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Sustaining Development: Results from a Study of Sustainability and Exit Strategies among Development Food Assistance Projects

Bolivia Country Study

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Abbreviations and Acronyms

ADRA	Adventist Development and Relief Agency
ASC	agricultural service center
BJA	Bono Juana Azurduy
CAPyS	<i>comité de agua potable y saneamiento</i> (potable water and sanitation committee)
CHW	community health worker
DHS	Demographic and Health Survey
DILOS	Directorio Local de Salud (Local Health Directorate)
EPSAS	Empresa Pública Social de Agua y Saneamiento (public water and sanitation utility)
FANTA	Food and Nutrition Technical Assistance III Project
FAO	Food and Agriculture Organization of the United Nations
FFP	Office of Food for Peace
FFW	food for work
FGD	focus group discussion
FH	Food for the Hungry
FY	fiscal year
GIR	<i>generación de ingresos rurales</i> (rural income generation)
GOB	Government of Bolivia
HAZ	height-for-age z-score
IGA	income-generating activity
IPTT	Indicator Performance Tracking Table
kg	kilogram(s)
MCHN	maternal and child health and nutrition
NGO	nongovernmental organization
NRM	natural resource management
OTB	<i>organización territorial de base</i> (local grassroots organization)
PA	producer association
SAFCI	Salud Familiar Comunitaria Intercultural (Intercultural Family and Community Health)
SC	Save the Children
UNI	<i>unidad de nutricional integral</i> (comprehensive nutrition unit)
USAID	U.S. Agency for International Development
W&S	water and sanitation
WAZ	weight-for-age z-score
WHO	World Health Organization
ZM	Desnutrición Cero (Zero Malnutrition National Health Program)

Executive Summary

Background

From 2009 to 2016, the Tufts University Friedman School of Nutrition Science and Policy, a partner on the U.S. Agency for International Development (USAID)-funded Food and Nutrition Technical Assistance III Project (FANTA), conducted a multi-country study to assess the effectiveness of USAID's Office of Food for Peace (FFP) development food assistance projects' sustainability plans and exit strategies for achieving sustainable impacts after the projects exited their implementation areas.¹ In Bolivia, the focus country of this report, funding for FFP development projects ended in 2009, which provided the study team an opportunity to observe how project activities, outcomes, and impacts evolved over the 2 years after project exit. FFP development projects were implemented by four organizations in Bolivia in the technical sectors of maternal and child health and nutrition (MCHN); water and sanitation (W&S); and agriculture, income-generating activities (IGAs), and natural resource management (NRM). Cross-cutting infrastructure projects were also implemented in support of agriculture, IGA, and NRM interventions.

Objectives

The objectives of the study were to determine the extent to which activities, outcomes, and impacts of FFP development projects were sustained after the withdrawal of FFP funding; identify project and non-project factors that made it possible to sustain project benefits after the projects ended; assess how project design, sustainability plans, the development of exit strategies, and the process of exit affected sustainability; and provide guidance to future project implementers and funders regarding how to improve sustainability.

Methods

Three rounds of qualitative data collection were implemented 1 year apart, starting at the time of each project's exit in 2009. During qualitative data collection, the study team conducted key informant interviews and focus group discussions with project participants and non-participants, as well as with service providers and other stakeholders. The study team also visited and observed farmers' fields and infrastructure created by the projects. Two years after the projects' exited (2011), the study team also implemented a quantitative follow-up survey that replicated the endline evaluation surveys conducted by the projects. Indicators of project outputs, outcomes, and impacts at endline were compared with the same indicators at follow-up to assess what activities, outcomes, and impacts had been sustained. Primary data collection was complemented by information from baseline and midterm evaluation reports, as well as from other project documents.

Results

As successive rounds of data collection were implemented, the study team identified three factors that it considered to be critical to sustainability: an ensured source of **resources** to sustain the activities that contribute to sustainable impact, sufficient technical and managerial **capacity** on the part of project

¹ This report defines sustainability plans and exit strategies as follows:

- **Sustainability Plan:** A plan describing those elements of a project that incorporate sustainability concerns and increase the likelihood that project activities, outcomes, and impacts will continue after exit.
- **Exit Strategy:** An operational plan for withdrawing from target communities without jeopardizing progress toward project goals.

participants and service providers to continue implementing activities independent of the projects, and **motivation** on the part of service providers and project participants to continue engaging in these activities post-project. The study team also found that a fourth factor, **linkages** (including vertical linkages, such as from a community health worker [CHW] to the Government of Bolivia's [GOB's] health system, and/or horizontal linkages, such as among local committees), was also essential to consider, and appropriate linkages were critical to sustainability for most technical sector interventions. In addition, the study team found that the process of exit affected sustainability: **Gradual exit**, with the opportunity for project participants to operate independently prior to project closure, made it more likely that activities would be continued without project support. The results from each technical sector supported the importance of these factors.

Sustainability was judged in terms of the continuation of service delivery and service use, the adoption of practices promoted by the projects, and the maintenance or further improvement of project impacts. One of the key results applicable to all technical sectors was that evidence of significant impact at the time of project exit did not necessarily predict sustainability 2 years later. There were many examples of project impacts that were significant and positive at exit that were maintained or even improved 2 years later. Equally, there were many examples of positive impacts at exit that were not sustained and, in some cases, declined to baseline levels or below at follow-up. A synopsis of findings by technical sector follows.

MCHN: In the MCHN sector, projects trained volunteer CHWs to promote maternal and child health in the community by organizing mothers' groups; conducting monthly growth monitoring sessions combined with educational talks on nutrition and health; and undertaking home visits to encourage good nutrition, health, and hygiene practices. The projects worked to link CHWs to the national health system so that they would continue to receive supervision, training, and resources to conduct their work after project exit. The results were mixed: Where CHWs were effectively linked to the health system or to health projects implemented by other nongovernmental organizations (NGOs), they continued to provide services. Where such linkages had not been established, many CHWs lost motivation and stopped working. In addition, the withdrawal of free rations at the FFP projects' end affected beneficiary mothers' motivation to continue attending growth monitoring sessions, and these declines in attendance also reduced CHW motivation. However, the study's qualitative data indicated that after project closure mothers appeared to be following the projects' advice to substitute locally available foods for the project rations and were using project-provided recipe books to facilitate these substitutions. The projects had promoted the formation of CHW associations as a means of sharing best practices and providing mutual motivation for their continued work, but even though CHWs expressed interest in these associations, they lacked financial resources to travel to association meetings.

At the time of exit, the GOB was initiating two new MCHN-focused programs: *Desnutrición Cero* (the Zero Malnutrition National Health Program), which provided nutritional supplements at *unidades de nutricional integral* (UNIs) (comprehensive nutrition units), which in turn offered growth monitoring and nutritional advice to mothers of young children, and a conditional cash transfer, which provided cash vouchers to women who attended public health clinics to comply with primary health care recommendations (e.g., ante- and postnatal checkups, vaccinations, and growth monitoring). These government programs incentivized mothers to make use of clinic-based UNI services, rather than the community-based CHW services. As a result, mothers' participation in growth monitoring was high 2 years after exit, but not necessarily because of services accessed within the community.

Rates of exclusive breastfeeding until 6 months of age increased during the life of the FFP development projects studied in Bolivia, and these increases were well maintained after the projects' exit. However, some other health and hygiene practices, such as appropriate feeding during diarrhea and correct

handwashing behaviors, were less well maintained, possibly because the substitution of clinic-based for community-based service provision reduced CHW home visits to monitor and encourage these practices. In terms of impact, the substantial improvements in rates of stunting achieved during the life of the projects were maintained or improved after exit in all project areas.

W&S: The main intervention in the W&S sector was to support the construction of community water systems that would provide piped water to households. The FFP projects supported construction of piped water units that included a sink, in many cases a shower, and a flush toilet or improved latrine. Beneficiary households paid a connection fee for the units and a monthly fee for use of the piped water. The projects also organized water committees or, in instances where such committees were already operational, strengthened them with training in two key areas: maintenance and repair of the piped water system and administration of the fees collected. The W&S intervention combined all of the critical factors for sustainability: Beneficiaries greatly valued having piped water and were therefore motivated to pay for it, these fees provided the resources needed to ensure the continued function of the water systems, and the water committees demonstrated good technical and managerial capacity to administer the systems effectively. As a result, 2 years after exit, more than 75 percent of households in all areas, and as many as 95 percent in some areas, reported having piped water. Between 75 percent and 100 percent of these systems were maintained by the recipient community.

The projects worked to establish linkages between community water committees and municipal governments with the expectation that municipalities would be able to provide resources for repairs and refresher training in system maintenance when needed, but water committees did not take advantage of these linkages, citing concern that the resources from user fees would be diverted to other municipal priorities. This concern proved to be justified in at least one case where the municipality took over administration of the community water system, raised fees, and used the fees for purposes other than water system maintenance.

The implementation of microbiological testing of water quality and of chlorination at the tank was less well maintained. For these activities, all of the critical factors for sustainability were not present. Beneficiary households did not value (and, in many cases, because of taste, resisted) central chlorination of water, so water committees were not motivated to maintain these activities even though user fees could have provided the resources needed to carry out this treatment. In addition, gradual transition of water quality testing from the projects to the communities during project implementation was not done in most cases. According to the water committees visited during qualitative fieldwork, the FFP projects had arranged for water quality testing up until their exit; the committees did not do so independently prior to the projects' closure.

Agriculture, IGAs, and NRM: All of the FFP development projects studied in Bolivia worked to improve agricultural productivity, introduce improved crop and (in some cases) livestock production techniques, and diversify agricultural production by introducing new crops. After the midterm evaluations, the projects increased their emphasis on promoting the commercialization of production by linking farmers to markets and market information. Projects trained model farmers in the community and gave them inputs to use on their demonstration plots so that the model farmers could then train other farmers, who were organized into farmer groups. The projects expected that model farmers would continue providing training to farmer groups after project exit, despite no longer receiving free inputs from the projects. However, at follow-up, almost no model farmers were providing training to other farmers, and the percentage of farmers who reported having received training since the projects' exit was very low. Use of training and technical assistance had fallen among all of the project-targeted communities by follow-up, but decreased most dramatically in areas where project-supported training was

provided free until project exit, with a charge instituted after project closure. These results relate to the key factors of resources, capacity, and motivation identified earlier, in that although model farmers had the technical capacity, they stopped providing services when resources were no longer provided, as these resources served as incentives that, when removed, reduced their motivation.

The projects also organized and strengthened producer associations (PAs) with the goal of giving farmers a means of marketing their products (as produced or after processing) and purchasing inputs collectively to obtain more favorable prices. The PAs imposed quality and quantity requirements on the products that they worked with and usually charged a fee for membership. Projects worked to establish linkages between PAs and municipalities for continued assistance with access to markets and price information after the projects ended. Between endline and follow-up, however, participation in PAs fell, as did the proportion of farmers selling through PAs, while the proportion of farmers selling individually rose. Nonetheless, there were many examples of project-supported PAs that had successful long-term contracts with buyers, and some of the buyers were providing technical assistance and credit to PA members. Many PAs were also receiving support from the municipality, and some had joined with larger, regional PAs to further increase their market power.

Overall, the proportion of farmers selling any agricultural products fell from endline to follow-up in two of the FFP development project areas, but was maintained in the other two areas; the proportion selling was nonetheless fairly high, from more than 75 percent to 100 percent among all farmers at follow-up.² Agricultural incomes (adjusted for inflation) fell between endline and follow-up, but in all cases agricultural incomes 2 years after exit remained substantially higher than at baseline, although the post-project downward trajectory is troubling. Incomes of PA members at follow-up were significantly higher than incomes of non-members. In addition, although the proportion of farmers using agricultural techniques learned in the project fell in all targeted areas from endline to follow-up, the practices that were still being applied by a substantial proportion of farmers appeared to be those that improved productivity (which motivated their continued use) and did not require a high level of resources or technical capacity to implement.

In the area of NRM, where the context was appropriate, projects established irrigation systems that charged a fee for water use; the projects then trained irrigation committees to manage these systems. Projects implemented NRM interventions using demonstration plots to encourage use of soil-conserving techniques, and used food for work (FFW) and free inputs (such as seedlings) to engage communities in conservation activities, such as reforestation. After the projects' midterm evaluations, projects specifically targeted NRM techniques directly associated with improved productivity and/or resilience to climate shocks, and such techniques were found to be better maintained at follow-up than those that were not linked to such factors. While NRM practices that provided clear benefits were more likely to be sustained, the withdrawal of free inputs reduced the sustainability of those NRM activities that had used them. In contrast, where projects established commercial nurseries to provide seedlings to local communities as a profit-making venture, many of these nurseries were still functioning 2 years after exit, based in part on a business model that offered both motivation and resources (return on sales) and independent functioning (capacity) prior to project exit.

² The organizations implementing the endline evaluation collected data only from participant farmers. At follow-up, the study team collected data from a representative sample of all farmers in project communities, but included information to allow comparison of participant farmers at endline with the same group at follow-up.

Conclusions and Recommendations

As previously noted, the study findings in Bolivia demonstrate that results evaluated at the time of project exit do not necessarily predict the persistence of those same results 2 years later. Impact and sustainability are distinct achievements, and an exclusive focus on impact at exit may jeopardize sustainability. For example, providing free resources up to the time of project exit may maximize project impact, but the withdrawal of those resources poses a bigger threat to sustainability than a gradual withdrawal with the development of substitute resources. Project funders and implementers need to incorporate sustainability into project evaluation criteria to avoid an exclusive focus on the situation at the time of exit.

The study results strongly supported the importance of having all three critical factors—resources, capacity, and motivation—in place before project exit to improve the likelihood of sustainability. Many examples from the study demonstrated the necessity of all three of these factors and emphasized the likelihood that sustainability will not be achieved if any one factor is missing. While linkages were not universally critical, vertical linkages (e.g., of CHWs to the health system and of farmers and PAs to buyers) were in many cases essential to the successful continuation of former project activities.

The study's results also demonstrate the importance of establishing independent operation among community-based groups and organizations before project exit: Gradual exit with a transition from project-assisted to independent operation improved the likelihood of sustainability. Phase over of responsibility to municipalities or other donors or NGOs proved to be effective in some cases but not in others, and plans for such phase over need to be made with a realistic assessment of the resources, capacity, and motivation of these other entities to continue supporting project-initiated activities. Finally, when a project provides free resources—whether food rations to mothers, agricultural inputs to model farmers, or FFW to community members—withdrawal of those resources can threaten motivation for the continued participation of those who had received them and can jeopardize sustainability.

The results of the study in Bolivia led to the following recommendations for project designers, managers, and donors/funders, and for future research.

Recommendations for Project Designers and Managers

- Build sustainability plans into project design from the beginning: Identify the exit approach (phase-over or phase-out) and the specific roles and responsibilities each entity engaged with the project will have after project exit.
- Ensure that the critical factors—resources, capacity, and motivation—are addressed in the design of the sustainability plan for the project and in the project itself.
- Carefully assess the long-term sustainability of linkages intended to support project-related activities after project closure based on the resources, capacity, and motivation of the institution or entity involved. Focus on ensuring local capacity to negotiate future linkages given political turnover and changing priorities.
- As part of project design and sustainability planning, make explicit plans for replacing any material benefits provided by the project, including food, once project resources are withdrawn.
- Realistically assess the potential reach and coverage of project activities, and address barriers to inclusion so that sustainable benefits affect a majority of the population of a given implementation area, if possible.
- Carefully assess the likely benefit of each component of an intervention to the individual participants; those that offer a tangible benefit are more likely to be sustained.

- Withdraw resources and support gradually, allowing local institutions and organizations to operate independently while project support is still available.

Recommendations for Donors/Funders

- Incorporate indicators of sustainability into project assessment (monitoring and evaluation) and build time into the project cycle after resources are withdrawn and implementation has been completed to evaluate sustainability. This may require extending the overall timeframe of the project cycle.
- Integrate indicators of sustainability into project monitoring and evaluation across the project's life of activity to ensure that a focus on endline impacts does not jeopardize investment in longer-term sustainability.
- Require projects to maintain archives of baseline, midterm, and endline evaluations, as well as associated data, along with information derived from routine project monitoring and associated reporting.
- Set aside funding for post-project impact evaluation.

Recommendations for Future Research

- Incorporate into sustainability studies, when possible, a control (randomly assigned) or comparison group to permit an experimental research design in order to strengthen conclusions.
- Collect information on activities, outcomes, and impacts at the level of the target communities and beyond, rather than focusing only on the intended direct beneficiaries. That is, design sustainability studies to capture not only direct, but also second- and third-order indirect effects (for example, project impact not only on agricultural income, but on household income from all sources).
- Consider studies to compare the long-term impacts on low-income communities of targeting project resources to the poorest of poor farmers versus targeting those with more resources who may have greater potential.

1. Study Overview and Objectives

To be effective, development projects must result in lasting change. Projects may meet their objectives by improving economic, health, or social conditions while they are operating, but genuine success is achieved only through sustained change that does not depend on continued external resources. The U.S. Agency for International Development (USAID) recognized this in 2006, when it began requiring that all applications for Office of Food for Peace (FFP) development food assistance projects³ include explicit sustainability plans, that is, explanations of how projects intend to ensure that their benefits will last beyond the project life cycle. The USAID-funded Food and Nutrition Technical Assistance III Project (FANTA) contracted the Friedman School of Nutrition Science and Policy at Tufts University to assess the effectiveness of sustainability plans and exit strategies used in FFP development food assistance projects in achieving sustainable impacts. The multi-country study was conducted using a mixed-methods approach in Bolivia, Honduras, India, and Kenya between 2009 and 2016. This report presents key findings of the Bolivia research. A report synthesizing findings from all four countries is also available (Rogers and Coates 2015).

USAID Food for Peace Development Projects

FFP is a USAID program, authorized under the U.S. Government's Farm Bill, that supports projects intended to increase food security in vulnerable populations in the developing world. The program, in existence since 1954, provides food commodities (such as wheat, rice, lentils, and other foods), value-added foods (such as corn-soy blend and ready-to-use supplementary food), and complementary cash resources to support projects implemented by nongovernmental and intergovernmental organizations in some of the world's most resource-poor and food-insecure settings. Projects supported by FFP typically include interventions in several sectors, including maternal and child health and nutrition, water and sanitation, agricultural development, rural income generation, natural resource management, and microfinance.

Development food assistance projects, such as those included in this study, make use of food and/or cash resources—supported by other project approaches (e.g., training, infrastructure improvements, and social and behavior change communication)—to feed vulnerable groups directly (as in the provision of supplementary foods for the treatment and prevention of child malnutrition or cash vouchers for the purchase of select food commodities) or to support development-related activities (as in the provision of food or cash for work to support participation in natural resource management or infrastructure construction interventions). Food can also function as an incentive for participation in project activities.

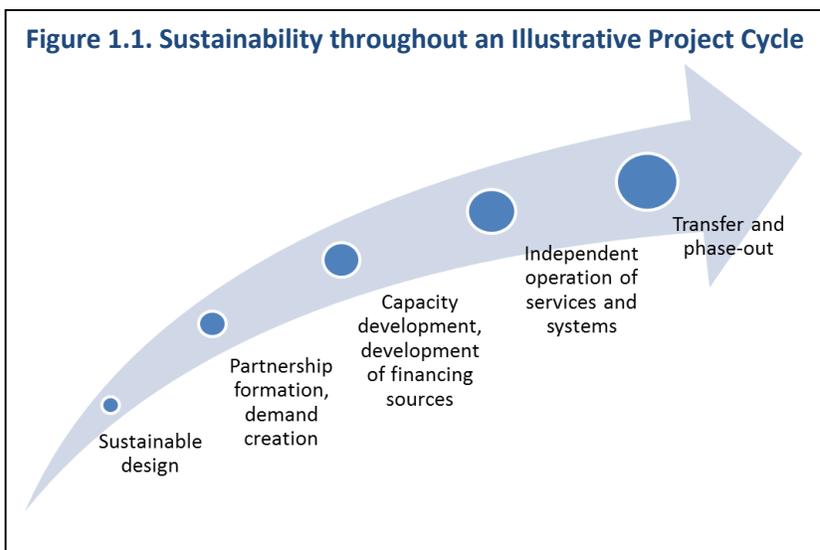
The present study addresses the sustainability of FFP development projects implementing activities in a range of technical sectors in Bolivia. The findings of the study are likely to be applicable not only to FFP and other food-assisted projects, but to a broad range of development interventions.

³ Development food assistance projects have previously been referred to as Title II programs, development programs, development assistance programs, and multi-year assistance programs.

Sustainability is achieved when outcomes and impacts (and sometimes activities) are maintained or even expanded after a project withdraws its resources through the exit process. A **sustainability plan** should represent all the elements of project design that take sustainability into account and should increase the likelihood that project outcomes and impacts and (where relevant) activities continue. An **exit strategy**, by contrast, relates specifically to the portion of a sustainability plan that deals with the process of “phase-out” (withdrawal of external support) and/or “phase-over” (transfer of responsibility) by an implementing organization from an activity, a project, or an entire area by the end of a project cycle (Rogers and Macias 2004; Levinger and McLeod 2002). “Exit” can also refer to the graduation of individuals from external support for certain activities (Gardner et al. 2005). For example, an organization may decide to phase out its technical support to farmer groups once the groups’ members have been trained, are registered with the government, have a constitution and a renewable resource base, and have demonstrated that they can access and use market information and negotiate contracts with buyers independently.

It is a common misconception that a “sustainability plan” and an “exit strategy” connote actions that need to be taken only at the final phases of a project’s closeout. On the contrary, a well-designed sustainability plan should be developed from the beginning of a project’s conception, with actions tailored to each stage of project design, implementation, and closeout. As illustrated in **Figure 1.1**, stages of sustainability throughout a project can include (though are not limited to) partnership formation, creation of demand for services or practices, capacity development, consolidation of capacity through continued application of practices learned, and exit. The phase-out or phase-over stage of an activity should be triggered by the achievement of criteria that are likely to be predictive of sustainability. While FFP development food assistance projects have been required to incorporate mechanisms for achieving sustainability into their design since 2006, few awardees had developed detailed, explicit sustainability plans or exit strategies by the time of completion of this

study.⁴ Elements such as capacity building and training, strengthening of vertical and horizontal linkages, and promoting self-governance and self-financing have been used throughout the design of various FFP projects to contribute to sustainability. However, the study team’s comprehensive review of the sustainability plans and exit strategies of all FFP development food assistance projects operating worldwide in 2009 found that only a handful of awardees in two countries—Bolivia and



⁴ FFP guidance for FY 2016 projects now requests a fairly comprehensive description of all of the necessary and sufficient capacities, practices, behaviors, systems, and linkages a proposed project expects are needed to sustain the outcomes articulated in its theory of change, including a description of plans for all specific, tangible resource transfers provided to project beneficiaries. This guidance further requires descriptions of exit strategies (e.g., phase down, handover, and termination) for each activity and identification of concrete timelines and benchmarks for the transition of any project-financed activities to local private or public sector service delivery systems (USAID 2016). FFP’s FY 2016 guidance also provides links to multiple resources on how to consider various aspects of sustainability and incorporate sustainability into project plans in various sectors (USAID n.d. [updated April 20, 2016]).

Honduras—had developed detailed and explicit sustainability plans and exit strategy documents that were intended to be used as roadmaps for project implementation (Koo 2009).

There are several reasons why few projects had developed detailed, explicit sustainability plans or exit strategies as of the start of this study. One is that there is little empirical evidence to guide organizations in designing exit strategies and implementation processes to yield longer-term, sustainable results. These evidence gaps exist partly because funds for evaluation have typically been tied to project cycles, not reserved for assessment after projects end. A second reason relates to the real methodological challenges of attributing progress or lack thereof to projects that ended years ago. And, despite the fact that sustainability plans have been required in FFP project applications since 2006, FFP has typically held projects accountable for achieving impacts over the life of the project activities, but not for ensuring that those benefits are maintained following projects' closure.⁵ There is an implicit assumption that large, short-term impacts will result in improved sustainability. However, the strategies used to achieve short-term impacts may actually undermine the likelihood of producing lasting results.

FFP is to be commended for supporting studies such as this one and for requiring awardees to think about sustainability and exit strategies in their applications. While FFP has been taking steps to increase its focus on sustainability, additional strides must be made to build the evidence base to institutionalize these changes within FFP's processes and to ensure broader learning within the implementing community.

This study is designed to contribute to that evidence base by achieving the following objectives:

- Determining the extent to which activities, outcomes, and impacts of FFP projects are sustained after the withdrawal of external funding⁶
- Identifying project and non-project factors that make it possible to sustain project benefits after a project ends
- Assessing how the process of “exiting” affects sustainability
- Providing guidance to future projects regarding how to ensure sustainability

Many of these evidence gaps fall under the umbrella of “delivery science,” that is, the study of how to better deliver assistance. In the context of sustainability, this extends to understanding the dynamic processes that continue (or do not continue) after a development project ends. The results of this multi-country study, including those specific to the Bolivia research documented here, are intended to help guide FFP development food assistance projects and other development practitioners in the best approaches for achieving lasting positive change.

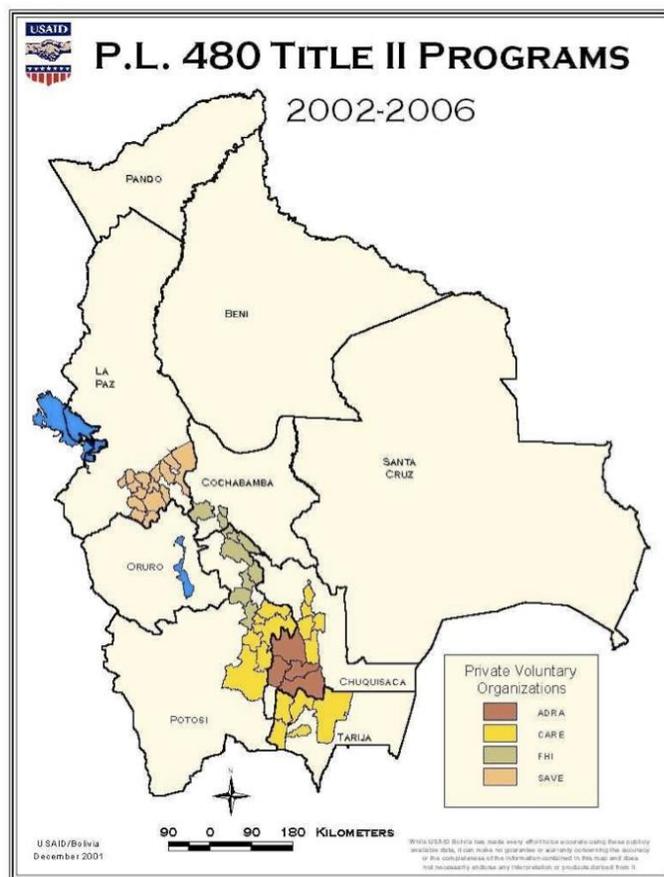
⁵ Recent shifts in broad USAID and FFP-specific priorities have moved toward promoting approaches that focus more explicitly on sustainable development, for example, by incorporating “systems thinking” into the design of FFP and other USAID projects. See, for example, USAID's *Local Systems: A Framework for Supporting Sustained Development* (2014). Nonetheless, endline evaluations still focus on measuring baseline-endline impacts rather than indicators of sustainability, although there were indications at the time of the release of this report that this, too, may be changing.

⁶ The following definitions, taken from USAID's *Glossary of Evaluation Terms* (2009), are applied in this study (note that these definitions have been updated in the current version of USAID's Automated Directives System):

- **Activity:** A specific action or process undertaken over a specified period of time by an organization to convert resources to products or services to achieve results.
- **Outcome:** A result or effect that is caused by or attributable to a project, program, or policy. Outcome is often used to refer to more immediate and intended effects.
- **Impact:** A result or effect that is caused by or attributable to a project or program. Impact is often used to refer to higher-level effects of a program that occur in the medium or long term, and can be intended or unintended and positive or negative.

The FFP development food assistance projects studied in Bolivia were implemented by Adventist Development and Relief Agency (ADRA), CARE, Food for the Hungry (FH), and Save the Children (SC). The specific locations where the projects operated during the time period covered in this study are shown in **Figure 1.2**. ADRA, which had been implementing FFP projects in Bolivia since 1976, worked in the department of Chuquisaca; CARE, implementing with FFP funds in Bolivia since 1999, worked in the departments of Chuquisaca, Potosí, and Tarija; FH, which had received FFP support in Bolivia since 1983, worked in the departments of Potosí and Cochabamba; and SC targeted the *altiplano* region of the department of La Paz in what was its first FFP-funded project in the country.

Figure 1.2. Food for Peace Project Implementation Areas in Bolivia



Note: FH is referred to as “FHI” in this figure.

The FFP projects in Bolivia undertook interventions in three technical sectors—maternal and child health and nutrition (MCHN); water and sanitation (W&S); and agriculture, income-generating activities (IGAs), and natural resource management (NRM)—and implemented cross-cutting infrastructure projects in such areas as road construction. The projects implemented in Bolivia incorporated explicit sustainability plans into their project applications and, when FFP decided to withdraw support at the end of the 2002–2008 project period, each project developed an explicit exit strategy. This study was designed to assess the sustainability of project impacts and outcomes in 2011, 2 years after the projects ended.

This report is structured as follows:

- **Section 2** details the conceptual frameworks guiding the study design.

- **Section 3** describes the data collection and analysis methods used, as well as the study's limitations.
- **Section 4** provides a brief overview of the design and operating context of each of the four FFP development projects studied.
- **Sections 5–7** present the study findings by sector.
- **Section 8** discusses overall findings.
- **Section 9** presents a set of associated recommendations.

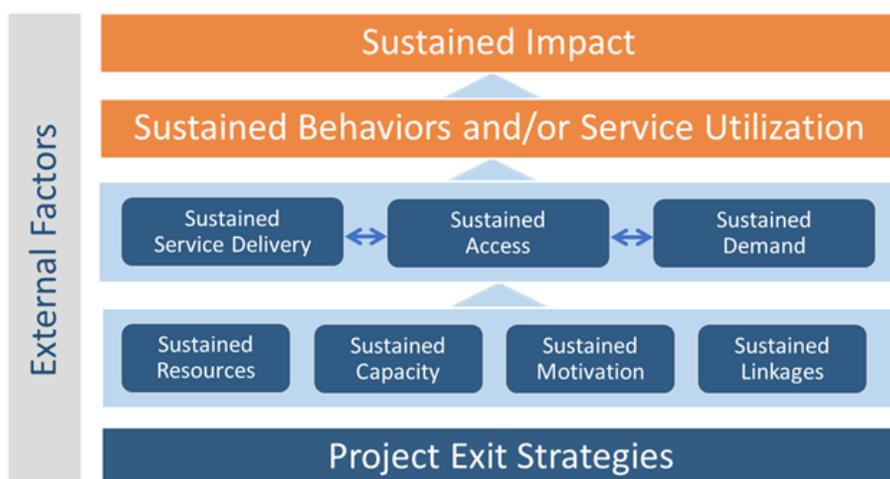
Each of the three sector results sections (5–7) first summarizes the elements of the sector interventions that were intended to lead to sustained or expanded benefits and the planned exit strategy for that sector. The subsequent four subsections of each sector results section present results related to the implementation of these sustainability components and exit processes in association with the documented sustainability of: service delivery (organized by factors related to resources, capacity, motivation, and linkages), service use, uptake and continuation of recommended practices, and impacts. The final subsection for each sector summarizes key sustainability findings and lessons learned.

2. Conceptual Framework and Hypothesized Factors Predicting Sustainability

Based on observations during the early stages of the study, the study team formulated a conceptual framework of factors that were hypothesized to predict continued benefit after the end of a project (**Figure 2.1**).

The framework is based on the idea that most project activities can be grouped into three categories of implementation outputs: 1) creation or strengthening of service *delivery* mechanisms, 2) assurance of beneficiary *access* to services, and 3) improvements in beneficiary *demand* for services. For example, the MCHN components of the projects in this study trained community health workers (CHWs) to provide community-based health services, such as growth monitoring, to strengthen service delivery. Activities to improve beneficiary access to services included reducing social, geographic, and time barriers to services through community-based growth monitoring and CHW home visits. Activities to improve beneficiary demand for services included health and nutrition education to sensitize child caretakers to the role that behavior changes, including increased health service uptake, can play in child health.

Figure 2.1. Sustainability Plans and Exit Strategies Conceptual Framework



As shown in the framework, the sustainability of project impacts was hypothesized to depend on the continued delivery of these types of services and/or the continued adoption and use of practices and behaviors promoted in the project. The study team hypothesized that sustained service delivery, service use, and practices require four key factors: 1) a sustained source of *resources*; 2) sustained technical and managerial *capacity*, so that service providers can operate independently of the awardee; 3) sustained *motivation and incentives* that do not rely on project inputs; and often 4) sustained *linkages* to other organizations or entities that can promote sustainability by augmenting resources, refreshing capacity, and motivating frontline service providers and beneficiaries to provide and make use of services and to continue practices promoted by the projects.

The study team expected that the same categories of factors needed to sustain service delivery would also be critical to sustain demand. Beneficiaries would require the resources, capacity, motivation, and linkages to demand, afford, and participate in services and to implement desired behaviors. Sustained access is the confluence of supply and demand. It pertains to the ability and motivation of beneficiaries to

continue to avail themselves of services that were previously subsidized or free (demand) and to the geographic and physical accessibility of the services (supply).

The study team also hypothesized that the exit process would be critical to sustainability. In particular, the team hypothesized that a more gradual exit that allows a period of independent operation with some supervision is likely to be more successful in promoting sustained impact than abrupt disengagement. A final hypothesis underlying the study was that external shocks, such as periodic droughts, political crises, or global market fluctuations, as well as key contextual factors, such as governmental structure, other projects operating in the area, and/or cultural beliefs, could threaten the sustainability of activities, outcomes, and impacts achieved during the project unless recognized and managed from project conception by incorporating resilience strategies and other contingencies into the sustainability plan.

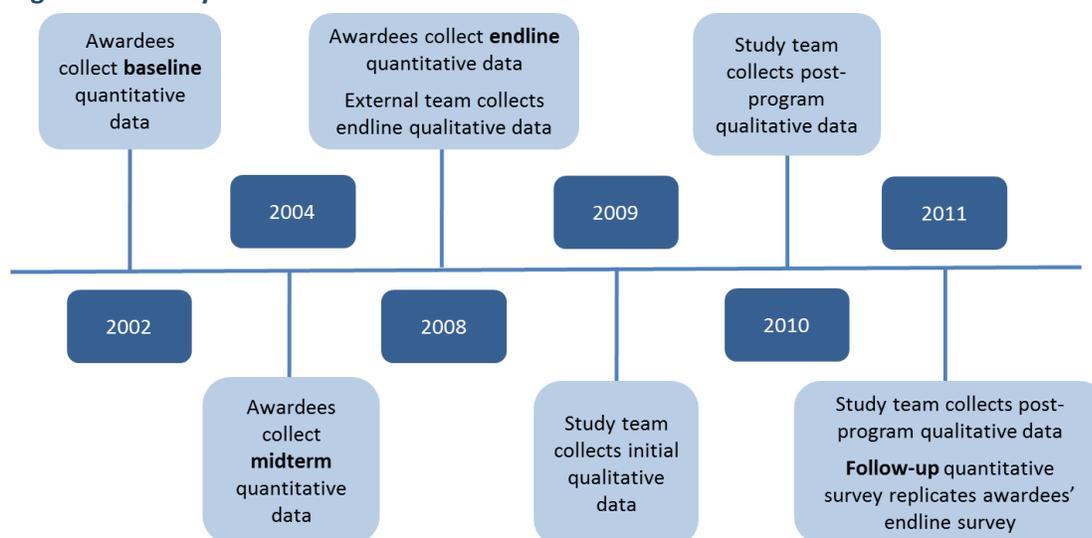
3. Research Methods and Analysis Approach

3.1 Overview of Data Sources and Timeline

The study used a combination of qualitative and quantitative methods to collect primary data, which were complemented with secondary data from awardee reports (e.g., quantitative baseline, midterm, and endline evaluation reports; a qualitative final evaluation covering all awardees and conducted by an external, USAID-funded team [van Haeften et al. 2009]; and regular reports required by USAID). The study team conducted three rounds of annual qualitative data collection, including focus group discussions (FGDs), key informant interviews, site visits, and direct observations, between 2009 (at the time of project exit) and 2011, in order to understand project implementation, sustainability plans, and exit strategies in the four awardee areas.⁷ During the third round of qualitative data collection, the study team also conducted a quantitative survey in each project's target communities, replicating the awardees' 2008 endline evaluation surveys. This was done to assess the degree to which activities, outputs, and impacts achieved during the life of the projects were sustained 2 years after project exit. Additional information was obtained from project documents, including project proposals, Indicator Performance Tracking Tables (IPTTs), and documented sustainability plans.

Sustainability was assessed by comparing quantitative outcome and impact indicators at endline and follow-up. Baseline information was used to assess the degree to which the level of change from endline to follow-up reflected a continuation of a positive project impact (that is, an improvement from baseline). Qualitative information was used to understand the reasons underlying observations of changes (or lack of changes) between endline and follow-up. **Figure 3.1** shows the timeline of data sources used in the study. All qualitative and quantitative primary data collection methods were reviewed and approved by the Tufts University Institutional Review Board for the Social and Behavioral Sciences. Informed consent procedures were implemented prior to all interviews and FGDs. Data were de-identified prior to analysis, and only the study team had access to the data in hard copy or in electronic form.

