraints excluded the regions of Tombouctou, Gao, and Kidal, such that study villages were selected from the five remaining regions. Discussions with NGOs at the time of the organizational interviews provided an initial list of possible sites for focus group discussions. This initial list was refined to develop a final list that included villages from across the five southernmost regions of

FIGURE AI-1: AGRO-ECOLOGICAL ZONES OF MALI



Source: Ellis, E.C., and Ramankutty, N. (2008). *Anthropogenic Biomes of the World, Version 1*. Palisades, NY: NASA Socioeconomic Data and Applications Center (SEDAC). Available at: <http://sedac.ciesin.columbia.edu/data/set/anthromes-anthropogenic-biomes-world-v1>. Accessed June 2014.

the country and spanned several FEWS NET Livelihood zones. Final selection took into account broad agro-ecological zones. It included three villages located in the Sahel (Sahélienne) zone, one village located in the delta interior area, four in the North Guinea (Sudano-guinéenne) zone, and five in the Sudan (Sudainienne) zone. (See Figure 1.) Criteria also included village size and the proximity of markets. Accessibility also had to be considered, given time constraints.

No attempt was made to create a representative sample through random selection of study sites. In fact, a bias was consciously introduced. Because the study was to explore the promotion and adoption of practices, recommendation by an NGO served as a criteria for selection. This intentional sampling method increased the chances of focus-group participants having adopted practices they could discuss. It also had the more practical result of facilitating access, and an introduction, to participants. In most cases, NGO staff scheduled the event, introduced the research team to the village, and attended the focus-group discussion as a silent observer.

ANNEX 2: LIST OF NGOS

INTERVIEWED

- *Association Conseil pour les Initiatives et Actions de Développement (ACIAD)*
- *Association pour le Développement des Activités de production et de Formation (ADAF GALLE)*
- *Action pour le Développement et contre la Pauvreté au Sahel (ADCOPS)*
- *Association pour la Défense de l'Environnement et des Droits des Consommateurs (ADESCOM)*
- *Association des Femmes d'Afrique et de la Diaspora (AFAD)*
- AMADE PELCODE
- *Association Malienne pour la Promotion de l'Education, l'Environnement et la Santé (AMAPEES)*
- *Association Malienne pour la Promotion du Sahel (AMAPROS)*
- *Association Malienne pour la Conservation de la Faune et de l'Environnement (AMCFE)*
- *Alliance au Mali pour l'Environnement (AMEN)*
- *Association des organisations professionnelles paysannes (AOPP)*
- *Association pour la Promotion de la Femme et de l'Enfant au Mali (APROFEM)*
- *Association for the Safeguard of the Environment and the Development of the Sahel (ASEDS)*
- *Association de Soutien aux Initiatives Communautaires (ASIC)*
- *Association pour l'Aide aux Femmes en Détresse et aux Enfants de la Rue (ASSAFEDE)*
- *Carrefour Développement (CARD)*
- Care Mali
- *Centre d'Expertise Recherche Action pour le Développement (CERAD)*
- *Centre Technique pour l'Environnement, la Santé et l'Agriculture (CTESA)*
- *Groupe Action pour l'Enfance au Sahel (GAE Sahel)*
- *Groupe de Coordination des Zones Arides (GCOZA)*
- GRAPES for Humanity
- *Groupe de Recherches et d'Application des Techniques (GRAT)*
- *Groupe Interdisciplinaire d'Assistance pour le Développement des Communauté (GRIDAC)*
- *Harmonie du Développement au Sahel (HDS)*
- Mali Folk Center
- *Organization for an Integrated Development in the Sahel Region (ODI Sahel)*
- *Pôle des Actions d'Intégration des Droits Humains en Afrique (PACINDHA)*
- Sahel Eco
- STOP-Sahel

ANNEX 3: LIST OF STUDY VILLAGES

- Djinina (pilot)
- Sabe-Fatoma
- Bounguel
- Soungalabougou
- Fani
- M'pella
- Diadjirila
- Sebekoro
- Sangarebougou
- Mpedegou
- Donsela
- Bambala
- Selingue

ANNEX 4: GUIDE FOR NGO INTERVIEWS

BACKGROUND

As part of the West African Vulnerability Assessment activity funded by USAID, the African and Latin American Resilience to Climate Change (ARCC) project was asked to conduct an assessment of field-level practices, methods, and technologies currently being extended in the Sahel, to evaluate their utility to adapt to projected climate change¹¹. ARCC developed an approach to conduct this assessment which consists of the following elements: 1) a review of research on technologies being promoted in the Sahel; 2) technical assessments of technologies designed to manage moisture and improve soil; 3) community focus groups to identify farmer adjustments to climate and practices that have been adapted; and 4) implementation of the present survey designed to identify practices being extended in country to improve farmer adaptation to climate change. Results from the survey will be entered into a database designed to produce adaptation profiles of the various practices. To the extent possible, these profiles will provide the information necessary to assess the performance of various practices under future climate regimes. This will require both a technical description of the practice, as well as the location in which it is being extended, and a description of the context in which it is adopted. In addition to piloting this element of ARCC's assessment approach, the survey of organizations is intended to produce information useful to USAID/Mali regarding the types of practices currently being extended by development partners in Mali.

OBJECTIVE OF THE SURVEY

To identify and describe in as much detail as possible the technologies being promoted in Mali to assist farmers in adaptation to and/or mitigation of climate change.

CORE QUESTIONS TO BE EXPLORED

- What adaptive/mitigation practices are being extended in Mali?
 - What are the technical specifications of the practices being extended?
 - In what climate zone (region and/or circle) is each practice being extended?
 - Under what soil and water conditions is the practice intended to be used?
 - What approach is being used to extend the practice?
- What practices are different donors and implementing partners extending?
- What has been the level of Malian receptivity to these various practices and why?

¹¹ This questionnaire is based on a template prepared by Brent M. Simpson, Michigan State University, Department of Agricultural, Food, and Resource Economics.

GENERAL INSTRUCTIONS

The following survey is designed to collect information from local and international organizations working in Mali regarding their activities related to climate change adaptation and/or mitigation. In order to collect adequate range and depth of information solicited, interviewees should include the executive director (or equivalent thereof) of the organization, senior technical personnel best placed to provide information regarding the organization's activities and objectives regarding climate change adaptation and mitigation, and the organization's chief financial officer to ensure accurate technical and budgetary information is provided.

Each organization targeted will be visited by a team of two interviewers, one of which will lead the interview with the organizational representatives while the other records either directly onto their laptop or in hand writing onto the survey tool itself, responses to questions and topics discussed (notes taken by hand will be computerized each evening, after the last interview of the day). Information gathered will remain confidential among survey team members and will be summarized and presented in a final report that will be submitted to USAID in March 2014 that will present the range of activities which local and international organizations in Mali are promoting or supporting regarding climate change adaptation or mitigation and the networks and resources they have been able to tap in order to assist them in implementing related work.

EXPECTED DURATION OF THE INTERVIEW

The survey/interview is expected to take anywhere from 60 to 90 minutes to complete, depending on the extent of the organization's activities related to climate change.

The following survey is divided into three sections: Organizational Information, Operational Profiles, and Budgetary Information. In the first section, Organizational Information, basic contact information is requested for the organization's national headquarters and, if the organization is international, its international home office. Details are also requested on the organization's major donors, its membership or participation in Agriculture/Natural Resource Management Networks or Associations, and personnel. The second section, Operational Profile, requests detailed information on areas of agriculture and natural resource management climate change adaptation activities, specific target groups, operational methodologies, partner organizations, and types of field interventions at the level of administrative units (Malian regions, circles, and communes). For organizations operating in more than one region, a separate Operational Profile must be completed for each of the regions in which the organization works.

Interviewer Name: _____ **Date:** _____ (dd/mm/yyyy)

Interviewer Name: _____ **Date:** _____ (dd/mm/yyyy)

SECTION I: ORGANIZATIONAL INFORMATION

1. What is the name of Organization? _____

1a. Abbreviation? _____

[NOTE: Organization Abbreviation + Country Code = SurveyID. Please write the SurveyID on each page]

2. What is the nature/status of the organization? (ex. registered NGO, CBO, research institution, etc.)

3. List the names and positions of the people being interviewed and their contact numbers.

4. Is the organization international?

No. Go directly to Question 5.

Yes. International home-office contact information:

| | |
|--------------------|--|
| 4a. Postal Address | |
| 4b. City | |
| 4c. Country | |
| 4d. Phone | |
| 4e. Fax | |
| 4f. Email Address | |
| 4g. Web Address | |

5. Local headquarter contact information:

| | |
|--------------------------------|--|
| 5a. Postal Address | |
| 5b. City | |
| 5c. Executive Secretary (name) | |
| 5d. Phone | |
| 5e. FAX | |
| 5f. Email Address | |
| 5g. Web Address | |

6. List regions, circles, and communes in which the organization works. (Interviewers use supplementary checklist for this question.)

7. List locations (Malian regions/towns) where any sub-offices are located.

8. Who are the organization's major donors? Provide details on all donor-funded projects implemented within the past five years, related to climate change adaptation and/or mitigation (project title, funding level, dates, goals, objectives, results).

8a. Donor1 Name: _____

Description of CC related projects supported:

8b. Donor2 Name: _____

Description of CC related projects supported:

8c. Donor3 Name: _____

Description of CC related projects supported:

8d. Donor4 Name: _____

Description of CC related projects supported:

8e. Donor5 Name: _____

Description of CC related projects supported:

8f. Donor6 Name: _____

Description of CC related projects supported:

9. What climate-change-relevant networks/associations does the organization belong to or participate in?

9a. Network/Association1 Name: _____

9b. Network/Association2 Name: _____

9c. Network/Association3 Name: _____

10. How many technical/administrative staff does the organization employ? _____

11. Are staff assigned separately to adaptation and mitigation activities? _____

11a. If yes, what number of personnel are active in adaptation activities? _____

11b. If yes, what number of personnel are active in mitigation activities? _____

12. In what year did the organization begin activities in Mali? _____ (dd/mm/yyyy)

SECTION II. OPERATIONAL PROFILE

Note: For organizations that work in more than one region, a separate Operational Profile (Section II) must be completed for each region. The Survey ID number and correct Regional Code (below) must be entered in the space provided at the top of each page for each profile completed.

| Regions | Admin Unit Code | Regions | Admin Unit Code |
|-----------|-----------------|------------|-----------------|
| Gao | MA01 | Mopti | MA05 |
| Kayes | MA02 | Segou | MA06 |
| Kidal | MA03 | Sikasso | MA07 |
| Koulikoro | MA04 | Tombouctou | MA08 |

| Climate Change Adaptation and/or Mitigation: | |
|--|--|
| <p>1. Does the organization implement climate change adaptation activities with any of the following specific target groups?</p> <p><input type="checkbox"/> AIDS Affected Households (HH)</p> <p><input type="checkbox"/> Disabled/Blind</p> <p><input type="checkbox"/> Elderly</p> <p><input type="checkbox"/> Fisher Folks</p> <p><input type="checkbox"/> Pastoralists</p> <p><input type="checkbox"/> Refugees/Displaced HH</p> <p><input type="checkbox"/> Women/Female Headed HH</p> <p><input type="checkbox"/> Rural Poor Farmers</p> <p><input type="checkbox"/> Other (specify) _____</p> | <p>2. Does the organization incorporate climate change adaptation activities into any of the following operational methodologies it employs?</p> <p><input type="checkbox"/> Community-Based Natural Resource Management</p> <p style="padding-left: 20px;"><input type="checkbox"/> Pasturelands</p> <p style="padding-left: 20px;"><input type="checkbox"/> Forest</p> <p style="padding-left: 20px;"><input type="checkbox"/> Land</p> <p style="padding-left: 20px;"><input type="checkbox"/> Water Resources</p> <p><input type="checkbox"/> Community-Based Seed Systems</p> <p><input type="checkbox"/> Farmer Field Schools/Lead Farmers</p> <p><input type="checkbox"/> Demonstration plots</p> <p><input type="checkbox"/> Food For Work</p> <p><input type="checkbox"/> Indigenous Knowledge Systems</p> <p><input type="checkbox"/> Livelihood Framework Approach</p> <p><input type="checkbox"/> Participatory Varietal Selection</p> <p><input type="checkbox"/> Vulnerability Assessment</p> <p><input type="checkbox"/> Other (specify) _____</p> |

3. Please list any important adaptation-related operational partner organizations (other than donors). Write the organization name and indicate the type of organization.

