Chapter 5 Contents

5. Infrastructure	5-1
Abstract	5-1
5.1 Introduction	5-2
5.1.1 Policy and Program Environment	5-2
5.1.2 Country Context	5-3
5.2 Basic Facts about Infrastructure Programs in the FAFSA-2 Universe	5-5
5.2.1 Projects and Countries	
5.2.2 Resources	
5.3 Program Approaches and Interventions	
5.3.1 Objectives	
5.3.2 Approaches	
5.3.3 Interventions and Outcomes	
5.3.3.1 Roads	
5.3.3.2 Water Management Structures	
5.3.3.3 Natural Resource Management Interventions	
5.3.3.4 Buildings	5-12
5.4 Cross-Cutting Issues and Opportunities	5-13
5.4.1 The Role of Infrastructure in Title II Development Programs	5-13
5.4.2 Technical Efficiency and Cost Effectiveness	
5.4.3 Collaborating with Communities and Local Governments	5-14
5.4.4 Infrastructure Priorities: Project- and/or Community-Driven	5-16
5.4.5 Using Food-for-Work in Infrastructure Programs	5-17
5.4.6 Capacity Strengthening	5-19
5.4.7 Sustainability	5-19
5.4.8 Basic Principles for Guiding Infrastructure Development	5-21
5.5 Conclusions and Recommendations	5-22
5.5.1 Conclusions	
5.5.2 Recommendations	5-23
Bibliography for Chapter 5	5-25

5. Infrastructure

Abstract

Infrastructure activities (not including drinking water and sanitation infrastructure, which are assessed in Chapter 7) were implemented in 61 Title II development programs in 23 countries. This included 39 programs in Africa, 3 programs in Asia, and 19 programs in LAC. Using food to pay unskilled labor to work on public infrastructure (i.e., FFW) was a common feature of food assistance programs prior to USAID's 1995 Policy Paper. Since then, more attention has been paid to the contributions that public infrastructure can make to a Title II development program's longer-term goals, such as increasing agricultural productivity and production, increasing community resiliency, and reducing rural poverty. Most areas where Title II development programs work are relatively isolated geographically, and their lack of productive infrastructure, access roads, and irrigation and other water harvesting structures in particular is frequently a major constraint to their development over the longer term. Infrastructure activities were particularly crucial during the FAFSA-2 time period in countries where the focus was on the repair and rehabilitation of infrastructure damaged or destroyed by natural disasters or complex emergencies. The Title II program is somewhat unique within USAID in its ability to support small-scale infrastructure activities. During the FAFSA-2 time period, few other USAID projects had the resources needed to help poor rural communities improve their basic productive infrastructure and their links to markets. However, many implementers seemed reluctant to use this capability for a variety of reasons, including the technical complexities of these activities, the additional technical staffing required, and the additional efforts needed to respond to the increased emphasis on quality and sustainability. The value of the food devoted to FFW activities (excluding Ethiopia) declined from approximately US\$50 million in FY 2003 to a little more than US\$20 million in FY 2009, despite the emphasis in the USAID/FFP Strategic Plan on the importance of increasing the use of FFW in public works programs. The amount of cash used to pay for all the necessary complementary inputs, including engineering drawings and services and the TA and training needed to ensure that the public works would be constructed, operated, and maintained properly is unknown since USAID/FFP has not required its Awardees to report on the total amount of resources devoted to infrastructure. The policy implications of the infrastructure assessment are provided in Box 5.13, and the details on the conclusions and recommendations are provided in Sections 5.5.1 and 5.5.2.