Figure 3.1. Study Methods Overview and Timeline



⁷ This study began after the quantitative and qualitative endline evaluations were conducted by the awardees and USAID, respectively.

3.2 Qualitative Methods

The study team collected qualitative data to understand stakeholder perceptions of the processes involved in project exit and to inform analysis and interpretation of the quantitative results that identified which project outputs, activities, and impacts were sustained, how, and why. **Table 3.1** provides details for each awardee on the number of interviews and FGDs conducted, the number of communities where they were undertaken, and the types of informants encountered for each round of data collection. Locations for data collection for each awardee were chosen to represent a range of conditions and project interventions, since not every project component was implemented in every community. A minimum of two municipalities per province and two communities per municipality were selected for qualitative data collection, with interviews extending to nearby communities affected by the projects. Projects operating in fewer provinces included more municipalities per province. The qualitative rounds of data collection were conducted in the same geographic areas and at the same season each year to limit, to the extent possible, that seasonal factors would not confound year-to-year comparisons. Specifically, qualitative data collection was undertaken in May, during the transition from the rainy to the dry season, so that the team could observe crops in the field and at harvest.

FGDs were conducted with women's groups, producer associations (PAs), water committees, and other community organizations, as well as with groups of farmers/producers and women with small children. Focus group size typically ranged from 8 to 12 participants, and discussions were typically conducted by a facilitator, with a second person taking notes and ensuring that no key points were missed. FGDs were usually taped (with permission), so that summary transcriptions could be prepared, reviewed, and coded. FGDs were conducted in Spanish. Typically, FGD participants spoke enough Spanish so that the discussions could easily be explained to any participant in the group who was more comfortable in the local language. Focus groups of mothers were conducted with only the mothers and their children present. Focus groups of farmers typically included both men and women, as did focus groups of water committee members. Most CHWs were women, but focus groups contained CHWs of both sexes, as appropriate.

Key informants were drawn from the same general populations as the FGDs. These interviewees were chosen from a broad spectrum of community members, including committee leaders, mothers, producers (both those who participated in the FFP projects and those who did not), vocal community members with strong opinions on project results, and participants who remained quiet in FGDs. Some key informants had participated in the FGDs and others had not. The qualitative study team visited the homes and fields of community members and observed facilities constructed during the FFP projects (such as piped water systems and latrines) and assessed the results of the project on the individual's hygiene, health, apparent economic status, and living conditions. During the qualitative data collection, team members also visited infrastructure projects that the awardees had facilitated (such as water tanks, roads, and farmers' fields) to assess their quality and maintenance over time. In addition, the study team identified and interviewed others in the municipality and beyond who were involved in project activities, including municipal officials, health center personnel, staff at other institutions and nongovernmental organizations (NGOs) working in the region, and industry representatives involved in the value chains. Current and former regional and central FFP project staff were also interviewed. Interviews and FGDs were conducted in the community at a suitable location or, when appropriate, in nearby municipal centers or in the offices of (individual) respondents.

Interview and FGD guides were developed by the study team based on the factors hypothesized to be important for sustainability after initial visits to several of the communities. Interviews and FGDs were not transcribed word for word, but detailed summaries were prepared independently by the two interviewers who had been present at the interviews. These summaries included verbatim quotes when

relevant. Initial themes were identified based on the factors hypothesized in advance to be important. Additional themes were added based on the content of the interviews. The two interviewers reviewed the summaries independently and concurred on the themes to be added.

Table 3.1. Information Sources for Qualitative Data Collection in Implementation Areas, by Project

ADRA							
Program Sector	Respondent	No. of Interviews	No. of Communities	No. of Interviews	No. of Communities	No. of Interviews	No. of Communities
		2009		2010		2011	
MCHN	Focus Group – Mothers and Women’s Group Leaders	3	5	2	6	4	6
	Individual Mothers	3		3		6	
	Individual CHWs	3		4		3	
	Community Health Center Personnel	2		2		2	
	Municipal Leadership	3		4		4	
	NGO	2		3		0	
W&S	Community CAPyS* Leadership	1	1	1	1	5	3
	Focus Group – Beneficiaries	0		1		3	
	Municipal Leadership	1		1		2	
	Municipal EPSAS**	1		1		1	
Ag/IGA/NRM	Focus Group – Producers	1	2 Municipalities	4	3 Municipalities	3	3 Municipalities
	Individual Producers	1		3		9	
	Producer Associations	2		4		3	
	Micro-Credit Enterprises	2		0		0	
	Irrigation Committees	0		1		2	
	Buyers	0		0		1	
	Municipal Leadership	4		7		7	
	NGO	2		3		3	
NRM Leaders	3	2	4				
Awardee	Chief Operating Officer	1	Technical Specialist (Ag/IGA/NRM)	1		PA Technical Support	2

* CAPyS = *comité de agua potable y saneamiento* (potable water and sanitation committee)

** EPSAS = Empresa Pública Social de Agua y Saneamiento (public water and sanitation utility)

CARE							
Program Sector	Respondent	No. of Interviews	No. of Communities	No. of Interviews	No. of Communities	No. of Interviews	No. of Communities
		2009		2010		2011	
MCHN	Focus Group – Mothers and Women’s Group Leaders	3	5	5	6	5	5
	Individual Mothers	3		3		4	
	Individual CHWs	2		5		2	
	Community Health Center Personnel	1		4		5	
	Municipal Leadership	3		3		3	
	NGO	0		1		0	
W&S	Community CAPyS* Leadership	1	2	2	3	3	3
	Focus Group – Beneficiaries	1		3		2	
	Municipal Leadership	1		3		2	
	Municipal EPSAS**	0		1		0	
Ag/IGA/ NRM	Focus Group – Producers	2	2 Municipalities	3	4 Municipalities	3	4 Municipalities
	Individual Producers	5		4		6	
	Producer Associations	1		3		2	
	Micro-Credit Enterprises	0		0		0	
	Buyers	0		1		1	
	Municipal Leadership	5		5		6	
	NGO	4		5		3	
	NRM Leaders	1		0		0	
Awardee	National Program Director and Director of Monitoring	1	Health Technical Specialist	1	GIR*** Technical Support	1	

* CAPyS = *comité de agua potable y saneamiento* (potable water and sanitation committee)

** EPSAS = Empresa Pública Social de Agua y Saneamiento (public water and sanitation utility)

*** GIR = *generación de ingresos rurales* (rural income generation)

FH							
Program Sector	Respondent	No. of Interviews	No. of Communities	No. of Interviews	No. of Communities	No. of Interviews	No. of Communities
		2009		2010		2011	
MCHN	Focus Group – Mothers and Women’s Group Leaders	2	4	4	4	3	4
	Individual Mothers	2		5		1	
	Individual CHWs	1		4		3	
	Community Health Center Personnel/UNI*	4		3		3	
	Municipal Leadership	3		3		3	
	NGO	0		1		0	
W&S	Community CAPyS** Leadership	2	2	2	2	3	3
	Focus Group – Beneficiaries	2		2		1	
	Municipal Leadership	2		3		3	
	Municipal EPSAS***	0		0		1	
Ag/IGA/ NRM	Focus Group – Producers	3	2 Municipalities	7	3 Municipalities	4	3 Municipalities
	Individual Producers	0		5		7	
	Producer Associations	1		2		2	
	Irrigation Committees	1		0		0	
	Buyers	0		1		0	
	Municipal Leadership	2		4		4	
	NGO	0		4		1	
	NRM Leaders	2		2		3	
Awardee	National Program Director and Health Director	1	PA Technical Support	1			

* UNI = *unidad de nutricional integral* (comprehensive nutrition unit)

** CAPyS = *comité de agua potable y saneamiento* (potable water and sanitation committee)

*** EPSAS = Empresa Pública Social de Agua y Saneamiento (public water and sanitation utility)

SC							
Program Sector	Respondent	No. of Interviews	No. of Communities	No. of Interviews	No. of Communities	No. of Interviews	No. of Communities
		2009		2010		2011	
MCHN	Focus Group – Mothers and Women’s Group Leaders	2	5	2	5	3	5
	Individual Mothers	5		5		5	
	Individual CHWs	4		5		4	
	Community Health Center Personnel/UNI*	2		4		4	
	Municipal Leadership	2		5		4	
	NGO	1		1		0	
W&S	Community CAPyS** Leadership	3	2	0	5	0	3
	Focus Group – Beneficiaries	0		0		0	
	Municipal Leadership	2		4		4	
	Municipal E***	0		0		0	
Ag/IGA/NRM	Focus Group – Producers	6	3 Municipalities	4	4 Municipalities	4	4 Municipalities
	Individual Producers	8		4		10	
	Producer Associations	3		2		2	
	Irrigation Committees	2		1		2	
	Buyers	1		2		2	
	Municipal Leadership	2		5		4	
	NGO	0		1		0	
	NRM Leaders	2		0		1	
Awardee	Executive Director	1	Director of Programs	1			

* UNI = *unidad de nutricional integral* (comprehensive nutrition unit)

** CAPyS = *comité de agua potable y saneamiento* (potable water and sanitation committee)

*** EPSAS = *Empresa Pública Social de Agua y Saneamiento* (public water and sanitation utility)

3.3 Quantitative Methods

Table 3.2 shows the data sources, locations, dates, and number of respondents for the baseline, midterm, and endline evaluations and follow-up project surveys. The baseline, midterm, and endline evaluations’ quantitative surveys were implemented by the awardees; the follow-up survey, which repeated each awardee’s endline survey, was implemented by the study team. The follow-up survey was conducted in the same months as the endline evaluations (between August and November), as this period is after harvests, allowing farmers to report on what they harvested and sold during the most recent season.

During the follow-up survey, community-level data were collected on each community by means of a questionnaire administered to community leaders in a group interview. Data collected at the community level included services available, new projects implemented, and presence of community organizations, as well as local terms and measures for use in quantifying agricultural production.

Questionnaires for the follow-up surveys were based on the awardees’ endline evaluation survey questionnaires, with some questions specific to the study added; questionnaires were pretested and modified as necessary to ensure clarity. Community questionnaires were also developed based on information needs, and these questionnaires were similarly pretested in several communities prior to implementation. Interviewers were recruited by the study’s collaborating research firm from among experienced enumerators with whom they had worked before and were trained through a combination of office- and field-based experiences. After training, the most proficient interviewers were selected. In the field, interviewers worked in teams, with one interviewer administering the agriculture, IGA, and NRM questionnaire and one administering the MCHN and W&S questionnaires. Supervisors occasionally sat in on interviews and reviewed completed questionnaires at the end of each day to check for completeness

and errors.⁸ Data were entered into password-protected files using CSPro; respondents in the database were identified by ID number to ensure anonymity. Consistency checks within the data entry program provided a second line of quality control on the data.

Table 3.2. Data Sources for Quantitative Study Information across Projects

Data Source	Month Year	Sample Size	Location (Department)	Data Collected by:	Available to Study Team for Analysis?
ADRA					
<i>Baseline Survey</i>					
MCHN Survey	June 2005	n/a	Chuquisaca	ADRA; validated by external consultant	No
Ag/NRM Survey	June 2005	n/a	Chuquisaca	ADRA; validated by external consultant	No
<i>Midterm Survey</i>					
MCHN Survey	June 2005	n/a	Chuquisaca	ADRA; validated by external consultant	No
Ag/NRM Survey	June 2005	n/a	Chuquisaca	ADRA; validated by external consultant	No
<i>Endline Survey</i>					
MCHN Survey	Sep 2008	827 caretakers, 1,196 children	Chuquisaca	ADRA; validated by external consultant	Yes
Ag/NRM Survey	Sep 2008	676	Chuquisaca	ADRA; validated by external consultant	Yes
W&S	Sep 2008	420	Chuquisaca	ADRA; validated by external consultant	Yes
<i>Follow-Up Survey</i>					
MCHN Survey	Oct 2011	661 caretakers, 916 children	Chuquisaca	Tufts University/ Consejo de Salud Rural Andino	Yes
Ag/NRM Survey	Oct 2011	812	Chuquisaca	Tufts University/ Consejo de Salud Rural Andino	Yes
W&S	Oct 2011	220	Chuquisaca	Tufts University/ Consejo de Salud Rural Andino	Yes
Water Committee	Oct 2011	11	Chuquisaca	Tufts University/ Consejo de Salud Rural Andino	Yes
CARE					
<i>Baseline Survey</i>					
MCHN Survey	June 2005	n/a	Chuquisaca, Potosí, Tarija	CARE; validated by external consultant	No
Ag/NRM Survey	June 2005	n/a	Chuquisaca, Potosí, Tarija	CARE; validated by external consultant	No
<i>Midterm Survey</i>					
MCHN Survey	June 2005	n/a	Chuquisaca, Potosí, Tarija	CARE; validated by external consultant	No
Ag/NRM Survey	June 2005	n/a	Chuquisaca, Potosí, Tarija	CARE; validated by external consultant	No
<i>Endline Survey</i>					
MCHN Survey	Aug 2008	1,058	Chuquisaca, Potosí, Tarija	CARE; validated by external consultant	Yes
Ag/NRM Survey	Aug 2008	1,200	Chuquisaca, Potosí, Tarija	CARE; validated by external consultant	Yes
<i>Follow-Up Survey</i>					
MCHN Survey	Sep 2011	1,115	Chuquisaca, Potosí, Tarija	Tufts University/ Consejo de Salud Rural Andino	Yes
Ag/NRM Survey	Sep 2011	1,116	Chuquisaca, Potosí, Tarija	Tufts University/ Consejo de Salud Rural Andino	Yes

⁸ Hard copies of the questionnaires were stored in locked cabinets in the offices of the collaborating research firm, Consejo de Salud Rural Andino.

Data Source	Month Year	Sample Size	Location (Department)	Data Collected by:	Available to Study Team for Analysis?
FH					
<i>Baseline Survey</i>					
MCHN Survey	June 2005	n/a	Cochabamba, Potosí	FH; validated by external consultant	No
Ag/NRM Survey	June 2005	n/a	Cochabamba, Potosí	FH; validated by external consultant	No
<i>Midterm Survey</i>					
MCHN Survey	June 2005	n/a	Cochabamba, Potosí	FH; validated by external consultant	No
Ag/NRM Survey	June 2005	n/a	Cochabamba, Potosí	FH; validated by external consultant	No
<i>Endline Survey</i>					
MCHN Survey	Sep 2008	496 caretakers, 1,666 children	Cochabamba, Potosí	FH; validated by external consultant	Yes
Ag/NRM Survey	Sep 2008	610	Cochabamba, Potosí	FH; validated by external consultant	Yes
<i>Follow-Up Survey</i>					
MCHN Survey	Oct 2011	697	Cochabamba, Potosí	Tufts University/ Consejo de Salud Rural Andino	Yes
Ag/NRM Survey	Oct 2011	659	Cochabamba, Potosí	Tufts University/ Consejo de Salud Rural Andino	Yes
SC					
<i>Baseline Survey</i>					
MCHN Survey	June 2005	n/a	La Paz	SC; validated by external consultant	No
Ag/NRM Survey	June 2005	n/a	La Paz	SC; validated by external consultant	No
<i>Midterm Survey</i>					
MCHN Survey	June 2005	n/a	La Paz	SC; validated by external consultant	No
Ag/NRM Survey	June 2005	n/a	La Paz	SC; validated by external consultant	No
<i>Endline Survey</i>					
MCHN Survey	Aug 2008	760	La Paz	SC; validated by external consultant	Yes
Ag/NRM Survey	Feb and July 2008	362	La Paz	SC; validated by external consultant	Yes
<i>Follow-Up Survey</i>					
MCHN Survey	Sep 2011	781	La Paz	Tufts University/ Consejo de Salud Rural Andino	Yes
Ag/NRM Survey	Sep 2011	657	La Paz	Tufts University/ Consejo de Salud Rural Andino	Yes

The study team had access to the datasets from the 2008 endline and 2011 follow-up surveys and performed its own calculations of impact and outcome indicators based on these data; results from the 2002 baseline and 2004 midterm evaluations reported here were taken from awardee and evaluator reports,⁹ as the team did not have access to the original data from these surveys.

The 2008 endline and 2011 follow-up indicators were calculated by the study team from the original data, using the methods described by the awardees in their IPTTs or quantitative endline evaluation reports, so as to maintain comparability of baseline, midterm, endline, and follow-up calculations. A significant change ($\alpha \leq .05$) in the desired direction for an indicator was interpreted as evidence of improvement from endline to follow-up, and a significant change in the undesired direction was interpreted as evidence that

⁹ At the time of this study, FFP awardees were responsible for conducting baseline surveys and preparing associated reports. The midterm evaluation surveys for this particular set of projects were conducted by a team of external evaluators hired by FFP.

the achievement was not sustained.¹⁰ A non-significant change in this context implied that the researchers could not state with statistical certainty that there was any change in either direction. Whether an observed change was important in terms of its relevance to assessing project sustainability (separate from statistical significance) was a matter of judgment, and the results are reported with this perspective. In some cases, the study team computed additional indicators, described in the appropriate results sections of this report, to have comparable indicators across awardees. The quantitative data allowed for comparisons of endline and follow-up values for service provision and use, use of practices, and impact indicators.

Note that the 2008 project endline evaluation surveys were not consistently administered to a representative sample of community members (that is, population-based sampling was not consistently used), and different methods were used to select respondents. For example, the endline MCHN questionnaires were administered to all families with children under 5 years of age. The W&S questionnaires for ADRA and FH were administered only to a subsample of the MCHN sample. The agriculture, IGA, and NRM questionnaires were administered only to farmers who had participated in the awardees' agriculture or NRM training projects and were drawn from the awardees' list of participants at endline. Awardee evaluations did not include control groups for attribution of impact; however, information on nutritional status (stunting) and practices (exclusive breastfeeding) from a recent Demographic and Health Survey (DHS) provide a basis for comparison.

In 2011, the study team's follow-up survey was administered to a representative sample of the appropriate community members.¹¹ The MCHN and W&S questionnaires were administered to a representative sample of mothers of children under 5 years of age; the agriculture, IGA, and NRM questionnaires were administered to a representative sample of all producers in the awardees' areas of influence, with a question to identify which farmers were or had been participants in the FFP project.¹² The midterm and endline evaluation surveys were administered only to project participants. Comparisons between endline

¹⁰ The sample size for the follow-up surveys was calculated to detect a 10 percentage point difference from the endline value of the most demanding of key indicators (that is, assuming a starting value of 50 percent, the most conservative assumption) in a two-tailed test with 80 percent power and $\alpha = 0.05$. The significance level used for all hypothesis tests was $\alpha = 0.05$. All significance tests were two-sided, using the null hypothesis of no difference between endline and follow-up results. Statistical analyses were performed using Stata (version 12.0). Differences between values of indicators at endline and follow-up (2 years after project exit) were assessed using chi-square tests for proportions and two-sided independent sample t-tests for means. In addition, multivariate regression models were used to assess relationships between project inputs and their outcomes or impacts, controlling for related external factors. Survey commands were employed to adjust for the study's two-stage cluster sampling design.

¹¹ The sampling frame for each 2011 survey consisted of the communities in a given awardee's area of influence. Communities were divided into three strata: those with MCHN and W&S activities; those with agriculture, IGA, and NRM activities; and those with both sets of activities (MCHN and W&S activities, as well as agriculture, IGA, and NRM activities). Sampling was done with probability proportional to size so that no weighting was necessary to represent beneficiary communities in any of the technical sectors. Once communities were selected, sampling of households was done by randomly selecting a starting point and a direction and selecting households along that line that included a mother of a child under 5 years of age or a farmer. If the interviewers did not encounter enough households when they reached the border of the community, they randomly selected a new direction and continued. The sampling fraction was determined by the ratio of households to the number of households needed in the cluster, information that was available from the awardees. For the endline surveys, the awardees used their own methods to select respondent households and individuals, sometimes drawing from the awardee's own list of project beneficiaries. These methods are noted where relevant in the text.

¹² The follow-up surveys included a question that identified which respondent farmers represented the comparable group to those interviewed in 2008. For ADRA, FH, and SC, these were farmers who reported that they had participated in the awardee's FFP project during the 2002–2008 implementation period. For CARE, these were farmers who had participated in one of CARE's promoted value chains in 2008 and in 2011. FH's follow-up survey also included a question about whether farmers said that they had been trained by the FFP project during the 2002–2008 implementation period. Many of these farmers did not define themselves as "participants" in response to the earlier question. (Of the 515 farmers interviewed, 467 said that they had been trained by the awardee, but only 187 defined themselves as participants.) For comparability between endline and follow-up, analysis of project participants included only those who defined themselves as such.

and follow-up are therefore between participant farmers in 2008 and 2011; comparisons between baseline and follow-up are for all farmers.

Indicator Construction

The awardees' project documents specified the activities, outcomes, and impacts that they intended to achieve during the life of the project, and the study team calculated key outcome and impact indicators (used to judge project sustainability) from the data collected in the endline and follow-up quantitative surveys. For indicators of nutritional status, weight-for-age z-score (WAZ) and height-for-age z-score (HAZ) were calculated using the updated 2006 World Health Organization (WHO) Child Growth Standards (WHO 2006); data collected prior to the endline evaluation were converted for comparison using the method described in Yang and de Onis (2008). All four awardees defined stunting as HAZ less than -2 , with a cutoff for outliers of z-scores of -5 or $+5$. The baseline was calculated with cutoffs of z-scores of -5 and $+5$ for all anthropometric calculations. These cutoffs were used to eliminate outliers, rather than the WHO recommended cutoffs of HAZ of -6 or $+6$ and WAZ of -6 or $+5$ to allow comparison with baseline data. However, results did not change when the WHO standard cutoffs were used.

For indicators on agricultural/livestock income, income was adjusted for inflation using consumer price indices from the Food and Agriculture Organization of the United Nations' (FAO) FAOSTAT database (FAO 2013) and recalculated to reflect 2011 US\$ using the annual inflation rates of consumer prices provided by the World Bank (2012).

Comparison of agricultural income and yield data required adjustment due to the extreme rightward skew of these distributions (that is, the distributions contained several extremely high values that, although accurate, could distort the results). In this report, therefore, medians and α -truncated means (means of the distribution, with the top and bottom 2.5 percent of cases removed) are presented. The distributions of crop yields are truncated at three times the interquartile range above the upper bound of the third quartile; only non-zero yields are included.

3.4 Study Limitations

The study encountered challenges related to design and data quality, many of which are unique to this type of post-project evaluation and the retrospective nature of the research. As described previously, the study was started just as the projects were closing and after their final evaluations were complete. This meant that the awardees were not aware at the time of their endline evaluation surveys that sustainability would be assessed. It also meant that the study team did not have influence over the design of the endline evaluations. Consistent with USAID policy, awardees were not required to assign a control or comparison group at their baseline, midterm, and endline evaluations. Therefore, the study team could not employ an experimental study design. The lack of a comparison group compromised the study team's ability to determine statistically whether maintenance, improvements, or deterioration in impact indicators after the projects ended were attributable to the projects' effectiveness and the sustainability of their benefits or to non-project factors. Triangulation of multiple data sources, including key informant interviews, FGDs, and direct observation, was used, along with assessment of potential confounding factors, to mitigate these challenges. While the optimal study design might have been longitudinal, this was not feasible because endline evaluation surveys did not collect household identifiers to enable the study team to return to the households that had been previously surveyed.

Another challenge was ensuring comparability between the study team's follow-up surveys and the awardee endline surveys that had been implemented 2 years earlier, while also ensuring data quality. The

study team based the follow-up surveys on the questionnaires that were administered in the awardees' endline surveys, with some additions, but without modifying the original questions. This was done to enable endline/follow-up comparisons, even where overall survey design and individual questionnaire items could have been improved. Some indicators that would have been useful to compare at follow-up were not collected at endline, and often not reported in the baseline reports. As a result, some elements of the awardees' projects were not addressed in the follow-up surveys, and their sustainability could not be determined.

The goal of the FFP development food assistance projects in Bolivia was to promote increased food security in the communities in which they worked. However, as previously mentioned, endline evaluation surveys for the agriculture, IGA, and NRM interventions were, in most cases, administered only to farmers who had participated in the projects' activities: Subjects were drawn from the awardees' participant lists. The follow-up survey collected data on all eligible community members in each technical sector, with a question permitting identification of those who had been project participants. Therefore, comparison between endline participants and participants at follow-up was possible, as was comparison between all farmers at baseline and all farmers at follow-up. However, comparison between all farmers at endline and follow-up was not possible.

Unfortunately, the institutional archiving of monitoring and evaluation data was not a prioritized or standardized practice among the FFP development projects in Bolivia at the time of the study. Baseline and midterm evaluation survey datasets were not available in most cases. In lieu of raw data, the team relied on indicator results as reported in the awardees' midterm and endline evaluation reports and/or their IPTTs, preventing statistical comparisons with baseline data. In addition, most former project staff had departed the organizations by the time of the follow-up surveys, and detailed project documentation was not always available. Last, the follow-up surveys were conducted only 2 years after the end of the projects in Bolivia. As such, activities, outcomes, and impacts that were sustained over the time period of the study may not have been sustained in the longer term. These limitations underscore the challenges of conducting sustainability research, particularly if such research is not anticipated from the start of the project.

4. Project Descriptions and Operating Context

4.1 Project Activities

Four awardees implemented the 2002–2008 FFP development food assistance projects in Bolivia, targeting areas of the country with high levels of food insecurity with directly distributed food rations to supplement the diets of young children and pregnant women and as food for work (FFW) to “pay” beneficiaries for participation in community infrastructure projects. Awardees also monetized food rations¹³ to provide services across project components that worked to integrate MCHN, W&S, agriculture, IGAs, and NRM. However, not all project components were implemented in every community. Related infrastructure projects, including roads, irrigation systems, stables, stock water ponds, and silos, were also implemented using FFW and monetized FFP food for inputs.

The overall goal of the FFP development projects studied in Bolivia was to improve household food security in project implementation areas. The projects’ strategic objectives, also common across the four Bolivia awardees, were to:

- Reduce child malnutrition and improve MCHN through integrated health, education, and W&S interventions
- Improve agricultural productivity and agriculture-related incomes through marketing links
- Improve food availability and access through NRM practices for sustainable agricultural production

The awardees used common strategies to achieve these objectives in their respective projects (these strategies are summarized in the sector-specific sections of this report). The awardees had also incorporated explicit sustainability plans into their project applications. In 2004–2005, USAID contracted a team of evaluators to conduct midterm evaluations that made several recommendations that substantially changed the direction of the projects in their final 2 years. The specific activities and changes that were made are described in the respective sections, by technical sector.

4.2 Operating Context

Implementation of the community-based rural development projects funded by FFP was assisted by a national movement toward political decentralization in Bolivia. The 1994 Law of Popular Participation encouraged municipal governments to assume more responsibility for the welfare of their communities and decentralized both financial resources and political authority. This law promoted the development and legal recognition of the community *organización territorial de base* (OTB) (local grassroots organization)—a system that provides a mechanism for communities to organize to influence policy making through participation in community and municipal meetings and in the development of project proposals. As a result of these strengthened municipal and community organizations, the FFP awardees in Bolivia were able to coordinate with local leaders in executing and supervising projects, receiving counterpart funding (through municipal budgets) and engaging in strategic partnerships to promote long-term sustainability.

Even before the 1994 law, Bolivian culture was strongly communitarian, with community members traditionally owing a certain number of days per month for public projects, such as road maintenance.

¹³ Monetization refers to the process of selling FFP food on the market in a given recipient country to obtain cash resources for the purchase of needed complementary project inputs.

Community meetings at which citizens provided input into annual community action plans were held regularly, and the public health system organized community meetings to share health statistics with the community through information analysis committees.

Community elections are held regularly in all areas so that communities have input into their governance. Community elections also encourage a level of transparency in communication from leaders to members of the groups to which they are elected. Generally, this high level of community engagement is conducive to successful implementation of activities that require community participation. Frequent elections also pose challenges, however. When community elections take place, so do municipal elections, and there is often turnover at the municipal level. This turnover can destabilize existing agreements and plans as priorities shift and individual leaders try to distinguish themselves from their predecessors.

4.3 Food for Peace Development Projects' Closure

The Bolivia FFP projects' midterm evaluations were followed by an announcement a year later that FFP development projects would not be renewed in the country. While sustainability plans were part of the projects for 2002–2008, after this announcement (during 2006–2007), the awardees developed explicit and detailed exit strategies that incorporated phase-over or phase-out approaches, benchmarks indicating readiness for exit, and allocations of post-project responsibility. The awardees' exit strategies included the gradual phase out of donated food rations throughout the final year of the project. They also included strategies to strengthen municipal partners' capacities throughout the exit process and to link FFP activities with national programs and/or with other donors for continued funding and technical support of some initiatives.

Each awardee developed exit strategies that included an assessment of community capacity and readiness for exit, but FH adopted a more strategic approach. As part of its advance planning, beneficiary communities in FH target areas were ranked in terms of their likelihood of achieving sustainability, and timing of project exit was based on these rankings. Those communities deemed unlikely to succeed in sustaining the interventions were exited first, to allow FH to concentrate efforts in those communities judged to have a higher probability of success. About 18 percent of FH target communities were exited early. The rest were exited in stages, with the most promising communities exited last to give them the greatest chance of achieving sustainability.¹⁴ The criteria for judging communities unlikely to achieve sustainability included low population density, limited water resources, and high levels of seasonal migration, among others, all of which FH felt made a successful transition to sustainability more difficult (FH/Bolivia 2007).

At the time the FFP projects were closing, the government, under a newly elected populist president, Evo Morales, started to implement a series of programs to provide decentralized health and nutrition services to Bolivian communities, with goals similar to those of the MCHN component of the FFP projects. For example, *Desnutrición Cero (ZM)* (Zero Malnutrition National Health Program) was started in 2006–2007, and one of its objectives was to construct *unidades de nutrición integral* (UNIs) (comprehensive nutrition units) to provide micronutrient supplements and antenatal care to pregnant women; postnatal care, growth monitoring, and a supplementary food similar to corn-soy blend (called *Nutribébé*) to children (if the municipal government paid for it); and related services. The government also started a conditional cash transfer program in 2009, known as the *Bono Juana Azurduy (BJA)*, which provided cash incentives for mothers to use preventive health services, complete vaccinations for their children,

¹⁴ The follow-up survey included all FH areas in the sampling frame, irrespective of their sustainability ranking. Their representation should have been proportional to their representation in the overall sampling frame of communities, but this was not possible because the FH rankings of communities in the study sample were not available.

and attend growth monitoring sessions at clinics or UNIs. A third national initiative, Salud Familiar Comunitaria Intercultural (SAFCI) (Intercultural Family and Community Health), encouraged health care personnel to work alongside local community leaders and families to design responses tailored to locally identified health problems. At the time of the FFP development projects' exit from Bolivia, the SAFCI program was in the early stages of development, and much of the progress implementing it and these other national initiatives took place after the FFP projects' closure. All of these initiatives had the potential to replace inputs formerly provided through the FFP projects, but because they were relatively new at the time of exit, these national programs did not figure into the sustainability plans of the awardees, aside from efforts to ensure that the awardee-trained CHWs were linked to their local health centers for supervision, training, resources, and integration into the decentralized health system.

4.4 Activities after Food for Peace Exit

Not all FFP awardees studied in Bolivia exited from the communities in which they were working after FFP resources were withdrawn. In the health sector, for example, FH continued to operate in almost half of its former FFP communities with new funding, working with organizations like UNICEF to provide technical and administrative support to the UNIs and to align local health priorities with national initiatives in malnutrition prevention and growth monitoring. As the government expanded the UNIs, FH helped promote decentralization in its former FFP communities to facilitate establishment of community-based UNIs, the goal of which was to provide outreach for early identification of malnutrition. Similarly, in coordination with other NGOs, CARE maintained a presence in Tarija, supporting the development of national health programs, such as the ZM initiative.

Awardees also continued to work in the areas of agriculture, IGAs, and NRM after exit. FH received funding from both the United States Department of Agriculture and the Inter-American Development Bank to continue IGAs in some of its (as well as CARE's) former FFP communities. CARE also continued working in some of its former FFP communities on promotion and marketing within select value chains. ADRA received (non-FFP) USAID funding for a period after FFP exit to continue supporting its agricultural service centers. **Table 4.1** shows the percentage of communities in which the awardees were still working at the time of the follow-up surveys. Most of the awardees maintained a presence in at least some of their communities, with FH maintaining the greatest presence in its former FFP implementation areas.

Table 4.1. Percentage of Communities Where Former FFP Awardees Were Still Working 2 Years after FFP Project Exit

Awardee	n	Percent
ADRA	55	5.5%
CARE	86	2.3%
FH	39	43.6%
SC	42	7.1%

Source: 2011 Community Surveys; n is the number of communities surveyed.

5. Results: Maternal and Child Health and Nutrition Sector

Summary

All of the FFP development project awardees in Bolivia studied trained CHWs to provide health services for pregnant and lactating women and children under 3 years of age (e.g., provision of growth monitoring, educational talks, supplementary foods, and home visits to monitor health and hygiene). CHWs encouraged mothers to make use of preventive health care at clinics and coordinated with clinic staff during growth monitoring sessions to provide vaccinations and other services. CHWs worked as volunteers but received occasional material incentives and were credentialed by the awardee. Awardees worked to link CHWs with government-run health centers to provide continued training, supervision, materials, and supplies after exit to motivate CHWs to continue providing community-based services.

At the time of the FFP projects' exit, the Government of Bolivia was implementing two new national MCHN programs: ZM, which offered nutritional supplements along with nutrition education and primary care, and BJA, a conditional cash transfer that rewarded mothers for using preventive prenatal, postnatal, and well-baby care at government health clinics.

After the projects exited, some CHWs found work with other NGOs doing health-related activities, and a few found work within the government's health system, though awardee credentials did not assure CHWs of employment after exit. New government services diverted demand for CHW services to clinics that were typically outside the community, and a decline in participation reduced CHW motivation to continue growth monitoring sessions and home visits. Some CHWs repurposed their mothers' groups to work on general health and welfare issues or to undertake IGAs. Linkages between health centers and the CHWs were inconsistently maintained, but where CHWs were supported by the health system, they maintained their motivation to provide community services, had the resources to do so, and retained their capacity through refresher trainings.

Mothers' participation in growth monitoring was sustained after the projects' exit, but with much of that participation taking place at clinics rather than in the community, leaving these mothers with less exposure to CHW health talks and home visits. Reductions in stunting achieved during the projects' life were sustained or improved after exit, and the practice of exclusive breastfeeding to 6 months of age was sustained, while other health practices (e.g., handwashing, feeding during diarrhea) declined.

5.1 Maternal and Child Health and Nutrition Sector Project Descriptions, Sustainability Plans, and Exit Strategies

5.1.1 Project Descriptions

The basic MCHN approach of all FFP development project awardees studied in Bolivia was to select and train CHWs who organized monthly growth monitoring sessions for children under 3 years of age, provided health education to mothers and community members, and provided a supplementary food ration to pregnant and lactating women and children under 3 years of age. CHWs were drawn from among leaders in the community. Most were female, but there were some male CHWs, and most were older, as young adults tended to migrate for work. Many selected CHWs had previous health experience or training from participation in prior NGO activities, and these previous interactions often increased community confidence in them. CHWs were not remunerated but did receive occasional material incentives, such as cement for patio repairs, chairs, and other items. CHWs were also provided with credentials (e.g., certificates, identification cards) issued by the awardees, although these credentials were not officially recognized by the public health system. There was no set ratio of CHWs to the size of the community.

The CHWs made home visits to pregnant and lactating women and women with children under 3 years of age to monitor the health of children and the health and hygiene conditions of the household and to follow up with children whose growth trajectories were unsatisfactory. All FFP awardees' MCHN approaches included the objective of increasing use of public health services by publicizing their availability and promoting awareness of health circumstances that necessitate a health center visit. The goal of the supplementary food rations was to prevent malnutrition by supplementing the family's food and directing it to the pregnant or lactating woman or target child. Nonetheless, mothers' participation in growth monitoring sessions was incentivized by the provision of supplementary food rations, as well as by the perceived benefit of learning about their children's growth and health.

The awardees also worked to strengthen health center staff capacities through training in such areas as integrated management of childhood illness, positive deviance inquiry, use of health data for planning and management, and implementing management systems. Using various mechanisms, awardees worked to promote health center staff outreach to the community and referral to health center services by CHWs. In many cases, outreach was accomplished by having health center staff attend monthly growth monitoring sessions organized by the CHWs and often by involving CHWs in the information analysis committee meetings conducted by health center staff. The awardees worked to ensure that sustainable linkages were established between the health center staff and the CHWs.

After the midterm evaluations, awardees shifted the emphasis of MCHN activities from direct response to cases of malnutrition (although this was still done) toward strengthening community growth monitoring and behavior change activities for all children under 5 years of age by encouraging attendance at growth monitoring sessions and increasing home visits to monitor and promote good child care practices and to include children other than the malnourished, using the CHWs who were already trained and working in the communities. CHWs did not report that this change affected their workload, as it mainly shifted the topics addressed at growth monitoring sessions and home visits from malnutrition to hygiene and health practices. After the midterm evaluations, awardees focused more on strategies for replacing FFP rations using locally available foods by providing cookbooks and food demonstrations, and they put more effort into establishing effective linkages with health centers to provide support, supervision, and motivation to the CHWs. The awardees, especially CARE and SC, reduced their intervention areas in response to the midterm evaluation recommendations, to better focus staffing and to strengthen activities to meet impact indicator goals.