Definitions: **IO** = international organization (e.g. Africa Rice, FAO, ICRISAT, IRD, UNDP, etc.), **GO** = governmental organization (domestic), **NGO** = non-governmental organization, **MA** = member associations (e.g. Coops, Producer Association, Village Associations, and so on).

| 4. Which type(s) of adaptation activity/activities does the organization promote/support related to? | 5. Involving which crops and/or adaptation sub-activities? |
|--|--|
| <p><input type="checkbox"/> Drought-Tolerant Crops/Varieties</p> <p>List and provide details on various related activities being conducted, and include expected outcomes of each activity. Include specifics on crops/varieties promoted and provide details on what groups are targeted and approaches are employed.</p> | <p><input type="checkbox"/> Cereals, <input type="checkbox"/> Legumes, <input type="checkbox"/> Vegetables, <input type="checkbox"/> Roots/Tubers, <input type="checkbox"/> Fruits, <input type="checkbox"/> Cotton, <input type="checkbox"/> Other (specify) _____</p> |
| <p><input type="checkbox"/> Heat-Tolerant Crops/Varieties</p> <p>List and provide details on various related activities being conducted, and include expected outcomes of each activity.</p> <p>Include specifics on crops/varieties promoted and provide details on what groups are targeted and approaches are employed.</p> | <p><input type="checkbox"/> Cereals, <input type="checkbox"/> Legumes, <input type="checkbox"/> Vegetables, <input type="checkbox"/> Roots/Tubers, <input type="checkbox"/> Fruits, <input type="checkbox"/> Cotton, <input type="checkbox"/> Other (specify) _____</p> |
| <p><input type="checkbox"/> Disease-Tolerant Crops/Varieties</p> <p>List and provide details on various related activities being conducted, and include expected outcomes of each activity.</p> <p>Include specifics on crops/varieties promoted and provide details on what groups are targeted and approaches are employed.</p> | <p><input type="checkbox"/> Cereals, <input type="checkbox"/> Legumes, <input type="checkbox"/> Vegetables, <input type="checkbox"/> Roots/Tubers, <input type="checkbox"/> Fruits, <input type="checkbox"/> Cotton, <input type="checkbox"/> Other (specify) _____</p> |
| <p><input type="checkbox"/> Short-Cycle Crops/Varieties</p> <p>List and provide details on various related activities being conducted, and include expected outcomes of each activity.</p> <p>Include specifics on crops/varieties promoted and provide details on what groups are targeted and approaches are employed.</p> | <p><input type="checkbox"/> Cereals, <input type="checkbox"/> Legumes, <input type="checkbox"/> Vegetables, <input type="checkbox"/> Roots/Tubers, <input type="checkbox"/> Fruits, <input type="checkbox"/> Cotton, <input type="checkbox"/> Other (specify) _____</p> |
| <p><input type="checkbox"/> Irrigation Systems</p> <p>List and provide details on various related activities being conducted, and include expected outcomes of each activity.</p> | <p><input type="checkbox"/> Bas-Fond Development, <input type="checkbox"/> Check Dam, <input type="checkbox"/> Floodplain Development, <input type="checkbox"/> Goute-a-Goute, <input type="checkbox"/> Gravity System, <input type="checkbox"/> Pump Systems <input type="checkbox"/> Other (specify) _____</p> |
| <p><input type="checkbox"/> Moisture Capture</p> <p>List and provide details on various related activities being conducted, and include expected outcomes of each activity.</p> | <p>Technology Type: <input type="checkbox"/> ANC, <input type="checkbox"/> Contour Plowing/Ridges, <input type="checkbox"/> Rock Lines, <input type="checkbox"/> Terraces, <input type="checkbox"/> Vegetative Barrier/Living Fences, <input type="checkbox"/> Micro-Catchments, <input type="checkbox"/> Vellerani/Nardi System, <input type="checkbox"/> Zai Holes, <input type="checkbox"/> Other (specify) _____</p> |

| | |
|---|--|
| <p><input type="checkbox"/> Soil Fertility Management</p> <p>List and provide details on various related activities being conducted, and include expected outcomes of each activity.</p> | <p>Technology Type: <input type="checkbox"/> Compost/Manure, <input type="checkbox"/> Crop Residue Management, <input type="checkbox"/> Conservation Agriculture, <input type="checkbox"/> Mulching,</p> <p><input type="checkbox"/> Integrated Soil Fertility Management, <input type="checkbox"/> SRI, <input type="checkbox"/> Other (specify)_____</p> |
| <p><input type="checkbox"/> Agroforestry (with what species and for what reasons)</p> <p>List and provide details on various related activities being conducted, and include expected outcomes of each activity.</p> <p>Include specifics on species promoted and provide details on what groups are targeted and approaches are employed.</p> | <p>Technology Type: <input type="checkbox"/> Alley-Cropping, <input type="checkbox"/> Intercropping,</p> <p><input type="checkbox"/> Use of Nitrogen-Fixing Trees, <input type="checkbox"/> Fire-Breaks <input type="checkbox"/> Wind Breaks <input type="checkbox"/> Cover Cropping <input type="checkbox"/> Live Fencing <input type="checkbox"/> Other (specify)_____</p> |
| <p><input type="checkbox"/> Seed Research/Multiplication/Dissemination</p> <p>List and provide details on various related activities being conducted, and include expected outcomes of each activity.</p> <p>Include specifics on crops/varieties promoted and provide details on what groups are targeted and approaches are employed.</p> | <p><input type="checkbox"/> Cereals, <input type="checkbox"/> Vegetables, <input type="checkbox"/> Roots /Tubers, <input type="checkbox"/> Fruits,</p> <p><input type="checkbox"/> Cotton, <input type="checkbox"/> Peanuts, <input type="checkbox"/> Sesame, <input type="checkbox"/> Other (specify) _____</p> |
| <p><input type="checkbox"/> Plantation Crops</p> <p>List and provide details on various related activities being conducted, and include expected outcomes of each activity.</p> <p>Include specifics on what orchard/plantation varieties are promoted and provide details on what groups are targeted and approaches are employed.</p> | <p><input type="checkbox"/> Cashew, <input type="checkbox"/> Citrus, <input type="checkbox"/> Gum Arabic, <input type="checkbox"/> Mango, <input type="checkbox"/> Oil Palm, <input type="checkbox"/> Other (specify) _____</p> |
| <p><input type="checkbox"/> Woodlot Establishment / Reforestation</p> <p>List and provide details on various related activities being conducted, and include expected outcomes of each activity.</p> <p>Include specifics on species are promoted and provide details on what groups are targeted and approaches are employed.</p> | <p><input type="checkbox"/> Acacia spp, <input type="checkbox"/> Eucalyptus, <input type="checkbox"/> Mahogany, <input type="checkbox"/> Neem,</p> <p><input type="checkbox"/> Other (specify) _____</p> |
| <p><input type="checkbox"/> Carbon Offsets/Payments</p> <p>List and provide details on various related activities being conducted, and include expected outcomes of each activity.</p> | <p><input type="checkbox"/> REDD, <input type="checkbox"/> REDD+, <input type="checkbox"/> CDM, <input type="checkbox"/> Voluntary Market,</p> <p><input type="checkbox"/> Other (specify) _____</p> |

| | |
|--|--|
| <p><input type="checkbox"/> Orchard/Forestry Seedling Production/ Dissemination</p> <p>List and provide details on various related activities being conducted, and include expected outcomes of each activity.</p> <p>Include specifics on what species are promoted and provide details on what groups are targeted and approaches are employed.</p> | <p><input type="checkbox"/> Acacia, <input type="checkbox"/> Citrus, <input type="checkbox"/> Karité, <input type="checkbox"/> Néré, <input type="checkbox"/> Mango, <input type="checkbox"/> Oil Palm, <input type="checkbox"/> Other (specify) _____</p> |
| <p><input type="checkbox"/> Alternative Energy</p> <p>List and provide details on various related activities being conducted, and include expected outcomes of each activity.</p> | <p><input type="checkbox"/> Biofuels, <input type="checkbox"/> Fuel Efficient Stoves, <input type="checkbox"/> Methane Capute/Use, <input type="checkbox"/> Mini-Hydro, <input type="checkbox"/> Solar, <input type="checkbox"/> Wind Power, <input type="checkbox"/> Other (specify) _____</p> |
| <p><input type="checkbox"/> Livestock Management</p> <p>List and provide details on various related activities being conducted, and include expected outcomes of each activity.</p> | <p><input type="checkbox"/> Beef cattle, <input type="checkbox"/> Dairy Cattle, <input type="checkbox"/> Sheep, <input type="checkbox"/> Goat, <input type="checkbox"/> Chicken/Ducks, <input type="checkbox"/> Animal Traction (Horses/Donkeys), <input type="checkbox"/> Supplementary Feed <input type="checkbox"/> Pass on the Gift <input type="checkbox"/> Livestock Fattening <input type="checkbox"/> Veterinary Services <input type="checkbox"/> Other (specify) _____</p> |
| <p><input type="checkbox"/> Fisheries Management</p> <p>List and provide details on various related activities being conducted, and include expected outcomes of each activity.</p> <p>Provide details on species promoted.</p> | <p><input type="checkbox"/> Aquaculture (Fish Ponds), <input type="checkbox"/> Fresh Water (River) Fishing, <input type="checkbox"/> Fishers Association Development, <input type="checkbox"/> River Resource Management, <input type="checkbox"/> Other (specify) _____</p> |
| <p><input type="checkbox"/> Water Resources Management</p> <p>List and provide details on various related activities being conducted, and include expected outcomes of each activity.</p> | <p><input type="checkbox"/> Water User Rights Development/Management <input type="checkbox"/> Fresh Water (River) Fishing, <input type="checkbox"/> Fishers Association Development, <input type="checkbox"/> River Resource Management, <input type="checkbox"/> Other (specify) _____</p> |
| <p><input type="checkbox"/> Land Resources Management</p> <p>List and provide details on various related activities being conducted, and include expected outcomes of each activity.</p> | <p><input type="checkbox"/> Cadaster Development, <input type="checkbox"/> Development/Management of Transhumance Passageways <input type="checkbox"/> Advocacy, <input type="checkbox"/> Legal <input type="checkbox"/> Water Point Tenure, <input type="checkbox"/> Herder Organization Development, <input type="checkbox"/> Mediation Services, <input type="checkbox"/> Studies, <input type="checkbox"/> Other (specify) _____</p> |
| <p><input type="checkbox"/> Other Adaptive Practices</p> <p>List and provide details on various related activities being conducted, and include expected outcomes of each activity.</p> | <p>Type: <input type="checkbox"/> Flood Control/Protection, <input type="checkbox"/> Sand Dune Stabilization, <input type="checkbox"/> Dyke Stabilization, <input type="checkbox"/> Canal Construction <input type="checkbox"/> Use Of Vetiver/Elephant Grass, <input type="checkbox"/> Other (Specify) _____</p> |
| <p><input type="checkbox"/> Posts Harvest Handling and Storage</p> <p>List and provide details on various related activities being conducted, and include expected outcomes of each activity.</p> | |

6. What other specific adaptation or mitigation-related interventions does the organization carry out?

- Infrastructure Construction, Input /Equipment supply, Credit Provision,
 Technical/Enterprise Mgt Training, Extension/ Technical services, MRV Services, Local Organization/Coop Development, Research/Development, Advocacy, Legal Representation, Mediation Services, Studies, Climate/weather information collection/analysis Other (specify): _____

List and provide details on various related activities being conducted, and include expected outcomes of each activity.

7. Please provide a general description of the principal field-level practices promoted by the organization, and how those practices figure into their approach to addressing climate change.

8. Please indicate which of the above practices mentioned have experienced the greatest uptake, and which Malians are not interested in adopting and why.

SECTION III: BUDGETARY INFORMATION

1. What is the organization's approximate total annual budget in US\$ in FY2013? (Check one)

- 0-\$100,000
 \$100,001 to 500,000
 \$500,001 to 1,000,000
 \$1,000,001 to 5,000,000
 more than \$5,000,000

2. What portion of the organization's 2013 annual budget was used for climate change (adaptation and/or mitigations related activities?) _____ %.

3. Is the annual budget separated for climate change adaptation and mitigation activities?

3a. If yes, what portion of annual budget for climate change adaptation activities?
_____ %.

3b. If yes, what portion of annual budget for climate change mitigation activities?
_____ %.

ADDITIONAL INFORMATION/COMMENTS:

INTERVIEWER: Please provide in the space provided below general observations/comments/additional findings regarding this organization.

ANNEX 5: GUIDE FOR INTERVIEWING DONORS

ARCC MALI ORGANIZATIONAL INTERVIEWS

Parameters:

Interviews should be scheduled using the provided list of major bilateral and multilateral donors, several days in advance of the interview.

Team members can split up to work independently or go in pairs to conduct these interviews. The independent interviewer is also responsible for taking notes during the interview.

Ideally the donor will make available their most senior technical person in charge of climate change adaptation/mitigation activities, as well as a senior member of the admin and finance unit that can speak to budgetary matters (allocated to climate change activities).

The interviews should take no more than 45 minutes to conduct.

After each interview, the interviewer(s) must type up their notes from the interview, in keeping with the numbered questions asked.

At the beginning of each interview, the interviewer will present him/herself, explain the objective of the interview and the fact that USAID is commissioning this study in order to determine agricultural practices currently being promoted in Mali to prepare for and/or adapt to climate change and its effects on the agricultural sector.

Questions To Be Posed:

Ask the donor representative to list their projects in Mali related to climate change adaptation (project name, overall goal, implementation zone-region only, funding level, and duration). They should NOT go into details on activities per project.

| Project Name | Overall Goal | Implementation Zone (Regions) | Funding Level | Duration |
|--------------|--------------|-------------------------------|---------------|----------|
| | | | | |
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| | | | | |
| | | | | |

Describe all adaptation practices/technologies they are actively promoting and indicate where they are implementing them.

Provide their impressions regarding Malian receptivity to each practice/technology.

Provide reasons/speculate why Malians adopt (or resist) each practice/technology.

| Adaptation Practice/Technology Promoted | Where Implemented (Regions) | Malian Receptivity (High, Med, Low) | Why Are Malians Receptive or Not? | Other Important Details |
|---|-----------------------------|-------------------------------------|-----------------------------------|-------------------------|
| | | | | |
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Ask them to provide a list of local entities they are working through (to triangulate what we are hearing from implementing organizations).

