ENABLING SMALL-SCALE FARMERS

How US development assistance influences local capacity for climate change adaptation: Lessons from Senegal

EXECUTIVE SUMMARY

Senegal is highly sensitive to the impacts of climate change. The livelihoods of about 77 percent of the Senegalese population depend on agriculture, which is adversely affected by the consequences of climate change. Against this backdrop, investments in agriculture must focus on increasing the food security and household incomes of small-scale farmers while enabling their adaptation to climate change. Feed the Future (FTF), a US government initiative to support global agricultural development, food security, nutrition, and poverty reduction, has recognized the need to integrate climate change adaptation in agricultural development programming in Senegal.

Senegal suffers the consequences of climate change, characterized by reduction and increased variability in rainfall and an increase in temperatures. For instance, average rainfall in the 2000-2009 period fell by 15 percent compared to 1920-1969, and average temperatures have increased by 0.9ºC (1.62ºF) since 1975.[1] These changes, combined with population growth, could decrease per capita cereal production by 30 percent by 2025[2] if the government and its development partners do not take measures to ensure effective adaptation to climate change in agricultural development programs.

Feed the Future in Senegal, one of 19 countries supported by the initiative, set out to improve productivity for small-scale farmers and fishers in the country, including by fostering adaptation to climate change and improved natural resource management. Oxfam sought to understand how FTF programming contributes to the capacity of small-scale farmers to adapt to climate change in Senegal. FTF is of particular interest as it represents an important food security program in Senegal from a major donor and has prioritized climate change adaptation as a critical issue in investments. Hence, lessons learned from this program could inform other agricultural development initiatives in Senegal.

1. C. Funk et al. A Climate Trend Analysis of Senegal, U.S. Geological Survey Fact Sheet (2012). Accessed May 22, 2013, http://pubs.usgs.gov/fs/2012/3123/FS12-3123.pdf

2. Ibid.

OXFAM America

To this end, Oxfam commissioned a country study focused on the Agriculture and Natural Resource Management project, an FTF project locally known as Wula Nafaa. Perspectives were also gathered from two other FTF projects: Yaajeende and the Economic Growth Project (PCE). Our field research showed that FTF investments are contributing to building livelihood assets, particularly through sustainable land use (forest resources preservation and conservation farming), finance for adaptation (facilitating access to credit) and innovations that increase yield. Conservation farming methods, in particular, promoted through Wula Nafaa have increased farmers' yields and sustainable land use, thereby reducing vulnerability to climate change impacts.

But there is considerable opportunity to improve and extend these outcomes. For instance, although farmers have adopted conservation farming, they perceive it as a technique for increasing yield rather than adapting to climate change impacts. They lack not only an understanding of their long-term vulnerability to climate change, but also access to short-term and long-term weather information, which would enable them to plan more effectively for the cropping seasons. Because they lack such understanding and information, farmers are not fully empowered to make informed decisions about strategies that could affect their vulnerability to climate change in the future.

Local and national institutions also lack relevant climate change information that could inform rural development plans as well as national-level policies. Furthermore, the National Adaptation Plan of Action (NAPA) of 2006 that sets priority activities for adaptation is based on limited information of climate forecasts, which means strategies based on the NAPA may be limited in the long-term.

To improve the ability of rural Senegalese communities to adapt to climate change, FTF and other donor initiatives should invest in:

- **Empowering farmers to** better anticipate and plan for climate change **by raising their awareness of climate change and its effects**;
- **Providing weather forecast information** for the short- and long-term, as well as enabling farmers to gather and interpret weather data from their own observations;
- **Strengthening local institutions'** ability to program and monitor projects that will improve adaptation to climate change; and
- **Incorporating climate change analysis and adaptation approaches** in formal national policies for development and agricultural investment.

BACKGROUND

As extreme weather events become the norm, it is vital to set up effective programs that help the most vulnerable people withstand the harmful impacts. Local communities in low-income countries need support from governments and donors, not only through direct development programs but also through national policies and programs that build sustainable adaptive capacities.