5.1.2 Sustainability Plans and Exit Strategies

All awardees' sustainability plans intended to make use of the Directorio Local de Salud (DILOS) (Local Health Directorate), which included representatives from the municipal government, the Ministry of Health, and various community organizations, to support the CHWs' work. In addition, SC's sustainability plan included an intent to partner with the La Paz-based University of San Andres to coordinate with municipalities for the training and supervision of community health promotion teams. While the awardees provided some official recognition and material incentives for CHWs, continuation of these efforts was not part of the projects' sustainability plans. Rather than explicitly provide for such incentives to continue motivating the CHWs, awardees expected that the CHWs would be motivated by recognition of their work. FH and SC planned to organize networks of CHWs from different communities so that they would motivate each other to continue working and share experiences and best practices. These organizations of CHWs were to be trained in developing proposals and advocating for the health needs of their communities at the municipal government level.

All of the awardees used FFP rations to fill the caloric and nutrient gaps in the food consumption of beneficiary children 6–35 months of age, as well as similar gaps among pregnant and lactating women. The projects provided supplementary food and a complementary ration to mothers participating in the MCHN activities. These rations acted as an incentive for mothers to participate in growth monitoring and nutrition education sessions. All of the awardees planned to replace these rations by teaching mothers to use local food as a means of providing a similarly nutrient-rich diet and by creating recipe books to leave in the communities. In addition, SC and FH planned to work with the municipal governments and the Ministry of Health to ensure the continued provision of free food supplements for children under 2 years of age through the ZM program.¹⁵ **Box 5.1** summarizes the awardees' sustainability strategies and identifies the key assumptions underlying these strategies. The assumptions were not typically made explicit in the awardees' own documents; the study team inferred them from the plans as presented.

All four FFP awardees in Bolivia based their exit strategies on the expectation that the municipalities and the health care system would provide support and supervision for the local CHWs and that municipality and health care staff would make use of linkages with the CHWs to improve information reporting and analysis of local health conditions through community activities that were part of the government's decentralization policy, such as through information analysis committee and integrated management of childhood illness meetings. These strategies were based on the idea that mutual dependence would motivate CHWs to continue working in the communities and motivate health center staff to continue providing resources to benefit from the CHW outreach and from the information that they would provide on local health and nutrition conditions. Additional vertical linkages were planned between the CHWs and the UNIs for the continued UNI provision of CHW training, materials, and supplementary rations to motivate mothers' participation.

¹⁵ The BJA (the national conditional cash transfer program to encourage mothers to participate in maternal and child health care) was not in place at the time of the FFP projects' exit and therefore was not included in the projects' sustainability plans or exit strategies.

Box 5.1. Summary of MCHN Sustainability Strategies and Key Assumptions

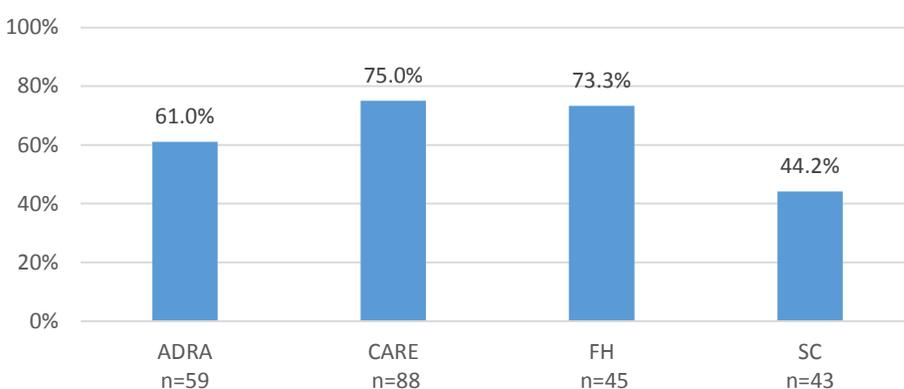
SUSTAINABILITY STRATEGIES	KEY ASSUMPTIONS
<ul style="list-style-type: none"> • Ensure that municipal health system, UNIs, and local health posts provide continued supervision, training, and materials to CHWs, and engage them in community information sharing and analysis. 	<ul style="list-style-type: none"> • These partners will have the resources, capacities, and motivation to sustain CHW linkages and provide support. • Commitment to these linkages will continue despite turnover among municipal government officials.
<ul style="list-style-type: none"> • Have DILOS provide ongoing funding for CHW training, supervision, and material needs to facilitate the continued work of CHWs in the communities. 	<ul style="list-style-type: none"> • Key representatives from the municipal government, the Ministry of Health, and community organizations, including DILOS, will maintain contact without ongoing awardee facilitation.
<ul style="list-style-type: none"> • Form networks of CHWs from different communities to provide mutual support and assist CHWs in advocating for additional needs (SC and FH). 	<ul style="list-style-type: none"> • CHWs will maintain contact across communities without awardee facilitation or resources.
<ul style="list-style-type: none"> • Have the health system provide formal recognition and community appreciation to replace project-provided tangible incentives, motivating CHWs to continue providing services in their communities. 	<ul style="list-style-type: none"> • CHWs will be motivated by contact with the health system and by recognition and appreciation of their skills and capacities, without material incentives.
<ul style="list-style-type: none"> • Replace free food rations with nutritious local foods, with preparation guided by project-provided instructional cookbooks. 	<ul style="list-style-type: none"> • Beneficiaries will have access to nutritious foods, will be able to afford them, and will be able to prepare them and be interested in preparing them.
<ul style="list-style-type: none"> • Have municipalities provide free food supplements for children under 2 years of age through the ZM program to incentivize participation in growth monitoring and well-baby care and to fill nutrient gaps.* 	<ul style="list-style-type: none"> • Municipalities will have the resources, capacities, and motivation to continue offering supplements to provide needed nutrients and to motivate continued participation in growth monitoring, well-baby care, and prenatal/postnatal care.

* Note that in the FFP projects, children under 3 years of age were eligible to receive the supplementary food.

5.2 Sustainability of Maternal and Child Health and Nutrition Service Delivery

A central component of the FFP projects' MCHN approach was to train CHWs working in every community to deliver growth monitoring services, conduct home visits to encourage good health practices, and provide health information to the health posts and health centers. At the time of the FFP development projects' exit in Bolivia, all awardees' implementing communities had at least one working CHW. Two years later, the percentage of communities with a functioning CHW, as reported in the follow-up survey's community questionnaire, had fallen significantly, although with notable differences among the four awardee areas, as shown in **Figure 5.1**. Fewer than 50 percent of SC communities had an active CHW at the time of follow-up, while active CHW presence in the other awardee communities ranged from 61 percent to 75 percent.

Figure 5.1. Percentage of Communities with an Active CHW since FFP Project Exit



Note: FH continued to work in more than 40 percent of FFP-targeted communities; CARE's area included Tarija, where the government had implemented universal health care since the projects' exit.

Source: 2011 Community Surveys; n is the number of communities surveyed.

Of the CHWs who continued working, some had been incorporated into the public health system as CHWs (called local health authorities) under the national SAFCI program. As the SAFCI program was being rolled out at the time of this study, not all municipalities had implemented it. Where it was being implemented, health center personnel were required to collect community-level data, and it was the health center staff who identified the CHWs as potential contributors of this community-level data; this task would also serve as a way to keep them involved. This was a source of motivation for many CHWs. As one former CHW from Huanocollo (an SC area) stated, "I am no longer only a health promoter, but a local health authority.... I am now responsible for serving the health needs of the entire community." However, qualitative interviews revealed that these workers felt that their position had shifted away from providing direct services like growth monitoring and health care to more administrative duties. This possibly reflects the philosophy heard from several municipal medical directors in qualitative interviews that CHWs are useful for outreach into communities, but are not capable of providing health services independently.

Other CHWs continued working through regional government programs. For example, in Tarija, an FFP project implementation area for CARE (and an area where CARE continued to work without FFP support following project closure), the departmental government ran its own health program to provide universal health care and basic health and nutrition services. This program promoted the continued participation of CHWs by taking some of them on as *guardianes de salud* (health guardians) to coordinate with local

health personnel to conduct growth monitoring and to promote prenatal care and vaccinations. The department's program also provided material incentives, like bicycles, and inputs, such as first aid kits, to the CHWs. While the department's program was intended to provide supervision to these health guardians through departmental-level health leaders, in practice these workers told the study's qualitative interviewers that they coordinated only with the local health centers, and not with the departmental-level leaders. Local coordination, though, can be effective in keeping CHWs engaged and motivated. The government's SAFCI health program required health posts to identify local health authorities in each community, and the CHW, already trained and well integrated into the community, was often a natural choice to fill that role.

In still other cases reported during the qualitative fieldwork with current and former CHWs, CHWs trained during the FFP projects were supported by other NGOs working in the former FFP project areas. In some FH communities, for example, other NGOs were supporting CHWs with monthly stipends, and in several former ADRA municipalities, other NGOs used the CHWs for their own activities, providing incentives such as backpacks and flashlights. However, in some cases, new CHWs were used in lieu of FFP-project trained CHWs, due to new projects' shifting focus toward issues like diseases, such as Chagas and tuberculosis, rather than broad health and nutrition promotion. This led to a perceived presence of multiple CHWs in the community (even though they had different areas of focus) and, according to qualitative interviews, discouraged some FFP project-trained CHWs from continuing their activities. There were also cases where a new NGO came into communities and supported FFP project-formed mothers' groups, involving them in new activities, such as home gardens (as was the case with Plan International in Huanocollo, formerly in SC's project area). In this case, the NGO also maintained contact with health center personnel to ensure that when the CHWs conducted growth monitoring sessions in the community, these sessions were conducted in coordination with health center staff. As a final example of CHWs who continued working following closure of the FFP projects, in two FH communities, the water committees supported continued provision of CHW services by paying them a stipend from water user fees. Of the 22 individual CHWs interviewed (some more than once over the duration of the study),¹⁶ 10 continued to be informal partners of the local health center, 6 were formally integrated into the health system as *autoridades locales de salud* (local health authorities), and 6 reported that they were receiving continued support (training, materials) from new NGOs in the area.

In 12 of the 23 unique women's groups with whom the qualitative study team conducted FGDs,¹⁷ the women reported that the CHWs had taken it upon themselves (after the project ended) to repurpose their growth monitoring and health education sessions to include community members other than mothers and small children and to address their health concerns, as well as broader issues, including domestic violence. In some cases, the mothers' groups were transformed into women's groups that undertook various income-generating projects, which provided an incentive for continued participation. These were mechanisms used on the initiative of the CHWs to keep their meetings relevant to the community as the demographics of the communities changed (due to migration and smaller family size) and as alternative services began to be provided by the government.

While CHWs found a variety of ways to maintain their services for the communities, in qualitative interviews the majority expressed a wish to be incorporated into the formal health system and felt that health system support was critical to sustaining both their motivation and their technical capacity. As one CHW in Uriondo said, "[The mothers] have already heard the messages that I can teach them."

¹⁶ Note that the figures in Table 3.1 list the number of interviews completed, some of which were with the same individuals in subsequent rounds; thus, the number of completed interviews exceeds the number of (unduplicated) individuals.

¹⁷ Table 3.1 lists the number of FGDs conducted with women's groups; some women's groups were interviewed multiple times during the course of this study.

Interpretation of these results can be informed by linking them to the hypothesis that resources, capacity, and motivation are all needed for sustainability, while the role of linkages must be considered in planning for sustained service delivery, as described in Section 5.2.4.

5.2.1 Resources

The resources needed to maintain provision of basic health services in the study areas came from three main sources: the Government of Bolivia (GOB), other NGOs, and the awardees when they continued to work in former FFP-targeted communities with other, non-FFP funds. The awardees and other NGOs worked closely with municipal governments on health priorities, as required by the central government, but municipalities had limited funds of their own and largely depended on NGOs for the resources needed to maintain local (community) services beyond health centers and UNIs.

Table 5.1 shows the percentage of former FFP project communities in which a new health project had been implemented in the 2 years since project exit and their associated sources of support (central or municipal government, NGO, or community; note that one project may have had multiple sources of support). “Implemented by the community” means that the community dedicated its own resources to the new project, but resource details were not provided. There is variation in the number of new projects implemented, but particularly striking is the difference in sources of support. The majority of “new” projects in ADRA and CARE areas received support from the municipality. In FH areas, the majority of new projects received support from NGOs; support from the central government for new health projects was relatively low. Many of the new government initiatives, including the BJA and the UNIs, are not community-based but rather based in health centers and UNIs, and thus were not necessarily providing services to the community, but at locales outside of the communities studied. CHWs reported that demand for their services had fallen since substitute incentives had become available elsewhere through the BJA and UNIs. Qualitative data suggested that CHWs were more likely to remain active in communities with lower participation in the BJA.

Table 5.1. Percentage of Communities with “New” Health Projects Implemented since FFP Project Exit, by Source of Support

Communities (n)	Percent with a Health Project	Percent Supported by Municipal Resources	Percent Supported by NGO Resources	Percent Supported by Central Government Resources	Percent Implemented by the Community
ADRA communities (59)	11.9%	71.4%	28.6%	28.6%	57.1%
CARE communities (88)	30.7%	96.3%	33.3%	22.2%	37.0%
FH communities (45)	22.2%	50.0%	60.0%	20.0%	70.0%
SC communities (43)	20.9%	44.4%	22.2%	11.1%	0.0%

Source: 2011 Community Surveys.

5.2.2 Capacity

The CHWs trained by the FFP awardees were able to maintain their capacity to provide growth monitoring and health care services, as long as they were able to access continued support from the health system or from NGOs. Those CHWs who joined one of the NGOs or government programs to provide health care had access to ongoing supervision and training and therefore were able to maintain their skills. In qualitative interviews, those who were not connected with an institution felt that their skills were eroding and that they had little new information to offer. As noted above, among 22 CHWs interviewed in the years after project exit, 10 reported they were working as informal partners with their local health

centers, 6 were formally integrated into the health system as local health authorities (of whom 2 were also receiving support from NGOs); and 6 were receiving support (training, materials) only from other NGOs. Nonetheless, four of the CHWs interviewed after exit stated they were not receiving any kind of support after project exit, despite these linkages.

5.2.3 Motivation

The FFP awardees expected that the CHWs would be motivated to continue working in the community because of their personal commitment as members of the community and as community leaders. Qualitative interviews with CHWs showed that they were motivated by the expectation that their training and participation in the FFP project would lead to paid employment in the future. Because their awardee-provided credentials were not formally recognized by the health system, they did not ensure that CHWs would be qualified for such employment. At follow-up, some CHWs reported being given stipends and/or other incentives by the NGOs or by the health system that employed them or (in some FH communities) by the community water committees. Typically, these positions were not formal, salaried jobs, but rather only provided some material incentives.

CHWs were also motivated by being incorporated into a health system that provided them with ongoing training and supervision, where, whether paid or not, their work was recognized and needed. Their participation in the information analysis committees was another way in which CHWs could be made to feel that their contributions were valued, because CHWs had unique access to information on the health situation at the community level. However, CHWs reported feeling displaced and unmotivated to continue working when new CHWs were hired to address different health priorities, even though they did not duplicate the services provided by the FFP-trained CHWs. Diversion of beneficiary mothers to health centers and UNIs also diminished participation in the CHW-led growth monitoring and educational sessions, which further challenged the motivation of CHWs to continue working. Qualitative interviews also indicated that the lack of prospects for CHW credentialing to result in future health system employment also appeared to discourage new candidates from coming forward to replace CHWs who were retiring or leaving.

5.2.4 Linkages

Vertical linkages between the CHWs and other institutions were critical to sustaining their provision of services. Working within the public health system or with an NGO (whether a former awardee or not) provided material incentives and needed inputs, as well as ongoing supervision and training, and were effective mechanisms for sustainability. However, as community leaders expressed in qualitative interviews, linkages with the municipality were often jeopardized by the frequent turnover of elected officials. Similarly, the linkages that SC tried to establish with the University of San Andres for ongoing CHW training and capacity building through the municipalities was not sustained after exit, and it appears that the linkage was not operational even at the time of exit.

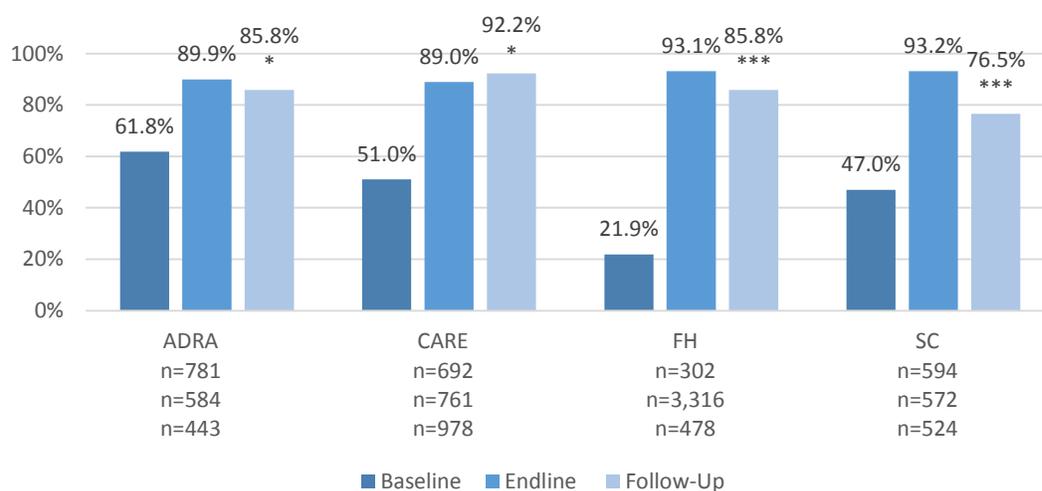
Horizontal linkages among CHWs in different communities did not appear to be sustainable as a means of maintaining their motivation or capacity due to a lack of resources to cover travel to meetings outside their communities. Only one community in a former SC implementation area had an association that was still operating at the time of the follow-up survey, and it had a number of factors that facilitated its continuation. For example, the municipal government had hired a former SC employee who was committed to helping the CHWs. The CHWs themselves were interested in using their association to help them obtain a formal credential that would gain them employment in the health system in the future. In addition, another NGO (Plan International) was training and providing incentives for new CHWs in the

same area. Thus, the association had expanded to incorporate new members, the members were strongly motivated, and the association had an external source of resources to support it.

5.3 Sustainability of Maternal and Child Health and Nutrition Service Use

Figure 5.2 shows the percentage of households in which mothers or caretakers reported taking their children to growth monitoring sessions in the past month. The percentage rose substantially from baseline to endline, and, in CARE communities, those gains were sustained at follow-up. Although there was a significant decline in growth monitoring participation between endline and follow-up in the other awardee areas, participation was still considerably higher in these areas at follow-up than it had been at baseline. Other indicators of maternal and child health care also showed sustained change. For example, **Figure 5.3** shows that the substantial baseline-to-endline increase in the percentage of women receiving prenatal care during the first 5 months of pregnancy was sustained at follow-up for all four awardees. **Figure 5.4** shows that the percentage of children 1–2 years of age completing their diphtheria, pertussis, and tetanus vaccine series (an indicator of postnatal well-baby care) was mostly maintained at follow-up and reached over 90 percent in all project areas.

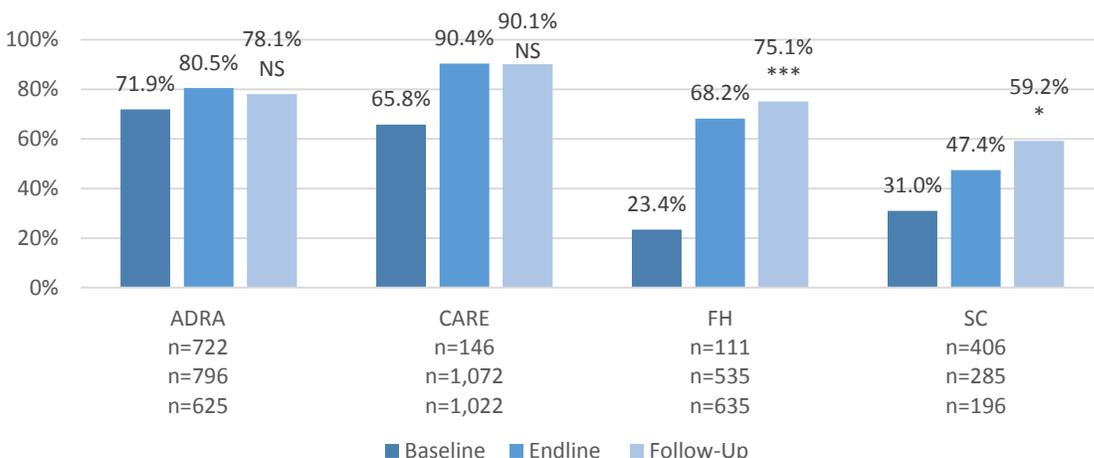
Figure 5.2. Percentage of Households Reporting Taking Children 3–35 Months of Age to Growth Monitoring Sessions



Sources: All 2002 (baseline) data were taken from awardee and evaluator reports. All 2008 data were taken from the MCHN endline evaluation surveys. All 2011 data were taken from the MCHN follow-up surveys.

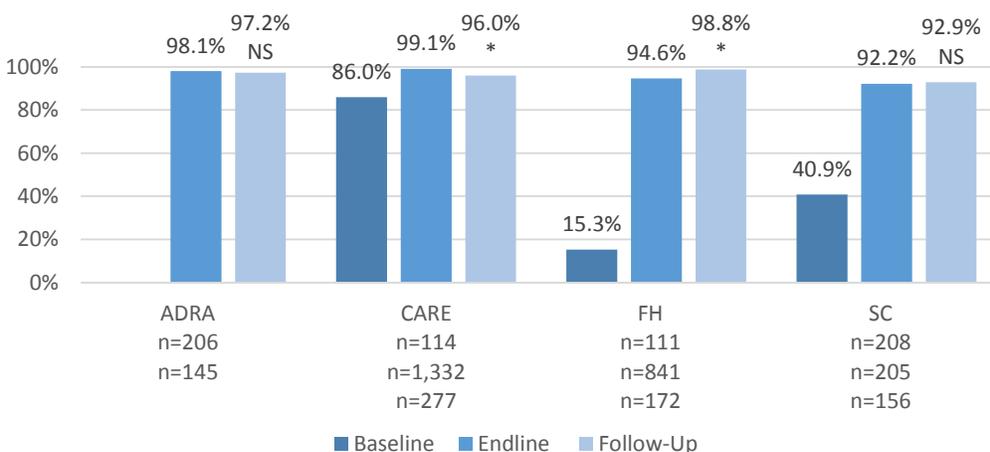
Significance is of the difference between endline and follow-up (2008 and 2011) based on two sample z-tests; * p<0.05, *** p<0.001.

Figure 5.3. Percentage of Mothers Reporting Receiving Prenatal Care in the First 5 Months of Their Last Pregnancy



Sources: All 2002 (baseline) data were taken from awardee and evaluator reports. All 2008 data were taken from the MCHN endline evaluation surveys. All 2011 data were taken from the MCHN follow-up surveys. Significance is of the difference between endline and follow-up (2008 and 2011) based on two sample z-tests; NS=not significant; * p<0.05, *** p<0.001.

Figure 5.4. Percentage of Children 12–23 Months of Age Receiving the Third Dose of the Diphtheria, Pertussis, and Tetanus or Pentavalent Vaccine

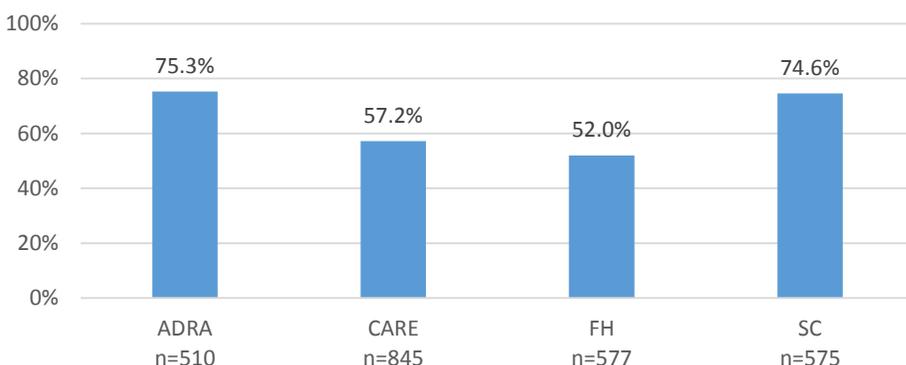


Sources: All 2002 (baseline) data were taken from awardee and evaluator reports. All 2008 data were taken from the MCHN endline evaluation surveys. All 2011 data were taken from the MCHN follow-up surveys. Significance is of the difference between endline and follow-up (2008 and 2011) based on two sample z-tests; NS=not significant, * p<0.05.

Several factors affected service use after the FFP development projects in Bolivia exited, particularly the BJA program, which provided a cash incentive to women for attending prenatal care, taking their children to growth monitoring, and completing required vaccinations. **Figure 5.5** shows that a high percentage of mothers in all areas made use of the BJA program in 2011. Similarly, the ZM program, which started in 2006 but was still expanding at the time of the FFP projects' exit, provided free nutritional supplements (micronutrient powders) and, in some cases, supplementary food for children over 6 months of age, if the municipal government paid for it. These nutritional supplements were intended to fill nutrient gaps in targeted groups' food consumption, but also served as an incentive to attend growth monitoring at the

UNIs, which were established in health centers. The ZM program explicitly coordinated with municipal governments to promote the support and training of CHWs and their involvement in outreach (that is, encouraging women to make use of their services), but in the case of both the ZM and the BJA programs, the actual services provided were offered at health centers and not by the CHW in the community. No endline data for this measure are available, but in 2011, between 61 percent (FH) and 76 percent (ADRA and SC) of mothers who used growth monitoring did so at health centers rather than in the community. These figures support the conclusion that the high rate of use of primary health services observed at follow-up may be attributed to the government’s successful provision of decentralized primary health services.

Figure 5.5. Percentage of Mothers with Children under 5 Years of Age Reporting Receiving BJA Program Benefits at Follow-Up



Source: 2011 MCHN Surveys.

The service use results further confirm the role of the three hypothesized key factors: participation in growth monitoring and other health services was either sustained or maintained at much higher than baseline levels because resources and motivation were provided by GOB programs. Capacity to participate was not a barrier to beneficiaries, and capacity to provide the services was maintained because the services were available through health workers employed, supervised, and trained by the government health system.

5.4 Sustainability of Recommended Maternal and Child Health and Nutrition Care Practices

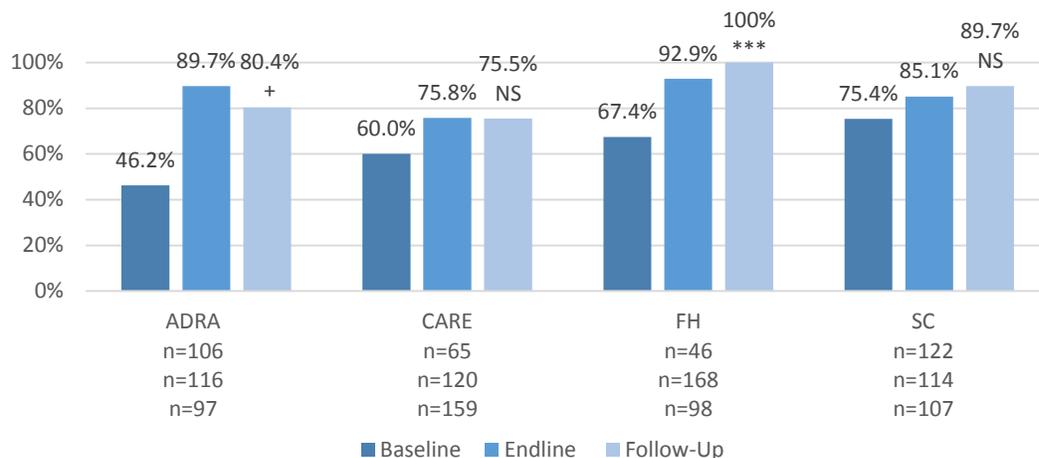
All FFP development project awardees in Bolivia trained CHWs to promote good child feeding, health, and hygiene practices through educational talks and home visits. Promoted practices included exclusive breastfeeding, continued feeding of liquids and age-appropriate food during periods of diarrhea, appropriate use of complementary feeding, and good hygiene practices. For exclusive breastfeeding rates, improvements made during the projects were sustained after exit for the four awardees, with FH communities showing a significant increase (see **Figure 5.6**).^{18,19} Other practices were not as well

¹⁸ Exclusive breastfeeding was measured by asking women with infants under 6 months of age what they fed their babies in the previous 24 hours. Exclusive breastfeeding was defined as receiving only breast milk, with an exception for medications prescribed by a health care provider.

¹⁹ While exclusive breastfeeding rates were increasing nationally during the time of FFP project implementation, awardees achieved higher exclusive breastfeeding rates than those reported nationally. The DHS reported an increase in exclusive breastfeeding from 53.6 percent in 2003 to 60.4 percent in 2008, the most recent national figures available at the time of this study.

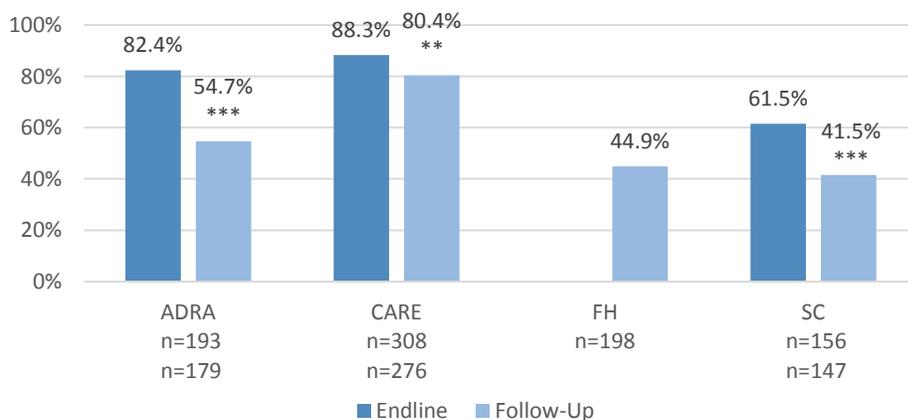
maintained. The recommended practice of increasing a child’s consumption of liquids during episodes of diarrhea dropped significantly between endline and follow-up in the awardee areas that measured this practice, as shown in **Figure 5.7**. (Note, though, that CARE measured knowledge, not practices.) Continued feeding of solid food during diarrhea also showed a significant decline between endline and follow-up for two of the three awardees that measured it, as shown in **Figure 5.8**.

Figure 5.6. Percentage of Mothers Reporting Exclusive Breastfeeding of Their Children under 6 Months of Age

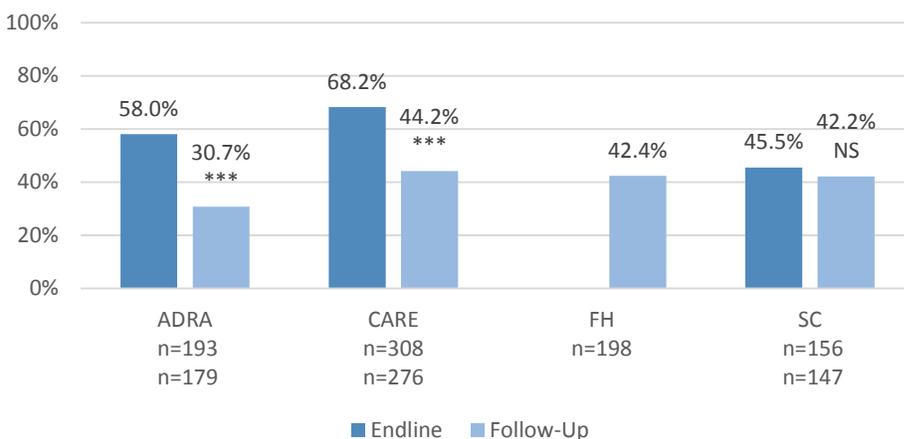


Sources: All 2002 (baseline) data were taken from awardee and evaluator reports. All 2008 data were taken from the MCHN endline evaluation surveys. All 2011 data were taken from the MCHN follow-up surveys. Significance is of the difference between endline and follow-up (2008 and 2011) based on two sample z-tests; NS=not significant, + p<0.1, *** p<0.001.

Figure 5.7. Percentage of Mothers Reporting Their Children’s Increased Consumption of Liquids during Diarrhea



Note: CARE’s questionnaire asked “what **should** you do.” FH did not collect endline data, therefore significance could not be determined. Sources: All 2008 data were taken from the MCHN endline evaluation surveys. All 2011 data were taken from the MCHN follow-up surveys. Significance is based on two sample z-tests; ** p<0.01, *** p<0.001.

Figure 5.8. Percentage of Mothers Reporting Continued Child Feeding during Diarrhea Episodes

Note: CARE's questionnaire asked "what **should** you do." FH did not collect endline data, therefore significance could not be determined.

Sources: All 2008 data were taken from the MCHN endline evaluation surveys. All 2011 data were taken from the MCHN follow-up surveys.

Significance is based on two sample z-tests; NS=not significant, *** $p < 0.001$.

Among the practices apparently sustained was the use of local nutritious foods to replace the rations previously provided. In 8 of 21 communities visited during the qualitative rounds of data collection that were conducted 1 and 2 years after exit, women reported (in both FGDs and key informant interviews) that they made use of the cookbooks that had been provided to them and were using local foods to prepare recommended dishes for their young children. The team also observed CHWs using the cookbooks to prepare food for women's group meetings. Some mothers were engaging their older daughters in using the cookbooks, which was helpful to both, as it was typical for the daughters to have a higher level of literacy than their mothers, and it allowed the mothers to involve their daughters in using the new recipes. In two communities, mothers reported not receiving the cookbooks, and in one community visited, mothers generally agreed that they did not use them, possibly because this was a remote community where there was little access to markets to buy the needed substitute foods.

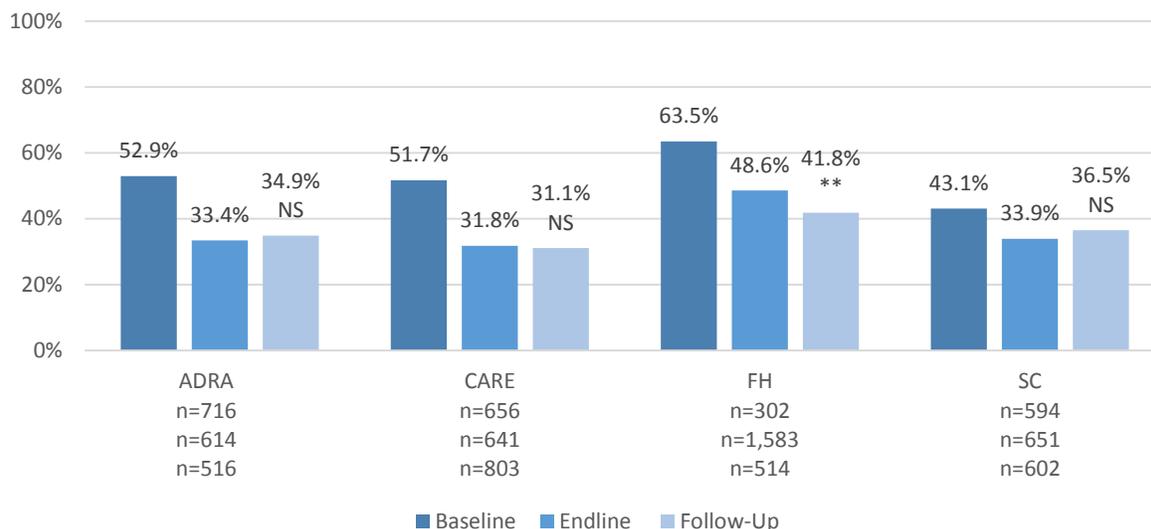
5.5 Sustainability of Maternal and Child Health and Nutrition Impacts

The objective of the FFP projects' MCHN approach in Bolivia was to reduce childhood stunting (chronic malnutrition).²⁰ **Figure 5.9** shows that the prevalence of stunting in children 3–35 months of age decreased significantly from baseline to endline and that these declines were maintained or improved (in FH areas) at follow-up 2 years later. Stunting prevalence for children 6–24 months of age showed no significant change from endline to follow-up (data not shown). (This information was not collected at baseline, because the target population was children 3–35 months of age.) The declines in stunting in the awardee areas were greater than those reported in the DHS for children under 5 years of age between 2003 and 2008. (DHS data are based on nationally representative samples.)

Although wasting (low WAZ) is not a common problem in Bolivia, the prevalence of wasting also appeared to fall (from already low levels) between baseline and endline (significance cannot be calculated for baseline data), and these very low levels of wasting were sustained at follow-up (data not shown).