ANNEX 6: FOCUS GROUP

DISCUSSION GUIDE

Guide relatif aux entretiens de groupes dans les villages

Objectifs

- Identifier les technologies d'agriculture qui sont perçues comme étant les plus efficaces et profitables
- Déterminer la réceptivité aux différentes mesures d'adaptation au / d'atténuation du changement climatique promues

Méthodologie et Organisation

Des échanges en groupes représentatifs des populations de douze (12) communautés se pencheront sur les stratégies et les pratiques agricoles utilisés face à la réalité de la variabilité du climat. L'origine de ces mesures adaptatives ainsi que les contraintes à l'adoption de stratégies efficaces seront également analysées.

Organisation

1. Chaque groupe sera composé d'entre trente et quarante femmes et hommes activement engagés dans des activités agricoles. La sélection des participants (jeunes, adultes et vieux des différents quartiers, clans, castes et groupes religieux) sera négociée avec les leaders villageois, qui seront informés des objectifs de la visite avant l'arrivée de l'équipe.
2. La séance de travail dans chaque village commencera en plénier dans le grand groupe, qui se divisera en deux groupes (femmes et hommes) pour une partie de la séance.
3. Les échanges seront animés par une équipe de deux personnes, une qui dirigera les échanges et l'autre qui prendra des notes en plénier. Pour le travail avec les deux groupes chaque chercheur posera les questions et prendra notes au même temps.
4. Avant de se lancer dans les échanges, l'équipe se présentera et expliquera le contexte et l'objectif de la rencontre et le programme prévu
5. Certaines questions liées au contexte peuvent être posées directement aux leaders villageois.
6. Le changement climatique ne sera pas mentionné avant ou pendant l'activité. Bien que certaines questions porteront sur la météo et le climat, la discussion sera plutôt axée sur les « changements agricoles » et les « changements économiques » afin d'éviter d'influencer les réponses.
7. Les participants déjeuneront avec l'équipe. Le repas sera financé par Tetra Tech et préparé dans le village.
8. A la fin de la séance l'équipe complète ses notes, qui seront enregistrées dans l'ordinateur dans un formulaire pré-développé pendant la soirée du même jour.

NB : En cas des événements sociaux dans le village concerné, tels que décès, mariage, ou autres qui empêchent à l'activité de se dérouler normalement, l'équipe doit s'adapter et utiliser le temps pour trouver les informations requises dans le guide dans la mesure possible.

I. INFORMATIONS GENERALES (à noter avant le commencement de la séance en plénier)

1. Date:
2. Village:
3. Population approximative:
4. Nombre de ménages:
5. Description des participants: (nombre total d'hommes / de femmes et une impression sur la répartition des couches d'âges)
6. Animateur de la séance : Cissouma / Djeneba
7. Preneur de notes de la séance : Cissouma / Djeneba

II. ENTRETEIN EN PLENIER

Introduction

1. Présentations de l'équipe et des participants;
2. Explication de l'objectif de la visite;
3. Partage des grandes lignes du programme de la journée.

Questions générales concernant les modes générales de subsistance dans la communauté

1. **Quels sont le moyen d'existence le plus important** dans le village ? Pourquoi ? Quel est le suivant, ainsi de suite jusqu'à trouver les 5 activités les plus importants (*par exemple : Agriculture ; Pastoralisme ; Élevage du bétail ; Jardinage ; Vergers ; Produits forestiers ; Pêche ; Migration saisonnière ; Migration à long terme ; Travail rémunéré (main-d'œuvre qualifiée) ; Envois de fonds ; Produits artisanaux ; Autres - préciser*) :

| Moyen d'existence le plus important dans le village | |
|--|---------------------------------|
| Activités par ordre d'importance | Raisons de ce classement |
| 1. | |
| 2. | |
| 3. | |
| 4. | |
| 5. | |

2. **Principales activités agricoles** (seulement) au cours des 3 dernières années (évaluez la superficie totale cultivée dans la communauté dans son ensemble, pour l'ensemble des **cultures**, des **jardins**, et des **arbres fruitiers**)
 1. _____ (% approximatif des superficies cultivées : %)
 2. _____ (% approximatif des superficies cultivées : %)
 3. _____ (% approximatif des superficies cultivées : %)

3. Matrice Historique

Cet outil de la MARP sera utilisé pour identifier les tendances et les changements importants des derniers vingt ans. Le chercheur explique l'outil et pose les questions sur les 06 sujets, et les haricots sont placés par les participants pour noter les tendances d'agrandissement ou de diminution des différents éléments mentionnés dans les échanges. Le chercheur posera les questions d'approfondissement pour mieux comprendre les raisons de certaines tendances identifiées et les stratégies adoptées face à certains changements. Les détails des échanges sont notés par le rapporteur.

| Sujets | | Présidence d'Alpha | Présidence d'ATT à nos jours |
|--------|---|----------------------------------|----------------------------------|
| 1. | La population (taille en termes de tendance) | | |
| 2. | L'environnement physique du village | Remplissez en bas par sous-sujet | Remplissez en bas par sous-sujet |
| | Champs (superficie) | | |
| | Jardins (superficie) | | |
| | Vergers (superficie) | | |
| | Rivières (plus ou moins d'eau ?) | | |
| | Forets (plus ou moins en termes de densité et superficie ?) | | |
| | Désert (l'intensité de désertification) | | |
| 3. | Le climat | Remplissez en bas par sous-sujet | Remplissez en bas par sous-sujet |
| | Pluviométrie (plus ou moins ?) | | |
| | Température (plus ou moins chaud ?) | | |
| | Vents (intensité plus ou moins ; poussier plus ou moins ?) | | |
| 4. | Superficie cultivée (changement dans la <i>taille moyenne</i> des champs des gens) | | |
| 5. | Distance des maisons aux champs (plus ou moins distant ?) | | |
| 6. | La propriété sur les terres (Questions de foncier) (quantité de terre matriculer au gens – titre provisoire, permit, etc) | | |

III. TRAVAUX DE GROUPE HOMMES ET FEMMES

Après la construction de la matrice le groupe de participants est scindé en deux groupes (hommes et femmes) et chaque chercheur s'occupera d'un groupe en faisant la passation du guide d'entretien ci-dessous, sans faire appel aux outils de la MARP :

I. Changement dans la production agricole - CHAMPS:

(Facilitateur) Voici quelques questions pour éliciter la réaction cherchée de participants :

Est-ce qu'il y avait des changements pendant le temps d'Alpha, dans les différentes étapes de production agricole ?

Y a-t-il des différences dans la préparation des terres ? Les cultures sont-elles plantées dans les mêmes champs ou dans différents types de champs ?

Comment vous désherbez et protéger les cultures ?

Y a-t-il eu (d'autres) changements dans la manière dont vous gérez les faibles précipitations, les périodes de sécheresse pendant la saison des pluies, les inondations, l'imprévisibilité des précipitations, la chaleur ou les vents forts ?

Y a-t-il eu (d'autres) des changements dans la façon dont vous traitez le sol pour maintenir or augmenter la fertilité, contrôlez l'humidité et gérez les ravageurs ? Plantez-vous ou laissez-vous des arbres dans le champ ? Quels engrais utilisez-vous ?

Ce changement a-t-il été adopté par tous dans le village ? Quel pourcentage de la population concernée a adopté le changement? Pourquoi certaines personnes l'ont-elles adopté et d'autres pas ? Ce changement a-t-il un avantage ?

Pour les personnes qui ont adopté ce changement, quels sont les défis et les points faibles ?

D'où est venue l'idée de faire ce changement à l'origine ? Par qui les villageois ont-ils été aidés à faire ce changement, à adopter cette pratique - ont-ils reçu des informations, des outils ou d'autres ressources pour faire les choses différemment ?

| Description du changement par étape (détails techniques supplémentaires sur les changements liés aux précipitations, aux températures, aux inondations et à la sécheresse) | Mesure dans laquelle le changement a été adopté (% de la population concernée qui a adopté ce changement) | Pourquoi certaines personnes l'ont-elles adopté et d'autres pas? | Origine du changement (D'où est venue cette technique?) | Avantages ? | Inconvénients ? Déficits ? Points faibles ? |
|---|--|---|--|--------------------|--|
| | | | | | |
| Techniques pour gérer les ravageurs | | | | | |
| | | | | | |
| | | | | | |
| Description du changement par étape (détails techniques supplémentaires sur les changements liés aux précipitations, aux températures, aux inondations et à la sécheresse) | Mesure dans laquelle le changement a été adopté (% de la population concernée qui a adopté ce changement) | Pourquoi certaines personnes l'ont-elles adopté et d'autres pas? | Origine du changement (D'où est venue cette technique?) | Avantages ? | Inconvénients ? Déficits ? Points faibles ? |
| | | | | | |
| | | | | | |
| Techniques pour désherber | | | | | |
| | | | | | |
| | | | | | |
| Description du changement par étape (détails techniques supplémentaires sur les changements liés aux précipitations, aux températures, aux inondations et à la sécheresse) | Mesure dans laquelle le changement a été adopté (% de la population concernée qui a adopté ce changement) | Pourquoi certaines personnes l'ont-elles adopté et d'autres pas? | Origine du changement (D'où est venue cette technique?) | Avantages ? | Inconvénients ? Déficits ? Points faibles ? |
| | | | | | |
| | | | | | |
| Technique de Récolte et stockage | | | | | |

| Description du changement par étape (détails techniques supplémentaires sur les changements liés aux précipitations, aux températures, aux inondations et à la sécheresse) | Mesure dans laquelle le changement a été adopté (% de la population concernée qui a adopté ce changement) | Pourquoi certaines personnes l'ont-elles adopté et d'autres pas? | Origine du changement (D'où est venue cette technique?) | Avantages ? | Inconvénients ? Déficits ? Points faibles ? |
|---|--|---|--|--------------------|--|
| D'autre Technique | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |

| Changement dans la production agricole – CHAMPS - FEMMES | | | | | |
|---|--|---|--|--------------------|--|
| Description du changement par étape (détails techniques supplémentaires sur les changements liés aux précipitations, aux températures, aux inondations et à la sécheresse) | Mesure dans laquelle le changement a été adopté (% de la population concernée qui a adopté ce changement) | Pourquoi certaines personnes l'ont-elles adopté et d'autres pas? | Origine du changement (D'où est venue cette technique?) | Avantages ? | Inconvénients ? Déficits ? Points faibles ? |
| Techniques pour préparer les terres | | | | | |
| | | | | | |
| Description du changement par étape (détails techniques supplémentaires sur les changements liés aux précipitations, aux températures, aux inondations et à la sécheresse) | Mesure dans laquelle le changement a été adopté (% de la population concernée qui a adopté ce changement) | Pourquoi certaines personnes l'ont-elles adopté et d'autres pas? | Origine du changement (D'où est venue cette technique?) | Avantages ? | Inconvénients ? Déficits ? Points faibles ? |

| | | | | | |
|---|--|---|--|--------------------|--|
| | | | | | |
| Techniques pour améliorer la fertilité du sol | | | | | |
| | | | | | |
| Description du changement par étape (détails techniques supplémentaires sur les changements liés aux précipitations, aux températures, aux inondations et à la sécheresse) | Mesure dans laquelle le changement a été adopté (% de la population concernée qui a adopté ce changement) | Pourquoi certaines personnes l'ont-elles adopté et d'autres pas? | Origine du changement (D'où est venue cette technique?) | Avantages ? | Inconvénients ? Déficits ? Points faibles ? |
| | | | | | |
| Techniques pour contrôler l'humidité dans le sol | | | | | |
| | | | | | |
| Description du changement par étape (détails techniques supplémentaires sur les changements liés aux précipitations, aux températures, aux inondations et à la sécheresse) | Mesure dans laquelle le changement a été adopté (% de la population concernée qui a adopté ce changement) | Pourquoi certaines personnes l'ont-elles adopté et d'autres pas? | Origine du changement (D'où est venue cette technique?) | Avantages ? | Inconvénients ? Déficits ? Points faibles ? |
| | | | | | |
| Techniques pour gérer les ravageurs | | | | | |
| | | | | | |
| Description du changement par étape (détails techniques supplémentaires sur les changements liés aux précipitations, aux températures, aux inondations et à la sécheresse) | Mesure dans laquelle le changement a été adopté (% de la population concernée qui a adopté ce | Pourquoi certaines personnes l'ont-elles adopté et d'autres pas? | Origine du changement (D'où est venue cette technique?) | Avantages ? | Inconvénients ? Déficits ? Points faibles ? |

| | | | | | |
|---|--|---|--|--------------------|--|
| | changement) | | | | |
| | | | | | |
| Techniques pour désherber | | | | | |
| | | | | | |
| | | | | | |
| Description du changement par étape (détails techniques supplémentaires sur les changements liés aux précipitations, aux températures, aux inondations et à la sécheresse) | Mesure dans laquelle le changement a été adopté (% de la population concernée qui a adopté ce changement) | Pourquoi certaines personnes l'ont-elles adopté et d'autres pas? | Origine du changement (D'où est venue cette technique?) | Avantages ? | Inconvénients ? Déficits ? Points faibles ? |
| | | | | | |
| | | | | | |
| Technique de Récolte et stockage | | | | | |
| | | | | | |
| | | | | | |
| Description du changement par étape (détails techniques supplémentaires sur les changements liés aux précipitations, aux températures, aux inondations et à la sécheresse) | Mesure dans laquelle le changement a été adopté (% de la population concernée qui a adopté ce changement) | Pourquoi certaines personnes l'ont-elles adopté et d'autres pas? | Origine du changement (D'où est venue cette technique?) | Avantages ? | Inconvénients ? Déficits ? Points faibles ? |
| | | | | | |
| | | | | | |
| D'autre Technique | | | | | |
| | | | | | |
| | | | | | |
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2. Changement dans la production agricole – MARAICHAGE - HOMMES:

| |
|--|
| Quels sont les produits de maraichage qu'on cultive dans le village ? |
| Qui pratique le maraichage dans le village ? (Sexe, âge, groupe ethnique de la population impliquée (si approprié)) |

| Changement dans la production agricole – MARAICHAGE- HOMMES | | | | | |
|---|--|---|--|--------------------|--|
| Etapas et description du changement (détails techniques supplémentaires sur les changements liés aux précipitations, aux températures, aux inondations et à la sécheresse) | Mesure dans laquelle le changement a été adopté (% de la population concernée qui a adopté ce changement) | Pourquoi certaines personnes l'ont-elles adopté et d'autres pas? | Origine du changement (D'où est venue cette technique?) | Avantages ? | Inconvénients ? Défits ? Points faibles ? |
| Techniques pour préparer les terres | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |
| Etapas et description du changement (détails techniques supplémentaires sur les changements liés aux précipitations, aux températures, aux inondations et à la sécheresse) | Mesure dans laquelle le changement a été adopté (% de la population concernée qui a adopté ce changement) | Pourquoi certaines personnes l'ont-elles adopté et d'autres pas? | Origine du changement (D'où est venue cette technique?) | Avantages ? | Inconvénients ? Défits ? Points faibles ? |
| Techniques pour améliorer la fertilité du sol | | | | | |
| | | | | | |
| | | | | | |

| Étapes et description du changement (détails techniques supplémentaires sur les changements liés aux précipitations, aux températures, aux inondations et à la sécheresse) | Mesure dans laquelle le changement a été adopté (% de la population concernée qui a adopté ce changement) | Pourquoi certaines personnes l'ont-elles adopté et d'autres pas? | Origine du changement (D'où est venue cette technique?) | Avantages ? | Inconvénients ? Déficits ? Points faibles ? |
|---|--|---|--|--------------------|--|
| Techniques pour contrôler l'humidité dans le sol | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |
| Étapes et description du changement (détails techniques supplémentaires sur les changements liés aux précipitations, aux températures, aux inondations et à la sécheresse) | Mesure dans laquelle le changement a été adopté (% de la population concernée qui a adopté ce changement) | Pourquoi certaines personnes l'ont-elles adopté et d'autres pas? | Origine du changement (D'où est venue cette technique?) | Avantages ? | Inconvénients ? Déficits ? Points faibles ? |
| Techniques pour gérer les ravageurs | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |
| Étapes et description du changement (détails techniques supplémentaires sur les changements liés aux précipitations, aux températures, aux inondations et à la sécheresse) | Mesure dans laquelle le changement a été adopté (% de la population concernée qui a adopté ce changement) | Pourquoi certaines personnes l'ont-elles adopté et d'autres pas? | Origine du changement (D'où est venue cette technique?) | Avantages ? | Inconvénients ? Déficits ? Points faibles ? |
| Techniques pour désherber | | | | | |
| | | | | | |

| Technique de Récolte et stockage | | | | | |
|---|--|---|--|--------------------|--|
| Etapas et description du changement (détails techniques supplémentaires sur les changements liés aux précipitations, aux températures, aux inondations et à la sécheresse) | Mesure dans laquelle le changement a été adopté (% de la population concernée qui a adopté ce changement) | Pourquoi certaines personnes l'ont-elles adopté et d'autres pas? | Origine du changement (D'où est venue cette technique?) | Avantages ? | Inconvénients ? Déficits ? Points faibles ? |
| | | | | | |
| D'autre Technique | | | | | |
| | | | | | |

3. Changement dans la production agricole – MARAICHAGE - FEMMES:

| |
|--|
| <p>Quels sont les produits de maraichage qu'on cultive dans le village ?</p> |
| <p>Qui pratique le maraichage dans le village ? (Sexe, âge, groupe ethnique de la population impliquée (si approprié))</p> |

| Changement dans la production agricole – MARAICHAGE- FEMMES | | | | | |
|---|--|---|--|--------------------|--|
| Étapes et description du changement (détails techniques supplémentaires sur les changements liés aux précipitations, aux températures, aux inondations et à la sécheresse) | Mesure dans laquelle le changement a été adopté (% de la population concernée qui a adopté ce changement) | Pourquoi certaines personnes l'ont-elles adopté et d'autres pas? | Origine du changement (D'où est venue cette technique?) | Avantages ? | Inconvénients ? Défits ? Points faibles ? |
| Techniques pour préparer les terres | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |
| Étapes et description du changement (détails techniques supplémentaires sur les changements liés aux précipitations, aux températures, aux inondations et à la sécheresse) | Mesure dans laquelle le changement a été adopté (% de la population concernée qui a adopté ce changement) | Pourquoi certaines personnes l'ont-elles adopté et d'autres pas? | Origine du changement (D'où est venue cette technique?) | Avantages ? | Inconvénients ? Défits ? Points faibles ? |
| Techniques pour améliorer la fertilité du sol | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |
| Étapes et description du changement (détails techniques supplémentaires sur les changements liés aux précipitations, aux températures, aux inondations et à la sécheresse) | Mesure dans laquelle le changement a été adopté (% de la population concernée qui a adopté ce changement) | Pourquoi certaines personnes l'ont-elles adopté et d'autres pas? | Origine du changement (D'où est venue cette technique?) | Avantages ? | Inconvénients ? Défits ? Points faibles ? |
| Techniques pour contrôler l'humidité dans le sol | | | | | |
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| Etapes et description du changement (détails techniques supplémentaires sur les changements liés aux précipitations, aux températures, aux inondations et à la sécheresse) | Mesure dans laquelle le changement a été adopté (% de la population concernée qui a adopté ce changement) | Pourquoi certaines personnes l'ont-elles adopté et d'autres pas? | Origine du changement (D'où est venue cette technique?) | Avantages ? | Inconvénients ? Déficits ? Points faibles ? |
| Techniques pour gérer les ravageurs | | | | | |
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| | | | | | |
| Etapes et description du changement (détails techniques supplémentaires sur les changements liés aux précipitations, aux températures, aux inondations et à la sécheresse) | Mesure dans laquelle le changement a été adopté (% de la population concernée qui a adopté ce changement) | Pourquoi certaines personnes l'ont-elles adopté et d'autres pas? | Origine du changement (D'où est venue cette technique?) | Avantages ? | Inconvénients ? Déficits ? Points faibles ? |
| Techniques pour désherber | | | | | |
| | | | | | |
| | | | | | |
| Technique de Récolte et stockage | | | | | |
| Etapes et description du changement (détails techniques supplémentaires sur les changements liés aux précipitations, aux températures, aux inondations et à la sécheresse) | Mesure dans laquelle le changement a été adopté (% de la population concernée qui a adopté ce changement) | Pourquoi certaines personnes l'ont-elles adopté et d'autres pas? | Origine du changement (D'où est venue cette technique?) | Avantages ? | Inconvénients ? Déficits ? Points faibles ? |

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|--------------------------|--|--|--|--|--|
| | | | | | |
| | | | | | |
| D'autre Technique | | | | | |
| | | | | | |
| | | | | | |

4. **Classer les cinq cultures et variétés spécifiques qui réussies le plus** (sont plus productifs) pendant une bonne année (bonnes précipitations et bon climat) ainsi que celles qui réussies le plus dans une mauvaise année. Donnez les raisons des classements faits.

HOMMES

| Rank | Bonne année | Les raisons du classement | Mauvaise année | Les raisons du classement |
|------|-------------------|---------------------------|-------------------|---------------------------|
| 1 | Culture / Variété | | Culture / Variété | |
| 2 | Culture / Variété | | Culture / Variété | |
| 3 | Culture / Variété | | Culture / Variété | |
| 4 | Culture / Variété | | Culture / Variété | |
| 5 | Culture / Variété | | Culture / Variété | |

FEMMES

| Rank | Bonne année | Les raisons du classement | Mauvaise année | Les raisons du classement |
|------|-------------------|---------------------------|-------------------|---------------------------|
| 1 | Culture / Variété | | Culture / Variété | |
| 2 | Culture / Variété | | Culture / Variété | |
| 3 | Culture / Variété | | Culture / Variété | |
| 4 | Culture / Variété | | Culture / Variété | |
| 5 | Culture / Variété | | Culture / Variété | |

5. Changement dans les cultures/variétés cultivées - HOMMES

| Les cultures et variétés cultivées aujourd'hui (chaque culture et variété listée si possible) | Cultivés pendant la période de Alpha ? (oui/non) et Dans quelles proportions ? (beaucoup plus, une peu plus, même proportion, un peu moins, beaucoup moins) | Si pas cultivée dans la période de Alpha, quel problème spécifique est ce que ce nouveau culture/ variété essaie de résoudre ? Si (oui) cultivée dans la période d'Alpha, expliquez pourquoi les gens continuent à le cultiver. | Est-ce qu'il y a des inconvénients, défis, points faibles liés à ces cultures/variétés ? |
|---|---|--|--|
| I. | Oui / Non (cerclez un) Proportion : | | |

| | | | |
|--|--|---|---|
| | <input type="checkbox"/> Beaucoup Plus <input type="checkbox"/> Un peu Plus <input type="checkbox"/> Même proportion <input type="checkbox"/> Un peu moins <input type="checkbox"/> Beaucoup moins | | |
| 2. | Oui / Non (cerclez un) Proportion : <input type="checkbox"/> Beaucoup Plus <input type="checkbox"/> Un peu Plus <input type="checkbox"/> Même proportion <input type="checkbox"/> Un peu moins <input type="checkbox"/> Beaucoup moins | | |
| 3. | Oui / Non (cerclez un) Proportion : <input type="checkbox"/> Beaucoup Plus <input type="checkbox"/> Un peu Plus <input type="checkbox"/> Même proportion <input type="checkbox"/> Un peu moins <input type="checkbox"/> Beaucoup moins | | |
| 4. | Oui / Non (cerclez un) Proportion : <input type="checkbox"/> Beaucoup Plus <input type="checkbox"/> Un peu Plus <input type="checkbox"/> Même proportion <input type="checkbox"/> Un peu moins <input type="checkbox"/> Beaucoup moins | | |
| 5. | Oui / Non (cerclez un) Proportion : <input type="checkbox"/> Beaucoup Plus <input type="checkbox"/> Un peu Plus <input type="checkbox"/> Même proportion <input type="checkbox"/> Un peu moins <input type="checkbox"/> Beaucoup moins | | |
| Les cultures et variétés cultivées aujourd'hui (chaque culture et variété listée si possible) | Cultivés pendant la période de Alpha ? (oui/non) et Dans quelles proportions ? (beaucoup plus, une peu plus, même proportion, un peu moins, beaucoup moins) | Si pas cultivée dans la période de Alpha, quel problème spécifique est ce que ce nouveau culture/ variété essaie de résoudre ? Si (oui) cultivée dans la période d'Alpha, expliquez pourquoi les gens continuent | Est-ce qu'il y a des inconvénients, défis, points faibles liés à ces cultures/variétés ? |

| | | à le cultiver. | |
|--|--|---|--|
| 6. | Oui / Non (cerclez un) Proportion : <input type="checkbox"/> Beaucoup Plus <input type="checkbox"/> Un peu Plus <input type="checkbox"/> Même proportion <input type="checkbox"/> Un peu moins <input type="checkbox"/> Beaucoup moins | | |
| 7. | Oui / Non (cerclez un) Proportion : <input type="checkbox"/> Beaucoup Plus <input type="checkbox"/> Un peu Plus <input type="checkbox"/> Même proportion <input type="checkbox"/> Un peu moins <input type="checkbox"/> Beaucoup moins | | |
| 8. | Oui / Non (cerclez un) Proportion : <input type="checkbox"/> Beaucoup Plus <input type="checkbox"/> Un peu Plus <input type="checkbox"/> Même proportion <input type="checkbox"/> Un peu moins <input type="checkbox"/> Beaucoup moins | | |
| 9. | Oui / Non (cerclez un) Proportion : <input type="checkbox"/> Beaucoup Plus <input type="checkbox"/> Un peu Plus <input type="checkbox"/> Même proportion <input type="checkbox"/> Un peu moins <input type="checkbox"/> Beaucoup moins | | |
| 10. | Oui / Non (cerclez un) Proportion : <input type="checkbox"/> Beaucoup Plus <input type="checkbox"/> Un peu Plus <input type="checkbox"/> Même proportion <input type="checkbox"/> Un peu moins <input type="checkbox"/> Beaucoup moins | | |
| Listez les cultures et variétés cultivaient pendant la période d'Alpha qui ne sont plus cultivées | | Pourquoi elles ne sont plus cultivées <i>(collectez les détails concernant changements liées au climat)</i> | |
| 1. | | | |

| | |
|----|---|
| 2. | |
| 3. | |
| 4. | <i>Si plus, mettez les et le pourquoi au verso du papier.</i> |