Senegal is highly vulnerable to the impacts of climate change. It already faces the challenge of addressing poverty and food insecurity, especially among the small-scale farmers whose livelihoods are further compromised by extreme weather. More than half of the Senegalese population lives in poverty, and the majority of these (65 percent) live in rural areas, where they work primarily in agriculture.[3] Climate change in Senegal is causing severe weather distortions, such as unpredictability in the start of the rainy season, declining rainfall, and rising temperatures, all of which affect agricultural ecosystems and fisheries. For instance, average rainfall in 2000-2009 decreased by 15 percent compared to the 1920-1969 base average, and farmers observe unpredictable starts and stops in the rainy season. These climatic changes, combined with population growth, may decrease per capita cereal production in Senegal by 30 percent by 2025.[4]

The US government, through its Feed the Future (FTF) initiative, is one of Senegal's major partners in supporting the agricultural sector and integrating climate change adaptation strategies and food security investments. The US government launched FTF in Senegal in FY2010 with the aim of contributing to the sustainable reduction of poverty and hunger as well as improving the nutritional status of the Senegalese people.[5] The initiative focuses on households in Senegal's northern, southern, and eastern areas, which have strong potential for agricultural growth, and fishing communities in the Sine-Saloum delta of western Senegal. By 2016, FTF will invest more than $149 million in five projects supporting agricultural and fisheries production, nutrition, agricultural research, and economic growth.[6]

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3. International Monetary Fund, "Senegal Poverty Reduction Strategy Paper," 2006, Accessed June 4, 2013. http://www.imf.org/external/pubs/ft/scr/2007/cr07316.pdf.

4. C. Funk et al. A Climate Trend Analysis of Senegal, U.S. Geological Survey Fact Sheet, 2012, Accessed May 22, 2013, http://pubs.usgs.gov/fs/2012/3123/FS12-3123.pdf

5. Feed the Future, Senegal: FY 2011-2015 Multi-Year Strategy, 2011, 12, Accessed May 15, 2013, http://feedthefuture.gov/sites/default/files/country/strategies/files/SenegalFTFMulti-YearStrategy.pdf.

6. Interview with USAID Senegal. 2012

In order to increase and sustain agricultural productivity and food security, FTF strategies integrate climate change adaptation as a cross-cutting issue. FTF Senegal uses four quantitative indicators to measure progress toward improved climate change adaptation and natural resource management:

The number of hectares of agricultural lands showing improved bio-physical conditions;

The number of stakeholders, mainly producers, implementing risk-reducing practices to improve resilience to climate change;

The number of stakeholders using climate information in their decision-making; and

The number of water resources sustainably accessed.[7]

Given the context of climate change impacts and recurrent food crises in the Sahel, Oxfam sought to learn whether FTF in Senegal responds to small-scale farmers' real and perceived needs, and whether it improves their ability to adapt to the effects of climate change. Oxfam commissioned a case study, "The Influence of US Development Assistance on Local Adaptive Capacity to Climate Change: Insights from Senegal" to explore this question.[8] We summarize the research findings and recommendations in this paper. Our field surveys focused primarily on the Agriculture and Natural Resource Management project (locally known as Wula Nafaa), and perspectives were also gathered from two other FTF projects—Yaajeende and the Economic Growth Project (PCE)—operating in the same geographic area.

With this research, Oxfam hopes to generate dialogue with stakeholders (donors, project implementers, and policymakers both in Senegal and the United States) to learn from field experiences, with the ultimate goal of improving programming that enhances farmers' ability to adapt to variable and extreme weather. In the following sections, we identify aspects where FTF contributes to building small-scale farmers' adaptive capacity and make recommendations for key areas where FTF should invest to have greater impact.