²⁰ As mentioned previously, all measurements used cutoffs of z-scores of -5 and +5 to be able to compare with baseline data.

Figure 5.9. Percentage of Children 3–35 Months of Age Who Were Stunted (HAZ < -2)



Sources: All 2002 (baseline) data were taken from awardee and evaluator reports. All 2008 data were taken from the MCHN endline evaluation surveys. All 2011 data were taken from the MCHN follow-up surveys.

Significance is of the difference between endline and follow-up (2008 and 2011) based on two sample z-tests; NS=not significant, ** p<0.01.

5.6 Maternal and Child Health and Nutrition Sector Sustainability: Lessons Learned

The local provision of health services through CHWs fell substantially following the FFP projects' exit, but the level of service use among beneficiary mothers and children remained high, and reductions in the prevalence of chronic childhood malnutrition were sustained or improved. Where CHWs were incorporated into the health system, either working for an NGO or as part of the national health system (e.g., the SAFCI), they continued to provide local health services, motivated by material incentives (stipends or occasional gifts) and by continued supervision, training, and involvement in the health care system. Two factors explain the high level of service use and sustained positive impacts:

- The continued presence of NGOs providing the resources needed for continued service provision at the community and municipal levels
- Active central government investment in providing decentralized health care, including growth monitoring, ante- and postnatal care, and nutrition services

Some of these central government funds were channeled through municipal and local governments, which were required to spend these resources on health care to be eligible for continued funding the following year.

Neither of these factors was, nor could have been, part of the FFP awardees' sustainability plans, although all the awardees cited linkages between CHWs and the health system as integral to their sustainability approaches. FH continued to work in a large proportion of communities after the withdrawal of FFP support. In addition, several governmental structures, including the OTB as a mechanism for community involvement in governance and the SAFCI as a means of providing health services tailored to the local

context, contributed to sustained use of health services once the CHWs were no longer supported by the FFP awardees.

During the FFP development projects in Bolivia, awardees worked closely with municipal leaders through the DILOS and through health centers to encourage them to make use of CHWs for data sharing and the setting of health priorities. Where this was accomplished, CHWs continued to work in the community as volunteers. However, provision of CHW training was inconsistent after the FFP projects ended, as some municipalities prioritized construction of health centers and the purchase of ambulances over less-visible support for CHWs. Further, the credentials provided by the awardees were not officially recognized by the government and did not provide assurance of future employment as health workers. In addition, credentialed medical staff were hesitant to take advantage of the local CHWs to decentralize basic health services because of the CHWs' lack of credentials, which in some cases limited the breadth of work provided by the CHWs, as well as their opportunities to receive regular training and supervision to maintain the quality of that work. It was common in qualitative study interviews for doctors to express their reluctance to depend on CHWs for the provision of health services, and they referred to the CHWs' lack of official licensure as one reason for this hesitancy.

The plan to engage the University of San Andres in supporting CHWs with training and capacity building was unsuccessful, apparently because this linkage had not been established early enough to be functioning before project exit, and it was not clear what the basis was for expecting the university to devote its own resources to this task. The idea of establishing networks of CHWs for mutual support, while appreciated by CHWs, was difficult to sustain after external resources were withdrawn. If CHWs were working in a community, it was because they were linked either to a local health center or to an NGO and had the incentive either of pay or material resources or of a sense of engagement in the health system. Efforts to maintain associations of CHWs that lacked external resources to support travel to meetings were generally unsuccessful.

In the Bolivian political and economic context, the central government put resources into promoting growth monitoring, primary health care, and nutrition, and it had the political power to require that NGOs implementing health activities do so in coordination with these national health priorities. Resources for health care in Bolivia are not supported by a fee-for-service mechanism, but rather by the government, other NGOs, or, as in a few communities in FH areas, from cross-subsidization with funds from water fees to support CHW stipends. In many cases though, these services were not community-based. With growth monitoring and preventive health care incentivized by the conditional cash transfer program (BJA) and attendance at UNIs incentivized by supplementary food distribution, participation in local, community-based growth monitoring declined. Where the BJA was most widely used, communities were less likely to have a locally based CHW, and CHWs in qualitative interviews reported that demand for their growth monitoring services and educational talks declined when they no longer offered food supplements and substitute incentives were offered elsewhere (e.g., at the UNIs). Some CHWs reported that they repurposed their regular health talks as microenterprise groups, teaching crafts and other skills, to maintain beneficiary participation. Others coordinated monthly growth monitoring and educational sessions with meetings of the OTB in the community and provided health education to both women and men. While health centers and UNIs did offer health education, they did not have the community presence that allowed CHWs to monitor children's progress and make home visits to encourage good health and hygiene practices. This may be the reason that some practices, such as correct feeding during diarrhea, declined even while use of services was maintained.

Local leadership appears to be an important factor in the continuation of home visits and the promotion of good health and hygiene practices. During the study's qualitative investigation, some communities had

particularly active and dedicated leaders who encouraged the work of the CHWs and promoted good health practices at community meetings. There may be a lesson for awardees in the usefulness of identifying and training local leaders to act as advocates for the continuation of CHW activities and promoted health practices once the awardees' technical staff no longer make frequent visits to the community.

One important lesson, then, is that phase-over of responsibility for health care provision to the government can be successful only if the government has the resources and political will (motivation) to maintain decentralized health services and if local staff have the capacity to provide these services at a high level of quality. This was the case in Bolivia. While it was not possible to say at the time of the completion of the fieldwork for this study whether the BJA and ZM programs would become sufficiently institutionalized so as not to be threatened by a change in government at the national level (though they are based on national laws and decrees that will likely contribute to their permanence), these programs represent the government commitment of resources needed to continue health service provision. But if service provision is to continue at the community level through CHWs, and not only at health centers and UNIs, resources are needed to support these community-based workers not only with material incentives, but with training and supervision as well. When the CHWs were effectively linked to the health care system, their ability to function as CHWs—performing home visits, monitoring the health situation in the community, and providing information on the community to higher levels of the health system—was maintained. Where CHWs were not effectively linked to the health care system, these functions were jeopardized.

Further, national government commitment needs to be complemented by a commitment of resources at the municipal and local levels. Some of the services provided at the UNIs, such as the provision of supplementary food, depended on the municipal purchase of these goods. The study team observed examples of changing priorities after elections at the municipal and local levels, resulting in changing resource allocations, as elected leaders were replaced. It seemed that with community leadership and strong ties directly with the health system, health-related activities were more likely to be maintained.

Box 5.2. MCHN Sector Sustainability: Key Findings

WHAT WORKED

- Government-supported primary health care and nutrition services reached a substantial proportion of the target population.
- Conditional cash transfers and free supplementary food from government programs were substitute incentives for mothers to make use of growth monitoring and preventive health services.
- Vertical linkages between CHWs and the health centers or with NGOs provided resources and motivation to keep CHWs working, when these linkages were in place.
- In some cases, awardees (FH in particular) were able to continue work in their communities using alternative resources.
- Some CHWs found ways to incentivize continued participation in educational sessions, by organizing women's groups for income earning or by coordinating with monthly community meetings of the OTB.
- One successful model for sustainability was the cross-subsidization of CHW activities using funds from some of the larger water systems' user fees (in FH areas).
- Incorporation of CHWs into data collection efforts for the health system provided motivation for their continued involvement in the community.
- Mothers continued to use cookbooks provided by the awardees to prepare locally available foods, and they used the cookbooks to involve their older daughters in this learning.

WHAT DID NOT WORK

- The work of CHWs was inconsistently maintained, depending on the presence of NGOs or linkages with the health system.
- Credentials provided to CHWs by the awardees were not recognized by the health system and did not ensure future employment in the health sector, as CHWs had hoped.
- Where linkages were not in place, ongoing training of CHWs was not maintained.
- Incentives at the health center substituted for rations provided by the CHWs, but this reduced demand for CHW services in the community, possibly negatively affecting the frequency of home visits and sustained use of some improved child care practices.
- While interest was high, horizontal linkages among CHWs across communities were rarely sustained without awardee support.
- The plan for a university to provide training to CHWs did not work, as the linkage had not been adequately established and was not functioning at the time of FFP project exit.

6. Results: Water and Sanitation Sector

Summary

In the W&S sector, FFP awardees in Bolivia implemented the construction of piped water systems into households using FFW and monetization, and organized, strengthened, and trained water committees elected by the community to manage and maintain these systems. Awardees also implemented the construction of latrines (in units combining a toilet, sink, and shower, all served by piped water). Households were charged a fee for the connection of the unit and a monthly fee for use of the piped water, which they were willing to pay because of the recognized benefit of having piped water. Water fees paid for the maintenance and repair of the systems when needed. The proportion of households with in-home piped water increased from endline to follow-up in two of the FFP awardees' areas and were at a high level (over 85 percent) 2 years after exit in the other two former projects' areas. The piped water intervention demonstrates the convergence of resources (user fees supported maintenance and any needed repairs), capacity (water committees were well trained in administration and system maintenance), and motivation (participating households valued the service).

In contrast, water quality testing and treatment (chlorination) was not generally maintained in any awardee area. Water committees were trained to administer chlorine at the water tank as part of their system administration training, but did not prioritize water treatment, and participating households often objected to the taste of treated water. In addition, awardees arranged for water quality testing up to the time of exit, so water committees did not have the experience of making these arrangements themselves. In the case of water quality testing and treatment, resources (from user fees) and capacity (from training) were present, but motivation was lacking. Further, the principle of gradual exit with transfer of responsibility was not followed in this instance: Water committees had not independently arranged for water quality testing prior to exit.

6.1 Water and Sanitation Sector Project Descriptions, Sustainability Plans, and Exit Strategies

6.1.1 Project Descriptions

The W&S approach implemented by all the FFP development project awardees in Bolivia was to create a self-financing system for the provision of piped water to households. The awardees provided resources for the construction of piped water systems, using monetization to pay for the necessary inputs and skilled labor. These resources were complemented by municipal funds, as well as community-contributed unskilled labor and materials. The awardees formed or strengthened (with technical and management training) community water committees that were responsible for managing the piped water systems once they were constructed. Households that were linked to the piped water network paid a monthly user fee to ensure that the water systems were maintained and repaired when necessary. Water committee training focused on management and administration, so that the committees could track and enforce payment by cutting off the water (and charging a reconnection fee) for non-payment. All community members were trained in the technical aspects of system operation and maintenance so that when water committee

members stepped down and new members were elected, those new members would also have a basic understanding of the system. Current members were given the responsibility of training newly elected members as well. Interviews with water committee members in qualitative data collection found that awardees, and not the water committees themselves, generally took on the responsibility of ensuring routine water quality testing for microbiological contamination and water quality maintenance. The awardees established connections with universities or government laboratories to implement microbiological water testing. After the 2005 midterm evaluations, awardees increased their focus on capacity strengthening for future replication of piped systems in new communities and on water quality management. But water committees, though interested in expanding coverage within their communities and identifying new water sources to permit such expansion, were not generally interested in replicating water systems in new communities. Awardees therefore worked with municipal governments to provide documentation of their implementation processes that would permit such replication.

The FFP projects also promoted the construction of latrines, providing materials for their construction and instruction on their use. The units provided by the awardees were of an unusual design that included a sink with running water, a porcelain flush toilet, and a shower, all connected to the piped water system. In addition, the projects focused on promoting appropriate hygiene behaviors through the CHWs working in the MCHN sector, and sometimes through water committees as well, as health and W&S interventions were implemented together in the same communities.

6.1.2 Sustainability Plans and Exit Strategies

The organization of the W&S systems implemented by the FFP projects in Bolivia incorporated the key factors for sustainability: User fees provided the resources needed to keep the systems operating, awardees built the administrative/management and technical capacities of the water committees and the communities at large, and households receiving piped water valued the service and were motivated to pay user fees. In addition, all of the awardees expected to establish linkages between the water committees and the municipal government so that the municipality could provide training and resources to the water committees after project exit. For example, ADRA and FH planned to establish groups of water committees from different communities that would support each other and be able to receive refresher training from the municipality through links with the OTB. Some of the awardees planned additional methods to ensure continued training and support for the water committees. For example, CARE led reinforcement training workshops prior to exit, but without plans to continue the training after exit. FH worked with the water committees to get them *personería jurídica* (legal recognition), with the idea that the water committees could then function as small businesses, using the surplus from user fees to invest in other development projects and, presumably, generate funds.

At least some of the communities already had functioning water committees when the FFP awardees began implementing their W&S activities. Only FH specified the gradual phasing out of awardee-led activities in its sustainability plan, allowing the water committees to manage their systems independently throughout the final year before exit. None of the other awardees' plans mention this, but conversations with former awardee staff and with the water committees visited during the qualitative study rounds revealed that water committees in all of the awardees' areas were operating their water systems independently for a long period of time before exit.

Most of the awardees did not have explicit plans for the continuation of water quality monitoring and maintenance after exit. ADRA operated and paid for a portable lab for water testing during the life of the project and planned to encourage the Empresa Pública Social de Agua y Saneamiento (public water and sanitation utility), a public entity for providing water services, to purchase these machines and start charging the water committees for their use once the awardee departed. However, there was no explicit

plan for transitioning the responsibility for testing from ADRA to the water committees or the municipality.

Similarly, none of the awardees had explicit sustainability plans for the latrines, as these became the property of the beneficiary households. The exit strategy for promotion of health behaviors relied on the continued functioning of the CHWs.

Key W&S sustainability strategies and assumptions are summarized in **Box 6.1**.

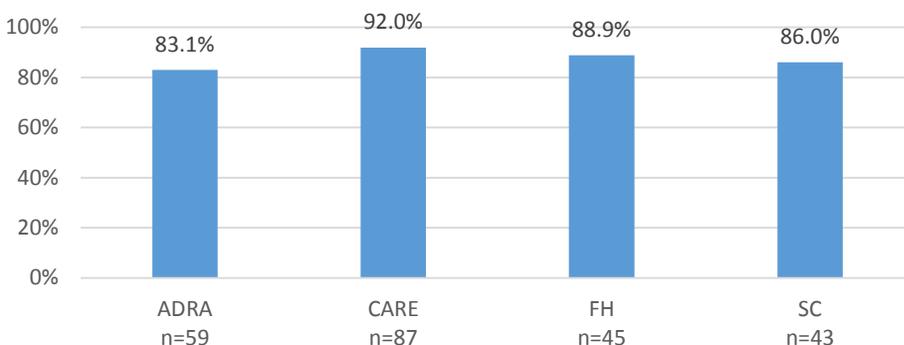
Box 6.1. Summary of W&S Sustainability Strategies and Key Assumptions

SUSTAINABILITY STRATEGIES	KEY ASSUMPTIONS
<ul style="list-style-type: none"> • Show beneficiaries the value of piped water services and make sure that they are willing and able to pay monthly user fees. 	<ul style="list-style-type: none"> • Piped water supplies will be reliable and adequate, so households will pay.
<ul style="list-style-type: none"> • Provide water committees with the resources to pay for materials and labor when repairs are needed using the fees collected from households receiving piped water. 	<ul style="list-style-type: none"> • Water committees will monitor and enforce payment. • Collected revenue will be sufficient to pay for system maintenance.
<ul style="list-style-type: none"> • Adequately train water committees to manage and maintain water systems. 	<ul style="list-style-type: none"> • Water committee members will maintain their skills and knowledge without further awardee support.
<ul style="list-style-type: none"> • Ensure that water committees adequately train newly elected members. 	<ul style="list-style-type: none"> • Water committees will maintain their skills at a sufficient level to train replacement members.
<ul style="list-style-type: none"> • Create vertical linkages with municipal government to provide future funding for water systems to support water quality testing, major repairs, refresher training in system maintenance, and other needs. 	<ul style="list-style-type: none"> • Municipalities will have the resources, capacities, and commitment to support future needs of community water committees. • Community water committees will seek and accept municipal input into their water systems.
<ul style="list-style-type: none"> • Facilitate meetings of groups of water committee members from different communities for motivation and information sharing. 	<ul style="list-style-type: none"> • Water committees will perceive a benefit from group meetings and will have the resources to dedicate to periodic gatherings.

6.2 Sustainability of Water and Sanitation Service Delivery

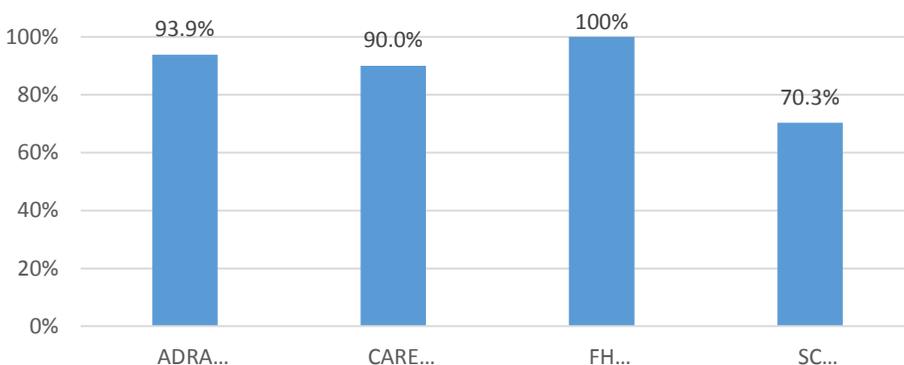
At the time of the follow-up survey, the majority of communities had a functioning potable water system (**Figure 6.1**), and most of these systems were being maintained by the communities themselves (**Figure 6.2**). Three rounds of qualitative interviews with water committee members indicated that water quality testing was not continued after the FFP awardees' exit; none of the respondents in key informant interviews and FGDs mentioned this aspect of maintaining the water system in response to questions about their activities and responsibilities.

Figure 6.1. Percentage of Communities with Potable Water Systems in 2011



Source: 2011 Community Surveys; n is the number of communities surveyed.

Figure 6.2. Percentage of Community Water Systems Maintained by the Community in 2011



Source: 2011 Community Surveys; n is the number of communities that had water systems.

The following sections discuss how the results of the study support the hypothesis that the key factors of resources, capacity, and motivation are essential to sustainability, while linkages are variably important, depending on the nature of the project and its context.

6.2.1 Resources

The piped water systems that the FFP projects installed in Bolivia generated their own resources through a fee for service. The systems were effective in ensuring that funds were available to keep them operating reliably, with user fees paying for repairs and often also paying for a salaried plumber. One of the awardees (FH) also worked to ensure that water committees obtained legal recognition so that they could function as microenterprises (e.g., obtaining loans, seeking municipal funding for projects), but this is a long and bureaucratic process. Only one of the water committees visited during the qualitative data

collection undertaken after the FFP projects exited was legally recognized as a microenterprise and was lending out some of its user fee earnings to members. These members had 1 year to repay the loan, with interest. This committee's members noted using the interest and savings from user fee savings to construct a building to store materials and hold meetings. While none of the other committees visited had become legal microenterprises, they were still recognized in the municipality as formal community-level organizations.

ADRA was the only awardee that collected endline information on the work of the water committees, and this information was collected again in 2011. Within this former project's area, committees maintaining an up-to-date income and expense ledger fell from 100 percent at the time of project exit to 64 percent in 2011 (based on interviews with committee members in 18 communities in 2008 and members in 11 communities in 2011). Of the individual committees interviewed in 2008, 55 percent reported that all members paid their bills on time, while the remaining 45 percent reported that more than half (though not all) did so. In 2011, five of the seven committees keeping a ledger said that fewer than half of their members paid their bills on time. The fact that 92 percent of households in ADRA communities still reported having piped water suggests that beneficiary payment (even if late) was still sustaining the provision of the water, at least in the short term, even if piped water was provided without payment for some time in some cases. However, this evolving decline in timely payment poses a question of enforcement in the long run. In qualitative interviews, members of water committees did not identify refusal to pay as a problem, so perhaps timely payment was less important than knowing that payments would be made (or, if not, that service would eventually be cut off).

Piped water seemed to be sustainably provided to the households linked into the system. However, according to water committee members, expansion of the system to new beneficiaries was limited by a lack of water resources and/or a concern about the certainty of a year-round water supply in many communities. The FFP projects' water systems appeared adequate to the scale at which they were operating at the time of this study, though the study team acknowledged that they may not be appropriate as larger-scale systems without serious consideration of the available water supply.

6.2.2 Capacity

Awardees trained water committees in administration and management, but included the wider community in training on the piped water system's operation and maintenance. The systems appeared to be operating successfully, based on the high proportion of community-maintained systems. Water committee members appreciated the awardees' focus on capacity building during the projects, contrasting this with previous experiences with private sector contractors who built systems but then departed without offering training. During the life of the FFP projects, water committees had the opportunity to practice and consolidate their management skills. Nonetheless, in key informant interviews and FGDs with water committee members following project exit, many committee members expressed concern over the lack of external support for refresher training after exit.

In contrast, the awardees did not develop water committee capacities to perform or contract for water quality testing prior to the projects' exit. Neither did municipal governments, identified by the awardees as a source of support for water quality maintenance, provide water committees with any further training (or other support) for water quality testing or water purification activities following the FFP projects' closure. Instead, water committees preferred to use their limited funding to improve water system coverage in the region (which increased their overall income as more users received coverage), rather than ensuring the potability of existing water systems.

The fact that water committees did not generally seek linkages with municipal government entities or with other water committees means that a potential source of training was not utilized. Water committees operated independently of each other and of any other organization. As a result, it was not clear how refresher training or training of new water committee members could have been provided if members' skills eroded over time. At the time of the follow-up surveys, water committees were still functioning effectively and demonstrated the capacity not only to manage their systems but also to plan for future needs and investments. Nonetheless, of nine committees interviewed (with 11 individual members interviewed), only one community had successfully replaced its committee members and trained them. None of the committees had accessed training since project exit, and almost every plumber (technicians hired by the water committees) mentioned having an interest in refresher training or difficulty attracting replacements. The lack of provision for longer-term training is a cause for concern as to the ultimate sustainability of these interventions.

6.2.3 Motivation

Beneficiary households were motivated by the desire for piped water, which was widely perceived as an important benefit because of its convenience, time-saving potential, and abundance (compared with having to carry water from a distant source). Beneficiary motivation ensured resources for system maintenance, and lack of motivation appeared to be at the heart of the failure to provide assurance of microbiological water quality. When piped water appeared clean, poor microbiological quality was not visible, and beneficiary households were not aware of the water quality issues. In addition, although contaminated water is a source of infection and disease, because these environments contain significant numbers of pathogens, the role of those pathogens specifically found in the water might not have been perceived. Some water committee members said that beneficiaries complained about the taste of chlorinated water, further reducing the motivation to implement water purification activities, despite presumably having the resources to do so.

6.2.4 Linkages

Awardees tried to establish linkages between water committees and municipalities as a way of ensuring continued resources and support/training, if needed, once the FFP projects were no longer able to provide these. However, water committees reported generally avoiding any official linkage with or incorporation into the municipal government out of a concern that they would lose control over their budgets. One case encountered in the qualitative interviews of a water committee being taken over by the municipality demonstrated the legitimacy of the concern that funds from user fees would be diverted to other uses, as the municipality that took over did, in fact, usurp the water committee's budget. In addition, when community members perceived that water was being provided by the municipal government, they resisted paying fees because they noted that they believed government services should be free.

Attempts to establish horizontal linkages among water committees from different communities were similarly unsuccessful, not so much because they were resisted as because committee members did not prioritize these meetings as a good use of time and funds. Such associations were also not supported financially by the municipalities. Committee members expressed interest in meeting with other water committees, but did not feel that they had the resources to cover transportation to attend gatherings. By the time of the follow-up surveys, qualitative interviews with water committees found no examples of water committee participation in these groups.

6.2.5 Other Factors

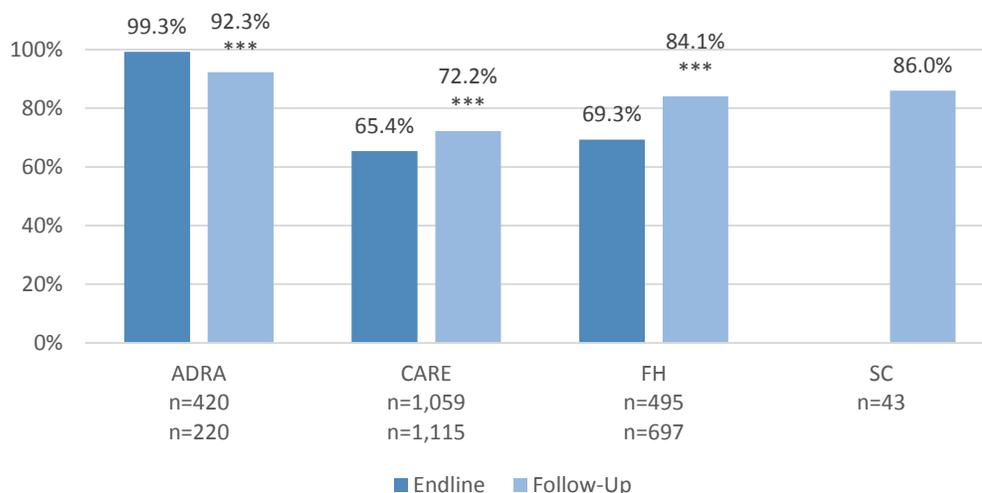
One of the strengths of the elected water committee system applied by the FFP projects was that the committees were forced to be open and transparent about the handling of funds. Communities in rural Bolivia are accustomed to holding monthly open meetings, attended by the entire community, at which officials and committee representatives present their reports. Because the committees depended on the cooperation of beneficiaries to pay their user fees, a level of confidence and trust was essential to maintaining the systems. In one community visited during the rounds of qualitative data collection, the original water committee president had been pressed by the community to return from his work-related emigration to Spain to reassume the committee's leadership position after his replacement began to mismanage funds.

As with many of the activities in the MCHN sector, the W&S sector activities represented a convergence of FFP project approaches and government priorities. The government policy of *desarrollo comunitario* (community-based development) was focused on developing local technical and administrative capacity for new projects, and water and latrines were a priority project area for the government. As a result, water committees could see future benefits from central government resources provided for water-related activities through such initiatives.

6.3 Sustainability of Water and Sanitation Service Use

Figure 6.3 shows that a high percentage of households continued to benefit from in-home piped water at the time of follow-up. The small but significant decline in former ADRA implementation areas might be related to the reported drop in the proportion of timely payments, but ADRA areas still demonstrated higher coverage than other project areas. Both CARE and FH areas saw significant increases in the percentage of households with piped water since their projects' exit, suggesting that the self-financing model for providing piped water was sustainable in these contexts. SC also had a high level of households benefiting from piped water at the time of follow-up, although comparison data from their endline evaluation survey were not available.

Figure 6.3. Percentage of Households in FFP Project Areas with In-Home Piped Water

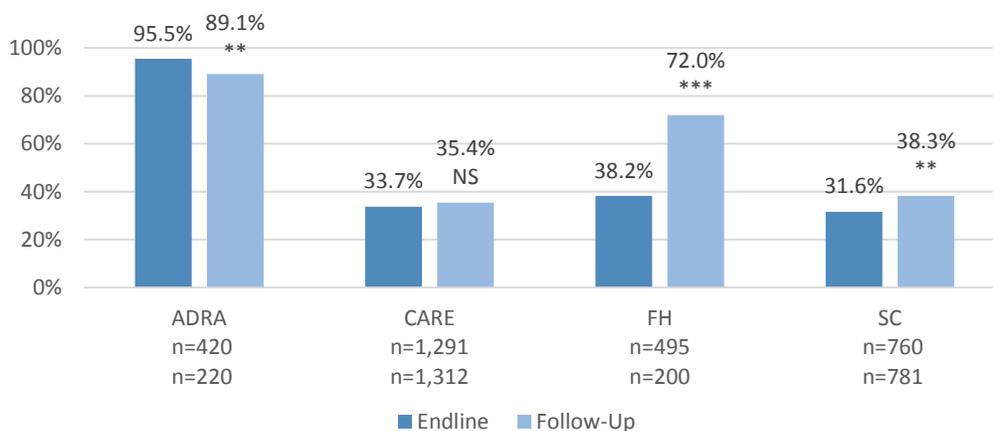


Sources: 2008 and 2011 W&S Surveys.

Significance is based on two sample z-tests; *** p<0.001.

One of the objectives of the FFP projects' W&S interventions was to provide latrines to households that were receiving piped water. Awardees made it clear to the water committees that the latrines, along with the piped water, were a component of the W&S intervention. In FH areas, some water committees reported in qualitative interviews that they used the funds from water user fees to assist households in repairing latrines if needed. In other areas, the awardees' project applications included no explicit plan to maintain the latrines; once constructed, their maintenance and repair became the responsibility of the owner. **Figure 6.4** shows that the percentage of households with access to a latrine fell slightly from endline to follow-up in former ADRA implementation areas, though these areas still had the highest overall latrine access at both of these time periods. Latrine access was maintained or increased from endline to follow-up in the other project areas. The substantial and significant increase in latrine access in FH areas may be attributed to the fact that FH continued to work in close to half of its former FFP beneficiary communities following FFP project exit using other resources. At the time of the follow-up survey, UNICEF was also working in FH areas building latrines with counterpart funding from the municipality. As latrine access is a priority of the GOB, municipal funds for these interventions may also have been derived from a government initiative. Therefore, it is not possible to say whether the FH practice of having water committees help with latrine maintenance was an important contributor to the sustainability of this intervention.

Figure 6.4. Percentage of Households in FFP Project Areas with Latrines



Sources: 2008 and 2011 W&S Surveys.

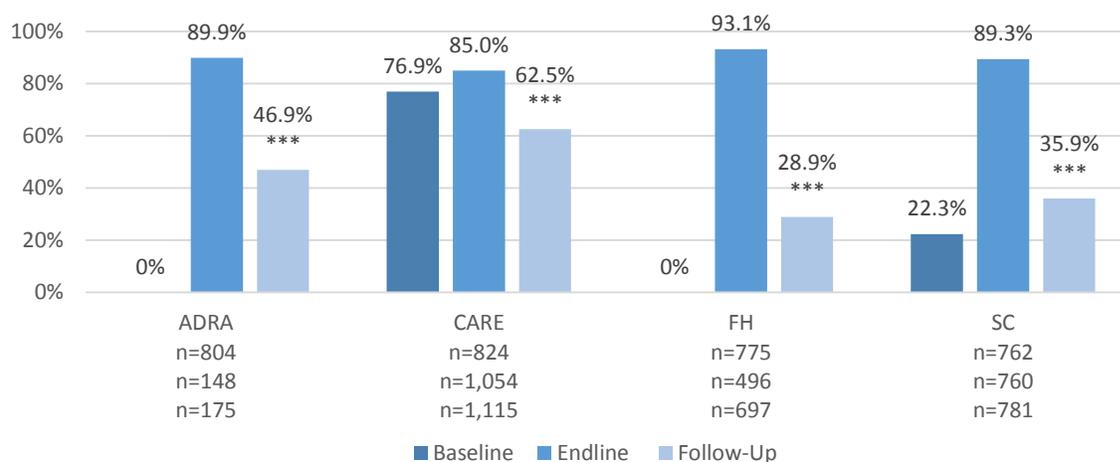
Significance is based on two sample z-tests; NS=not significant, ** p<0.01, *** p<0.001.

6.4 Sustainability of Water and Sanitation Practices

6.4.1 Handwashing

Most self-reported hygiene practices fell between endline and follow-up, even when practices improved substantially from baseline to endline. **Figure 6.5** shows the frequency with which caretakers reported “adequate handwashing practices” according to the awardees' own criteria for success. Individual practices showed a similar pattern. **Figure 6.6** shows the percentage of caretakers reporting handwashing at a minimum of three of the four critical times promoted: before food preparation, after defecating, after cleaning a child's diaper or feces, and before feeding a child. All results showed significant and substantial declines from endline to follow-up; individual practices followed the same pattern.

Figure 6.5. Percentage of Caretakers Practicing Adequate Handwashing by Awardee Criteria

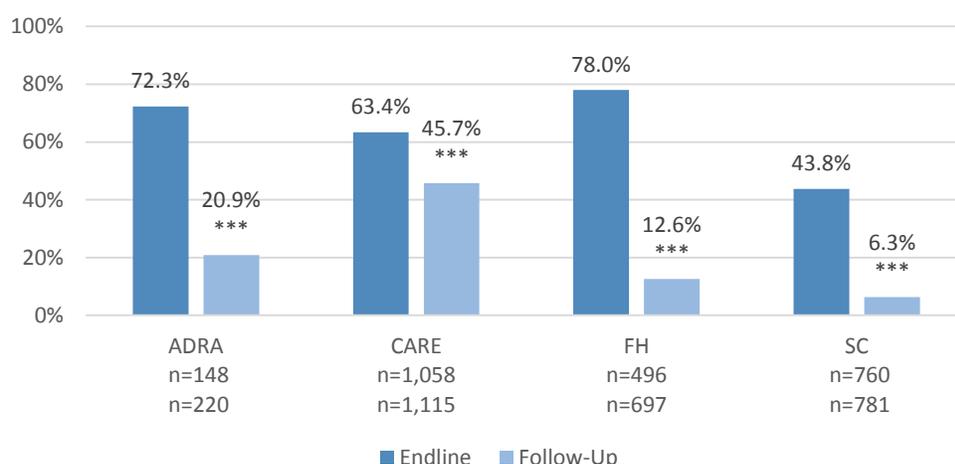


Notes on awardee criteria: ADRA—washing at least three times per day with some detergent (the interviewer saw that either soap or detergent was present); CARE—washing two times per day or more; FH—using at least eight handwashing practices (five different occasions and five different conditions: uses clean water, uses some sort of cleaning product, uses both hands, rubs three times, has a clean drying system); SC—washing at least three times per day with soap/detergent.

Sources: All 2002 (baseline) data were taken from awardee and evaluator reports. All 2008 and 2011 data were taken from the MCHN endline and follow-up surveys.

Significance is of the difference between endline and follow-up (2008 and 2011) based on two sample z-tests; *** p<0.001.

Figure 6.6. Percentage of Caretakers Reporting Handwashing on at Least Three Critical Occasions



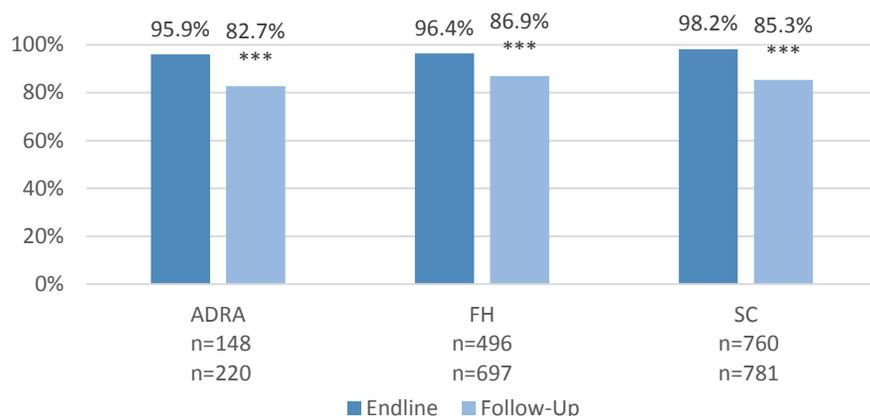
Note: CARE did not have information about handwashing after changing diapers/cleaning child feces; therefore, their criterion was at least two of the three critical time points.

Sources: 2008 and 2011 W&S Surveys.

Significance is based on two sample z-tests; *** p<0.001.

The handwashing practice that was best maintained was washing with soap. Even though this practice fell along with the others, more than 80 percent of caretakers in the three awardee areas where this was measured reported using soap when they washed their hands (**Figure 6.7**). This relatively high figure may be associated with the fact that the latrines constructed by the awardees had sinks attached to them that were used for laundry as well as handwashing, so soap was typically available if people washed their hands.

Figure 6.7. Percentage of Caretakers Reporting Using Soap When Washing Hands

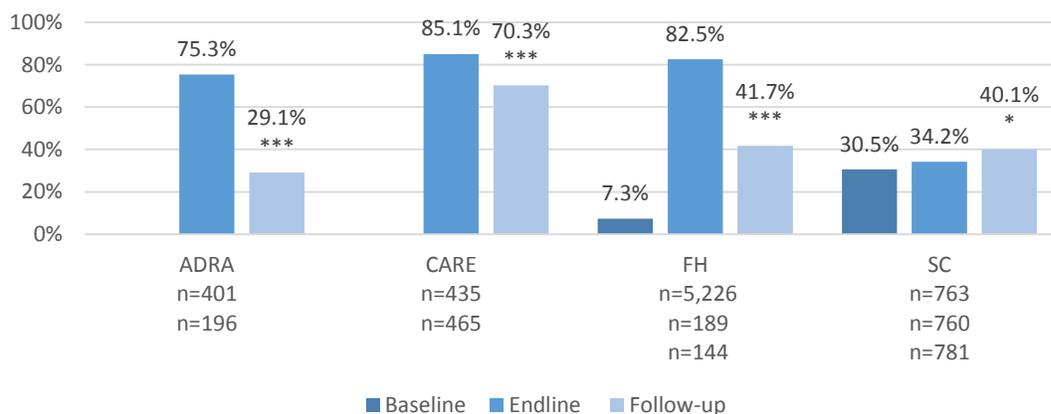


Note: CARE did not ask about soap use.
 Sources: 2008 and 2011 W&S Surveys.
 Significance is based on two sample z-tests; *** p<0.001.