Changement dans les cultures/variétés cultivées - FEMMES

| Les cultures et variétés cultivées aujourd'hui (chaque culture et variété listée si possible) | Cultivés pendant la période de Alpha ? (oui/non) et Dans quelles proportions ? (beaucoup plus, un peu plus, même proportion, un peu moins, beaucoup moins) | <i>Si pas cultivée dans la période de Alpha, quel problème spécifique est ce que ce nouveau culture/ variété essaie de résoudre ? Si (oui) cultivée dans la période d'Alpha, expliquez pourquoi les gens continuent à le cultiver.</i> | Est-ce qu'il y a des inconvénients, défis, points faibles liés à ces cultures/variétés ? |
|---|--|--|--|
| 1. | Oui / Non (cerclez un) Proportion : <input type="checkbox"/> Beaucoup Plus <input type="checkbox"/> Un peu Plus <input type="checkbox"/> Même proportion <input type="checkbox"/> Un peu moins <input type="checkbox"/> Beaucoup moins | | |
| 2. | Oui / Non (cerclez un) Proportion : <input type="checkbox"/> Beaucoup Plus <input type="checkbox"/> Un peu Plus <input type="checkbox"/> Même proportion <input type="checkbox"/> Un peu moins <input type="checkbox"/> Beaucoup moins | | |
| 3. | Oui / Non (cerclez un) Proportion : <input type="checkbox"/> Beaucoup Plus <input type="checkbox"/> Un peu Plus <input type="checkbox"/> Même proportion <input type="checkbox"/> Un peu moins <input type="checkbox"/> Beaucoup moins | | |
| 4. | Oui / Non (cerclez un) Proportion : <input type="checkbox"/> Beaucoup Plus <input type="checkbox"/> Un peu Plus <input type="checkbox"/> Même proportion | | |

| | | | |
|--|--|--|---|
| | <input type="checkbox"/> Un peu moins <input type="checkbox"/> Beaucoup moins | | |
| 5. | Oui / Non (cerclez un) Proportion : <input type="checkbox"/> Beaucoup Plus <input type="checkbox"/> Un peu Plus <input type="checkbox"/> Même proportion <input type="checkbox"/> Un peu moins <input type="checkbox"/> Beaucoup moins | | |
| Les cultures et variétés cultivées aujourd'hui (chaque culture et variété listée si possible) | Cultivés pendant la période de Alpha ? (oui/non) et Dans quelles proportions ? (beaucoup plus, une peu plus, même proportion, un peu moins, beaucoup moins) | Si pas cultivée dans la période de Alpha, quel problème spécifique est ce que ce nouveau culture/ variété essaie de résoudre ? Si (oui) cultivée dans la période d'Alpha, expliquez pourquoi les gens continuent à le cultiver. | Est-ce qu'il y a des inconvénients, défis, points faibles liés à ces cultures/variétés ? |
| 6. | Oui / Non (cerclez un) Proportion : <input type="checkbox"/> Beaucoup Plus <input type="checkbox"/> Un peu Plus <input type="checkbox"/> Même proportion <input type="checkbox"/> Un peu moins <input type="checkbox"/> Beaucoup moins | | |
| 7. | Oui / Non (cerclez un) Proportion : <input type="checkbox"/> Beaucoup Plus <input type="checkbox"/> Un peu Plus <input type="checkbox"/> Même proportion <input type="checkbox"/> Un peu moins <input type="checkbox"/> Beaucoup moins | | |
| 8. | Oui / Non (cerclez un) Proportion : <input type="checkbox"/> Beaucoup Plus <input type="checkbox"/> Un peu Plus <input type="checkbox"/> Même proportion <input type="checkbox"/> Un peu moins <input type="checkbox"/> Beaucoup moins | | |
| 9. | Oui / Non (cerclez un) Proportion : | | |

| | | | |
|--|--|--|--|
| | <input type="checkbox"/> Beaucoup Plus <input type="checkbox"/> Un peu Plus <input type="checkbox"/> Même proportion <input type="checkbox"/> Un peu moins <input type="checkbox"/> Beaucoup moins | | |
| 10. | Oui / Non (cerclez un) Proportion : <input type="checkbox"/> Beaucoup Plus <input type="checkbox"/> Un peu Plus <input type="checkbox"/> Même proportion <input type="checkbox"/> Un peu moins <input type="checkbox"/> Beaucoup moins | | |
| Listez les cultures et variétés cultivées pendant la période d'Alpha qui ne sont plus cultivées | | Pourquoi elles ne sont plus cultivées (collectez les détails concernant changements liées au climat) | |
| 1. | | | |
| 2. | | | |
| 3. | | | |
| 4. | | <i>Si plus, mettez les et le pourquoi au verso du papier.</i> | |

IV. RETOURNE A L'ENTRETIEN EN PLENIER

Diagramme de Venn

Les facilitateurs vont utiliser Diagramme de Venn pour identifier les services étatiques, les ONG et d'autres qui soutiennent activement la communauté dans le cadre de l'agriculture.

Information à chercher sur les fonctions et utilité des différentes structures :

- Les types de services fournis
- Quelle est la fréquence des services fournis ?
- Ces services se trouvent à quelle distance de la communauté ?
- L'appréciation de ces services?
- Les projets liés à l'agriculture qui ont fonctionnés dans le village

Questions sur les informations climatiques

1. **Quelles informations fournies par « Météo-Mali » êtes-vous habitués à recevoir ?** Le facilitateur doit demander aux participants de faire la liste des informations qu'ils ou elles reçoivent, et d'indiquer par « X », pour chaque type d'information, la fréquence de ces informations : tous les jours, tous les 10 jours ou chaque saison.

| Type d'information | Chaque Jour | Tous le 10 jours | Chaque saison |
|--------------------|-------------|------------------|---------------|
| | | | |
| | | | |
| | | | |

2. Comment recevez-vous les informations ?

- Radio
- Télévision
- Autres personnes
- Autre

3. Quelle importance donnez-vous à l'information météorologique fournie par « Météo-Mali » ?

- Faible
- Moyenne
- Élevée

4. Si « élevée » pourquoi est-ce que les informations fournies par Météo-Mali sont-elles utiles ?

ANNEX 7: SUMMARY OF INTERVIEWS WITH GOVERNMENT INSTITUTIONS AND RESEARCH ORGANIZATIONS

MALIAN GOVERNMENT INSTITUTIONS

National Office of Agriculture (*Direction National de l’Agriculture, DNA*)

The DNA plays an important role in defining and implementing the government’s response to climate change. Its mission includes ensuring climate change is taken into account when developing and implementing national agricultural policy, and in designing support services provided to producers throughout the country. Activities carried out by the DNA include the selection and diffusion of improved variety seed, the diffusion of adaptive practices and technologies aimed at improving soil fertility, training agricultural extension services agents (and, through them, farmers), and promoting synergy among government, private-sector, and civil-society entities promoting innovative strategies, practices, and technologies to improve resilience to climate change.

The DNA assists in building producers’ awareness of climate change through local radio programming and local administrative structures (“collectivities”), and assists communes in integrating aspects of climate change and the promotion of adaptive practices into local development programming.

The DNA works in close collaboration with a wide range of development partners including IER, the International Crops Research Institute for the Semi-Arid Tropics (ICRISAT), the National Committee for Agricultural Research, seed-certification laboratories, Assemblée Permanente des Chambres d’Agriculture du Mali (APCAM) Mali Météo, Agrimet, and other government services (hydraulics, vegetal protection, agricultural development offices, etc.).

The National Rural Research Institute, (*Institut d’Economie Rurale, IER*)

DNA’S “IMPROVING AGRICULTURAL ADAPTIVE CAPACITY AND RESILIENCY IN VIEW OF CLIMATE CHANGE” PROJECT

The *Améliorer la capacité d’adaptation et la résilience face aux changements climatiques dans le secteur agricole au Mali* project intervenes in six communes in three agro-ecological zones in Kayes, Koulikoro, Sikasso, Segou, Mopti, and Gao regions. The \$2.8-million, five-year project funded by FEM/LDCF, UNDP, and the Malian government aims to build the capacity of institutions and individuals at the local level to adapt to climate change, reduce vulnerability and disseminate results and lessons learned related to climate change.

The IER is the primary Malian government institution responsible for carrying out participatory agricultural research in partnership with agricultural extension services and NGOs. IER also works in close collaboration with international research organizations such as ICRISAT, Africa Rice, *Conseil ouest et centre africain pour la recherche et le développement agricoles* (CORAF), the International Livestock Research Institute (ILRI), and *Centre de coopération internationale en recherche agronomique pour le développement* (CIRAD), and with producer organizations and associations, and community seed banks in the field. The institute is responsible for researching, developing, and cataloguing a wide selection of improved varieties of cereals (such as millet, maize, sorghum, wheat, and fonio), legumes (groundnut and niebe), cotton, and various other crops adapted to Mali's various agro-ecological zones. Its seed catalogue covers 12 common crops, and documents between five and 100 varieties of each. IER donors include USAID, Biodiversity International, International Fund for Agricultural Development (IFAD), the United Nations Development Program (UNDP)'s Global Environment Facility, Foundation Syngenta, the Malian government, and several bilateral partners such as France, the Netherlands, and Norway.

Seed multiplication is the responsibility of producer organizations (outgrowers), private seed companies, and the National Seed Service, while seed certification is conducted by LaboSem, part of the National Office for Agriculture (DNA). Training for farmers on cultivating new varieties is typically provided by government technical extension agents and by NGOs.

The Ministry of Environment and Sanitation (*Ministère de l'Environnement et de l'Assainissement*)

This ministry is comprised of several technical structures directly concerned with issues related to climate change, including the:

- Agency for the Environment and Sustainable Development ([*Agence de l'Environnement et du Développement Durable*](#));
- National Office for Water and Forests (*Direction Nationale des Eaux et Forêts*);
- National Office for Sanitation and the Control of Pollution and Nuisance ([*Direction Nationale de l'Assainissement et du Contrôle de la Pollution et des Nuisances*](#), DNACPN); and the
- Agency for the Niger River Basin ([*Agence du Bassin du Fleuve Niger*](#))

Of these, the assessment team met only with the DNACPN. The DNACPN is responsible for assisting producers, projects, and others working in the agriculture sector in the environmentally safe and correct usage of agro-chemicals and for ensuring environmentally safe practices are adopted. They raise awareness and inform the public through the development and dissemination of brochures and informational documents that instruct farmers on the proper use of agrochemicals and disposal of containers, implement workshops for representatives of agricultural organizations to raise awareness of the effect of agrochemicals on the environment, support exchange visits among producers, and organize an annual open-house day where new agricultural technologies are shared with producers and others working in the agriculture sector. The DNACPN is also responsible for monitoring the application (or non-application) of recommended safe practices. To do so, they develop and disseminate standard practices to the public, conduct random annual audits of control measures and the application of recommendations made, visit agricultural projects to ascertain their compliance with environmental regulations, and impose sanctions on agriculturalists that do not respect the environmental norms regarding the use of agro-chemicals (barring them from any type of government-funded grants or support available).

The Malian Meteorological Agency (*Agence Nationale de la Météorologie, Mali Météo*)

Mali Météo is a parastatal agency in charge of national meteorological services provided throughout the country. Created in November 2012 out of the former Central Department of Meteorology of the Ministry of Equipment and Transport, it has recently been empowered to raise its own funds from the

public and private sectors, but confronts numerous challenges in becoming a highly functional institution capable of providing reliable and timely weather/water/climate information and analysis, and outreach services to a range of stakeholders.

INTERNATIONAL RESEARCH ORGANIZATIONS

The **World Agroforestry Center** was the only research institution with which the assessment team was able to meet. Given the bulk of their activities and limited time available to meet with them, this was an informal visit mainly to discuss in general terms and collect documents rather than to conduct a full interview. The World Agroforestry Center is a **Consultative Group on International Agricultural Research (CGIAR) Consortium Research Center** with its headquarters in Kenya. It focuses on research and outreach that assists smallholder households in increasing their use of trees in agricultural landscapes to improve their food security, nutrition, income, energy resources, and environmental sustainability. Research conducted by the World Agroforestry Center is organized around six science domains, one of which is climate change. Within this domain, the center raises awareness and promotes agroforestry as a means of improving agricultural production and diversifying sources of income to enhance resiliency to climate change.

The World Agroforestry Center is one of several research institutes collaborating on the global **Climate Change, Agriculture and Food Security (CCAFS) program** led by the **International Center for Tropical Agriculture**. CCAFS is exploring new ways to help vulnerable rural communities adjust to climate change by bringing together the world's best researchers in agricultural, climate, environmental, and social sciences to identify and address important interactions, synergies, and trade-offs between climate change and agriculture. Unfortunately, due to their extensive travel schedules, CCAFS representatives in Bamako were unable to meet with the assessment team during the duration of our visit.

In Mali and across West Africa, the World Agroforestry Center is actively engaged in “*recherche-action*” (action-research) targeting a number of areas directly relevant to enhancing Malian resiliency in the face of climate change. These include, but are not at all limited to:

- The use of certain ligneous trees species for soil fertility and restoration;
- Agroforestry systems appropriate to the region that enhance crop productivity, improve soil fertility, reduce wind and water erosion, and provide secondary products for income generation or domestic use;
- The use of appropriate tree and shrub species to develop live fencing to protect gardens;
- Fruit-tree production to offset dependency on crop production and diversify household income generation;
- The use of tree species appropriate for wind and fire breaks and which provide secondary products for income generation or domestic use;
- The use of forage crops and trees to provide additional feed and nutrition for livestock and small ruminants;
- The sustainable maintenance and exploitation of ligneous and non-ligneous forest tree products; and
- The development of alternative biofuel crops.

Despite efforts to do so, given time constraints, the team was not able to meet with the **International Crops Research Institute for the Semi-Arid Tropics (ICRISAT)**, which is the primary international research institute focusing on dryland cereals commonly grown in Mali. They work in close collaboration with the IER in researching, developing, and disseminating new varieties of pearl millet, small millet, sorghum, groundnut, and pigeon pea. They have also become increasingly involved in working

with government extension agents and NGOs that train farmers how to cultivate new varieties produced.