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7. Feed the Future, "M&E Guidance Series Volume 7: Measuring Natural Resources Management and Climate Change Adaptability under Feed the Future," accessed May 23, 2013, http://feedthefuture.gov/sites/default/files/resource/files/Volume7_FTFNRM.pdf

8. Henri Lo and Emmanuel Tumusiime (2013) "The Influence of US Development Assistance on Local Adaptive Capacity to Climate Change: Insights from Senegal." *Forthcoming* http://www.oxfamamerica.org/latest/research

METHODOLOGY

Data collection for this study included:

- synthesis and analysis of secondary data;
- focus groups and individual interviews with farmers, community leaders, NGO field agents, FTF project staff, and government and US Agency for International Development (USAID) technical staff; and
- field observations.

Primary data was collected from two villages each in the Tambacounda and Kedougou regions of southeastern Senegal where Wula Nafaa has conducted its activities.

ASSESSING FTF EFFECTS ON BUILDING ADAPTIVE CAPACITY TO CLIMATE CHANGE

Conceptually, this assessment is based on the local adaptive capacity (LAC) framework, which fits the development context of adaptation. The LAC framework has been used by development practitioners, particularly the Africa Climate Change Resilience Alliance (ACCRA),[9] as a tool to gauge and improve the design of development and humanitarian interventions. It provides a basis for determining whether or not development assistance is putting communities or households on a positive course for greater adaptability to climate change.

There are two inter-related areas central to strengthening adaptive capacity under the LAC framework: sustainable livelihoods assets and institutions.

Sustainable livelihoods assets are comprised of five types of capital: financial, physical, human, social, and natural. Positive impacts of FTF activities on each type of capital should enhance the adaptive capacity of the household or the community. Enhanced capital should enable individuals or communities to pursue strategies for making a living and coping with stressors like climate change effects.

Institutions, on the other hand, are rules that foster a system's adaptability. They create incentives that promote individual and collective action, and they are the medium through which external interventions either reinforce or

9. ACCRA is a consortium made up of Oxfam GB, the Overseas Development Institute, Save the Children Alliance, Care International and World Vision International and funded by DFID.

undermine existing adaptation practices.[10] Since institutions cannot be measured in the same way as assets, elements such as the level of participation in decision-making and the extent to which the voice of individuals and/or groups is heard are used as proxies in determining the direction of a community's adaptive capacity.

We also examined existing government policies and the macro environment for addressing adaptation to climate change in Senegal and how FTF can support the government's adaptation efforts in the future.

EFFECTS ON LIVELIHOOD ASSETS

1. Natural capital: Supporting sustainable management and governance

Natural capital consists of the natural resource stocks—such as forest, land, and water—that supply resources and services useful for livelihoods. For farmers, the most important natural asset for enabling adaptation is access to and sustainable use of land and water.

Oxfam's field interviews revealed that FTF is making an important contribution to sustainable land use in targeted communities, particularly through conservation farming and agro-forestry. Wula Nafaa actually began prior to FTF, with activities focused on natural resource management through reforestation, forest management plans, assisted natural regeneration, capacity building for better governance of forest resources, and forest products valorization.[11] Under FTF, Wula Nafaa has expanded its activities to agriculture (i.e., conservation farming and agro forestry) that is being integrated within the framework of forestry management principles. By implementing these land stewardship techniques, beneficiaries have improved their natural soil fertility. Producers interviewed also indicated that conservation farming (CF) techniques are improving water retention when rainfall is light, providing a viable option for adaptation.

2. Human capital: Knowledge generation and information sharing

Specific skills and knowledge are critical to enabling people to achieve sustainable livelihoods and withstand the effects of climate change. For example, successful adaptation to climate change requires information about probable changes in weather patterns, as well as knowledge about adaptation options and the capacity to implement suitable interventions. Farmers need weather forecasts and other climate-related information in

10. A. Agrawal. "The Role of Local Institutions in Adaptation to Climate Change," International Forestry Research and Institutions Program Working Paper (W08I-3) (2008).

11. Interview with Wula Nafaa official

order to plan agricultural activities, including those conducted through conservation farming, and institutions need this information in order to design and implement policies and programs.