6.4.2 Latrine Use

While latrine access was generally sustained or improved at follow-up, use of latrines (based on quantitative data, qualitative interviews, and direct observation of the environment around the project-provided latrines) was less positive. **Figure 6.8** shows that latrine use fell significantly in three of the four awardee areas. Signs of use applied included the latrine being cleaned, having paper, and not being used for storage, among others (see specific criteria in the notes for Figure 6.8).

Figure 6.8. Percentage of Households with Latrines That Showed Signs of Use (Based on Awardee Criteria)



Notes on awardee criteria: ADRA—direct observation: latrine (flush) works, is clean, has a trash bin, has no flies; CARE—direct observation: latrine has paper and a trash bin, is clean, has no flies, has a bucket; FH—direct observation: latrine works, has paper and a trash bin, door works, not being used for other purposes, has no cobwebs or flies, path to latrine is worn; SC—direct observation: latrine has paper and a trash bin, is clean, has no cobwebs or flies, is not being used for other storage.

Sources: 2008 and 2011 W&S Surveys.

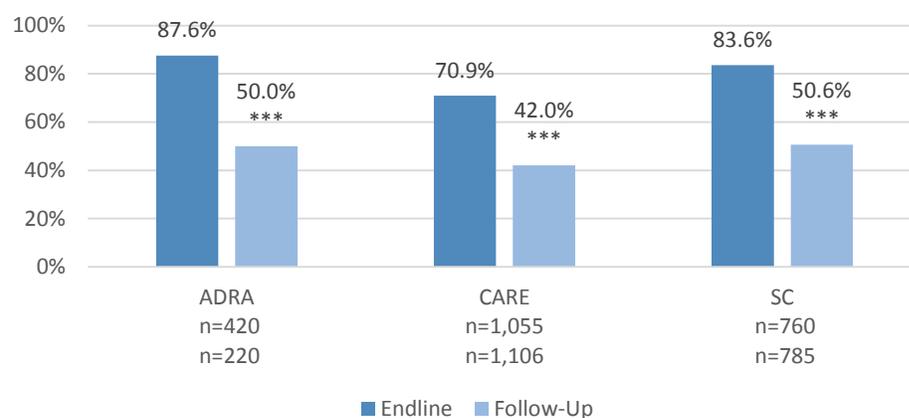
Significance is of the difference between endline and follow-up (2008 and 2011) based on two sample z-tests; * p<0.05, *** p<0.001.

6.4.3 Water Treatment

Water committees did not give priority to the microbiological quality of the water piped into households, and many households stopped using home purification methods between endline and follow-up.

Figure 6.9 shows that water treatment practices significantly declined in all awardee areas, although they had exhibited good levels of adoption at the time of exit.

Figure 6.9. Percentage of Caregivers Using Any Water Purification Practices (solar water disinfection, chlorine, boiling)



Note: FH did not ask about water treatment.

Sources: 2008 and 2011 W&S Surveys.

Significance is based on two sample z-tests; *** $p < 0.001$.

6.5 Sustainability of Water and Sanitation Impacts

The awardees identified diarrhea incidence as the key impact indicator for their W&S interventions. Incidence of diarrhea in the past 2 weeks was measured at endline and follow-up among children under 5 years of age. Among the four FFP awardees, there were small but significant changes, but the direction of change was not consistent. Given the multiple sources of possible contamination in the implementing environments, and the fact that diarrhea is an imperfect indicator of enteric infection, this is not a surprising result. For the W&S interventions, this study considers the impact to be the continued availability of piped water and availability of latrines with signs of use, rather than measured health impact.

6.6 Water and Sanitation Sector Sustainability: Lessons Learned

The FFP development projects' W&S work in Bolivia combined the key factors of resources, capacity, and motivation for sustainable provision of piped water to households. The intervention responded to a felt beneficiary need: Targeted households wanted the service and were willing to pay for it (motivation). User fees provided a reliable source of funds to pay for repairs and maintenance of the system (resources), making it reliable and therefore motivating beneficiaries to continue to pay. In addition, training by the awardees incorporated both technical and administrative/management skills so that water committees were able to undertake or manage repairs and monitor and manage their funds (capacity). In Bolivia, the awardees offered technical training not only to water committee members, but to all community residents, so that when water committee members were replaced, the new members would have received this technical training. The model, though, presupposed that the water committee members would be responsible for training newly elected members in administrative and more advanced technical

management tasks associated with the system. In 2011, the water committees appeared to be maintaining their capacity to manage the water systems, but had not yet identified and trained replacements. Water committees actively avoided formal linkages to the municipal government and did not join groups of water committee members from other communities (linkages), which may have limited their access to refresher training, raising concerns about the possible erosion of capacities associated with this intervention over time.

The gradual process of project exit from most parts of this intervention also contributed to its sustainability. Although many communities had water committees before the FFP development projects studied here began, some communities did not already have piped water systems. The awardees formed and trained the water committees in these communities and involved them from the beginning of system construction. Awardees also ensured that all committees had time to operate independently (with project support when needed) for a significant period prior to the projects' exit.

Microbiological water quality testing provided a contrasting case and demonstrated the importance of both independent operation prior to exit and the three key factors for sustainability. None of the water committees was implementing water quality testing at the time of the follow-up surveys, even though they had the resources available from user fees to do so. Awardees took responsibility for water quality testing until the time of exit, giving the water committees no independent experience in contracting for that service. ADRA's sustainability plan noted an expectation that municipal water service agencies would purchase and use mobile water quality testing labs and charge water committees for these services. However, this linkage was not put in place before the FFP projects exited and was not forged by the water committees following the projects' exit. The microbiological quality of water is not a visible benefit, as piped water is, and any association of clean water with lower rates of diarrhea is indirect and was not noted by beneficiaries encountered during qualitative data collection. In fact, some beneficiaries complained of the taste of chlorine when water was treated. Thus, water quality testing was not sustained once the awardees ceased to provide that service.

The quality of the W&S infrastructure also appeared to contribute to the overall sustainability of the intervention. Water committee members mentioned in qualitative interviews that previous attempts (e.g., by other NGOs) to provide piped water had sometimes failed because of system breakages due to poor quality pipes and connections. Maintenance of the system is easier when the infrastructure itself is durable and of high quality.

As with health practices (see Section 5.4, hygiene practices promoted by CHWs, including handwashing, latrine use, and home water treatment, were generally not well sustained after exit. As the presence of CHWs declined after exit, with beneficiaries taking advantage of health services at health centers and UNIs rather than in the community, the high level of contact between CHWs and beneficiaries, including regular health talks and home visits to monitor household hygiene, also likely declined. Caring and hygiene practices need to be reinforced to be maintained, since they do not provide the kind of tangible benefit that often motivates continued use. Similar to the case with health services, the central government was promoting local investment in health and hygiene infrastructure at the time of follow-up for this study, but these investments focused more on visible physical outputs than on behavior change interventions.

In FH communities, water committees appeared to recognize that piped water and latrines were part of a larger effort to improve community health. In a few FH communities visited during this study's qualitative investigation, water committee funds were used to pay for CHW services; in other FH communities, the water committees provided funds to repair latrines when needed. Water committees in some ADRA communities used their funds for the repair of latrines in the local school. However, these

were not common enough practices to see a significant difference in the application of supported hygiene practices or latrine use among the awardees' beneficiaries. This cross-subsidization of health services by the water committees was not a part of the awardees' sustainability plans and appeared to have been implemented as an independent water committee decision. Nonetheless, the integration of W&S with MCHN interventions suggests a promising model for sustainability of those MCHN services that would otherwise lack resources.

As discussed in the findings, linkages to the municipal government were not an effective strategy for sustainability and were resisted by communities. The awardees logically looked to municipalities to phase over responsibility for their interventions because of the municipalities' presumed command over resources and technical expertise, but the municipalities were not a reliable source of support for the W&S activities. Horizontal linkages among water committees were also ineffective. Committee members expressed interest in meeting to learn from plumbers in other communities and to refresh and maintain their skills, but they did not feel that they had the resources to devote to meetings outside of the community.

Box 6.2. W&S Sector Sustainability: Key Findings

WHAT WORKED

- The provision of piped water was sustained because of the convergence of an ensured source of resources from user fees, technical and management capacity, and motivation on the part of beneficiaries.
- The majority of FFP project-targeted communities had piped water systems, and the great majority of those systems were maintained by the community.
- Household access to in-home piped water was generally sustained or increased following project exit.
- Water committees were operating independently while the awardee was still present for support before the FFP projects exited, giving the committees an opportunity to consolidate their technical and management skills.
- Access to latrines at home was mostly sustained or increased from endline to follow-up.

WHAT DID NOT WORK

- Water committees did not take over responsibility for water quality testing once the awardees left.
- Municipalities did not take on responsibility for water quality assurance or for providing water committee training and supervision.
- Linkages of water committees to municipalities were avoided, and municipalities were not a source of training or financial support.
- Horizontal linkages among water committees were not implemented or were not maintained.
- Most hygiene practices were not sustained after exit; all showed significant decreases.
- In ADRA areas (the only sites with data available), the proportion of households paying water user fees on time declined following project closure.
- Water scarcity and identifying secure water sources posed problems for potential expansion of piped water systems to new households in the project-targeted communities and to new communities.
- Long-term sources of training for water committees were not identified.

7. Results: Agriculture, Income-Generating Activities, and Natural Resource Management

Summary

All the awardees worked to improve agricultural productivity, introduce improved crop and (in some cases) livestock production techniques, diversify agricultural production by introducing new crops, and (especially after the midterm evaluations) promote commercialization of production by linking farmers to markets and market information. Awardees trained model farmers in the community and gave them inputs and access to demonstration plots so that the model farmers would train other farmers who were organized into farmer groups. The awardees expected that model farmers would continue providing training to other farmers after exit, despite no longer receiving project inputs. Awardees organized and strengthened PAs with the goal of giving farmers a means of marketing their products (as produced or after processing) and purchasing inputs collectively to obtain more favorable prices. The PAs imposed quality and quantity requirements and usually charged a fee for membership. Awardees worked to link PAs with municipalities for continued assistance post-project with access to markets and price information. Where context allowed, the projects established irrigation systems and trained Irrigation committees to manage them, charging a fee to community members for water use.

Awardees implemented NRM interventions using demonstration plots to encourage soil-conserving techniques and used FFW to organize communities for conservation activities, such as reforestation. After the midterm evaluations, awardees specifically targeted techniques directly associated with improved productivity or resilience to climate shocks, and such techniques were better maintained at follow-up than those techniques that did not have these characteristics. Awardees also established commercial nurseries to provide seedlings to local communities as a profit-making venture.

At follow-up, almost no model farmers were providing training, and the percentage of farmers who reported receiving training was very low. Use of training and technical assistance fell among all awardee-targeted farmers, but decreased most dramatically in ADRA areas, where training was provided free until project exit and a charge was instituted thereafter. The proportion of project participant farmers selling any agricultural product fell in ADRA and CARE areas, but was maintained in FH and SC areas; however, the percentage of farmers with sales was fairly high, from more than 75 percent to 100 percent, among all participant farmers at follow-up. Participation in PAs fell between endline and follow-up, and the proportion of farmers selling through PAs also fell, while the proportion of farmers selling individually rose. There were many examples of successful PAs that had long-term contracts with buyers, some whom were providing participating farmers with technical assistance and credit. In addition, many PAs were receiving support from the municipality. Numerous farmers, whether or not they were in a PA, were making use of techniques learned in the FFP projects—producing higher-quality products and thus benefiting from higher sale prices. That said, agricultural incomes fell between endline and follow-up, but in all cases follow-up incomes were substantially higher than those at baseline. Incomes of PA members at follow-up were significantly higher than incomes of non-members.

7.1 Agriculture, Income-Generating Activity, and Natural Resource Management Sector Project Descriptions, Sustainability Plans, and Exit Strategies

7.1.1 Project Descriptions

The goal of the FFP projects' agriculture, IGA, and NRM interventions was to improve household income from agriculture to promote household food security. All awardees promoted improved production techniques for crops and (except ADRA) livestock through provision of technical assistance, encouraged crop diversification appropriate to the project areas, and promoted market linkages. Technical assistance was provided through training of model farmers and the establishment of demonstration plots where new techniques could be taught to other farmers in the community. A variety of agricultural and livestock management practices were promoted through these methods and through the training of agriculture extension workers.

All awardees organized farmer groups for training. In the case of ADRA, these were relatively formal technical assistance groups; those of the other awardees were more informal structures. In addition, the awardees formed or strengthened PAs to promote information sharing, facilitate the provision of market information, promote the collective marketing of products and purchase of inputs, and facilitate access to credit. Many of these PAs charged a fee for membership and were involved in the marketing of processed products, such as juices and preserves, as well as unprocessed produce. CARE and SC promoted family gardens within their agriculture activities, although this intervention focused on women in the household and was primarily aimed at improving household dietary diversity rather than marketing.

All awardees promoted small-scale irrigation and other productivity-enhancing improvements in land management and agricultural production technologies. They also focused on creation of productive infrastructure appropriate to the context, such as construction of small reservoirs to serve as stock water ponds, water harvest ponds, and filtration ditches, and rehabilitation of feeder roads to increase access to markets. CARE, FH, and SC also promoted the construction of household-level infrastructure, such as silos for the storage of potatoes or grain and stables or shelters for livestock. These interventions targeted model farmers, with the expectation that they would demonstrate the value of such infrastructure and encourage other farmers to adopt it.

Market linkages were an important component of the projects' agriculture, IGA, and NRM interventions, with various approaches to providing market information and promoting connections to markets. ADRA applied a unique approach, constructing a set of agricultural service centers (ASCs), one in each of its target municipalities, which were intended to be focal points for the marketing of a variety of crops. The ASCs were staffed by ADRA-trained technicians. ADRA farmers would bring their crops to an ASC, where the crops were sorted and graded; the farmers were paid at the ASC, which would then market the crops. The ASCs provided a venue for training of ADRA's technical assistance groups (awardee-formed groups of farmers participating in training provided by model farmers and ADRA technicians) and served as a location for disseminating market information. Ultimately, ADRA's intention was to turn the ASCs into commercial enterprises serving all farmers in their targeted areas, who, the project assumed, would pay for these services after project exit.

After the midterm evaluations, awardees shifted from a focus on increasing production and crop diversification to an emphasis on post-harvest technologies to reduce losses and efforts to increase processing for and links to markets and access to market information. While ADRA had a market-driven orientation from the beginning, the other awardees shifted to a market-oriented value chain approach after

the midterm evaluations and reduced the number of crops that they prioritized for production. CARE reduced its activities to two to three value chains after the midterm evaluation, and, after the FFP project's exit, in areas where it continued to operate without FFP support, CARE reduced its focus to a single value chain per province to further concentrate its efforts. Following the midterm evaluations, the awardees continued to strengthen PAs for the sale of products, and many of these groups engaged in transformation and processing of products before marketing. The awardees provided training in market analysis and marketing and helped the PAs establish links with long-term buyers.

In the area of NRM, all of the awardees used FFW and training to promote activities in afforestation/ reforestation, land reclamation, conservation, irrigation, and flood protection. Inputs such as seedlings and construction materials were provided without cost to the participants. Commercial greenhouses were started in some locations to provide continued access to seedlings and plants. All of the awardees trained community leaders to sustain NRM practices through the development of community land use plans with support from related municipal offices. These municipal offices were often founded and their staff trained by the awardee. After the midterm evaluations, there was a significant shift of NRM training to concentrate on practices that were most closely associated with improving economic impacts through increased productivity and increased resilience to shocks, such as floods and droughts.

7.1.2 Sustainability Plans and Exit Strategies

The concept underlying the sustainability plans of the agriculture, IGA, and NRM activities of all of the FFP development project awardees studied in Bolivia was that improved agricultural production and marketing would result in increased income from sales and increased food security, which would provide the motivation, as well as the resources, to continue implementing the practices taught in the projects. The formation and strengthening of PAs was intended to promote sustainable economic improvement; the PAs were to be a vehicle for information sharing, collective marketing, product processing and transformation, and access to credit. All awardees except ADRA worked to help the PAs obtain legal recognition, which would allow them to enter into contracts, obtain certification for their products (important for foodstuffs), and seek outside funds (e.g., from the municipality or from banks or other lending institutions). During the life of the FFP projects in Bolivia, a number of PAs established by the awardees joined larger municipal or regional PAs to expand their market power. Awardees assisted PAs in securing long-term contracts with buyers to ensure their continued access not only to markets, but also to technical assistance and credit if needed. Awardees strived to have these contracts in place well before exit, so that the PAs would have sufficient time to operate independently.

Training of farmers was not tied to membership in a PA, and the assumption was that farmers, whether in a PA or not, would be able to improve their production and income using practices promoted during the life of the projects and would continue to do so after projects exited. Trained model farmers were provided with agricultural inputs, as well as materials for the construction of silos, animal shelters, and other agricultural infrastructure. Awardees expected that model farmers would continue to train farmers even after these incentives were no longer provided, out of a sense of obligation for the benefits that they had received. Awardees also expected that farmers who were not part of the projects would emulate the practices that they observed to be beneficial, even if they were not being formally trained. No provision was made to continue supplying material incentives (e.g., agricultural inputs) to model farmers to encourage them to continue in their training role after the FFP projects ended.

Several other strategies were employed by awardees to promote sustainability in agriculture, IGA, and NRM sector interventions. FH and SC trained paraprofessionals to provide veterinary and other production and marketing services, with a view to helping these paraprofessionals establish themselves as paid technicians after project exit. ADRA's sustainability plan for agriculture was based on the ASCs

becoming self-sustaining business enterprises after awardee exit. While ADRA's technical assistance groups had access to the ASCs during the project, the expectation was that, following project closure, other farmers would join and would take advantage of ASC services as well. Services were offered free to technical assistance group members during the project, and charges were instituted at the time of exit. The sustainability plan for small-scale irrigation systems was similar to that for piped water to the households: Awardees trained irrigation committees to manage and maintain the irrigation systems, users would pay for the water they used, and the committees would use the funds from these payments to maintain and repair the systems.

To establish linkages, the awardees worked with municipalities for the provision of market assistance and technical support. This assistance included providing up-to-date price information, advice on branding, and assistance in arranging for the transportation of goods to market, among other activities. Municipal governments were engaged in promoting economic development in their communities, and they obtained some resources from the central government (under the government's decentralization policy) for such activities. The awardees also expected that municipal governments would take over responsibility for the continuation of NRM activities beneficial to the community, such as reforestation and flood control, and for maintaining the roads that were constructed or improved by the projects. (Most municipalities had offices responsible for environmental activities in their areas, as they did for economic development interventions in their communities.) The awardees trained community members in road maintenance and worked to organize them into small enterprises that might contract with municipalities for these services.

As part of their exit strategies, awardees also worked to establish links with other NGOs that would be operating in their former project areas in order to seek continued support for IGAs. In addition, some awardees implemented an exit strategy that focused the final years of project support on the areas that appeared most likely to be successful. ADRA explicitly told the qualitative study team that it focused its efforts on assisting the most advanced PAs with the strongest market linkages. Similarly, as previously mentioned, FH assessed the potential of the communities in which it was working and ceased operation in the communities with the least potential for success. It then undertook a staged graduation, with the most promising communities receiving support for the most time before FFP activities ended, with the idea that sustainability would be greatest in the best-performing communities.

Plans for the sustainability of NRM activities were largely based on the expectation that communities and individuals would recognize the benefits of these activities and continue to implement them without the FFW and free inputs that had been provided by the projects as incentives. The focus after the midterm evaluations on NRM practices with specific benefits to individual farmer's productivity and resilience to shocks was part of the sustainability plan, as a means of providing farmer motivation to continue the practices. SC, ADRA, and FH also provided formal certification of NRM leaders, as they did with model farmers, to increase the likelihood that the technical capacity to implement practices would not be lost.

Key agriculture, IGA, and NRM sustainability strategies and assumptions are summarized in **Box 7.1**.

Box 7.1. Summary of Agriculture, IGA, and NRM Sustainability Strategies and Key Assumptions

SUSTAINABILITY STRATEGIES	KEY ASSUMPTIONS
<ul style="list-style-type: none"> • Train farmers in improved production techniques (e.g., crop diversification, practices to improve yield and crop quality) and livestock management practices (except ADRA). 	<ul style="list-style-type: none"> • New practices will yield benefits (e.g., increased production) that will motivate producers to adopt them. • Increased income from sales will provide producers with the resources needed to continue applying improved techniques.
<ul style="list-style-type: none"> • Train model farmers in new practices that they will teach to other farmers on demonstration plots. 	<ul style="list-style-type: none"> • Model farmers will continue to provide training to other farmers after withdrawal of project-provided incentives. • Practices demonstrated by model farmers will be emulated by other farmers even if the other farmers do not receive explicit training from the model farmers.
<ul style="list-style-type: none"> • Provide resources to model farmers for the construction of household-level infrastructure (e.g., silos, animal shelters). 	<ul style="list-style-type: none"> • Producers will observe benefits from these structures and will replicate them for their own household. • Producers will have the resources needed to access inputs for these structures through increased income from sales.
<ul style="list-style-type: none"> • Establish small-scale irrigation systems and establish and train irrigation committees to manage them. 	<ul style="list-style-type: none"> • Visible benefits of irrigation will motivate farmers to pay for irrigation. • Irrigation committees will have the management and technical capacity to maintain irrigation systems, with user fees providing the resources.
<ul style="list-style-type: none"> • Establish alliances between PAs and other institutions (e.g., government agencies, NGOs, foundations supporting commercialization, businesses) for ongoing assistance in managing legal needs (e.g., product certification, formal contract development) and accessing credit and technical assistance. 	<ul style="list-style-type: none"> • These other institutions will have sustained interest in collaborating with PAs after awardee exit and will have adequate resources and capacities to do so.
<ul style="list-style-type: none"> • Establish vertical linkages with the municipality and other local institutions to maintain support for PAs. 	<ul style="list-style-type: none"> • Municipalities and other local institutions will have the technical and financial resources and motivation to support PAs.

SUSTAINABILITY STRATEGIES	KEY ASSUMPTIONS
<ul style="list-style-type: none"> Establish stable, long-term contracts between PAs and buyers for priority products. 	<ul style="list-style-type: none"> Producers will be able to meet the quantity and quality requirements of long-term contracts. PAs will have adequate management and accounting skills to execute long-term contracts. Buyers will have an interest in maintaining contracts with producers and will provide credit and technical assistance if needed.
<ul style="list-style-type: none"> Facilitate legal recognition of PAs or certification of producers (except ADRA). 	<ul style="list-style-type: none"> PAs will have the organizational capacity to obtain legal recognition. Legal recognition will facilitate entering into contracts or obtaining certification for products.
<ul style="list-style-type: none"> Ensure that PAs have a period of independent operation before exit. 	<ul style="list-style-type: none"> PAs will have sufficient experience in negotiating contracts and supporting members to be able to do these tasks without awardee guidance or support.
<ul style="list-style-type: none"> Insert communities and PAs into competitive national and international markets through participation in value chains. 	<ul style="list-style-type: none"> PAs will sustain contacts with national and international buyers. Product quality and quantity will consistently meet buyers' needs.
<ul style="list-style-type: none"> Establish ASCs to serve the commercialization needs of farmers in the municipality (ADRA). 	<ul style="list-style-type: none"> ASCs will have the technical and managerial capacity to charge for their services, and farmers will be willing to pay.
<ul style="list-style-type: none"> Train and empower community NRM committees (and their leaders) to conduct NRM activities. Promote NRM committee recognition by community and municipal government entities to encourage funding of future NRM activities. 	<ul style="list-style-type: none"> Communities and municipalities will be motivated to prioritize NRM projects and will have the resources and capacities to devote to such activities. NRM leaders will be motivated to continue in their positions or new leaders will emerge.
<ul style="list-style-type: none"> Promote NRM activities that are directly linked to improved production and/or greater resilience to shocks. 	<ul style="list-style-type: none"> Community members will recognize the tangible benefit of NRM practices and will be motivated to continue them without further project-provided inputs. Community members will maintain their technical capacity to implement NRM activities.
<ul style="list-style-type: none"> Construct or rehabilitate roads for market access. 	<ul style="list-style-type: none"> Municipalities will maintain rehabilitated roads using their own resources.
<ul style="list-style-type: none"> Organize community members into small enterprises to provide road maintenance to municipalities. 	<ul style="list-style-type: none"> Municipalities will contract with community groups for road maintenance.

7.2 Sustainability of Agriculture, Income-Generating Activity, and Natural Resource Management Service Delivery

It is difficult to disentangle service delivery from service use, because much of the evidence of service delivery available through the endline and follow-up surveys is that services were used by the beneficiary farmers and communities. Recall that the awardee endline surveys related to agricultural activities were administered only to those farmers who had participated in FFP activities during the life of each project. The follow-up surveys were administered to a representative sample of farmers in the communities, but with a question to permit identification of those farmers who had participated in FFP activities, so that appropriate comparisons could be made between endline and follow-up. This section focuses primarily on the existence of PAs and other services, while membership in PAs and the use of other services (e.g., training, credit) are discussed in the next section on service use.

A key element of the awardees' sustainability plans for the agriculture, IGA, and NRM interventions was that municipalities and other NGOs would take responsibility for implementing similar activities once the FFP projects ended. **Table 7.1** shows the number of communities that reported undertaking agriculture, IGA, and NRM-related activities in the 2 years following the FFP projects' exit. The activities reported were part of new projects, not continuations of the FFP projects. While fewer than half of the former FFP communities saw new projects during the 2 years after the FFP projects exited, the active involvement of the municipality in what new projects there were is notable. In the cases of agriculture, irrigation, road construction, and reforestation, well over half of the new projects were supported by the municipality, demonstrating that municipal governments in Bolivia did have access to resources through the central government's decentralization policy and made use of them for these priorities. The contribution of other NGOs is more variable, though, as Table 7.1 demonstrates, in many areas, NGOs maintained an active role in initiating new agriculture, IGA, and NRM projects. As seen with the MCHN activities, the continued presence of NGOs was important in maintaining interventions previously supported by FFP awardees.

Table 7.1. Agriculture, IGA, and NRM Activities Undertaken in the 2 Years following the FFP Projects' Exit

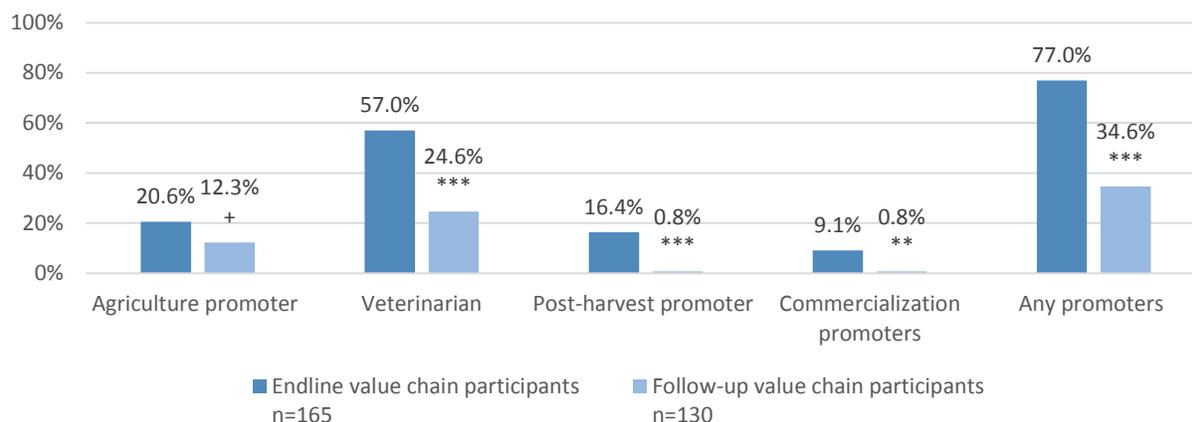
	ADRA	CARE	FH	SC
n	59	88	45	43
% of communities with agricultural projects	13.6%	40.9%	28.9%	18.6%
<i>Of those, % supported by...</i>				
Municipality	62.5%	61.1%	15.4%	50.0%
NGO	52.5%	63.9%	69.2%	12.5%
Central government	12.5%	22.2%	23.1%	25.0%
The community	62.5%	47.2%	53.9%	25.0%
% of communities with reforestation projects	32.2%	21.6%	26.7%	14.0%
<i>Of those, % supported by...</i>				
Municipality	63.2%	47.4%	50.0%	50.0%
NGO	42.1%	57.9%	50.0%	33.3%
Central government	5.3%	21.1%	16.7%	0.0%
The community	57.9%	57.9%	16.7%	33.3%

n	59	88	45	43
% of communities with road projects	39.0%	37.5%	31.1%	48.8%
<i>Of those, % supported by...</i>				
Municipality	82.6%	72.7%	64.3%	61.9%
NGO	4.4%	24.2%	85.7%	9.5%
Central government	8.7%	45.4%	28.6%	4.8%
The community	52.2%	39.4%	50.0%	14.3%
% of communities with irrigation projects	27.1%	30.7%	29.9%	34.9%
<i>Of those, % supported by...</i>				
Municipality	81.3%	59.3%	61.5%	66.7%
NGO	25.0%	33.3%	30.8%	13.3%
Central government	12.5%	40.7%	30.8%	0.0%
The community	43.8%	37.0%	69.2%	26.7%
% of communities with microenterprise projects	0.0%	4.6%	6.7%	2.3%
<i>Of those, % supported by...</i>				
Municipality	–	25.0%	0.0%	100.0%
NGO	–	25.0%	33.3%	100.0%
Central government	–	0.0%	0.0%	100.0%
The community	–	50.0%	100.0%	100.0%
% of communities with microcredit projects	0.0%	9.1%	13.3%	9.3%
<i>Of those, % supported by...</i>				
Municipality	–	0.0%	16.7%	0.0%
NGO	–	87.5%	66.7%	75.0%
Central government	–	0.0%	0.0%	0.0%
The community	–	75.0%	66.7%	0.0%

Source: 2011 Community Surveys. Percent represents the portion of projects that received funding or other resources from each source. Projects may have received support from more than one source.

In CARE communities only, the number of farmers who reported having access to agricultural support services/promoters was measured at endline (2008) and thus also at follow-up (2011), as shown in **Figure 7.1**. However, the availability of these promoters declined significantly between endline and follow-up. The best-maintained individual service was that of veterinarians, possibly because they were trained to provide veterinary services according to a fee-for-service model, which may have helped make their service provision more sustainable over time.

Figure 7.1. Presence of Agricultural Promoters in the Community (CARE)



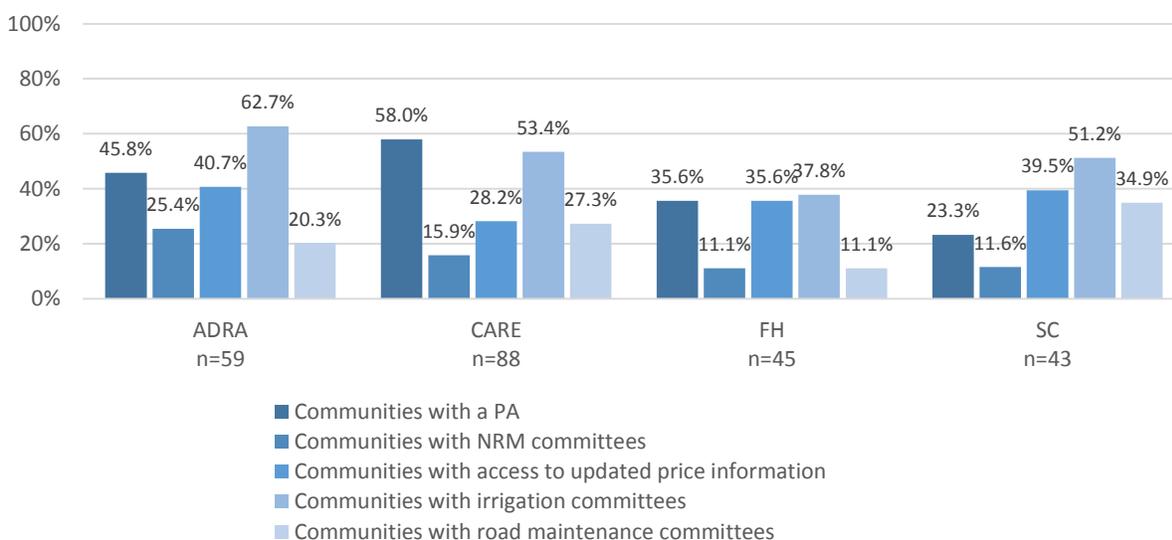
Note: Responses were from farmers engaged in one of the project-promoted value chains.

Source: 2008 and 2011 Agriculture, IGA, and NRM Surveys.

Significance is based on two sample z-tests; + $p \leq 0.1$, ** $p < 0.01$, *** $p < 0.001$.

Figure 7.2 shows the continued presence in communities of the organizations and services started or strengthened by the FFP projects. No comparison data are available from the endline surveys, but these results suggest that a substantial proportion of communities in ADRA and CARE areas had PAs in 2011. Irrigation committees were functioning to maintain the provision of irrigation in at least half of the project communities, except in FH areas. Fewer communities had operating NRM and road maintenance committees. Qualitative observations indicated that municipalities undertook road maintenance activities by hiring workers individually rather than operating through a committee- or community-based enterprise.

Figure 7.2. Percentage of Communities Providing Community Services in 2011



Source: 2011 Community Surveys.

Identifying potential sources of continued support for PAs after exit was a key part of the awardees' exit strategies, and in many cases it was successful (Figure 7.2). Post-FFP project sources of PA support included municipal governments, external donors, in some cases the original FFP awardees (ADRA, FH) that continued operating in the area with non-FFP support, and a variety of Bolivian governmental and nongovernmental organizations. Of some 30 communities with PAs visited at follow-up, only 10 were not receiving direct technical and/or financial support from an external agency; 3 of these were receiving technical assistance and help in accessing credit through their buyers. Among the communities visited in the qualitative rounds of data collection after the FFP projects' exit, the team observed many successfully functioning PAs. Specific examples of successful PAs are provided in **Box 7.2**.

It was not always obvious why some PAs attracted external support and others did not, but one consistent criterion was that the PA was well developed with good market linkages and a good prospect of success. While external support does not guarantee sustainability, the availability of such support allows for a longer period of transition during which PAs can build their markets and gain experience to allow them to operate independently. In at least one case, good linkages meant that the PA no longer needed external support by the time of the follow-up study, but many of the stronger PAs continued to receive external support precisely because they were successful and appeared likely to continue and grow.

Another strategy for sustainability has been vertical linkages between the community PAs and larger, regional PAs. Many of the PAs started by the awardees were municipal associations that already drew from a number of communities, and a number of PAs that started as community-level organizations achieved greater market power (and presumably sustainability) by joining larger, regional PAs or marketing associations. At follow-up, a number of local PAs across the awardee implementation areas had joined larger regional PAs. Larger associations can typically negotiate more effectively for resources and can secure and more reliably meet the requirements of long-term contracts.

Box 7.2. Examples of Successful and Sustainable PAs

- A dairy cooperative started by SC in Huanocollo had a long-term (multi-year) contract with Pil Andino, a Peruvian dairy company. Pil Andino also had long-term contracts with several other PAs in different regions.
- A honey-producing group marketed honey commercially, sold a high-profit specialized product used as a pharmaceutical (*propolio*), and, under a long-term contract, supplied a government program that provided a food package to eligible pregnant women.
- A local onion growers' cooperative joined a municipal association, which supplied produce to the school feeding programs in their municipality.
- An apple growers' association supplied apples to an international company, Windsor Tea, which used the apples to make apple tea for export.
- A peach growers' association supplied peaches to high-end supermarkets in the major cities in Bolivia.
- The textile association promoted by CARE in Tajzara produced high-end fashions from fabric made from the wool of alpacas that were raised by association members. The fashion items were marketed in La Paz and other cities in Bolivia and over the Internet.

Official recognition was important for PAs because it allowed them to access funds, engage in contracts, and obtain sanitary certificates required for the sale of food. Almost every PA interviewed following the FFP projects' closure had obtained or was in the process of obtaining legal recognition, and assistance with obtaining it was an important contribution of the donors that had supported the PAs. The few PAs without this credential did not have secure markets in which to sell their product(s) during follow-up.

Strong local leadership also contributed to the success of PAs. Community leaders can instill confidence in prospective buyers and increase the market potential of PAs, as was the case with the Culpina apple growers' association, whose president was a former congressman. Community leaders, whether elected officials or members of the OTB or other local or municipal organization, are often the first to take advantage of new activities that offer financial opportunities; their leadership can propel a PA forward, although the accompanying risk is that less-advantaged members of the community may feel excluded, as was heard in a number of qualitative interviews with farmers. More important to sustainability than the particular leader was the ability of PAs to negotiate and fulfill long-term contracts with buyers. These long-term contracts did often result in the exclusion of smaller farmers, who were unable to meet the quality and quantity requirements of these contracts.

Successful PAs benefited from a combination of technical training in production and processing and capacity strengthening in management and administration. Members of the associations visited during the qualitative fieldwork could explain how they calculated the profit margin on different products, how they maintained accounts to ensure that members received the appropriate amount of pay, and how they negotiated contracts with buyers and (in some cases) suppliers of inputs. In some cases, PA members were also able to explain their long-term plans for continued growth and expansion. The majority of PAs were able to access external sources of support due to their success. While not every association was equally successful, and a few had disbanded by follow-up, many were still growing and evolving, demonstrating the potential of this model.