ICRISAT also focuses on what they term **Inclusive Market-Oriented Development (IMOD)**, which seeks to link the poor more effectively to market opportunities. They conduct research and development in this area in order to devise more effective means of assisting the poor in moving from strictly subsistence agriculture to commercial agriculture. IMOD takes former efforts that aimed to increase crop yields by 10 to 20 percent many steps further by searching for a wider range of innovations that help farmers access broader markets, providing both incentive and know-how to move from subsistence to commercial farming.

ANNEX 8: SUMMARY OF INTERVIEWS WITH DONORS

The **Swedish International Development Agency (ASDI)** is the lead donor organization for climate-change-related issues in Mali. It supports several important state and NGO initiatives and projects throughout the country that focus specifically on climate change adaptation. ASDI-supported projects support a wide range of activities and adaptive practices to enhance resilience to climate change, including the promotion of gardening, *Zai*, and other anti-erosion and soil fertility techniques, beekeeping using modern hives, arboriculture, animal husbandry and fattening, rural microcredit activities, the promotion of multifunctional platforms, and improvements to water resources, swamps, and lowlands. ASDI has provided substantial support to *Réseau Climat Mali*, a network of more than 80 civil society organizations dedicated to improving awareness of climate change; advocating and lobbying before local, national, and international politicians and decision-makers regarding climate change issues; and helping its members obtain funding to realize their objectives.

The **Swiss Agency for Development and Cooperation (SDC)**, another leading donor, also supports a range of activities related to climate change adaptation and resilience working through international NGOs, organizations such as the *Association des Organisations Professionnelle Paysannes (AOPP)* and the *Coordination Nationale des Organisations Paysannes (CNOP)*, and certain administrative entities (communes, quartiers, and counsels). Through these partners, SDC promotes many of the agricultural adaptive practices discussed throughout this report; it has supported access to potable water and invested in infrastructure (dams, lowland development, and roads) to alleviate vulnerability to climate change. In the past, SDC also provided scholarships for government agents involved in the collection and analysis of meteorological data, and supported Mali Météo in the diffusion of such information.

UNDP funds the ***Programme de Micro-Financement du Fonds pour l'Environnement Mondiale (PMF/FEM)***, through which technical and financial support is provided to innovative community projects that contribute to environmental conservation and restoration. The PMF/FEM representative interviewed in Mali indicated that all of the projects they support focus on at least some aspects related to climate change adaptation or mitigation. To date, the fund has financed 56 separate projects, many of which promote a range of adaptive agricultural practices and techniques, promote sustainable use of forest and non-timber natural resources, and aim to control soil erosion, improve soil fertility, and preserve ecosystems and biodiversity.

The website of the Ministry of the Environment contains a table which, although dated 2011, provides a thorough summary of technical and financial assistance targeting climate change adaptation and mitigation efforts in Mali. It lists projects completed, in progress, or under consideration at the time, key activities carried out, partners engaged, geographic zones covered, and funding levels. At the time, Germany, Denmark, Norway, Sweden, and Switzerland were providing the most support to climate change initiatives and programming, while multilateral support came mostly from the World Bank, the African Development Bank, the Global Environment Facility, UNDP, and the European Union. While this situation may have changed in view of recent political developments, the document does provide a

thorough overview of past climate change initiatives and potential future co-funders and partners. It is found at www.changementsclimatiques-mali.org/partenaires_ccm.php.

ANNEX 9: TABLE OF TECHNICAL AREAS IN WHICH NGOS WORK

| NGO Technical Areas | % Surveyed NGOs Involved |
|--|---------------------------------|
| Soil Fertility | 93% |
| Soil Moisture Capture | 87% |
| Supplementary Water/Irrigation Systems | 73% |
| Agro-Forestry | 77% |
| Post-Harvest Handling and Storage Techniques | 77% |
| Use of Drought-Tolerant and/or Short-Cycle Crops/Varieties | 73% |
| Alternative Energy | 73% |
| Woodlot Establishment/Reforestation | 70% |
| Seed Research/Multiplication/Dissemination | 57% |
| Plantation Crops | 47% |
| Orchard/Forestry Seedling Production/Dissemination | 43% |
| Livestock Management | 73% |
| Fisheries Management | 80% |
| Land Resources Management | 73% |
| Water Resources Management | 30% |

ANNEX 10: LIST OF CLIMATE NETWORKS CITED BY NGOS

| Network | Times Cited |
|--|-------------|
| Réseau Climat Mali | 24 |
| GCOZA (<i>Groupe de Coordination des Zones Arides</i>) | 13 |
| SECO ONG (<i>Secrétariat de Concertation des ONG maliennes</i>) | 13 |
| CCA ONG (<i>Conseil de Concertation et d'Appui aux Organisations Non Gouvernementales</i>) | 4 |
| PAN – Mali (<i>Pesticide Action Network</i>) financé par PAN GB | 3 |
| Réseau Gourma | 3 |
| Réseau énergie | 2 |
| IUCN | 2 |
| Partenaires Nationales de l'Eau - Mali | 2 |
| CGIAR réseau intégration ONG | 1 |
| GeNOVICO (<i>Gestion non violente des conflits</i>) | 1 |
| Alliance Ecosystème | 1 |
| Réseau Vétiver | 1 |
| Réseau Jatropha (<i>pouhere</i>) | 1 |
| Réseau IPACC (<i>South Africa</i>) | 1 |
| PACJA (<i>Alliance panafricaine pour une justice climatique</i>) | 1 |
| UNCCD (<i>Secrétariat International de lutte contre la désertification</i>) | 1 |
| GWA (<i>Global Water Alliance</i>) | 1 |
| RESAD (<i>Réseau sahel et désertification</i>) | 1 |
| REPAD (<i>Réseau De Recherches Pour L'appui Au Développement En Afrique</i>) | 1 |
| RNSCC (<i>Regional Network for the Synergy between the Convention on Biological Diversity and the Convention to Combat Desertification in West and Central Africa</i>) | 1 |
| Réseau Climat Développement (<i>siège à Dakar</i>) | 1 |
| GAWA (<i>Green Actors of West Africa</i>) | 1 |
| West African Climate Network | 1 |
| Réseau Ouest Africain des Acteurs de l'Eau (<i>CAP-Net</i>) | 1 |
| CAN Afrique | 1 |
| ROPA (<i>Réseau des organisations paysannes de l'afrique</i>) | 1 |
| CNOP (<i>Coordination Nationale des org paysannes</i>) | 1 |
| CAFO (<i>Coordination des Associations et ONG Feminales</i>) | 1 |
| GP/EHA (<i>Groupe Pivot Eau, Hygiène et Assainissement</i>) | 1 |

ANNEX I I: VILLAGE PROFILES

Guide relatif aux entretiens de groupes dans les villages

Objectifs

- Identifier les technologies d'agricultures qui sont perçues comme étant les plus efficaces et profitables
- Déterminer la réceptivité aux différentes mesures d'adaptation au / d'atténuation du changement climatique promues

Méthodologie et Organisation

Des échanges en groupes représentatifs des populations de douze (12) communautés se pencheront sur les stratégies et les pratiques agricoles utilisés face à la réalité de la variabilité du climat. L'origine de ces mesures adaptatives ainsi que les contraintes à l'adoption de stratégies efficaces seront également analysées.

Organisation

1. Chaque groupe sera composé d'entre trente et quarante femmes et hommes activement engagés dans des activités agricoles. La sélection des participants (jeunes, adultes et vieux des différents quartiers, clans, castes et groupes religieux) sera négociée avec les leaders villageois, qui seront informés des objectifs de la visite avant l'arrivée de l'équipe.
2. La séance de travail dans chaque village commencera en plénier dans le grand groupe, qui se divisera en deux groupes (femmes et hommes) pour une partie de la séance.
3. Les échanges seront animés par une équipe de deux personnes, une qui dirigera les échanges et l'autre qui prendra des notes en plénier. Pour le travail avec les deux groupes chaque chercheur posera les questions et prendra notes au même temps.
4. Avant de se lancer dans les échanges, l'équipe se présentera et expliquera le contexte et l'objectif de la rencontre et le programme prévu.
5. Certaines questions liées au contexte peuvent être posées directement aux leaders villageois.
6. Le changement climatique ne sera pas mentionné avant ou pendant l'activité. Bien que certaines questions porteront sur la météo et le climat, la discussion sera plutôt axée sur les « changements agricoles » et les « changements économiques » afin d'éviter d'influencer les réponses.
7. Les participants déjeuneront avec l'équipe. Le repas sera financé par Tetra Tech et préparé dans le village.
8. A la fin de la séance l'équipe complète ses notes, qui seront enregistrées dans l'ordinateur dans un formulaire prédéveloppé pendant la soirée du même jour.

NB : En cas des événements sociaux dans le village concerné, tels que décès, mariage, ou autres qui empêchent à l'activité de se dérouler normalement, l'équipe doit s'adapter et utiliser le temps pour trouver les informations requises dans le guide dans la mesure possible.

I. INFORMATIONS GENERALES (à noter avant le commencement de la séance en plénier)

1. Date :
2. Village :
3. Population approximative :
4. Nombre de ménages :
5. Description des participants : (nombre total d'hommes / de femmes et une impression sur la répartition des couches d'âges)
6. Animateur de la séance : Cissouma / Djeneba
7. Preneur de notes de la séance : Cissouma / Djeneba

II. ENTRETEIN EN PLENIER

Introduction

1. Présentations de l'équipe et des participants ;
2. Explication de l'objectif de la visite ;
3. Partage des grandes lignes du programme de la journée.

Questions générales concernant les modes générales de subsistance dans la communauté

1. **Quels sont le moyen d'existence le plus important** dans le village ? Pourquoi ? Quel est le suivant, ainsi de suite jusqu'à trouver les 5 activités les plus importants (*par exemple : Agriculture ; Pastoralisme ; Élevage du bétail ; Jardinage ; Vergers ; Produits forestiers ; Pêche ; Migration saisonnière ; Migration à long terme ; Travail rémunéré (main-d'œuvre qualifiée) ; Envois de fonds ; Produits artisanaux ; Autres - préciser*) :

| Moyen d'existence le plus important dans le village | |
|---|--------------------------|
| Activités par ordre d'importance | Raisons de ce classement |
| 1. | |
| 2. | |
| 3. | |
| 4. | |
| 5. | |

2. **Principales activités agricoles** (seulement) au cours des 3 dernières années (évaluez la superficie totale cultivée dans la communauté dans son ensemble, pour l'ensemble des **cultures**, des **jardins**, et des **arbres fruitiers**)

1. _____ (% approximatif des superficies cultivées : %)
2. _____ (% approximatif des superficies cultivées : %)
3. _____ (% approximatif des superficies cultivées : %)

3. Matrice Historique

Cet outil de la MARP sera utilisé pour identifier les tendances et les changements importants des derniers vingt ans. Le chercheur explique l'outil et pose les questions sur les 06 sujets, et les haricots sont placés par les participants pour noter les tendances d'agrandissement ou de diminution des différents éléments mentionnés dans les échanges. Le chercheur posera les questions d'approfondissement pour mieux comprendre les raisons de certaines tendances identifiées et les stratégies adoptées face à certains changements. Les détails des échanges sont notés par le rapporteur.

| Sujets | | Présidence d'Alpha | Présidence d'ATT à nos jours |
|--------|---|----------------------------------|----------------------------------|
| 1. | La population (taille en termes de tendance) | | |
| 2. | L'environnement physique du village | Remplissez en bas par sous-sujet | Remplissez en bas par sous-sujet |
| | Champs (superficie) | | |
| | Jardins (superficie) | | |
| | Vergers (superficie) | | |
| | Rivières (plus ou moins d'eau ?) | | |
| | Forets (plus ou moins en termes de densité et superficie ?) | | |
| | Désert (l'intensité de désertification) | | |
| 3. | Le climat | Remplissez en bas par sous-sujet | Remplissez en bas par sous-sujet |
| | Pluviométrie (plus ou moins ?) | | |
| | Température (plus ou moins chaud ?) | | |
| | Vents (intensité plus ou moins ; poussier plus ou moins ?) | | |
| 4. | Superficie cultivée (changement dans la <i>taille moyenne</i> des champs des gens) | | |
| 5. | Distance des maisons aux champs (plus ou moins distant ?) | | |
| 6. | La propriété sur les terres (Questions de foncier) (quantité de terre matriculer au gens – titre provisoire, permit, etc) | | |

III. TRAVAUX DE GROUPE HOMMES ET FEMMES

Après la construction de la matrice le groupe de participants est scindé en deux groupes (hommes et femmes) et chaque chercheur s'occupera d'un groupe en faisant la passation du guide d'entretien ci-dessous, sans faire appel aux outils de la MARP :

I. Changement dans la production agricole - CHAMPS:

(Facilitateur) Voici quelques questions pour éliciter la réaction cherchée de participants :

Est-ce qu'il y avait des changements pendant le temps d'Alpha, dans les différentes étapes de production agricole ?

Y a-t-il des différences dans la préparation des terres ? Les cultures sont-elles plantées dans les mêmes champs ou dans différents types de champs ?

Comment vous désherbez et protéger les cultures ?

Y a-t-il eu (d'autres) changements dans la manière dont vous gérez les faibles précipitations, les périodes de sécheresse pendant la saison des pluies, les inondations, l'imprévisibilité des précipitations, la chaleur ou les vents forts ?

Y a-t-il eu (d'autres) des changements dans la façon dont vous traitez le sol pour maintenir or augmenter la fertilité, contrôlez l'humidité et gérez les ravageurs ? Plantez-vous ou laissez-vous des arbres dans le champ ? Quels engrais utilisez-vous ?