FTF focuses on strengthening the capacity of producers through farming practices, like agroforestry and CF,[12] and gaining access to credit and inputs. It focuses less on empowering farmers with increased understanding of the current and projected climate change impacts. However, if farmers are unaware of the threats of climate change and what (besides CF) they can do to adapt, then they have little opportunity to make the strategic decisions that will ensure better outcomes in the longer term.

3. Financial capital: Enabling access to finance to pay for adaptation

Financial resources are important for adaptation activities, both at the farm and institutional levels. Limited income from farming prevents farmers from accumulating savings they could use to finance local adaptation initiatives.

Through interviews with farmers, Oxfam's research found that credit available through banks, credit unions, and the National Agency for Agricultural and Rural Advice (ANCAR) is either too expensive, not suited to farmers' needs or their business cycle, or all of the above. Recognizing that farmers face this barrier, the FTF Yaajeende and PCE projects equipped community-based service providers[13] to connect farmers with microfinance organizations.[14] Wula Nafaa assists farmers in establishing savings mechanisms that enable them to buy seeds at planting time. FTF also supports building financial capital by funding the World Food Programme's implementation of the program R4: Rural Resilience,[15] which includes a weather-indexed crop insurance component.

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12. According to the project technical staff, CF has increased yields by 25 percent and maximizes environmental benefits.

13. The community-based service providers are community members elected to serve in other agricultural roles in the village, including aggregation for input purchases and crop marketing, as well as dissemination of farming knowledge.

14. United States Agency for International Development. "The Mile Between the Market and the Farm," *Frontlines* (2012), Accessed May 22, 2013. http://transition.usaid.gov/press/frontlines/fl_jul12/FL_jul12_SENEGAL.html

15. First implemented by Oxfam America in Ethiopia, the R4: Rural Resilience program builds the resilience of rural communities through a combination of services, including improved resource management (risk reduction); insurance (risk transfer); microcredit (prudent risk taking); and savings (risk reserves). Oxfam America, in collaboration with the World Food Programme, is currently piloting the R4 program in Senegal's Tambacounda region. For more information: http://www.oxfamamerica.org/issues/insurance

4. Physical capital: Building infrastructure

Senegalese farmers struggle to gain access to physical assets, whether they are farming tools, quality seeds and fertilizers, or storage facilities. Man-made assets, such as infrastructure (public roads and bridges, market systems, water supply, and irrigation systems) and producer goods (tools and equipment, seeds, fertilizers, and storage facilities), can help people meet their basic needs and be more productive.

Yaajeende increases farmers' access to seeds and quality fertilizer by training community-based service providers who connect villages to input suppliers. The project also plans to build warehouses, which will enable farmers to secure their production and sell when prices rise. However, farmers still lack access to adequate farming tools, especially in the villages studied in the Kedougou region, where the rocky and clay soils are too hard for hoes and simple weeding machines to be effective. Wula Nafaa and PCE have attempted to address this technological deficit by introducing a "ripper" tool, which costs only about 30,000 fcfa (approximately $59), and, when attached to a plow with animal traction, digs a trench that farmers can easily fill with organic materials and fertilizers before planting.[16]

5. Social capital: Building cohesion and collaborative networks

In the context of adaptation to climate change, social capital is understood as a process of sharing risk and costs associated with shocks and stresses. For this reason, development programs planned in support of climate adaptation must take into account local power dynamics, enhancing positive social capital and working to counteract attitudes and practices that prevent social cohesion.

Wula Nafaa supports community-based organizations[17] and brings farmers together in groups for learning, which could facilitate social cohesion and an increased ability to rely on one another and share information. However, in two of the four villages studied, Wula Nafaa has not changed the social dynamics. In one community, social cohesion was already strong before Wula Nafaa initiated program activities, and residents have been able to collaborate on community works projects such as building firebreaks and establishing seed banks. However, in another community, where the social fabric is weak, the village chief's son made decisions that directly contributed

16. United States Agency for International Development , ""Le Ripper" Optimise le "Conservation Farming" au Senegal," 2012, Accessed May 23, 2013, http://www.youtube.com/watch?v=qtQhV2vLaA8.