These results again confirm that resources, capacity, and motivation are critical to continued service delivery. In the case of PAs, linkages, both vertical (to buyers and markets, as well as to municipalities) and horizontal (to other PAs) were also critical to sustained success. Conversely, in CARE areas, the lack of incentives reduced motivation on the part of model farmers to provide training and reduced their access to resources (inputs previously provided free), even if their capacity was maintained. However, the qualitative results suggest that awardee-trained agricultural and veterinary technicians who established themselves as small businesses during the projects were able to continue providing these services after exit—capacity was maintained by practice, motivation by profit, and resources by the money earned.

7.3 Sustainability of Agriculture, Income-Generating Activity, and Natural Resource Management Service Use

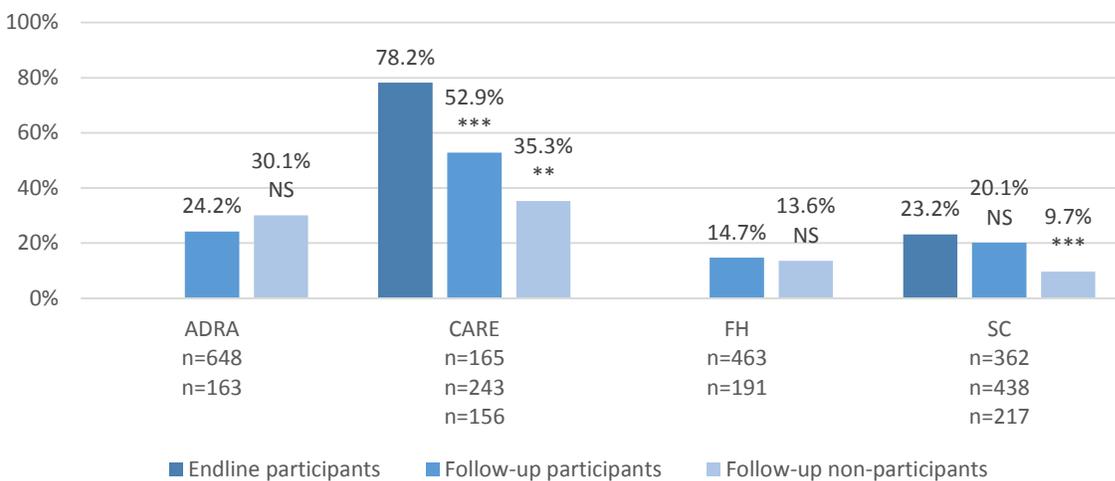
The following sections report results related to farmers' use of services promoted by the FFP projects. Results are reported comparing participants at endline with participants at follow-up. In some cases, comparisons with non-participant farmers are also presented (and are noted in associated figures and tables).

7.3.1 Producer Associations

The formation and strengthening of PAs was a key strategy for ensuring that farmers would continue to have a mechanism for marketing their products after the FFP awardees' exit. PA membership among farmers who participated in the FFP projects declined between endline and follow-up for CARE and was unchanged for SC, the two awardees for which there is comparison information, as shown in **Figure 7.3**.

However, in CARE and SC areas, farmers participating in the projects were considerably more likely than farmers not participating to join or remain in a PA after exit.

Figure 7.3. Percentage of Farmers Participating in PAs



Note: No endline data were available for ADRA and FH. CARE participant data were only for farmers in promoted value chains. FH participant data were only for farmers participating in agriculture, IGA, and NRM activities.

Sources: 2008 and 2011 Agriculture, IGA, and NRM Surveys.

Significance is of the difference between endline and follow-up (2008 and 2011) participants and between participant and non-participant farmers at follow-up based on two sample z-tests; NS=not significant, ** $p < 0.01$, *** $p < 0.001$.

PAs were intended to provide continued technical capacity building through shared knowledge and access to technical assistance and continued resources through ensured sales and market linkages. These benefits were intended to provide the motivation for farmers to join and remain members. PA membership provided benefits but may have also presented barriers to joining. The qualitative investigation discovered that some farmers dropped out of PAs or never joined because they were unable to meet the quality and quantity standards required by the PA to meet its long-term contracts. Often, PA members were those farmers with more resources, for whom the benefits of PA membership were more accessible. Those farmers who were in PAs at follow-up cultivated about 1 hectare more land than non-members, and PA members also generally had higher levels of production, sales, and income as is discussed later in this chapter.

In qualitative interviews, farmers were asked about their decision not to join a PA. Their reasons included membership fees, as well as quantity and quality requirements they felt unable to meet. In some cases, they preferred to market their crops individually so that they would not have to wait for payment by the PA.

7.3.2 Credit

The qualitative interviews conducted 1, 2, and 3 years after exit as part of this study suggested that most farmers in PAs found a variety of mechanisms to access credit and did not perceive barriers to credit as a constraint on their production and marketing activities.²¹

²¹ Although one of the goals of the FFP projects' agriculture, IGA, and NRM sector activities was to facilitate access to credit for agricultural production, no quantitative data were collected at endline on access to or use of credit. Therefore, statistical comparisons of access to and sources of credit from endline to follow-up were not possible.

Several PAs with long-term contracts were able to obtain credit or cash advances for their members for agricultural inputs against future production from their buyers. Other successful PAs were able to meet the needs of their members from membership dues without accessing outside credit. In still other cases, buyers themselves established relationships with lenders and facilitated access to credit on the part of the PA or, more commonly, to individual producer members, in many cases acting as guarantors for the loans. Yet another model had the NGO, rather than buyers, providing links between individual farmers and outside lenders, and serving as guarantors. Other PAs were being supported by NGOs that provided technical assistance and agricultural inputs, reducing the need for loans. One PA successfully sought credit on its own as an association (facilitated by having its own legal recognition) and provided loans to its members (to be paid back with interest).

The continued presence of NGOs in the former FFP project areas was an important element in access to credit. The involvement of buyers was another, potentially more sustainable, mechanism. PA membership appeared to facilitate access to credit. Some non-member farmers reported that they did not take credit because they were concerned about going into debt or paying interest rates that would eliminate any profit. Others noted that they lacked collateral, such as a formal title for land. Conversely, some farmers who had been participating in PAs noted in qualitative interviews that they dropped out of the PA specifically because they were unable to meet the criteria to obtain loans. But out of multiple key informant interviews and FGDs with both PA member and non-member farmers, few farmers noted access to credit as a constraint on their production (a specific question in the qualitative interview guide), and several noted that they had been able to invest in agricultural infrastructure out of their own profits, without seeking credit—precisely the sustainability strategy anticipated by the awardees.

7.3.3 Use of Training and Technical Assistance

Training farmers in improved agricultural and livestock production techniques was the FFP projects' key to ensuring that increases in agricultural productivity and incomes would be sustained after exit. Awardees achieved this through training of model farmers and the provision of inputs for demonstration plots.

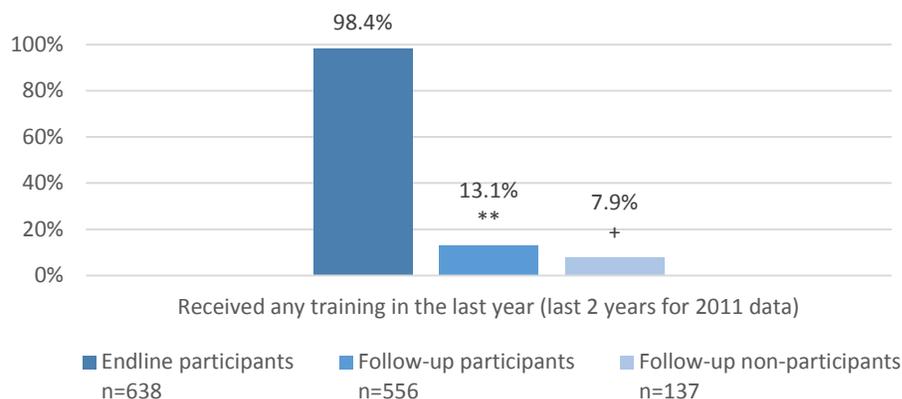
Figure 7.4 shows that the percentage of ADRA farmers receiving training dropped dramatically between endline and follow-up, falling from almost all participant farmers receiving training during the last year of the project to only 13 percent receiving training by the time of the follow-up survey. Recall that ADRA had organized relatively formal technical advisory groups of farmers linked to ASCs, and ASCs provided services free up to the time of project exit and then began to charge for them. The abrupt withdrawal of free services and the imposition of a charge is likely one reason for this decline in training, as farmers were not accustomed to paying fees for these services.

Figure 7.5 shows that for CARE value chain participants receipt of training also declined significantly after project exit, as did NRM training, because there were fewer promoters in CARE communities (as noted earlier in Figure 7.2) and CARE no longer provided transportation to participate in these trainings.

Figure 7.6 shows that use of technical assistance among farmers who participated in the IGA component of the SC project declined significantly from endline to follow-up, except for use of the services of veterinary technicians. The agricultural and veterinary technicians trained by SC were encouraged to develop small businesses and charge for their services, starting before project exit so that (in contrast to the case with ADRA) farmers would be accustomed to paying for these services rather than having a charge imposed on a previously free service. In qualitative interviews, farmers described using the services of technicians to continue benefiting from practices that they had found to be beneficial. The data show that demand for veterinary technicians was maintained, while demand for the other services

declined, though demand for these other services did continue in some places. For example, in Sapahaqui, even without PA involvement, individual farmers reported (in qualitative interviews) using the services of awardee-trained fruit tree technicians for grafting and pruning because of the visible benefit to the quality of their produce.

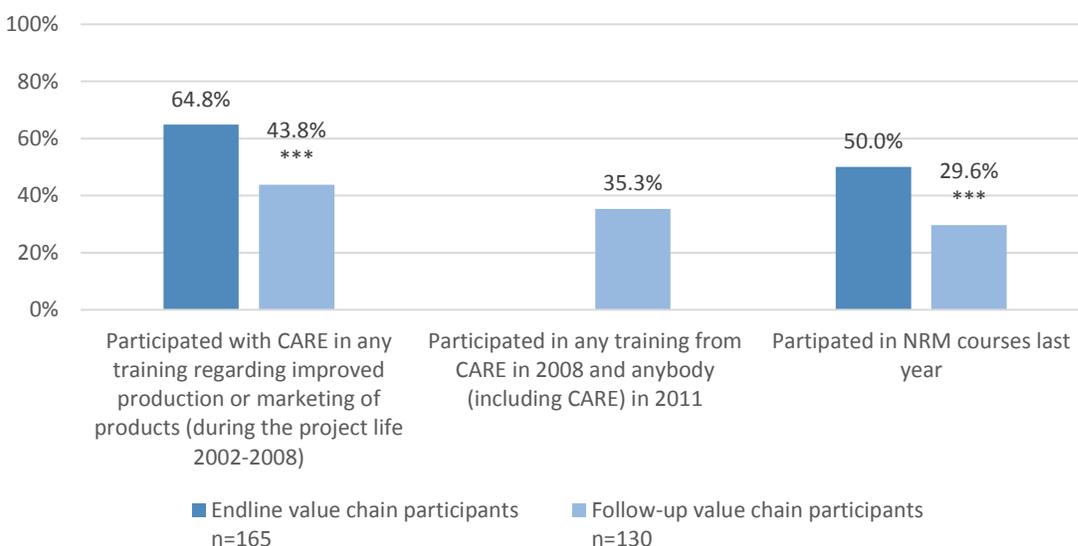
Figure 7.4. Percentage of Farmers Receiving Agricultural Training: ADRA



Sources: 2008 and 2011 Agriculture, IGA, and NRM Surveys.

Significance is of the difference between endline and follow-up (2008 and 2011) participants and between participant and non-participant farmers at follow-up based on two sample z-tests; + $p \leq 0.1$, ** $p < 0.01$.

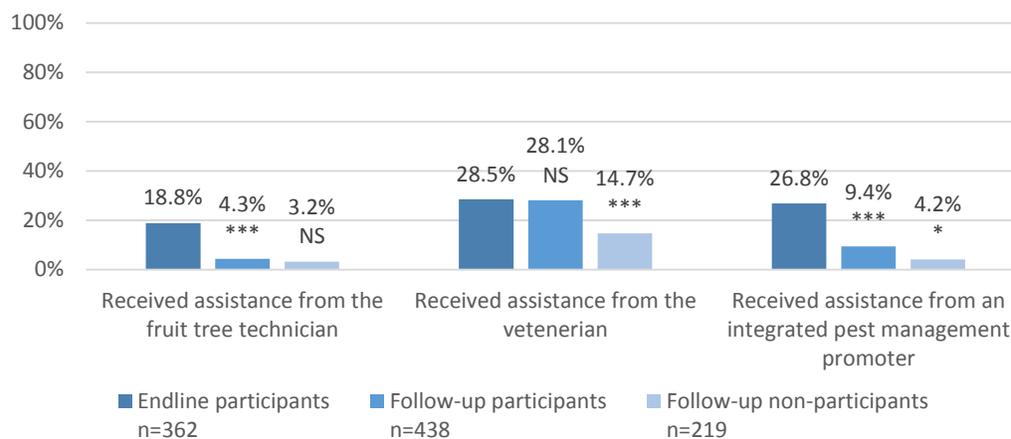
Figure 7.5. Use of Training among CARE Value Chain Participant Farmers



Note: Sources of training mentioned include university, CARE, Plan International, local NGOs, and government agencies such as Servicio Nacional de Sanidad Agropecuaria e Inocuidad Alimentaria (National Service of Agricultural and Livestock Health and Food Safety). CARE data were only for farmers in promoted value chains.

Sources: 2008 and 2011 Agriculture, IGA, and NRM Surveys. Data were from value chain participants only. Significance is based on two sample z-tests; *** $p < 0.001$.

Figure 7.6. Percentage of Participant Farmers Using Technical Assistance Services: SC



Sources: 2008 and 2011 Agriculture, IGA, and NRM Surveys.

Significance is of the difference between endline and follow-up (2008 and 2011) participants and between participant and non-participant farmers at follow-up based on two sample z-tests; NS=not significant, * $p < 0.05$, *** $p < 0.001$.

Aside from the awardees’ own technicians and the model farmers (most of whom did not continue providing training after the FFP projects’ exit), another source of technical assistance to farmers was the buyers who engaged in long-term contracts with farmers through PAs. As noted earlier, in qualitative visits over three rounds, the study team heard from several PAs that their buyers provided technical assistance to improve the quality of the products for which they had contracted.

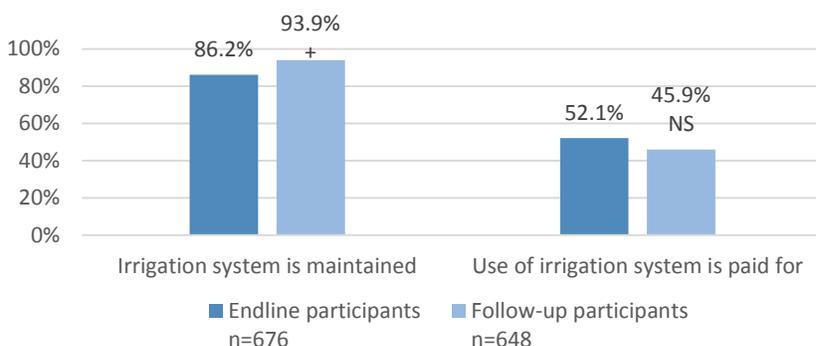
7.3.4 Use of Irrigation

Irrigation use was a strategy for improving agricultural production and incomes in all four awardees’ implementation areas. Community surveys showed that more than half of the communities in three of the four project areas had functioning irrigation committees 2 years after exit (FH being the exception).

Figure 7.7 shows that in ADRA areas, the only areas where data on use of irrigation were collected at endline, most farmers reported that their irrigation systems continued to be maintained 2 years after exit, even though only about half of farmers who used irrigation reported paying for it at endline or follow-up.²²

²² System maintenance may have been done by the farmers themselves or through one-time payments to technicians rather than through ongoing user fees; some system repairs were also supported by the municipality.

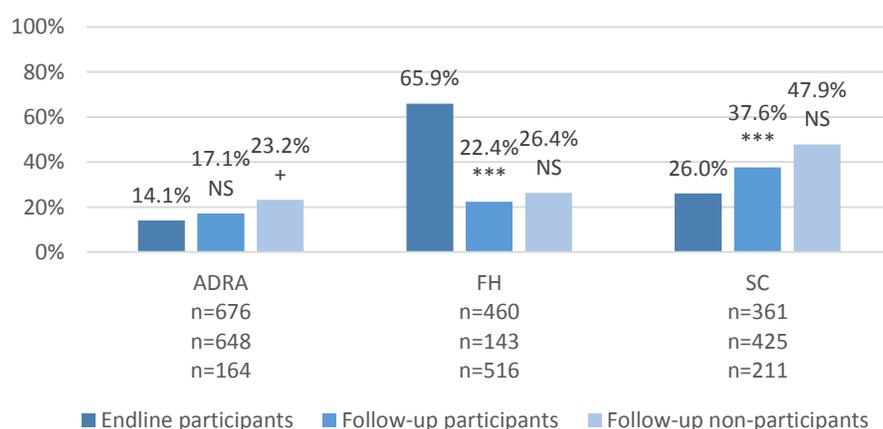
Figure 7.7. Use of Irrigation among ADRA Project Participants



Sources: 2008 and 2011 Agriculture, IGA, and NRM Surveys. Significance is based on two sample z-tests; NS=not significant, + p≤0.1.

Figure 7.8 shows the use of irrigation by farmers who participated in the FFP projects, as well as non-participants in the three awardee areas for which data were available. In ADRA areas, the percentage of participant farmers using irrigation was unchanged following project exit. In FH areas, use of irrigation fell significantly among project participants following project exit. However, data on FH farmers who were trained by the project, as opposed to just self-described “participants,” indicate that those who were trained were somewhat more likely to use irrigation than those who received no training (data not shown). In contrast, in SC areas, use of irrigation rose significantly among participants following project exit. In all awardee areas, use of irrigation was the same or somewhat higher among those who had not been project participants than among participants, suggesting that the systems were accessible to all farmers and not only those who had participated in the FFP-supported projects. In almost all the observations and interviews conducted by the qualitative team during the last round of qualitative data collection, irrigation systems were well maintained, with repairs supported through either user fees or help from the municipality. There were concerns expressed, though, about having a sufficient quantity of water to last through the dry season as demand on the systems increased.

Figure 7.8. Farmers Using Irrigation in Production



Note: For ADRA, question was whether farmer used irrigation from a tank or water storage pond in the past year (2008) or past 2 years (2011).

Sources: 2008 and 2011 Agriculture, IGA, and NRM Surveys. No data were available from CARE. FH participant data were only for farmers participating in agriculture, IGA, and NRM activities.

Significance is of the difference between endline and follow-up (2008 and 2011) participants and between participant and non-participant farmers at follow-up based on two sample z-tests; NS=not significant, + p≤0.1, *** p<0.001.

Awardees trained irrigation committees in management of the irrigation systems, including administration of user fees, and part of the awardees' exit strategies was to promote linkages between irrigation committees and their municipalities. This strategy may have been relatively successful with irrigation because irrigation was directly relevant to the economic development of the FFP-targeted area, a key responsibility of municipal government. Although quantitative data were not available for CARE areas, irrigation systems observed in almost all of the qualitative visits (including in CARE areas) were financially maintained by user fees from producers. In addition, many municipalities provided funding or in-kind contributions of materials and machinery to maintain and repair the systems, with community members providing labor. In several locations, municipal governments had not only supported repairs, but also expanded the reach of the irrigation systems by building, at municipal expense, additional storage tanks. In Yunga Yunga, an SC implementation region, the municipality had built one additional tank at the time of exit and by the last follow-up visit had built a total of five tanks. There were very few cases where repairs to damaged irrigation systems were too expensive to be covered by user fees or were not supported by the municipality. In most cases (in all of the awardee areas), the benefit to the economic development of the community by permitting greater and in some cases more diverse productivity, and more crops per year, was sufficient motivation to encourage the municipality to invest in these systems, using resources derived from the central government through its decentralization policy.

As was observed for piped water systems, the technical quality of the infrastructure created by the FFP projects contributed to its sustained use. In several of the Altiplano communities in the SC area, qualitative observations found continued use and maintenance of small reservoirs because the reservoirs had been placed close to streams and were in locations easily accessible by livestock; these communities were maintaining their reservoirs, in contrast to some that were not well located and were abandoned by the time of the follow-up visits.

7.4 Sustainability of Agriculture, Income-Generating Activity, and Natural Resource Management Practices

The key strategy for sustained improvement in agricultural income for all awardees, emphasized even more after the midterm evaluations, was to promote farmers' engagement in the market. Awardees encouraged the adoption of new crops, taught new crop and livestock production techniques to improve productivity, and promoted links to the market to encourage sales.

7.4.1 Production of Non-Traditional and Priority Crops and Livestock

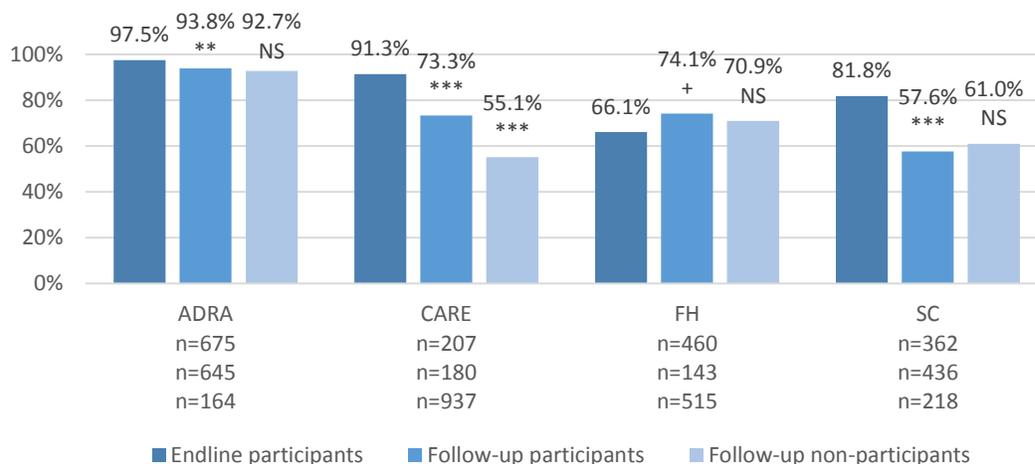
Promotion of non-traditional and priority crops (crops that were identified by the awardees as a priority for development because they were judged to have good market potential) was one element of the FFP projects' agriculture, IGA, and NRM sector interventions. Production of non-traditional crops was well maintained, at over 85 percent, for all farmers that participated in the FFP projects (in the case of CARE, value chain participants), despite small but significant declines for ADRA and SC between endline and follow-up. In the case of CARE and FH, non-participant farmers at follow-up were somewhat less likely than those who had been participants to be producing non-traditional crops.

The pattern was somewhat different for the percentage of participant farmers continuing to produce crops and livestock products explicitly promoted by the FFP projects, as shown in **Figure 7.9**. In particular, this figure shows a significant decline from endline to follow-up in all the awardee areas except for FH, where a small increase occurred. The drop was smallest for ADRA, where more than 90 percent of farmers continued to produce at least one of the many promoted products. The difference between participants and non-participants was slight, except in the case of CARE, where many fewer non-participant than

participant farmers produced products that were promoted. In all of the awardee areas, though, well over half of the former participant farmers at follow-up were producing at least one of the FFP projects' promoted priority products.

Livestock production was a focus of all the awardees except ADRA. There are no baseline data on livestock ownership, but, from endline to follow-up among project participants, livestock ownership declined in two of the awardee areas with a livestock focus and was maintained in one. While non-participants were less likely to own livestock than participants, more than 80 percent of participant and non-participant farmers owned livestock at both time points.

Figure 7.9. Percentage of Farmers Producing Any Promoted Priority Crop or Livestock Product



Note: Promoted crops: ADRA—barley, broad beans, corn (seed), garlic, grapes, onions, peas, peaches (fresh/processed), plums (fresh); CARE—chamomile, cheese, honey, peaches, peanuts, textiles (no data were collected on textiles, and honey was not sold by any CARE farmer); FH—amaranth, broad beans, corn (seed), maca (organic), onions (sweet), peanuts, potatoes (commercial/seed), milk; SC—apples (fresh/dehydrated), broad beans, maca (organic), milk, meats, onions/sweet onions, peas, peaches (fresh/processed), pears (fresh), plums (fresh), potatoes (commercial/seed), vegetables. CARE participation data were only for farmers in promoted value chains. FH participation data were only for farmers participating in agriculture, IGA, and NRM activities.

Sources: 2008 and 2011 Agriculture, IGA, and NRM Surveys.

Significance is of the difference between endline and follow-up (2008 and 2011) participants and between participant and non-participant farmers at follow-up based on two sample z-tests; NS=not significant, + p<0.1, ** p<0.01, *** p<0.001.

7.4.2 Participation in the Market

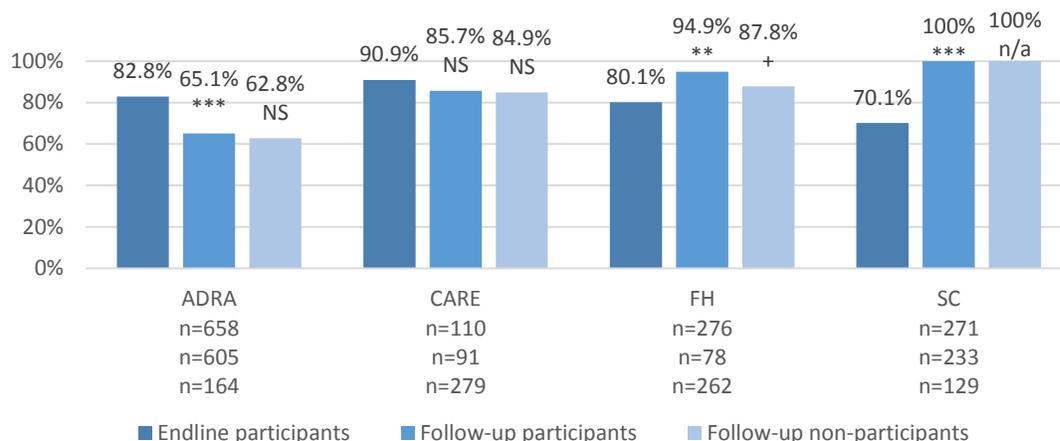
The key to successful sustainability of the agriculture, IGA, and NRM interventions of the studied FFP projects in Bolivia was not so much the specific crops that were produced but whether producers engaged in agricultural sales. Awardees taught producers how to respond to shifting market conditions by altering their crop mix, and understanding market conditions was one focus of awardee trainings.

Commercialization of crops was seen as the key to sustainable improvements in household income and food security by all awardees. Commercial participation was intended to provide resources and motivation (through profitable sales) to continue applying what farmers had learned and to contribute to the maintenance of technical capacity through practice and through links with buyers who would be motivated to provide technical assistance to their suppliers.

Figure 7.10 shows the percentage of farmers producing and selling the agricultural products promoted by the awardees. The data indicate the persistence of the agriculture, IGA, and NRM interventions, which, especially after the midterm evaluations, focused on a limited number of high-priority crops and

promoted techniques to improve their production and marketing. Of participating farmers, only ADRA saw a significant decline in sales of promoted products between endline and follow-up, possibly because ADRA withdrew its marketing support activities more abruptly at the end of the project (having provided them free up to the time of exit), so that participating farmers had not developed an independent capacity to contract for marketing services, including grading and arranging for transportation to market. Other awardee areas saw an increase in sales of promoted products between endline and follow-up. Nonetheless, at both endline and follow-up, the majority of participant farmers engaged in agricultural sales (including crops, livestock, and transformed products), and the majority sold them individually at both endline and follow-up.

Figure 7.10. Percentage of Farmers Producing Priority Products and Engaging in the Sale of Those Products



Note: CARE participant data were only for farmers in promoted value chains. FH participant data were only for farmers participating in agriculture, IGA, and NRM activities.

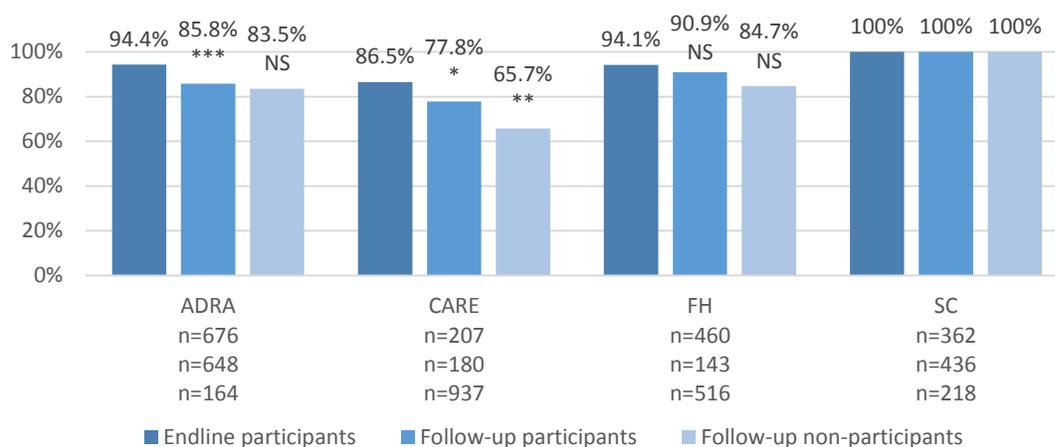
Sources: 2008 and 2011 Agriculture, IGA, and NRM Surveys.

Significance is of the difference between endline and follow-up (2008 and 2011) participants and between participant and non-participant farmers at follow-up based on two sample z-tests; NS=not significant, + $p \leq 0.1$, ** $p < 0.01$, *** $p < 0.001$.

Figure 7.11 shows the percentage of farmers engaged in the commercialization or sale of *any* agricultural products at endline and follow-up. Commercialization dropped off in ADRA and CARE areas, but a relatively high percentage of farmers continued to engage in agricultural sales, and only in CARE areas were non-participants less likely to engage in agricultural sales than value chain participants.

Commercialization was widespread in all awardee areas. **Figure 7.12** shows the percentage of participant farmers selling through PAs and individually at endline and follow-up. The percentage selling through PAs dropped significantly, and the percentage selling individually rose, but equally striking is that at both endline and follow-up, and among participants and non-participants, a majority of farmers were selling individually (in ADRA and FH areas, where data were available).

Figure 7.11. Percentage of Farmers Selling Any Crop or Livestock Products

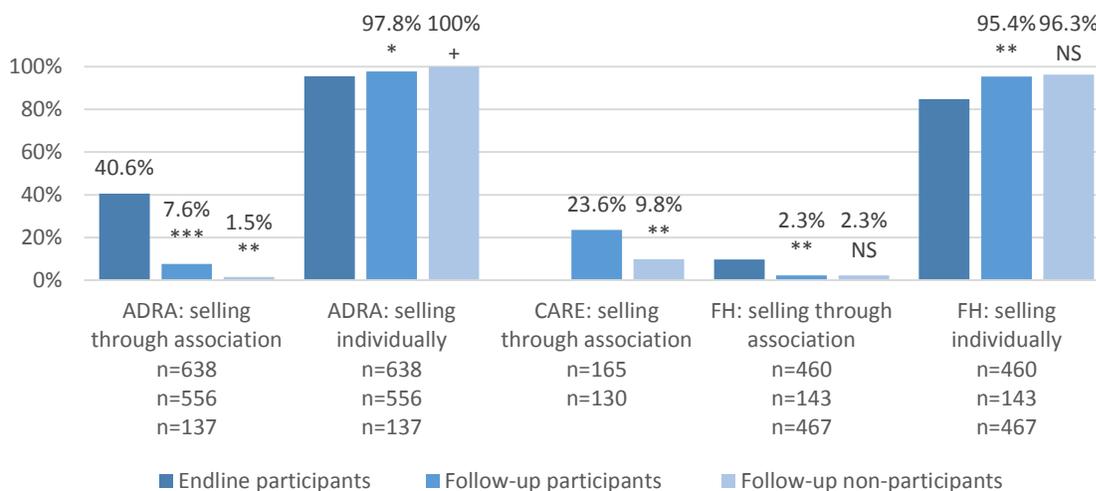


Note: CARE participant data were only for farmers in promoted value chains. FH participant data were only for farmers participating in agriculture, IGA, and NRM activities.

Sources: 2008 and 2011 Agriculture, IGA, and NRM Surveys.

Significance is of the difference between endline and follow-up (2008 and 2011) participants and between participant and non-participant farmers at follow-up based on two sample z-tests; NS=not significant, * p<0.05, ** p<0.01, *** p<0.001.

Figure 7.12. Percentage of Farmers Selling through PAs and Individually



Note: Information from CARE on individual sales was not available.

Sources: 2008 and 2011 Agriculture, IGA, and NRM Surveys.

Significance is of the difference between endline and follow-up (2008 and 2011) participants and between participant and non-participant farmers at follow-up based on two sample z-tests; NS=not significant, + p≤0.1, * p<0.05, ** p<0.01, *** p<0.001.

All awardees intended to promote market linkages so that farmers would be more likely to access secure commercial markets for their products. Each awardee collected information differently at endline; **Table 7.2**, **Table 7.3**, and **Table 7.4** show mechanisms for commercialization separately for each awardee, as measured at endline and at follow-up (no information was available for SC).

For ADRA, at endline, the great majority of farmers sold individually, and this percentage increased at follow-up. Selling through groups (even occasionally) or through PAs fell substantially between endline and follow-up, showing a clear disconnect of farmers from the process of collective marketing. The percentage of farmers selling to any one of the possible destinations fell between endline and follow-up,

suggesting that farmers who had been using multiple channels for sale were using fewer such channels at follow-up, since the responses were not mutually exclusive. The ASCs established by ADRA were intended to facilitate farmers' sales to commercial outlets—wholesalers, retailers, and exporters—but by 2 years after exit, the most common destinations for farm sales were agricultural fairs and middlemen who purchase locally for later sale outside of the community. The ASCs continued to fulfill their function, but, as was the case with the PAs, they appeared to be serving a smaller percentage of farmers who were able to meet the quality standards and quantity requirements of ASC contractors. In addition, the ASCs had been providing market linkage services free of charge prior to exit and instituted a charge only at the time of exit. Some farmers may have been unwilling to pay for these services, which they had previously received free.

Table 7.2. Mechanisms of Commercialization Employed: ADRA

	Endline Participants	Follow-Up Participants	Follow-Up Non-Participants	P-value (2008 Participants vs. 2011 Participants)	P-value (2011 Participants vs. Non-Participants)
n	676	648	164		
<i>Percent commercializing products</i>	94.4%	85.8%	83.5%	0.000	0.457
n	638	556	137		
<i>Of those commercializing, percent selling in...</i>					
PAs	40.6%	7.6%	1.5%	0.000	0.009
Occasionally in groups	26.0%	4.3%	1.5%	0.000	0.122
Individually	95.5%	97.8%	100.0%	0.029	0.080
<i>Of those commercializing, destination of sales</i>					
Wholesaler	52.4%	26.8%	38.0%	0.000	0.010
Retailer	47.6%	12.8%	8.8%	0.000	0.197
Directly to the consumer	62.2%	18.9%	13.9%	0.000	0.172
Exporter/food industry	26.2%	3.6%	0.0%	0.000	0.024
Agricultural fair	55.2%	48.7%	51.1%	0.025	0.615
Middleman	73.2%	35.4%	19.0%	0.000	0.000

Sources: 2008 and 2011 Agriculture, IGA, and NRM Surveys.

Table 7.3 shows the means of commercialization for CARE value chain participants. At exit, 16.0 percent of all farmers were value chain participants, and this percentage was maintained (16.7 percent at follow-up). Recall that after the project closed, CARE narrowed its focus to promoting one value chain per implementation region, although some farmers may have continued in other value chains without explicit support from CARE. Farmers might also have responded to the market and shifted their production to the most profitable crop. The most significant positive shift was in the number of farmers selling outside their community in urban areas. As with ADRA, a significant negative shift was seen in the percentage of previous CARE farmers selling through PAs.

Table 7.3. Mechanisms of Commercialization Employed: CARE

	Endline Value Chain Participants	Follow-Up Value Chain Participants	P-value
n	1,291	1,312	
Percentage of all farmers who were value chain participants	16.0%	16.7%	–
<i>Percentage of all farmers engaged in each value chain</i>			
Peanut	2.4%	26.2%	0.000
Cheese	4.8%	13.8%	0.067
Dried peaches	0.6%	n/a	n/a
Honey	3.0%	6.2%	0.184
Peach	53.3%	43.1%	0.082
Camelids (llamas, alpacas, and vicuñas)	18.8%	n/a	n/a
Textiles	17.0%	10.8%	0.131
<i>Destination of sales among value chain participants</i>			
n	165	130	
The community	15.8%	17.4%	0.713
Other communities	27.9%	21.2%	0.187
City	31.5%	52.3%	0.000
Wholesaler	2.4%	3.0%	0.751
Other departments	2.4%	3.8%	0.485
Export	1.2%	2.3%	0.466
To the PA	23.6%	9.8%	0.002

Sources: 2008 and 2011 Agriculture, IGA, and NRM Surveys.