Ce changement a-t-il été adopté par tous dans le village ? Quel pourcentage de la population concernée a adopté le changement? Pourquoi certaines personnes l'ont-elles adopté et d'autres pas ? Ce changement a-t-il un avantage ?

Pour les personnes qui ont adopté ce changement, quels sont les défis et les points faibles ?

D'où est venue l'idée de faire ce changement à l'origine ? Par qui les villageois ont-ils été aidés à faire ce changement, à adopter cette pratique - ont-ils reçu des informations, des outils ou d'autres ressources pour faire les choses différemment ?

Les informations seront notées dans le tableau en bas:

| Changement dans la production agricole – CHAMPS - HOMMES | | | | | |
|---|--|---|--|--------------------|--|
| Description du changement par étape (détails techniques supplémentaires sur les changements liés aux précipitations, aux températures, aux inondations et à la sécheresse) | Mesure dans laquelle le changement a été adopté (% de la population concernée qui a adopté ce changement) | Pourquoi certaines personnes l'ont-elles adopté et d'autres pas? | Origine du changement (D'où est venue cette technique?) | Avantages ? | Inconvénients ? Défits ? Points faibles ? |
| Techniques pour préparer les terres | | | | | |
| | | | | | |
| | | | | | |
| Description du changement par étape (détails techniques supplémentaires sur les changements liés aux précipitations, aux températures, aux inondations et à la sécheresse) | Mesure dans laquelle le changement a été adopté (% de la population concernée qui a adopté ce changement) | Pourquoi certaines personnes l'ont-elles adopté et d'autres pas? | Origine du changement (D'où est venue cette technique?) | Avantages ? | Inconvénients ? Défits ? Points faibles ? |
| | | | | | |
| | | | | | |
| Techniques pour améliorer la fertilité du sol | | | | | |
| | | | | | |
| | | | | | |
| Description du changement par étape (détails techniques supplémentaires sur les changements liés aux précipitations, aux températures, aux inondations et à la sécheresse) | Mesure dans laquelle le changement a été adopté (% de la population concernée qui a adopté ce changement) | Pourquoi certaines personnes l'ont-elles adopté et d'autres pas? | Origine du changement (D'où est venue cette technique?) | Avantages ? | Inconvénients ? Défits ? Points faibles ? |
| | | | | | |
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| Techniques pour contrôler l'humidité dans le sol | | | | | |
|---|--|---|--|--------------------|--|
| | | | | | |
| Description du changement par étape (détails techniques supplémentaires sur les changements liés aux précipitations, aux températures, aux inondations et à la sécheresse) | Mesure dans laquelle le changement a été adopté (% de la population concernée qui a adopté ce changement) | Pourquoi certaines personnes l'ont-elles adopté et d'autres pas? | Origine du changement (D'où est venue cette technique?) | Avantages ? | Inconvénients ? Déficits ? Points faibles ? |
| | | | | | |
| Techniques pour gérer les ravageurs | | | | | |
| | | | | | |
| Description du changement par étape (détails techniques supplémentaires sur les changements liés aux précipitations, aux températures, aux inondations et à la sécheresse) | Mesure dans laquelle le changement a été adopté (% de la population concernée qui a adopté ce changement) | Pourquoi certaines personnes l'ont-elles adopté et d'autres pas? | Origine du changement (D'où est venue cette technique?) | Avantages ? | Inconvénients ? Déficits ? Points faibles ? |
| | | | | | |
| Techniques pour désherber | | | | | |
| | | | | | |
| Description du changement par étape (détails techniques supplémentaires sur les changements liés aux précipitations, aux températures, aux inondations et à la sécheresse) | Mesure dans laquelle le changement a été adopté (% de la population concernée qui a adopté ce changement) | Pourquoi certaines personnes l'ont-elles adopté et d'autres pas? | Origine du changement (D'où est venue cette technique?) | Avantages ? | Inconvénients ? Déficits ? Points faibles ? |
| | | | | | |

| Technique de Récolte et stockage | | | | | |
|---|--|---|--|--------------------|--|
| | | | | | |
| Description du changement par étape (détails techniques supplémentaires sur les changements liés aux précipitations, aux températures, aux inondations et à la sécheresse) | Mesure dans laquelle le changement a été adopté (% de la population concernée qui a adopté ce changement) | Pourquoi certaines personnes l'ont-elles adopté et d'autres pas? | Origine du changement (D'où est venue cette technique?) | Avantages ? | Inconvénients ? Défits ? Points faibles ? |
| | | | | | |
| D'autre Technique | | | | | |
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| Changement dans la production agricole – CHAMPS - FEMMES | | | | | |
|---|--|---|--|--------------------|--|
| Description du changement par étape (détails techniques supplémentaires sur les changements liés aux précipitations, aux températures, aux inondations et à la sécheresse) | Mesure dans laquelle le changement a été adopté (% de la population concernée qui a adopté ce changement) | Pourquoi certaines personnes l'ont-elles adopté et d'autres pas? | Origine du changement (D'où est venue cette technique?) | Avantages ? | Inconvénients ? Défits ? Points faibles ? |
| | | | | | |
| Techniques pour préparer les terres | | | | | |
| | | | | | |
| Description du changement par étape (détails techniques supplémentaires sur les changements liés aux précipitations, aux températures, aux inondations et à la sécheresse) | Mesure dans laquelle le changement a été adopté (% de la population concernée qui a adopté ce changement) | Pourquoi certaines personnes l'ont-elles adopté et d'autres pas? | Origine du changement (D'où est venue cette technique?) | Avantages ? | Inconvénients ? Défits ? Points faibles ? |
| | | | | | |

| Techniques pour améliorer la fertilité du sol | | | | | |
|---|--|---|--|--------------------|--|
| Description du changement par étape (détails techniques supplémentaires sur les changements liés aux précipitations, aux températures, aux inondations et à la sécheresse) | Mesure dans laquelle le changement a été adopté (% de la population concernée qui a adopté ce changement) | Pourquoi certaines personnes l'ont-elles adopté et d'autres pas? | Origine du changement (D'où est venue cette technique?) | Avantages ? | Inconvénients ? Déficits ? Points faibles ? |
| | | | | | |
| Techniques pour contrôler l'humidité dans le sol | | | | | |
| Description du changement par étape (détails techniques supplémentaires sur les changements liés aux précipitations, aux températures, aux inondations et à la sécheresse) | Mesure dans laquelle le changement a été adopté (% de la population concernée qui a adopté ce changement) | Pourquoi certaines personnes l'ont-elles adopté et d'autres pas? | Origine du changement (D'où est venue cette technique?) | Avantages ? | Inconvénients ? Déficits ? Points faibles ? |
| | | | | | |
| Techniques pour gérer les ravageurs | | | | | |
| Description du changement par étape (détails techniques supplémentaires sur les changements liés aux précipitations, aux températures, aux inondations et à la sécheresse) | Mesure dans laquelle le changement a été adopté (% de la population concernée qui a adopté ce changement) | Pourquoi certaines personnes l'ont-elles adopté et d'autres pas? | Origine du changement (D'où est venue cette technique?) | Avantages ? | Inconvénients ? Déficits ? Points faibles ? |
| | | | | | |

| Techniques pour désherber | | | | | |
|---|--|---|--|--------------------|--|
| | | | | | |
| Description du changement par étape (détails techniques supplémentaires sur les changements liés aux précipitations, aux températures, aux inondations et à la sécheresse) | Mesure dans laquelle le changement a été adopté (% de la population concernée qui a adopté ce changement) | Pourquoi certaines personnes l'ont-elles adopté et d'autres pas? | Origine du changement (D'où est venue cette technique?) | Avantages ? | Inconvénients ? Défits ? Points faibles ? |
| | | | | | |
| Technique de Récolte et stockage | | | | | |
| | | | | | |
| Description du changement par étape (détails techniques supplémentaires sur les changements liés aux précipitations, aux températures, aux inondations et à la sécheresse) | Mesure dans laquelle le changement a été adopté (% de la population concernée qui a adopté ce changement) | Pourquoi certaines personnes l'ont-elles adopté et d'autres pas? | Origine du changement (D'où est venue cette technique?) | Avantages ? | Inconvénients ? Défits ? Points faibles ? |
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| D'autre Technique | | | | | |
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2. *Changement dans la production agricole – MARAICHAGE - HOMMES:*

| |
|--|
| Quels sont les produits de maraichage qu'on cultive dans le village ? |
| Qui pratique le maraichage dans le village ? (Sexe, âge, groupe ethnique de la population impliquée (si approprié)) |

| Changement dans la production agricole – MARAICHAGE- HOMMES | | | | | |
|---|--|---|--|--------------------|--|
| Étapes et description du changement (détails techniques supplémentaires sur les changements liés aux précipitations, aux températures, aux inondations et à la sécheresse) | Mesure dans laquelle le changement a été adopté (% de la population concernée qui a adopté ce changement) | Pourquoi certaines personnes l'ont-elles adopté et d'autres pas? | Origine du changement (D'où est venue cette technique?) | Avantages ? | Inconvénients ? Défits ? Points faibles ? |
| Techniques pour préparer les terres | | | | | |
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| | | | | | |
| | | | | | |
| Étapes et description du changement (détails techniques supplémentaires sur les changements liés aux précipitations, aux températures, aux inondations et à la sécheresse) | Mesure dans laquelle le changement a été adopté (% de la population concernée qui a adopté ce changement) | Pourquoi certaines personnes l'ont-elles adopté et d'autres pas? | Origine du changement (D'où est venue cette technique?) | Avantages ? | Inconvénients ? Défits ? Points faibles ? |
| Techniques pour améliorer la fertilité du sol | | | | | |
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| Etapas et description du changement (détails techniques supplémentaires sur les changements liés aux précipitations, aux températures, aux inondations et à la sécheresse) | Mesure dans laquelle le changement a été adopté (% de la population concernée qui a adopté ce changement) | Pourquoi certaines personnes l'ont-elles adopté et d'autres pas? | Origine du changement (D'où est venue cette technique?) | Avantages ? | Inconvénients ? Défits ? Points faibles ? |
|---|--|---|--|--------------------|--|
| Techniques pour contrôler l'humidité dans le sol | | | | | |
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| Etapas et description du changement (détails techniques supplémentaires sur les changements liés aux précipitations, aux températures, aux inondations et à la sécheresse) | Mesure dans laquelle le changement a été adopté (% de la population concernée qui a adopté ce changement) | Pourquoi certaines personnes l'ont-elles adopté et d'autres pas? | Origine du changement (D'où est venue cette technique?) | Avantages ? | Inconvénients ? Défits ? Points faibles ? |
| Techniques pour gérer les ravageurs | | | | | |
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| Etapas et description du changement (détails techniques supplémentaires sur les changements liés aux précipitations, aux températures, aux inondations et à la sécheresse) | Mesure dans laquelle le changement a été adopté (% de la population concernée qui a adopté ce changement) | Pourquoi certaines personnes l'ont-elles adopté et d'autres pas? | Origine du changement (D'où est venue cette technique?) | Avantages ? | Inconvénients ? Défits ? Points faibles ? |
| Techniques pour désherber | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |
| Technique de Récolte et stockage | | | | | |

| Etapes et description du changement (détails techniques supplémentaires sur les changements liés aux précipitations, aux températures, aux inondations et à la sécheresse) | Mesure dans laquelle le changement a été adopté (% de la population concernée qui a adopté ce changement) | Pourquoi certaines personnes l'ont-elles adopté et d'autres pas? | Origine du changement (D'où est venue cette technique?) | Avantages ? | Inconvénients ? Défits ? Points faibles ? |
|---|--|---|--|--------------------|--|
| | | | | | |
| D'autre Technique | | | | | |
| | | | | | |
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3. Changement dans la production agricole – MARAICHAGE - FEMMES:

| |
|--|
| Quels sont les produits de maraichage qu'on cultive dans le village ? |
| Qui pratique le maraichage dans le village ? (Sexe, âge, groupe ethnique de la population impliquée (si approprié)) |

| Changement dans la production agricole – MARAICHAGE- FEMMES | | | | | |
|---|--|---|--|--------------------|--|
| Étapes et description du changement (détails techniques supplémentaires sur les changements liés aux précipitations, aux températures, aux inondations et à la sécheresse) | Mesure dans laquelle le changement a été adopté (% de la population concernée qui a adopté ce changement) | Pourquoi certaines personnes l'ont-elles adopté et d'autres pas? | Origine du changement (D'où est venue cette technique?) | Avantages ? | Inconvénients ? Déficits ? Points faibles ? |
| Techniques pour préparer les terres | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |
| Étapes et description du changement (détails techniques supplémentaires sur les changements liés aux précipitations, aux températures, aux inondations et à la sécheresse) | Mesure dans laquelle le changement a été adopté (% de la population concernée qui a adopté ce changement) | Pourquoi certaines personnes l'ont-elles adopté et d'autres pas? | Origine du changement (D'où est venue cette technique?) | Avantages ? | Inconvénients ? Déficits ? Points faibles ? |
| Techniques pour améliorer la fertilité du sol | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |
| Étapes et description du changement (détails techniques supplémentaires sur les changements liés aux précipitations, aux températures, aux inondations et à la sécheresse) | Mesure dans laquelle le changement a été adopté (% de la population concernée qui a adopté ce changement) | Pourquoi certaines personnes l'ont-elles adopté et d'autres pas? | Origine du changement (D'où est venue cette technique?) | Avantages ? | Inconvénients ? Déficits ? Points faibles ? |
| Techniques pour contrôler l'humidité dans le sol | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |

| Etapes et description du changement (détails techniques supplémentaires sur les changements liés aux précipitations, aux températures, aux inondations et à la sécheresse) | Mesure dans laquelle le changement a été adopté (% de la population concernée qui a adopté ce changement) | Pourquoi certaines personnes l'ont-elles adopté et d'autres pas? | Origine du changement (D'où est venue cette technique?) | Avantages ? | Inconvénients ? Déficits ? Points faibles ? |
|---|--|---|--|--------------------|--|
| Techniques pour gérer les ravageurs | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |
| Etapes et description du changement (détails techniques supplémentaires sur les changements liés aux précipitations, aux températures, aux inondations et à la sécheresse) | Mesure dans laquelle le changement a été adopté (% de la population concernée qui a adopté ce changement) | Pourquoi certaines personnes l'ont-elles adopté et d'autres pas? | Origine du changement (D'où est venue cette technique?) | Avantages ? | Inconvénients ? Déficits ? Points faibles ? |
| Techniques pour désherber | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |
| Technique de Récolte et stockage | | | | | |
| | | | | | |
| Etapes et description du changement (détails techniques supplémentaires sur les changements liés aux précipitations, aux températures, aux inondations et à la sécheresse) | Mesure dans laquelle le changement a été adopté (% de la population concernée qui a adopté ce changement) | Pourquoi certaines personnes l'ont-elles adopté et d'autres pas? | Origine du changement (D'où est venue cette technique?) | Avantages ? | Inconvénients ? Déficits ? Points faibles ? |
| | | | | | |
| | | | | | |
| D'autre Technique | | | | | |
| | | | | | |
| | | | | | |

4. **Classer les cinq cultures et variétés spécifiques qui réussies le plus** (sont plus productifs) pendant une bonne année (bonnes précipitations et bon climat) ainsi que celles qui réussies le plus dans une mauvaise année. Donnez les raisons des classements faits.