17. International Resources Group, "Africa—Selected IRG Projects," Accessed May 23, 2013, http://www.irgltd.com/Our_Work/Projects/Africa.html

to the inclusion or exclusion of certain villagers in the Wula Nafaa program. This in turn determined these villagers' ability to benefit from program activities that could have enhanced their adaptive capacity.

While Wula Nafaa has had some positive influence on building social capital, it has not prioritized this aspect and therefore has not been able to overcome barriers to social cohesion such as those our research found in one village.

INSTITUTIONAL CAPACITY BUILDING

In addition to influencing individual and community-level capacity to adapt to climate change, development assistance can also affect institutional capacity. Formal and informal institutions at the local, regional, and national level can develop the capacity to anticipate and prepare for climate-related risks. While FTF has supported small-scale farmers' adaptive capacity, it could play a stronger role in building the capacity of Senegalese institutions.

In the case of Senegal, one institutional constraint is that Senegal's national agricultural policy does not explicitly integrate climate change issues. Nor is the role of climate change adaptation clearly stated in the mission of local bodies, such as the Regional Rural Development Directorates (DRDR) and the Rural Development Departmental Services (SDDR), decentralized structures of the Ministry of Agriculture that monitor the implementation of the agricultural policy. With increased technical knowledge and resources, these agencies could play a strong role in ensuring that farmers are able to increase their adaptive capacity through local development programs.

A second constraint is that Senegal's National Action Plan of Adaptation (NAPA), which is supposed to guide adaptation activities, lacks an implementation plan and fails to place those most at risk—including farmers—at the heart of the decision-making process. When Senegal wrote its NAPA in 2006, international guidance indicated that NAPAs should identify urgent adaptation needs, so the policy does not likely address longer-term issues. What the Senegalese government needs now is a climate change policy that incorporates climate forecasts into a medium- and long-term analysis. Climate integration in various policy documents (including the agricultural investment plan) would make it easier for donors and government agencies to coordinate their efforts around common goals.

Oxfam recognizes that local communities are at the center of adaptation, and that efforts to address the effects of climate change hinge on a community's awareness of the issues, their ownership of the process of adaptation, and their capacity to undertake and maintain adaptation activities. Ultimately,

national and sub-national plans and policies, as well as development projects, must reflect local communities' interests and experiences in order to effectively assist communities to realize their full potential to engage in climate change adaptation. At the time of writing, FTF is conducting a vulnerability assessment of the agriculture sector. This is one way that FTF can help the Senegalese government to identify more accurately those who are most at risk and ensure that their voices are heard in the formulation of climate adaptation strategies.

CONCLUSIONS AND RECOMMENDATIONS

Using the local adaptive capacity framework, Oxfam's research established that FTF projects in Senegal contribute to building livelihood assets, particularly sustainable land use through participatory forest resources management and conservation farming, as well as finance for adaptation by facilitating access to credit and innovations that increase yield. These projects can improve food security and reduce vulnerability to the impacts of climate change. However, more can still be done to make the most of FTF's contributions.

Development assistance can better facilitate adaptation by funneling external information and resources into communities. It is particularly well suited to promoting interactions across local, regional, and national structures; building flexibility into institutions; and providing space for collective learning that can lead to innovative approaches to adaptation.

To strengthen the ability of rural Senegalese communities to adapt to climate change, Feed the Future and other development initiatives should invest in the following:

- Empowering farmers to better plan for climate change by raising their awareness of climate change and its effects;
- Providing weather forecast information for the short- and long-term, as well as enabling farmers to gather and interpret weather data using their own observations;
- Strengthening local institutions' ability to develop programs and monitor projects that will improve adaptation to climate change; and
- Incorporating climate change analysis and adaptation approaches in formal national policies for development and agricultural investment.

Written by Julie Savane, based on Oxfam-commissioned research.

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