The experience in FH areas was similar, as shown in Table 7.4. The percentage of farmers selling individually without a contract, which was high at exit, rose significantly by follow-up, while the percentage of farmers selling with a contract or through an association, while not very high at exit, fell. Nonetheless, there was an increase in the percentage of farmers selling through wholesalers and a decrease in the percentage of farmers selling directly to the final consumer.

Table 7.4. Mechanisms of Commercialization Employed: FH

	Endline Agriculture, IGA, and NRM-Targeted Farmers	Follow-Up Agriculture, IGA, and NRM-Targeted Farmers	Follow-Up Non-Agriculture, IGA, and NRM-Targeted Farmers	P-value (2008 Participants vs. 2011 Participants)	P-value (2011 Participants vs. Non-Participants)
n	460	143	516		
Percentage of farmers commercializing products	94.1%	90.9%	84.7%	0.180	0.058
<i>Of those commercializing, mechanisms of commercialization</i>					
n	433	130	414		
Individual without a contract	84.8%	95.4%	96.3%	0.002	0.630
Individual with a contract	4.8%	0.8%	1.4%	0.383	0.575
Association and individual	7.6%	2.3%	0.5%	0.030	0.053
Association (with or without contract)	9.7%	2.3%	2.3%	0.006	1.000

	Endline Agriculture, IGA, and NRM- Targeted Farmers	Follow-Up Agriculture, IGA, and NRM- Targeted Farmers	Follow-Up Non- Agriculture, IGA, and NRM- Targeted Farmers	P-value (2008 Participants vs. 2011 Participants)	P-value (2011 Participants vs. Non- Participants)
<i>Of those commercializing, location of sales</i>					
Capital cities	67.7%	26.9%	68.9%	0.000	0.000
Intermediate capitals	20.6%	42.3%	14.2%	0.000	0.000
In the community	37.9%	50.0%	24.9%	0.014	0.000
Fairs	14.5%	20.0%	13.7%	0.131	0.079
Other	3.5%	1.5%	1.4%	0.244	0.933
<i>Of those commercializing, destination of sales</i>					
Wholesalers	27.3%	53.8%	26.4%	0.000	0.000
Intermediaries	69.3%	51.5%	64.7%	0.011	0.007
Final consumers	52.0%	18.5%	34.6%	0.000	0.001
Other	1.8%	1.5%	3.4%	0.818	0.262

Sources: 2008 and 2011 Agriculture, IGA, and NRM Surveys.

7.4.3 Improved Agricultural and Livestock Practices

This section reports evidence of sustained adoption of improved agricultural practices among farmers. Because each awardee measured different specific practices reflecting what its project promoted, and because each awardee specified its own criteria for judging whether farmers were using the practices, sustainability of practices for each awardee is presented in separate tables. Overall, even in communities without PAs or among farmers who were not PA members, qualitative interviews found many farmers were generating increased profits from the improved agricultural methods and commercialization strategies learned during the life of the projects. For example, in Cebada Pata (SC) and Narvaez (CARE), individual peach producers were using pruning and planting techniques that produced a much higher value product. As one producer in Narvaez said, “I will continue planting new peach trees and implementing improved agricultural techniques because we can earn higher profits.” In Sapahaqui (FH), the team observed that even farmers who had not participated in the FFP-supported trainings were emulating tree-planting techniques observed to be beneficial among the trained farmers.

ADRA

Table 7.5 shows the percentage of farmers in the ADRA implementation areas adopting project-encouraged practices at endline and follow-up. Adoption rates of almost all of the practices were quite high at endline: Almost all were practiced by more than 75 percent of farmers, and almost all farmers reported practicing at least half of the practices promoted in the projects. ADRA provided free inputs and trained almost all participant farmers during its project. At follow-up, adoption of most practices had fallen, some very substantially, but many practices were still well maintained. Use of organic fertilizer actually increased in the 2 years after exit in these areas. It seems that the practices that required training but not a lot of technical skill or financial input were more likely to be sustained: A high percentage of farmers continued to practice crop rotation, crop husbandry, product selection and grading, and timely harvesting, while more technically demanding or expensive practices, like use of liquid fertilizer (which had to be purchased), grafting and pruning, and maintaining seed beds, declined more. There were few marked differences at follow-up between farmers trained in the project and non-participants, indicating that non-participant farmers emulated the practices that they saw were beneficial, as was observed in a number of qualitative visits.

Table 7.5. Improved Agricultural Practices Employed: ADRA

	Endline Participants	Follow-Up Participants	Follow-Up Non-Participants	P-value (Endline vs. Follow-Up Participants)	P-value (Follow-Up Participants vs. Non-Participants)
n	676	648	164		
<i>Use of...</i>					
Liquid fertilizer	79.1%	17.6%	11.6%	0.000	0.064
Organic fertilizers	86.7%	94.1%	97.0%	0.000	0.139
Seedbeds	77.8%	39.2%	37.8%	0.000	0.743
Crop rotation	96.6%	90.1%	84.8%	0.000	0.052
Adequate planting density/number of seedlings per hectare (fruit crops)	86.2%	62.7%	57.9%	0.000	0.269
Certified, improved seeds	79.3%	64.8%	64.0%	0.000	0.848
Agronomic practices (crop husbandry)	97.9%	97.7%	97.0%	0.712	0.662
Optimum harvest time	95.9%	86.6%	79.3%	0.000	0.021
Drying/curing	86.1%	67.7%	68.3%	0.000	0.883
Product classification (grading)	90.7%	83.8%	81.1%	0.000	0.408
Product selection	95.0%	90.6%	87.2%	0.002	0.212
Adequate product stockpiles	80.8%	68.2%	56.1%	0.000	0.004
Rational/safe application of agrochemicals	75.3%	41.2%	43.3%	0.000	0.626
Pruning	75.0%	49.8%	42.7%	0.000	0.104
Grafts	52.7%	15.4%	9.8%	0.000	0.067
Practicing at least half of practices (7)	97.9%	88.9%	85.4%	0.000	0.215

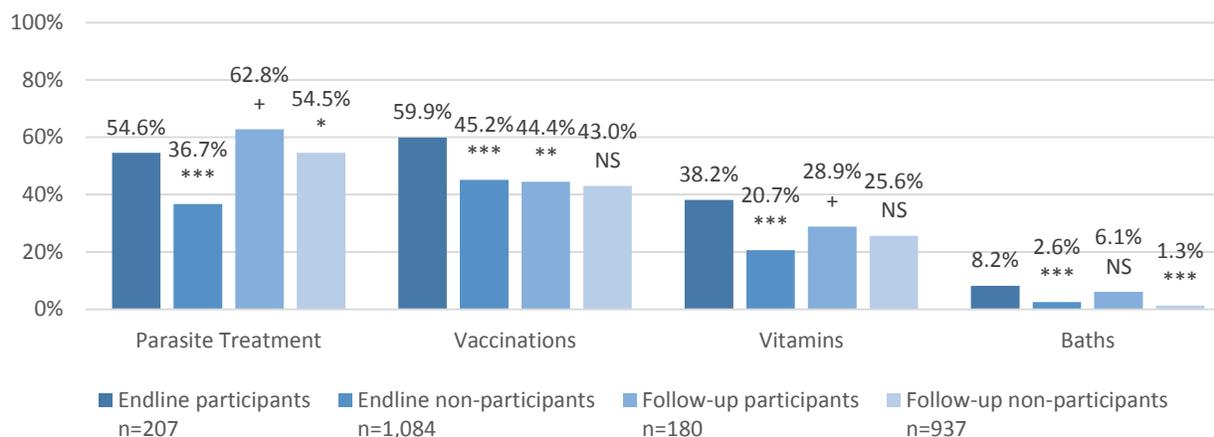
Sources: 2008 and 2011 Agriculture, IGA, and NRM Surveys.

Endline to follow-up participants differences are all significant at .002 or better except agronomic practices ($p=.712$). For follow-up participants to follow-up non-participants, no differences are significant except for optimum harvest time ($p=.021$) and adequate product stockpiles ($p=.004$).

CARE

CARE's information about crop production practices in its endline survey came from monitoring data and not from a representative sample of farmers, so comparisons with a follow-up survey were not possible. However, at endline, CARE did ask all farmers in the community, both value chain participants and non-participants, about promoted practices for the care of livestock. Two of the value chains developed during the project were for camelids (llamas, alpacas, and vicuñas). These animals provided meat and wool, as well as milk and cheese. To facilitate returns on these value chain investments, the project promoted a number of improved livestock care practices. As shown in **Figure 7.13**, between endline and follow-up the use of parasite treatment increased among both participants and non-participants, while the use of vaccinations declined somewhat among participants. Additionally, the use of vitamins appeared largely unchanged among participants, and the use of baths was more or less maintained at an already low level among this same group.

Figure 7.13. Percentage of Participants and Non-Participants Using Promoted Livestock Practices: CARE



Note: CARE participant data were only for farmers in promoted value chains.

Sources: 2008 and 2011 Agriculture, IGA, and NRM Surveys.

Significance is of the difference between endline participants and endline non-participants; endline participants and follow-up participants; follow-up participants and follow-up non-participants (shown in that order) based on two sample z-tests; NS=not significant, + $p \leq 0.1$, * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$.

FH

In FH areas, as was the case in ADRA areas, use of many positive practices continued even though some saw a statistically significant decline (**Table 7.6**). Use of fertilizer rose (although not significantly); use of guano for fertilizer rose significantly between endline and follow-up. Practices such as seed selection and classification of production by quality in order to obtain differentiated prices for higher-quality products were used by more than 90 percent of participating farmers even though these practices declined following endline. The use of “enhanced” storage silos, for which the awardee provided inputs at no charge during the project, was maintained, while the use of traditional and “improved” silos declined.²³ The storage of crops in a store room and bedroom (discouraged by the awardees because it would be unlikely that the products would be protected from damage) declined substantially. Almost all farmers reported using at least half (three) of the promoted practices at follow-up, and there were few notable differences between participant farmers and non-participant farmers.

²³ “Improved” silos were those that had been repaired or expanded. “Enhanced” silos had higher-quality construction and were in active use by farmers.

Table 7.6. Sustained Agricultural Practices Employed: FH

	Endline Agriculture, IGA, and NRM Participants	Follow-Up Agriculture, IGA, and NRM Participants	Follow-Up Non- Agriculture, IGA, and NRM Participants	P-value (2008 Participants vs. 2011 Participants)	P-value (2011 Participants vs. Non-Participants)
n	460	143	516		
<i>Use of...</i>					
Seed selection	99.6%	90.9%	89.3%	0.000	0.578
Certified seed	46.1%	37.1%	27.9%	0.058	0.034
Any fertilizer	95.0%	97.9%	95.3%	0.136	0.167
Guano ^a	43.9%	69.9%	55.4%	0.000	0.002
Chemicals ^a	6.4%	5.6%	5.6%	0.735	1.000
Guano and chemicals ^a	74.1%	53.1%	55.6%	0.000	0.595
Pesticides	70.1%	58.0%	65.1%	0.007	0.119
Product classification	99.6%	97.9%	96.1%	0.047	0.301
<i>Crop storage in...</i>					
Kitchen	3.6%	2.4%	7.1%	0.496	0.052
Store room	79.6%	50.8%	57.8%	0.000	0.165
Bedroom	9.3%	1.6%	3.1%	0.004	0.683
Improved silo	15.3%	2.4%	1.9%	0.000	0.726
Traditional silo	54.6%	2.4%	2.6%	0.000	0.000
Enhanced silo	16.1%	14.7%	7.2%	0.688	0.005
Practicing at least half of the key promoted practices (3) ^b	99.8%	95.8%	91.7%	0.000	0.098

Sources: 2008 and 2011 Agriculture, IGA, and NRM Surveys.

^a Asked with respect to the three top income-generating crops.

^b Promoted practices included use of: seed selection, certified seed, fertilizer, product classification, and enhanced storage silos. Endline to follow-up differences were all significant except for: use of guano, use of chemical fertilizer, and crop storage in kitchen. Among follow-up trained vs. follow-up untrained participants, no differences were significant, except for use of guano ($p=.002$) and use of enhanced silos ($p=.0052$).

FH also promoted livestock production, and the livestock practices promoted in the project were fairly well maintained (**Table 7.7**). Among project participants, treatment for parasites increased significantly from endline to follow-up. The use of vaccinations fell, but was still over 80 percent. There was also an increase in the number of project participants using improved stables and sheepfolds, and more former project participants used them at follow-up than non-participants. While the overall number of project participants using stables and sheepfolds was not large, the increase suggests that these farmers were using their own resources to construct this infrastructure, despite the fact that these inputs had been provided free during the project (in contrast to some other practices, which were not sustained once free resources were withdrawn or a charge was instituted for them).

Table 7.7. Sustained Livestock Practices Employed: FH

	Endline Agriculture, IGA, and NRM Participants	Follow-Up Agriculture, IGA, and NRM Participants	Follow-Up Non- Agriculture, IGA, and NRM Participants	P-value (2008 Participants vs. 2011 Participants)	P-value (2011 participants vs. Non- Participants)
n	471	143	516		
Owns livestock (cows, sheep, goats, pigs)	86.4%	88.8%	92.4%	0.455	0.169
n	407	127	477		
<i>Use of...</i>					
Vaccination in the past year	91.4%	84.1%	76.9%	0.019	0.081
Treatment for parasites in the past year	71.3%	83.3%	76.9%	0.007	0.122
Production of forage crops	95.8%	74.8%	76.9%	0.000	0.620
Purchase or bartering for forage crops	9.1%	7.9%	5.0%	0.677	0.207
Grazing of animals	84.8%	85.8%	88.9%	0.783	0.335
Other animal feeding practices	4.9%	3.9%	4.4%	0.641	0.805
Improved sheepfolds	3.6%	8.4%	2.9%	0.018	0.003
Improved stables	2.1%	6.3%	2.7%	0.010	0.038

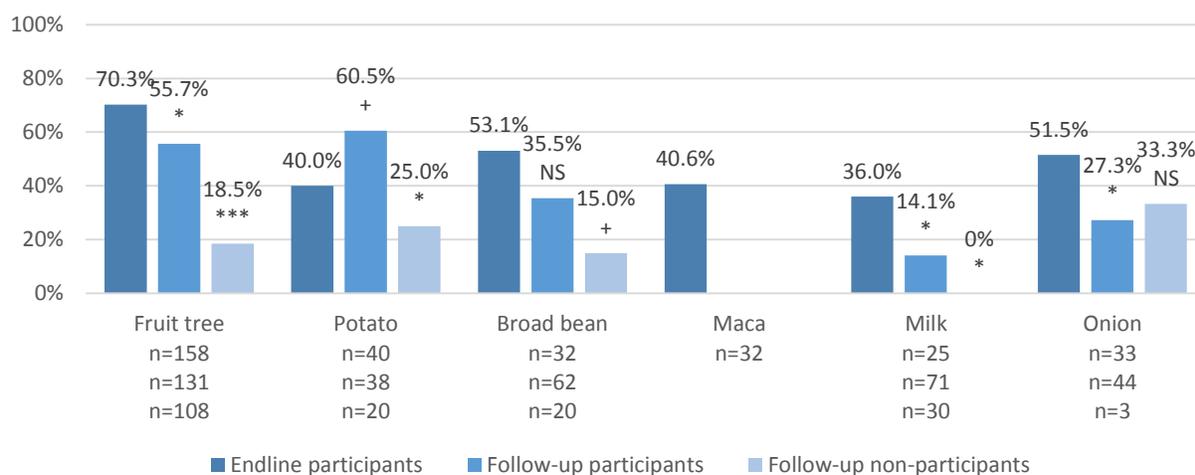
Sources: 2008 and 2011 Agriculture, IGA, and NRM Surveys.

SC

SC measured agricultural practices differently from the other awardees. SC's endline survey asked about specific practices related to individual crops promoted in the project and reported the percentage of farmers applying at least half of the recommended practices. To maintain consistency, the follow-up survey used the same method to assess sustainability of practices and asked the questions only of those farmers producing each crop mentioned. While recommended practices for potatoes (which were promoted as a commercial crop) showed increased adoption between endline and follow-up among participants (**Figure 7.14**), all of the other crops showed a decline in the application of promoted practices. Only fruit tree and potato practices were continued by more than half of participating farmers.

Except for onions, non-participants were markedly less likely to use project-promoted crop practices at follow-up than participants. Nonetheless, in qualitative visits to SC areas, a number of non-participating farmers were seen copying techniques that they had observed for the production of fruit. In Sapahaqui, one model farmer was highly successful in marketing his produce, as well as transformed products from his own and others' production, such as jam and preserves. While he was not actively serving as a model farmer, and there was no PA in that community, his success had motivated other farmers to apply the planting and pruning techniques that they had observed in the hope of producing at a similar level and obtaining contracts with the same supermarket chain.

Figure 7.14. Percentage of Farmers Using Sustained Crop Practices: SC



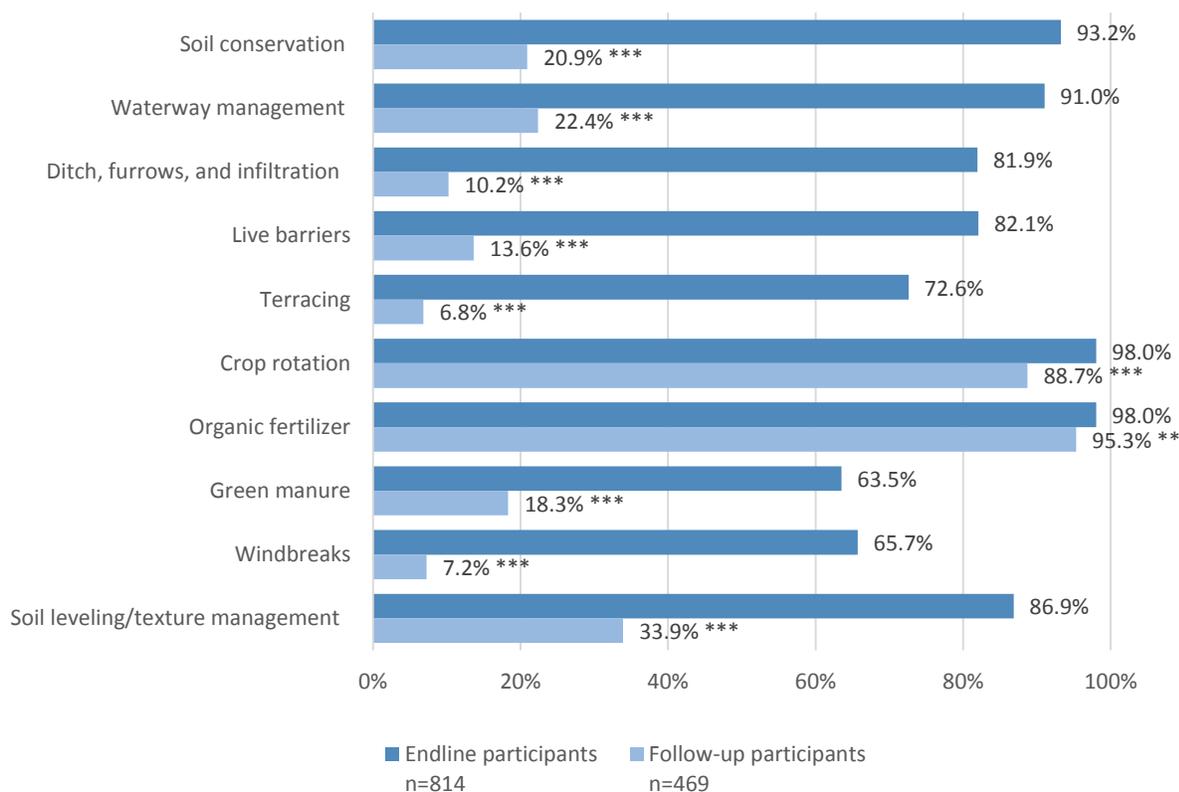
Sources: 2008 and 2011 Agriculture, IGA, and NRM Surveys.

Significance is of the difference between endline and follow-up (2008 and 2011) participants and between follow-up participants and follow-up non-participants based on two sample z-tests; NS=not significant, + $p \leq 0.1$, * $p < 0.05$, *** $p < 0.001$.

7.4.4 Improved Natural Resource Management Practices

In the area of NRM, after the midterm evaluations, the awardees shifted focus to emphasize practices that were directly linked to improved agricultural productivity or resilience to shocks, such as flooding. Nonetheless, NRM activities during the life of the projects were generally compensated with FFW, with inputs provided during the projects that were withdrawn when the projects ended. The surveys of NRM practices at endline were administered to a representative sample of all farmers in the communities where NRM projects had been implemented, and the follow-up surveys did the same.

Figure 7.15 shows the rates of adoption of NRM practices at endline and follow-up for farmers in ADRA areas. Most of the practices fell dramatically between endline and follow-up. A few practices that were promoted in the other components of this sector’s interventions (e.g., agriculture and IGAs)—specifically crop rotation and use of organic fertilizer—saw a less significant decline and were still practiced by a large proportion of farmers.

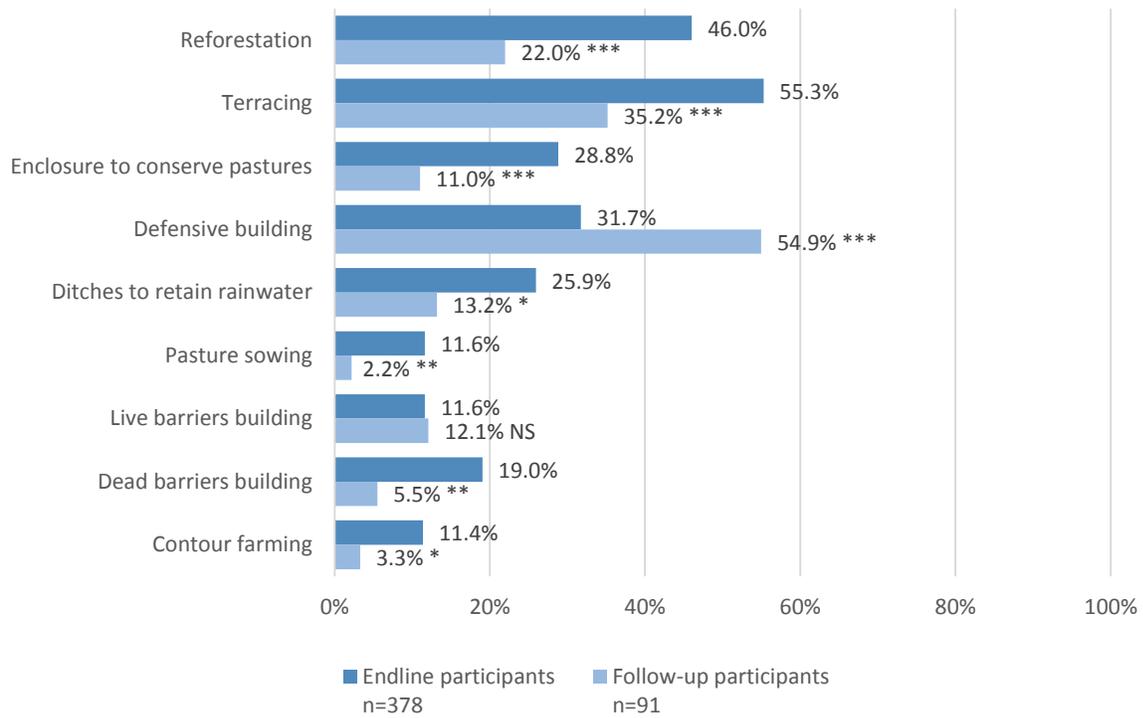
Figure 7.15. Adoption of NRM Practices: ADRA

Sources: 2008 and 2011 Agriculture, IGA, and NRM Surveys.
Significance is based on two sample z-tests; ** $p < 0.01$, *** $p < 0.001$.

The same pattern, though less dramatic, was seen in CARE areas, as shown in **Figure 7.16**. Except for defensive barriers against flooding (which increased to more than 50 percent) and live barriers (planted by around 12 percent of farmers at both endline and follow-up), all promoted practices had declined at follow-up, although a substantial portion (more than 30 percent) of farmers were still practicing terracing. Terracing and defensive barriers were practices promoted across the agriculture, IGA, and NRM components. In addition to the economic benefits of higher productivity, both contributed to soil conservation and flood resilience.

In FH areas, the picture is similar. **Figure 7.17** shows that two practices related to soil productivity (infiltration ditches for conserving soil moisture and straw terraces, which also contribute to flood protection) were maintained or increased, and one practice related to flood protection (protective levees) significantly increased. FH worked in an area that had been exposed to severe flooding in the intervening years, motivating farmers to invest in flood protection. Although the use of most practices had declined since endline, close to or more than one-third of farmers were engaged in terracing, building protective levees, agroforestry, and reforestation 2 years later.

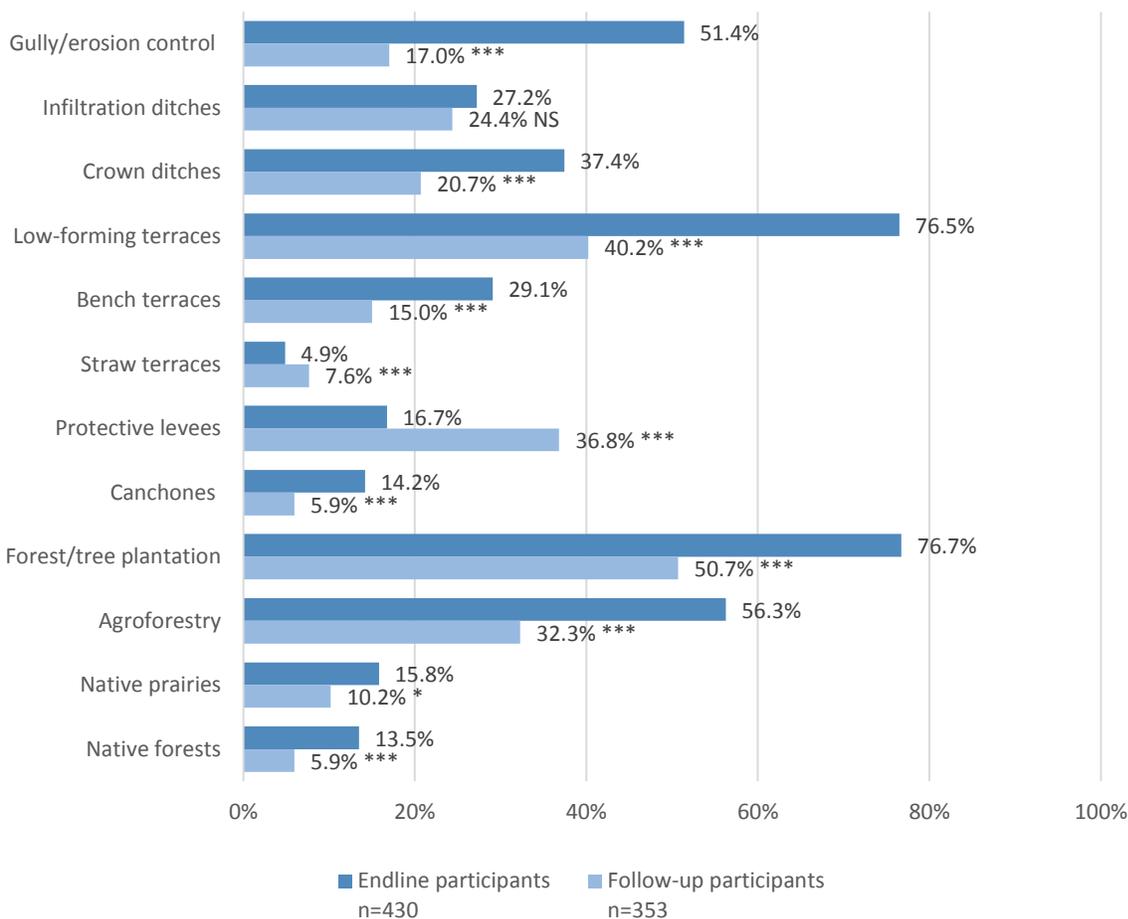
Figure 7.16. Percentage of Project Participants Using Improved NRM Practices: CARE



Sources: 2008 and 2011 Agriculture, IGA, and NRM Surveys.

Significance is based on two sample z-tests; NS=not significant, * p<0.05, ** p<0.01, *** p<0.001.

Figure 7.17. Percentage of Project Participants Using Improved NRM Practices: FH



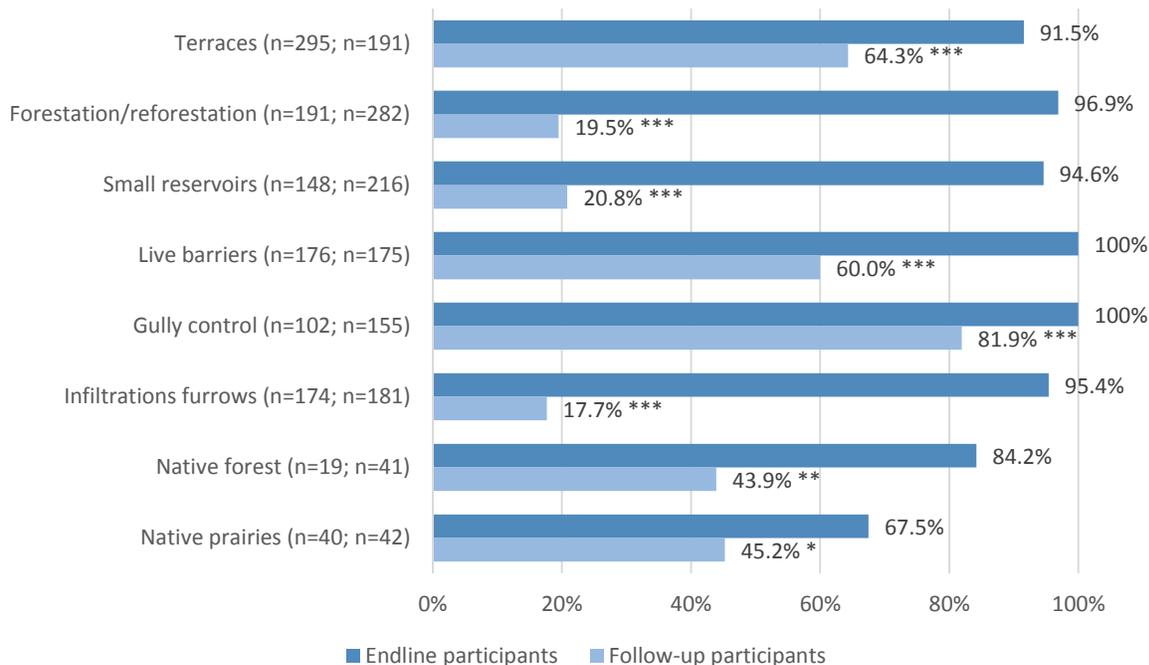
Note: Crown ditches are ditches at the top of a slope. Canchones are slots enclosed by mud walls.

Sources: 2008 and 2011 Agriculture, IGA, and NRM Surveys.

Significance is based on two sample z-tests; NS=not significant, * p<0.05, *** p<0.001.

Similarly, in SC areas, all the promoted practices declined significantly after exit (**Figure 7.18**). However, several practices were still used by a high percentage of farmers. Terraces, which facilitate both flood protection and improved soil productivity, were implemented by more than 60 percent of farmers at follow-up; live barriers and gully control (to protect against erosion) were also practiced by a majority of farmers at follow-up. In qualitative visits, some small reservoirs had technical problems due to their location and/or the maintenance of control valves; apparently no provision had been made for their maintenance after project exit. But, as noted earlier, the infrastructure created in the NRM interventions that were of good technical quality were generally well maintained and used.

Figure 7.18. Percentage of Project Participants Using Improved NRM Practices: SC



Sources: 2008 and 2011 Agriculture, IGA, and NRM Surveys.
 Significance is based on two sample z-tests; * p<0.05, ** p<0.01, *** p<0.001.

To compare across awardee areas, the percentage of farmers practicing at least three of the NRM behaviors promoted in each project was calculated. The number of promoted practices differed among awardees: ADRA had 10 practices, CARE had 9, SC had 8 practices, and FH had 12 practices. Regardless of the total number, all showed a significant decline from endline to follow-up, though the awardees differed in the level at which they were maintained: More than 50 percent of farmers in ADRA and FH areas continued at least three practices, while fewer than 20 percent of farmers in CARE and SC areas did. Among all FFP awardees, NRM practices most closely related to productivity and resilience to shock were continued, but still fell significantly once FFW and awardee-provided technical support and organization were withdrawn.

ADRA, CARE, and FH maintained a presence in some former FFP-targeted municipalities with new funding and may have supported some NRM activities through their continued involvement with municipal governments and other NGO partners. For example, ADRA’s work on land management in a few former FFP project municipalities may have contributed to sustained use of such practices as crop rotation and organic fertilizer. Similarly, in one of the FH municipalities visited, the awardee had continued to coordinate with other NGOs and the municipal government to sustain organic production and land management practices. Where other NGOs or the former FFP awardee itself continued to operate, communities may have been better able to access the financial and technical support needed to motivate participation in those NRM activities that aligned with new project objectives. According to qualitative interviews, awardees were also able to steer new project resources toward communities where the FFP projects had developed local leadership. Even in these areas, though, long-term sustainability of NRM activities was uncertain, as the newly formed municipal offices for the environment depended heavily on external support for their activities, did not have ensured funding in government budgets to continue community activities, and had no mechanism to make these activities self-financing.

7.4.5 Sustainability of Inputs for Natural Resource Management Activities

Because they would not be providing inputs after exit, some awardees initiated small businesses to provide seedlings for reforestation in the surrounding communities. There is no quantitative information on these efforts, but some were functioning after exit, as observed during qualitative visits. In Yunga Yunga (an SC implementation area), a greenhouse constructed with inputs from the awardee had fallen into disrepair after a windstorm damaged the roof and was unused 1 year after exit, but by the second year, repairs had been completed, and the greenhouse was again functioning and selling plants and seedlings. The community, which had good organization and strong local leaders, had been seeking funds from the municipal government since the greenhouse was damaged, but it took some time to put their proposal together and successfully obtain the funds.²⁴ Another such greenhouse, visited shortly after project exit, had been set up to provide seedlings for reforestation, but had expanded into the sale of decorative plants to respond to the demand of local communities. This model could have been replicated in other communities as well. Unfortunately, these were the only two examples observed during the qualitative study.

7.5 Sustainability of Agriculture, Income-Generating Activity, and Natural Resource Management Impacts

7.5.1 Yields²⁵

The objective of teaching improved agricultural practices and motivating farmers to make better use of agricultural inputs was to increase productivity through increased crop yields. Yields were calculated based on farmers' reports of area cultivated and amount harvested (only non-zero yields were included).²⁶ The long-term effects on the yields of traditional crops—potatoes, maize, and wheat—are shown in **Figure 7.19**, **Figure 7.20**, and **Figure 7.21**. All participant farmers reported significantly higher yields of potatoes at endline than was achieved at follow-up. For maize, this is true of all farmers, except in FH areas. The pattern for wheat is less consistent: In ADRA areas, wheat yields fell significantly, while they rose in FH and SC areas. Yields could have increased in FH areas because FH continued to operate in more than half of its original FFP communities and was implementing agricultural interventions in those areas through a United States Department of Agriculture-funded project.

What these graphs do not reveal is the very significant shifts in the *number* of farmers producing each crop between endline and follow-up. The majority of farmers, both FFP project participants and non-participants in all project areas, grew potatoes at both endline and follow-up. However, there were large declines in the number of farmers producing maize and wheat. For example, in SC areas, 32 percent of project-participating farmers were producing maize at endline, but only 19 percent of participants and 12 percent of non-participants were at follow-up. Wheat was even more variable: Among all awardees, between 10 percent and 47 percent of participants produced wheat at endline. At follow-up, among participants, the percent producing wheat was between 9 and 19, and ranged from 6 percent to 32 percent among non-participants. Some of these declines are likely due to the withdrawal of technical support and free or subsidized inputs for these specific products. Differences in yields of maize and wheat over time are likely due to decisions about what crop to plant, based on suitability of soil and climate, more than on application of specific agricultural practices learned during the projects. The qualitative team also heard

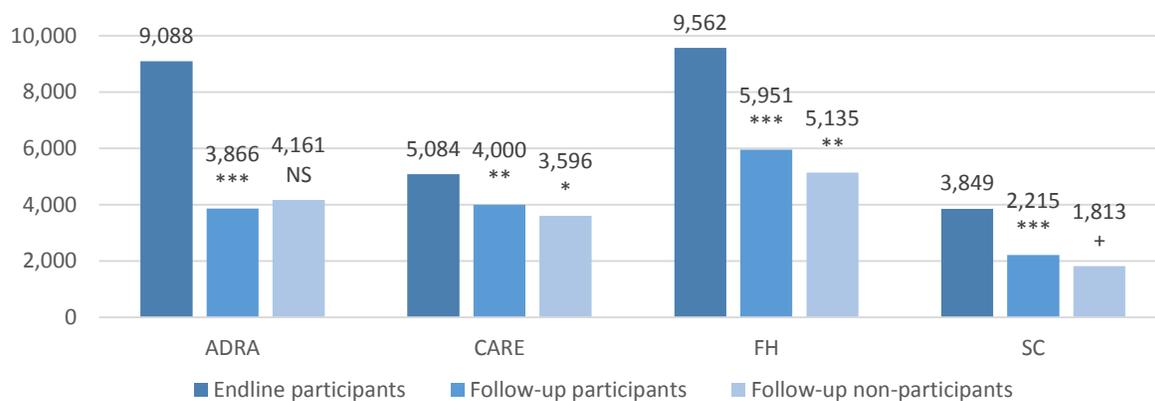
²⁴ Note that at the qualitative visit 1 year after project exit, the greenhouse looked like a failed effort, but by the second year after exit, its activities had been restored, underlining the importance of considering the time frame for assessing sustainability.