HOMMES

| Rank | Bonne année | Les raisons du classement | Mauvaise année | Les raisons du classement |
|------|-------------------|---------------------------|-------------------|---------------------------|
| 1 | Culture / Variété | | Culture / Variété | |
| 2 | Culture / Variété | | Culture / Variété | |
| 3 | Culture / Variété | | Culture / Variété | |
| 4 | Culture / Variété | | Culture / Variété | |
| 5 | Culture / Variété | | Culture / Variété | |

FEMMES

| Rank | Bonne année | Les raisons du classement | Mauvaise année | Les raisons du classement |
|------|-------------------|---------------------------|-------------------|---------------------------|
| 1 | Culture / Variété | | Culture / Variété | |
| 2 | Culture / Variété | | Culture / Variété | |
| 3 | Culture / Variété | | Culture / Variété | |
| 4 | Culture / Variété | | Culture / Variété | |
| 5 | Culture / Variété | | Culture / Variété | |

5. Changement dans les cultures/variétés cultivées - HOMMES

| Les cultures et variétés cultivées aujourd'hui (chaque culture et variété listée si possible) | Cultivés pendant la période de Alpha ? (oui/non) et Dans quelles proportions ? (beaucoup plus, un peu plus, même proportion, un peu moins, beaucoup moins) | Si pas cultivée dans la période de Alpha, quel problème spécifique est ce que ce nouveau culture/ variété essaie de résoudre ? Si (oui) cultivée dans la période d'Alpha, expliquez pourquoi les gens continuent à le cultiver. | Est-ce qu'il y a des inconvénients, défis, points faibles liés à ces cultures/variétés ? |
|---|--|--|--|
| 1. | Oui / Non (cerclez un) Proportion : <input type="checkbox"/> Beaucoup Plus <input type="checkbox"/> Un peu Plus <input type="checkbox"/> Même proportion <input type="checkbox"/> Un peu moins <input type="checkbox"/> Beaucoup moins | | |
| 2. | Oui / Non (cerclez un) | | |

| | | | |
|--|--|--|---|
| | Proportion : <input type="checkbox"/> Beaucoup Plus <input type="checkbox"/> Un peu Plus <input type="checkbox"/> Même proportion <input type="checkbox"/> Un peu moins <input type="checkbox"/> Beaucoup moins | | |
| 3. | Oui / Non (cerclez un) Proportion : <input type="checkbox"/> Beaucoup Plus <input type="checkbox"/> Un peu Plus <input type="checkbox"/> Même proportion <input type="checkbox"/> Un peu moins <input type="checkbox"/> Beaucoup moins | | |
| 4. | Oui / Non (cerclez un) Proportion : <input type="checkbox"/> Beaucoup Plus <input type="checkbox"/> Un peu Plus <input type="checkbox"/> Même proportion <input type="checkbox"/> Un peu moins <input type="checkbox"/> Beaucoup moins | | |
| 5. | Oui / Non (cerclez un) Proportion : <input type="checkbox"/> Beaucoup Plus <input type="checkbox"/> Un peu Plus <input type="checkbox"/> Même proportion <input type="checkbox"/> Un peu moins <input type="checkbox"/> Beaucoup moins | | |
| Les cultures et variétés cultivées aujourd'hui (chaque culture et variété listée si possible) | Cultivés pendant la période de Alpha ? (oui/non) et Dans quelles proportions ? (beaucoup plus, une peu plus, même proportion, un peu moins, beaucoup moins) | Si pas cultivée dans la période de Alpha, quel problème spécifique est ce que ce nouveau culture/ variété essaie de résoudre ? Si (oui) cultivée dans la période d'Alpha, expliquez pourquoi les gens continuent à le cultiver. | Est-ce qu'il y a des inconvénients, défis, points faibles liés à ces cultures/variétés ? |
| 6. | Oui / Non (cerclez un) Proportion : <input type="checkbox"/> Beaucoup Plus <input type="checkbox"/> Un peu Plus <input type="checkbox"/> Même proportion | | |

| | | | |
|--|--|---|--|
| | <input type="checkbox"/> Un peu moins <input type="checkbox"/> Beaucoup moins | | |
| 7. | Oui / Non (cerclez un) Proportion : <input type="checkbox"/> Beaucoup Plus <input type="checkbox"/> Un peu Plus <input type="checkbox"/> Même proportion <input type="checkbox"/> Un peu moins <input type="checkbox"/> Beaucoup moins | | |
| 8. | Oui / Non (cerclez un) Proportion : <input type="checkbox"/> Beaucoup Plus <input type="checkbox"/> Un peu Plus <input type="checkbox"/> Même proportion <input type="checkbox"/> Un peu moins <input type="checkbox"/> Beaucoup moins | | |
| 9. | Oui / Non (cerclez un) Proportion : <input type="checkbox"/> Beaucoup Plus <input type="checkbox"/> Un peu Plus <input type="checkbox"/> Même proportion <input type="checkbox"/> Un peu moins <input type="checkbox"/> Beaucoup moins | | |
| 10. | Oui / Non (cerclez un) Proportion : <input type="checkbox"/> Beaucoup Plus <input type="checkbox"/> Un peu Plus <input type="checkbox"/> Même proportion <input type="checkbox"/> Un peu moins <input type="checkbox"/> Beaucoup moins | | |
| Listez les cultures et variétés cultivées pendant la période d'Alpha qui ne sont plus cultivées | | Pourquoi elles ne sont plus cultivées <i>(collectez les détails concernant changements liées au climat)</i> | |
| 1. | | | |
| 2. | | | |
| 3. | | | |
| 4. | | | <i>Si plus, mettez les et le pourquoi au verso du papier.</i> |

Changement dans les cultures/variétés cultivées - FEMMES

| Les cultures et variétés cultivées aujourd'hui (chaque culture et variété listée si possible) | Cultivés pendant la période de Alpha ? (oui/non) et Dans quelles proportions ? (beaucoup plus, une peu plus, même proportion, un peu moins, beaucoup moins) | Si pas cultivée dans la période de Alpha, quel problème spécifique est ce que ce nouveau culture/ variété essaie de résoudre ? Si (oui) cultivée dans la période d'Alpha, expliquez pourquoi les gens continuent à le cultiver. | Est-ce qu'il y a des inconvénients, défis, points faibles liés à ces cultures/variétés ? |
|---|--|---|--|
| 1. | Oui / Non (cerclez un) Proportion : <input type="checkbox"/> Beaucoup Plus <input type="checkbox"/> Un peu Plus <input type="checkbox"/> Même proportion <input type="checkbox"/> Un peu moins <input type="checkbox"/> Beaucoup moins | | |
| 2. | Oui / Non (cerclez un) Proportion : <input type="checkbox"/> Beaucoup Plus <input type="checkbox"/> Un peu Plus <input type="checkbox"/> Même proportion <input type="checkbox"/> Un peu moins <input type="checkbox"/> Beaucoup moins | | |
| 3. | Oui / Non (cerclez un) Proportion : <input type="checkbox"/> Beaucoup Plus <input type="checkbox"/> Un peu Plus <input type="checkbox"/> Même proportion <input type="checkbox"/> Un peu moins <input type="checkbox"/> Beaucoup moins | | |
| 4. | Oui / Non (cerclez un) Proportion : <input type="checkbox"/> Beaucoup Plus <input type="checkbox"/> Un peu Plus <input type="checkbox"/> Même proportion <input type="checkbox"/> Un peu moins <input type="checkbox"/> Beaucoup moins | | |
| 5. | Oui / Non (cerclez un) Proportion : <input type="checkbox"/> Beaucoup Plus | | |

| | | | |
|--|--|--|---|
| | <input type="checkbox"/> Un peu Plus <input type="checkbox"/> Même proportion <input type="checkbox"/> Un peu moins <input type="checkbox"/> Beaucoup moins | | |
| Les cultures et variétés cultivées aujourd'hui (chaque culture et variété listée si possible) | Cultivés pendant la période de Alpha ? (oui/non) et Dans quelles proportions ? (beaucoup plus, une peu plus, même proportion, un peu moins, beaucoup moins) | Si pas cultivée dans la période de Alpha, quel problème spécifique est ce que ce nouveau culture/ variété essaie de résoudre ? Si (oui) cultivée dans la période d'Alpha, expliquez pourquoi les gens continuent à le cultiver. | Est-ce qu'il y a des inconvénients, défis, points faibles liés à ces cultures/variétés ? |
| 6. | Oui / Non (cerclez un) Proportion : <input type="checkbox"/> Beaucoup Plus <input type="checkbox"/> Un peu Plus <input type="checkbox"/> Même proportion <input type="checkbox"/> Un peu moins <input type="checkbox"/> Beaucoup moins | | |
| 7. | Oui / Non (cerclez un) Proportion : <input type="checkbox"/> Beaucoup Plus <input type="checkbox"/> Un peu Plus <input type="checkbox"/> Même proportion <input type="checkbox"/> Un peu moins <input type="checkbox"/> Beaucoup moins | | |
| 8. | Oui / Non (cerclez un) Proportion : <input type="checkbox"/> Beaucoup Plus <input type="checkbox"/> Un peu Plus <input type="checkbox"/> Même proportion <input type="checkbox"/> Un peu moins <input type="checkbox"/> Beaucoup moins | | |
| 9. | Oui / Non (cerclez un) Proportion : <input type="checkbox"/> Beaucoup Plus <input type="checkbox"/> Un peu Plus <input type="checkbox"/> Même proportion <input type="checkbox"/> Un peu moins <input type="checkbox"/> Beaucoup moins | | |

| | | | |
|--|--|--|---|
| 10. | Oui / Non (cerclez un) Proportion : <input type="checkbox"/> Beaucoup Plus <input type="checkbox"/> Un peu Plus <input type="checkbox"/> Même proportion <input type="checkbox"/> Un peu moins <input type="checkbox"/> Beaucoup moins | | |
| Listez les cultures et variétés cultivées pendant la période d'Alpha qui ne sont plus cultivées | | Pourquoi elles ne sont plus cultivées (collectez les détails concernant changements liées au climat) | |
| 1. | | | |
| 2. | | | |
| 3. | | | |
| 4. | | | <i>Si plus, mettez les et le pourquoi au verso du papier.</i> |

IV. RETOURNE A L'ENTRETIEN EN PLENIER

Diagramme de Venn

Les facilitateurs vont utiliser Diagramme de Venn pour identifier les services étatiques, les ONG et d'autres qui soutiennent activement la communauté dans le cadre de l'agriculture.

Information à chercher sur les fonctions et utilité des différentes structures :

- Les types de services fournis
- Quelle est la fréquence des services fournis ?
- Ces services se trouvent à quelle distance de la communauté ?
- L'appréciation de ces services?
- Les projets liés à l'agriculture qui ont fonctionnés dans le village

Questions sur les informations climatiques

1. Quelles informations fournies par « Météo-Mali » êtes-vous habitués à recevoir ?

Le facilitateur doit demander aux participants de faire la liste des informations qu'ils ou elles reçoivent, et d'indiquer par « X », pour chaque type d'information, la fréquence de ces informations : tous les jours, tous les 10 jours ou chaque saison.

| Type d'information | Chaque Jour | Tous le 10 jours | Chaque saison |
|--------------------|-------------|------------------|---------------|
| | | | |
| | | | |
| | | | |

2. Comment recevez-vous les informations ?

- Radio
- Télévision
- Autres personnes
- Autre

3. Quelle importance donnez-vous à l'information météorologique fournie par « Météo-Mali » ?

- Faible
- Moyenne
- Élevée

4. Si « élevée » pourquoi est-ce que les informations fournies par Météo-Mali sont-elles utiles ?

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