²⁵ Yields were calculated only for crops produced by at least 10% of farmers at at least one time point.

²⁶ The rightward skew of the distribution was corrected by truncating the upper end of each distribution at three times the interquartile range above the upper bound of the third quartile.

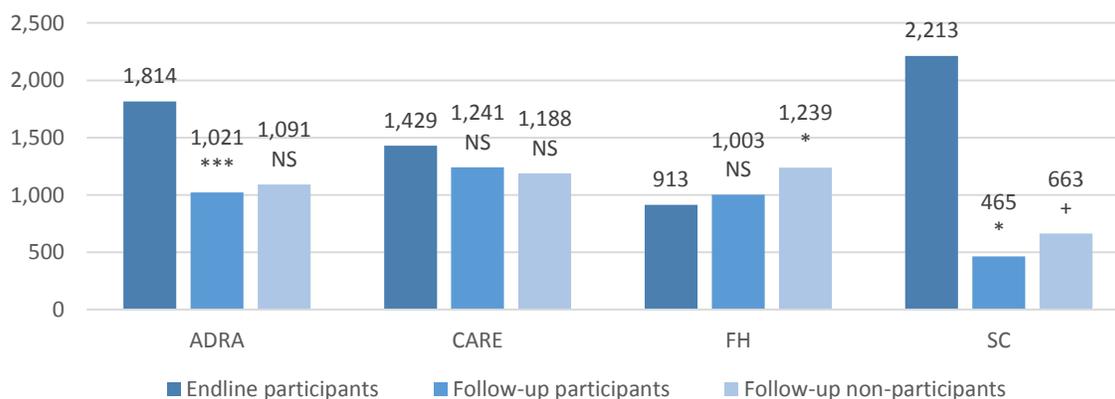
from farmers that climate shocks—drought in some areas, frost or hail in others—had compromised yields for both maize and wheat at follow-up.

Figure 7.19. Potato Yield per Farmer (kg per hectare)

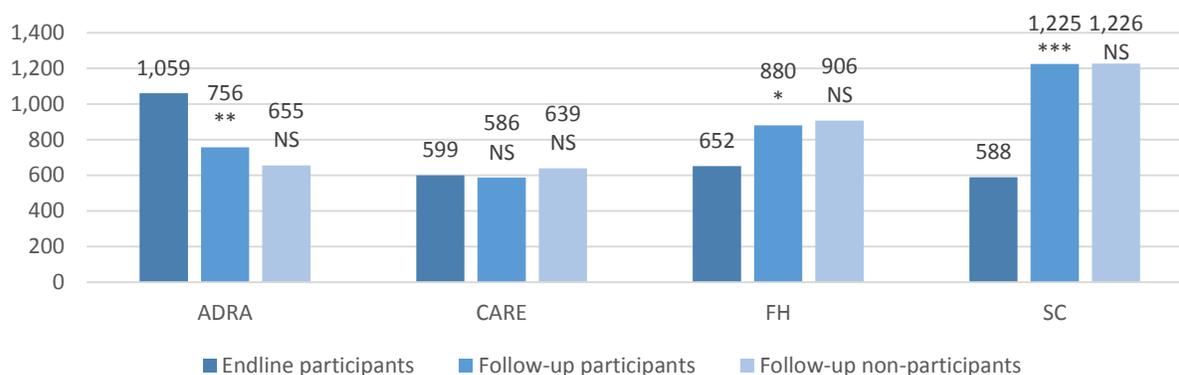


Note: Yield distribution was truncated at three times the interquartile range above the upper bound of the third quartile. Sources: 2008 and 2011 Agriculture, IGA, and NRM Surveys. Significance is of the difference between endline and follow-up (2008 and 2011) participants based on two sample z-tests; NS=not significant, + $p \leq 0.1$, * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$.

Figure 7.20. Maize Yield per Farmer (kg per hectare)



Note: Yield distribution was truncated at three times the interquartile range above the upper bound of the third quartile. Sources: 2008 and 2011 Agriculture, IGA, and NRM Surveys. Significance is of the difference between endline and follow-up (2008 and 2011) participants based on two sample z-tests; NS=not significant, + $p \leq 0.1$, * $p < 0.05$, *** $p < 0.001$.

Figure 7.21. Wheat Yield per Farmer (kg per hectare)

Note: Yield distribution was truncated at three times the interquartile range above the upper bound of the third quartile.

Sources: 2008 and 2011 Agriculture, IGA, and NRM Surveys.

Significance is of the difference between endline and follow-up (2008 and 2011) participants based on two sample z-tests; NS=not significant, * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$.

In terms of non-traditional priority crops promoted by the awardees, in ADRA areas, yields fell significantly and substantially for all of the priority crops produced. In CARE areas, yields for peaches fell (as did the percentage of farmers producing peaches), but yield for peanuts did not change significantly. It is worth noting that the proportion of farmers growing peanuts, one of the priority value chains promoted post-midterm evaluation, increased from 4 percent at endline to around 10 percent at follow-up. In FH areas, the evolution of yields was inconsistent: Yields rose substantially for broad beans and peanuts, but fell significantly for onions. In SC areas, yields for all the priority crops rose or were maintained between endline and follow-up. The number of farmers producing each crop in SC areas changed over time, with some farmers choosing to continue producing crops that were more successful. Local climate changes may also have affected these outcomes.

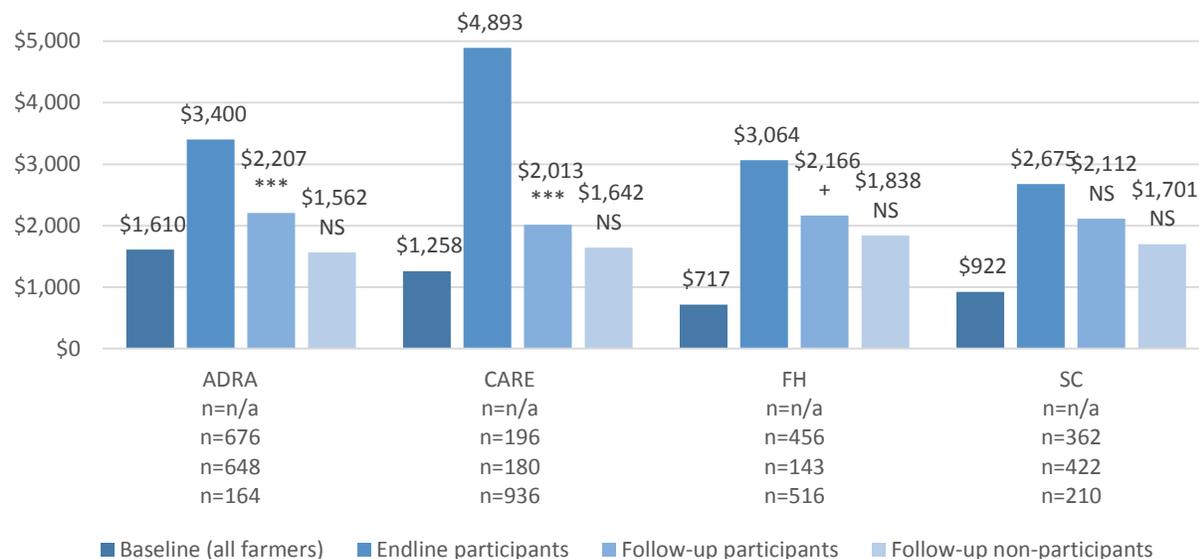
7.5.2 Agricultural Income

The main impact indicator for the agriculture, IGA, and NRM component of the FFP projects was agricultural (crops and livestock) income earned by participant farmers. These incomes rose substantially from baseline to endline (see **Figure 7.22**, which compares baseline data for all farmers with participants at endline and participants and non-participants at follow-up). At follow-up, income showed a significant decline in ADRA and CARE areas and a non-significant decline in FH and SC areas among participants. However, income was still substantially higher at follow-up for all awardees than it was at baseline. Participants in all the awardee areas had higher agricultural incomes at follow-up than non-participants, although not significantly. Removing the outliers by α -truncating the distribution (removing the top and bottom 2.5 percent of cases) alters the numbers, but does not substantially change the conclusions.

Agricultural income was, not surprisingly, consistently higher among PA members than non-members. The difference was greatest in FH and SC areas, but was significant for all project areas, as shown in **Figure 7.23**. PA members started with the advantage of cultivating larger land areas and subsequently benefited more from some agricultural inputs, such as irrigation. Farmers who remained in PAs were able to meet quantity and quality requirements of contracts with buyers. In some cases, they were also able to meet the eligibility requirements for credit. In contrast, less well-off or less capable farmers tended to not join (or dropped out of) PAs. Although farmers in associations did not represent the majority of farmers in the project areas, for those who were members, the PAs appeared to achieve the goal of sustainably improving incomes from farming. These cases tell an important story about the potential to develop a

successful and sustainable agriculture-based business, given appropriate resources, technical and managerial training, and leadership. Such businesses could provide an engine for further economic development in their communities.

Figure 7.22. Agricultural Income from Baseline to Follow-Up

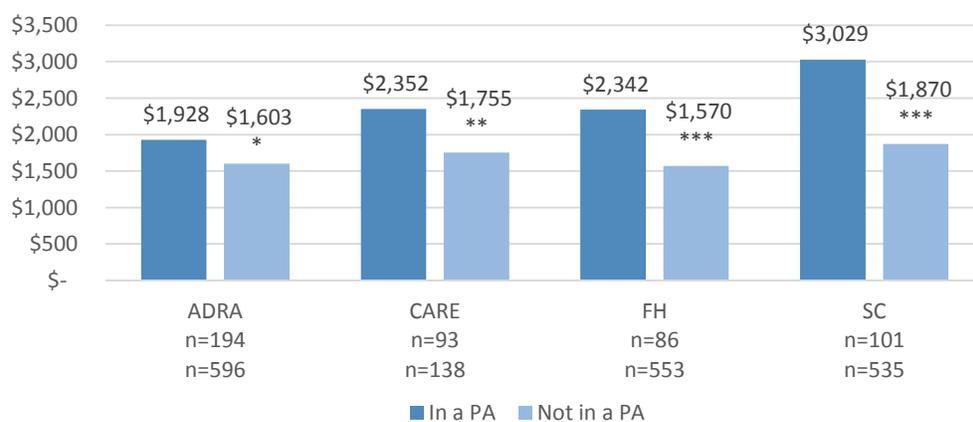


Note: Figures are in constant 2011 U.S. dollars (USD) and reflect the full range of reported incomes (no outliers were removed, despite the rightward skew in the distribution) to permit comparisons with baselines.

Sources: Baseline reports; 2008 and 2011 Agriculture, IGA, and NRM surveys.

Significance is of the difference between endline participants and follow-up participants and between follow-up participants and follow-up non-participants based on two sample t-tests; NS=not significant, + $p \leq 0.1$, *** $p < 0.001$.

Figure 7.23. Agricultural Income by PA Membership (2011)



Note: For CARE, the PA question was asked only of farmers in a value chain. The distribution was α -truncated to correct for skew. Dollar values are in constant 2011 USD.

Sources: 2008 and 2011 Agriculture, IGA, and NRM Surveys.

Significance is based on two sample t-tests; * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$.

7.5.3 Factors Predicting Agricultural Income

Multivariate analysis was conducted to determine the contribution of the components of the FFP intervention to the agricultural income of farmers at follow-up. The two most consistent factors affecting agricultural income were the number of hectares cultivated (in all areas) and the decision to produce priority crops (significant in three of the four awardee areas). Even after controlling for these factors, PA membership still showed a consistently positive relationship with agricultural income, significant among CARE value chain participants and among participant farmers in SC areas. In addition, having been trained by the awardee during the project significantly contributed to improved agricultural income in ADRA and CARE areas.

7.6 Agriculture, Income-Generating Activity, and Natural Resource Management Sector Sustainability: Lessons Learned

The key factors for sustainability—resources, capacity, and motivation—were demonstrated to be essential to sustaining the activities, outcomes, and impacts in the agriculture, IGA, and NRM components of the FFP development projects studied in Bolivia. Most practices that contributed to profitability (resources) and offered tangible benefits (motivation) continued to be implemented post-project, while those that did not offer these were not continued. Practices that required a high level of technical capacity (grafting, for example) were also typically not well maintained, while those that were beneficial and did not require a large number of resources or technical expertise (application of organic fertilizer, crop rotation, and maintenance of terraces, among others) continued to be implemented. Veterinary and agricultural technician services provided through a fee-for-service model continued to be available (as was revealed in qualitative visits), though only use of veterinary services was sustained from endline to follow-up. Those providing these services had technical training and were able to make a living and earn the resources needed to obtain the materials necessary for their work. For the most part, activities were not continued when the awardees made no provision to replace material incentives and inputs formerly provided without charge by the projects: a risk for sustainability. Finally, the experience of many of the PAs demonstrated the value of a gradual transition from supported to independent operation, though (as has been noted) in many cases they were still receiving external support from donors or municipal governments.

One clear lesson from these results is that the picture of project impact at exit does not necessarily indicate which of the changes attributable to the project that were observed at exit would remain in effect 2 or 3 years later, when awardee support and resources were no longer available. Some impacts were sustained relatively well—farmers continued to use a subset of the promoted practices and produce some of the promoted crops—but measures of impact at exit were imperfect predictors of continued impact years later.

Box 7.3. Agriculture, IGA, and NRM Sector Sustainability: Key Findings

WHAT WORKED

- The focus on productivity-enhancing NRM practices was effective. Several NRM practices with direct impacts on farmers' productivity and resilience to weather shocks continue to be implemented post-project.
- Use of agricultural practices directly related to improved productivity and resilience was well maintained by a substantial proportion of farmers.
- Formation of PAs resulted in many associations successfully engaging in marketing of crops and crop and livestock products.
- Turning over responsibility to other NGOs in the implementation areas was a successful strategy to provide continued support for agricultural production and marketing activities.
- Awardees continued operation in some FFP-targeted areas using other funds, permitting continuation of PA activities (though dependence on these external resources is not an indicator of sustainability).
- Municipal governments supported successful PAs' marketing activities with resources from the government's decentralization policy.
- Municipal governments also supported expansion of irrigation systems and maintenance of roads, often from resources from the decentralization policy.
- The fee-for-service model appears to have allowed agriculture and veterinary technicians to continue providing services, though only use of veterinary services was sustained at endline levels.

WHAT DID NOT WORK

- Without the continued provision of material incentives (FFW) and free inputs, the use of many NRM practices *not* directly linked to productivity (e.g., reforestation) declined significantly post-project.
- In the aggregate, many practices promoted by the projects declined, due to expense and/or the level of technical expertise required.
- PA benefits did not reach all farmers; poorer farmers were more likely to drop out of PAs or not join due to an inability to meet quantity and quality requirements of buyer contracts.
- Environmental units of municipal governments lacked resources to support continued NRM activities.
- Provision of training by model farmers was not sustained when project-provided inputs and material incentives were withdrawn.

8. Overall Findings

The following overall conclusions may be drawn from the experiences of the four FFP development project awardees studied in Bolivia.

Activities, outcomes, and impacts measured at the time of exit were poor predictors of sustainability at follow-up.

In all technical sectors, there were examples of activities, outcomes, and impacts that looked promising at project exit, but that declined, sometimes dramatically, by the time of follow-up, while other activities, outcomes, and impacts were sustained or even improved over the same period. In the MCHN and W&S sectors, some health and hygiene practices, such as exclusive breastfeeding, showed significant improvement from baseline to endline, and those improvements were maintained at follow-up. The same was true for the prevalence of childhood stunting: Achievements documented at endline were maintained or improved at follow-up. Meanwhile, other practices, such as those related to handwashing and feeding during illness, looked very good at endline (with substantial improvements from baseline and close to or more than 90 percent of targeted beneficiaries reporting employing such behaviors), but showed great declines, sometimes to below baseline levels, by the time of follow-up, possibly because of the reduction in CHW home visits to reinforce these behaviors.

The picture at endline was similar in the case of the agriculture, IGA, and NRM interventions. Very high rates of adoption of improved agriculture and livestock practices at endline showed significant, sometimes dramatic, declines at follow-up. At the same time, some practices that were well adopted at endline were sustained or increased at follow-up. Perhaps most importantly, the peak of agricultural income achieved by farmers in the final year of the project showed a significant and substantial decline at follow-up, although comparison with baseline data shows that incomes were still much higher at follow-up than they had been at the start of any of the projects.

The clear message from this is that evidence of impact at the time of exit is not an indicator of sustainability: Impact at exit and continued impact over time are distinct achievements, and projects must take account of both in the design and implementation of their activities. In fact, an exclusive focus on impact at exit can jeopardize sustainability. Providing free services (such as training in ADRA's agriculture interventions) or incentives (such as inputs and FFW in the NRM activities, or inputs and material incentives to model farmers or CHWs) may well produce high rates of participation at endline, but if no gradual transition is made that allows for adjustment to the withdrawal of these resources, their removal can result in a precipitous decline in the activities/practices that had been used. Endline numbers might be lower, but more sustainable, in situations where these free resources are withdrawn more gradually (or not applied at all). If all programmatic efforts are focused on the final evaluation, good results may come at the cost of sustained activities, outcomes, and impacts.

The results from the Bolivia country study support the hypothesized critical factors for sustainability: resources, capacity, and motivation.

The hypothesis that an ensured source of resources, technical and managerial capacity, and motivation on the part of beneficiaries and service providers are essential and must be present for sustainability was substantiated by the experience in the Bolivia country study. In the case of MCHN, mothers' participation in growth monitoring activities was well maintained after exit because the GOB was providing growth monitoring services with its own resources; using its own (paid) trained health care providers; and motivating women not only with access to care, but with a conditional cash transfer and free nutritional

supplements. The work of CHWs in the communities was less well maintained: CHWs were motivated by the occasional material incentives that they received from the projects and by the demand for their services on the part of beneficiary mothers. When the incentives were withdrawn, and mothers were diverted to public health clinics, the CHWs lacked motivation and, without the support of another institution, the resources they needed to continue their work.

The provision of piped water similarly demonstrated sustainability because it incorporated these three critical elements. Beneficiaries were highly motivated to receive piped water, a valued service; this motivated them to pay for the service; and the user fees provided resources to maintain the systems. In Bolivia, all community members were trained in water system maintenance, and the water committees were trained in management. Thus, resources, technical and management capacity, and motivation were included in the projects' model of piped water provision. The contrast case of water quality maintenance also demonstrates the importance of all three sustainability factors. Water quality maintenance was not practiced at follow-up in most of the water systems. Although the water committees had the resources and the technical capacity to contract for water quality testing, motivation was lacking: Beneficiaries did not recognize the need to improve the quality of water that appeared clean, and they disliked the chlorine taste that came with ensuring water quality. Without motivation, capacity and resources were not sufficient to ensure the sustainability of this intervention.

The maintenance of agricultural and livestock practices was dependent on this convergence of factors as well. Agricultural practices that returned a tangible benefit and did not require a high level of technical expertise or financial investment appeared to be best maintained. Even some practices that required an investment—vaccination and deparasitization of livestock and improved silos, sheepfolds, and stables—were fairly well maintained because the improvements in productivity these practices engendered provided both motivation and resources for their implementation. The fee-for-service model for veterinary technicians in FH areas similarly provided the motivation and resources for these veterinary paraprofessionals to provide services in which they had been technically trained.

Clearly, exit strategies must consider beneficiary as well as service provider motivation to sustain demand for services once food rations or other incentives are withdrawn. Sustained demand for services may depend on providing tangible benefits, improved awareness and recognition of the benefit of activities, or integration of project components (as was done in only two cases where water committee fees funded CHW activities). Without motivation and technical and management capacity, resources were insufficient to ensure sustained activities. Sources of resources and motivation sometimes shifted as the FFP projects left and turned over their activities to other organizations, but there were no cases where the absence of any one of these factors could be overcome to achieve sustainability.

Establishing linkages—both horizontal within and across communities and vertical to markets, institutions, and government—was often important, but the importance varied, depending on context and purpose.

This study's conceptual framework hypothesized that horizontal linkages (within and across communities) and vertical linkages (between communities and government or other institutions) would contribute to sustainability, but the importance of linkages was variable for the FFP development projects in Bolivia. In the health sector, vertical linkages from the community to the local or municipal health center were critical for the provision of services to mothers participating in primary health care and growth monitoring. Vertical linkages were important for the continuation of CHWs as well: Links to the health system were essential to maintaining the resources, capacity, and motivation that CHWs needed to continue providing community-based services. Where CHWs were effectively linked to health centers,

they had access to resources like growth charts and scales and to occasional refresher training. Being incorporated into the health system also motivated them, because it gave them the sense that their work was important and valued. Similarly, CHWs who were employed by another NGO in the community were given material incentives, resources, and, when needed, training to continue serving as CHWs. Without such vertical linkages, CHWs were unlikely to continue working in their communities. Horizontal linkages among CHWs though were never effective after external resources were withdrawn: All FFP awardees proposed to organize groups of CHWs to share information and provide mutual support, but, during follow-up data collection, only one formal CHW association was found to have sustained activities and achieved formal legal recognition after the FFP projects' exit.

Among PAs, both horizontal and vertical linkages proved to be important for sustained operation. Many of the PAs visited in the course of the study were formed as municipal-level organizations, and many of those that started at the community level found that linking with others into a municipal organization increased their market power and ability to fulfill contracts with buyers. A significant number of these PAs eventually joined larger regional organizations that could commit to bigger contracts (including with institutional buyers, such as government programs). Thus, horizontal linkages among community- and municipal-level PAs, and vertical linkages to regional organizations, were important for the potential growth and expansion of the PAs. Long-term contracts with buyers were another form of vertical linkage. These relationships with buyers (for example, supermarket chains, wholesalers, processors, and exporters) not only provided a market for the PA's products, but in many cases offered technical assistance and credit to the PA members.

In contrast, water committees did not create horizontal linkages across communities because they did not prioritize resource use for travel to meetings. In addition, water committees actively avoided establishing official vertical linkages with the municipal government in their communities, due to fears that any formal affiliation with the municipal government would put them at risk of being taken over by the municipality and their ensured flow of resources potentially diverted to other government priorities. Qualitative study data indicated this concern was justified: In the one case where the water committee was incorporated into the municipal government, its budget was, indeed, diverted. Fees had to be raised as a result, and community members resisted paying because (as they reported in qualitative interviews) "government services should be free."

The usefulness of linkages needs to be carefully assessed, and their purpose clearly articulated. Participation in organizations has costs in terms of time and money, and people will not participate if there is no clear benefit to doing so.

Gradual exit with a period of independent operation contributes to sustainability.

The principle of gradual exit, with a period of transition to independent operation, was supported by the Bolivia study findings. The most sustainable intervention—the provision of piped water—was instituted early in the FFP projects, and many of the water committees being trained by the awardees existed prior to the FFP interventions. All water committees had operated independently for some time before the end of the projects and, as a result, had the opportunity to work out problems in their systems. However, water quality testing was not sustained and, although a lack of motivation was undoubtedly the most important factor, it was awardees that took responsibility for ensuring water was tested throughout the life of the projects and they did not give water committees an opportunity to manage water quality testing prior to project exit.

Without detailed quantitative data on the functioning of PAs, it was possible only to observe that those that had been functioning for a long period of time and had established long-term relationships with

buyers showed the most promise for continued successful independent operation (although many PAs continued to receive external support and therefore had not demonstrated independent operation at the time of follow-up).

Among the awardees, ADRA implemented a fairly abrupt departure: The ASCs started by the awardee were providing free services (training, technical assistance, product grading, and marketing assistance) up until the time of exit. These ASCs began charging for their services only upon the departure of the awardee. This likely explains the dramatic drop from endline to follow-up in the receipt of training (98 percent to 13 percent) and the drop in the percentage of farmers engaging in commercial activities. The other awardees did not have such high rates of training at exit, but also did not experience as precipitous a decline, and the percentage of farmers engaging in commercial activity was maintained or rose among these awardees. The study team attributed this difference to the longer period of transition among the other awardees compared to ADRA's more abrupt transition, at least in the agriculture, IGA, and NRM sector.

Phase-over of responsibility to government appeared to be a successful strategy for some, but not all, technical sectors.

At the time of this study, the GOB was committed to a policy of decentralization in the provision of services and to the promotion of community involvement in governance and planning at the community and municipal levels. Even before the election of the populist president, Evo Morales, the country had passed a "Law of Popular Participation," which provided for regular community meetings, the formation of municipal operational plans with community involvement, and somewhat devolved responsibilities and budgetary resources to the municipalities and communities. As a result, the strategy of strengthening connections with the municipal government was effective for some of the FFP activities.

The health sector is a clear example of the potential effectiveness of municipal connections, as the GOB implemented the ZM program (that created nutrition units in health centers in every municipality) and the BJA program (which gave money to women who complied with growth monitoring and pre- and postnatal care requirements). A high proportion of women who might have been FFP beneficiaries during the project were taking advantage of the BJA and participating in growth monitoring at the local health center. In some cases, the health centers were maintaining a connection with the CHWs, and, where this occurred, the CHWs had the resources, access to training, and motivation that enabled them to continue in their role. But these connections were not consistent. Some municipalities did not prioritize resources to support CHW services, preferring to support more visible and politically beneficial investments, such as the UNIs.

A number of municipalities were active in supporting agricultural investment. Municipalities benefit when there is increased economic activity, and there were cases in which the municipal government invested in irrigation (construction of water tanks to expand a system initiated under an FFP project), as well as road maintenance (in some cases maintaining or improving roads built with FFW). Municipal governments also provided assistance with marketing to the more successful PAs. Not all sectors were equally well supported by the municipalities, however. Most municipal governments had environmental units, but generally these units lacked both staff and funds, unless they were provided by an outside donor. Relying on municipal support for NRM activities was ineffective, because the municipalities lacked the resources and capacity to organize such activities.

Despite a number of positive experiences, relying on municipal governments posed its own risks. Municipal (and community) elections are frequent in Bolivia, and turnover among elected officials is high. With a new government, priorities often shift, and support for former activities may wane. Since

municipal elections had taken place between the first and second follow-up field visits associated with this study, the qualitative study team observed problems with authority turnover harming vertical relationships built during the FFP projects. Even where new leaders were aware of the agencies' previous activities, they rarely had heard of exit or phase-over plans in which municipal offices were supposed to support specific activities. However, when a PA generated increased income and enthusiasm among producers for accessing new buyers, new community leaders often remained interested in supporting the associations, whether with land management practices or support for marketing activities. The study team also encountered cases where municipal leaders had previously been participants in FFP projects and were interested in continuing and increasing municipal support for the more successful activities. Engaging the municipalities in a phase-over of responsibility for FFP activities worked in a number of cases, but awardees should make a realistic assessment of a municipality's resources and motivation and make involvement of the government one part of a broader sustainability strategy.

The strategy of turning over certain responsibilities and activities to other donors continuing to work in former FFP areas was effective in providing medium-term support.

The involvement of other donors in sustaining FFP activities was an explicit part of the awardees' sustainability plans, and this strategy had some success. In a number of communities visited in the qualitative study rounds, new NGOs had come in and initiated health-related activities (although not always with the same priorities as FFP's nutrition-focused interventions); some of these new NGOs had taken on the CHWs trained by the FFP awardees. However, a relatively small percentage of communities reported having any new health projects implemented since the FFP activities ended.

A number of the more successful PAs were receiving support from outside donors: bilateral government donors and international and local NGOs. These donors were providing a wide range of assistance, from inputs and technical assistance to credit and links to markets, and may have provided the support needed to give the PAs time to transition to independent function. In another example, FH continued its presence in more than 40 percent of its former FFP communities—implementing agricultural development programs with non-FFP resources. Its continued presence may be one reason why the production of priority crops was maintained in FH areas, while in other awardee areas it decreased. This may also be one reason why yields generally increased in these areas.

The concern, though, is that turning over responsibility from one donor (the awardee) to another donor cannot really be defined as promoting sustainability. If the new donor is committed to transitioning the organization it is supporting to self-sustaining independence, then phase-over may create the time needed to accomplish this goal. However, in the case of Bolivia, it cannot be determined with certainty whether this commitment existed, or whether the new donor organizations will themselves eventually depart as a result of shifting priorities or budgets, without having created genuinely sustainable change.

The quality of material and construction affect the maintenance and sustainability of infrastructure.

It is perhaps obvious but nonetheless an important lesson that an intervention is only as good as the quality of the approach used and the inputs provided. In qualitative interviews, water committee members and beneficiaries frequently remarked that the quality of the pipes and connections and the adequacy of the water source were important contributors to the sustainability of the piped water systems, not only because these made the systems less likely to break down, but also because more reliable systems resulted in beneficiaries who were more willing to pay for the services that they received. In a few cases, committee members noted that previous water interventions implemented by other donors had provided inferior quality pipes that broke, and the system had not been set up to provide resources for repairs.

Similarly, the small reservoirs that were well constructed and well designed (e.g., close to a reliable water source, accessible to the livestock that would use it) were maintained and repaired when necessary by the community, while those that were less well designed and implemented were perceived as less useful, and were often abandoned when they broke.

The direct provision of free resources, whether as a benefit or an incentive, poses risks for sustainability if no reliable replacement source is developed.

Many of the components under study in the FFP development projects in Bolivia involved providing a resource free to beneficiaries or to service providers. The provision of a free resource risks creating an unsustainable expectation, and when the resource is withdrawn, if adequate plans are not made to replace it, the activities it supports are unlikely to be sustained. Sustainability depends on an ensured source of resources, capacity, and motivation. If the motivation and resources are based on free food or other inputs, a substitute must be identified and put in place early enough so that any new system is operating well before project exit.

The Bolivia country study provides many examples of this risk. In the case of MCHN interventions, the projects provided supplementary food, as well as a nutritional supplement for young children, as incentives for mothers to participate in growth monitoring. The strategy of providing recipes for nutritious local foods addressed the projects' nutritional goal but not the incentive role of the food supplement. In qualitative interviews, CHWs noted that the projects' withdrawal of food (at the projects' end), in combination with the availability of free food and cash at government health clinics, resulted in reduced attendance at community-based growth monitoring.

In the agricultural interventions, free agricultural inputs were provided to model farmers as an incentive to train other farmers in their communities. The awardees hoped that the model farmers would continue to provide training once these incentives were withdrawn, but that hope was not realized. Similarly, free inputs, as well as FFW, were provided to community members participating in NRM projects. The indirect or long-term benefit of some of these activities was not sufficient to compensate for the withdrawal of the free resources. However, those NRM activities that returned a tangible benefit in improved production were better sustained without the need for external motivation.

The free services provided by ADRA's ASCs were supposed to demonstrate their usefulness so that farmers would be willing to pay for them after the FFP projects ended, but at least as indicated by the decline in use of training (originally provided through the technical advisory groups linked to the ASCs) and sales through the ASCs (which provided market information, product grading, and other marketing services), it seemed that once a service was offered free, beneficiaries resisted paying for it.

One of the reasons for the sustainability of the piped water systems is that the free resources (such as pipes and connections provided by the awardee and FFW to compensate for labor to install the system) were used to create infrastructure as a one-time activity, while the fee-for-service model supported recurring costs. The fee-for-service model seemed to be effective in sustaining veterinary service provision as well; the veterinarians charged for their services from the beginning, thus not creating an expectation of free service.

There were some cases where the demonstration effect of beneficial practices or infrastructure was sufficient to motivate farmers to spend their own resources on things like enhanced silos, stables, and sheepfolds, the inputs for which were provided free to the model farmers during the FFP projects. But, as was the case with NRM practices, only those practices perceived to be beneficial and profitable—and these were not the majority—were continued once free resources were withdrawn.

The national political and cultural context affects the effectiveness of strategies for sustainability.

At the time of this study, the GOB had a demonstrated commitment to decentralizing governance and service provision, and this commitment resulted in the creation of local- and municipal-level institutions that happened to align with FFP project priorities, creating a context for sustainability. Community members participated in monthly open meetings and had direct input into the annual operating plans of their communities and municipalities. Local organizations could request to be included in these operational plans with some allocation of funds. The health system not only provided decentralized health and nutrition services through the clinics and UNIs, but, through the SAFCI, it also had a mechanism for adjusting services to meet local needs. Government programs sometimes also (with donor funding) supported the expansion of some FFP project activities, such as piped water systems to new communities and the construction of latrines. Municipal governments also had economic development units whose goal was to promote economic activity (such as the PAs) in their areas. One corollary to this policy of community involvement was the expectation of transparency and accountability on the part of community organizations; this expectation extended to the monthly meetings of many water committees, at which accounts were presented, so that the community could be confident about the uses of the fees that were being paid.

In addition, the Bolivian rural culture is strongly communitarian. Community members are accustomed to the requirement that they provide a certain number of days of labor on community projects, such as road maintenance and gully repair. Communities have “vigilance committees” that seek to ensure responsible community behavior, so that the idea of home visits by CHWs to check on sanitation, latrine use, and health practices is not alien in these settings. This cultural context means that activities that might not realistically be expected to continue in some places were more reasonable in this setting.

The local context and conditions affect sustainability in positive and negative ways.

Local leadership is an important contributor to the implementation and continuation of community activities. The same project design may fail or succeed based on the presence of dynamic leaders who take initiative and mobilize the community. A strong community leader can contribute to the success of a project. At the same time, community leaders may be perceived as exploiting new projects that provide resources and benefits, to the exclusion or marginalization of other community members. The Bolivian context offers examples of both situations. There were CHWs who mobilized entire communities, motivated behavior change, and advocated for community resources in municipal meetings. At the same time, there were individual model farmers who benefited greatly from the training and inputs provided by the FFP projects, but who were not taking steps to extend those benefits to other farmers.

It is not clear how to incorporate this recognition of the importance of leadership into project design other than to be conscious in initiating any community-based project of the potential benefits and risks when strong community leaders become involved and to monitor the involvement of the broader community, taking steps to promote community participation if needed.

9. Recommendations

Recommendations for Project Designers and Managers

- Build sustainability plans into project design from the beginning. Identify the exit approach (phase-over or phase-out) and the specific roles and responsibilities each entity engaged with the project will have after project exit.
- Ensure that the critical factors—resources, capacity, and motivation—are addressed in the design of the sustainability plan for the project and in the project itself.
- Carefully assess the long-term sustainability of linkages intended to support project-related activities after project closure based on the resources, capacity, and motivation of the institution or entity involved. Focus on ensuring local capacity to negotiate future linkages given political turnover and changing priorities.
- As part of project design and sustainability planning, make explicit plans for replacing any material benefits provided by the project, including food, once project resources are withdrawn.
- Realistically assess the potential reach and coverage of project activities, and address barriers to inclusion so that sustainable benefits affect a majority of the population of a given implementation area, if possible.
- Carefully assess the likely benefit of each component of an intervention to the individual participants; those that offer a tangible benefit are more likely to be sustained.
- Withdraw resources and support gradually, allowing local institutions and organizations to operate independently while project support is still available.

Recommendations for Donors/Funders

- Incorporate indicators of sustainability into project assessment (monitoring and evaluation) and build time into the project cycle after resources are withdrawn and implementation has been completed to evaluate sustainability. This may require extending the overall timeframe of the project cycle.
- Integrate indicators of sustainability into project monitoring and evaluation across the project's life of activity to ensure that a focus on endline impacts does not jeopardize investment in longer-term sustainability.
- Require projects to maintain archives of baseline, midterm, and endline evaluations, as well as associated data, along with information derived from routine project monitoring and associated reporting.
- Set aside funding for post-project impact evaluation.

Recommendations for Future Research

- Incorporate into sustainability studies, when possible, a control (randomly assigned) or comparison group to permit an experimental research design in order to strengthen conclusions.
- Collect information on activities, outcomes, and impacts at the level of the target communities and beyond, rather than focusing only on the intended direct beneficiaries. That is, design sustainability studies to capture not only direct, but also second- and third-order indirect effects (for example, project impact not only on agricultural income, but on household income from all sources).

- Consider studies to compare the long-term impacts on low-income communities of targeting project resources to the poorest of poor farmers versus targeting those with more resources who may have greater potential.
- Identify the implications for sustainable impacts of combining interventions in multiple technical sectors versus focusing on one sector (e.g., combining MCHN activities with IGAs to increase the impact of both).
- Implement longer-term studies, collecting data at multiple time points, to identify which indicators of probable sustainability are most reliable over the long run.
- Through qualitative and/or quantitative studies, explore ways in which local leadership can be identified and strengthened, given the key role of community leaders in sustainability.
- Compare the strategy of phasing over to another donor or external funding source with that of phasing over to a community organization or individual leader to sustain project activities, outcomes, and impacts.

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