5.1 Introduction

5.1.1 Policy and Program Environment

After USAID's 1995 Policy Paper was issued, more attention began to be paid to the contributions that public infrastructure can make to the Title II development program's longer-term goals, such as increasing agricultural productivity and production and reducing rural poverty. Infrastructure activities were more fully integrated into Title II development programs during the FAFSA-2 time frame than they had been before, frequently under an AG/NRM/ LH/IG SO. This was particularly true both at the beginning of the FAFSA-2 time period and then again later, following the adoption of the USAID/ FFP Strategic Plan, under components that focused on increasing "community resilience" and/or reducing "community vulnerabilities."¹⁴²

Public works programs were viewed as attractive interventions in the USAID/FFP Strategic Plan because of the contribution they can make to protecting and enhancing "livelihood capacities" and "community resilience." They were also promoted in the Strategic Plan as a "particularly attractive way to use food" (USAID/FFP Strategic Plan, 2005, p. 68). "The income transfer from the food provides a safety net for vulnerable households," the Strategic Plan argued, "while the infrastructure creates assets that can help households increase their productivity and incomes," "reduce their vulnerability to risks during the agricultural production cycle," and "help communities protect and enhance their resiliency" (USAID/FFP Strategic Plan, pp. 68 and 72). Repairing and rebuilding roads, according to the Strategic Plan, can help connect communities and markets, expand economic opportunities, and increase competition in local markets. Having access to a more reliable source of water, through the construction of water harvesting structures and irrigation systems, means farmers are less exposed to the effects of droughts and more able to increase current crop yields and to diversify into

Box 5.1. Limitations and Gaps in the Program Documentation and Data

There are significant gaps and limitations in information available on the Title II infrastructure activities implemented during the FAFSA-2 time period. Most documents reviewed had little to say about the infrastructure components included in the programs. This included mid-term and final evaluations, very few of which included civil engineers on the evaluation teams. There was also considerable variation across Awardees and programs as to whether or not they reported on certain types of infrastructure and, if so, what indicators they used. Key information was frequently lacking about: what was actually constructed (how many roads, bridges, canals, etc.) during the FAFSA-2 time period, the quality of the construction, its socioeconomic impacts, and its likely sustainability. The fact that only partial information was available on the amount of resources devoted to infrastructure activities in Title II programs during the FAFSA-2 time period was also a limitation. Title II Awardees were required to report on the amount and value of the food resources devoted to FFW programs in their AERs through FY 2009, but not since then. Plus, there is no infrastructure category for Title II Awardees to use in filling out their annual resources Tracking Tables. Thus, the FAFSA-2 was not able to determine the total amount of resources that went to infrastructure or the relative importance of cash versus food in these programs.

¹⁴² Some infrastructure activities were integrated into components that focused on water and sanitation. These are discussed in more detail in Chapter 7.

higher-yielding and higher-value crops. Building cyclone shelters, flood embankments, dams, and other soil and water conservation structures can help communities reduce damage due to storms and floods. These and other examples are included in the "Illustrative Activities" section of the 2006–2010 Strategic Plan (see one example in Table 5.1). These examples also include information on the types of non-food assistance (cash in particular) needed for these activities to be successful. Food, in other words, is only a part of the solution, a point that is made in numerous places in the Strategic Plan.

5.1.2 Country Context

During the FAFSA-2 time period, infrastructure programs were implemented in four types of country contexts¹⁴³:

• To rehabilitate infrastructure damaged or destroyed by natural disasters or complex

emergencies, including in Liberia, Mozambique, Sierra Leone, and northern Uganda. Road rehabilitation was a major focus in all four programs, although bridges were also a major activity in Liberia, and the Sierra Leone program also helped repair almost 4,000 houses damaged during the country's civil war, which ended in 2002.

- As an integral part of broader AG/NRM/LH programs, building roads, dams, canals, NRM structures, and a variety of buildings, including cyclone shelters and storage facilities.
- To support the Government of the Federal Democratic Republic of Ethiopia's (GFDRE) PSNP. This is not a typical Title II development program, given how closely the Awardees' individual programs are integrated into the GFDRE program. However, it is an important program, given its size and potential impact (see Box 5.2).
- In two urban public works programs in Bolivia (see Box 5.3) and the CARE urban slum program in Bangladesh.

Table 5.1. Illustrative Activities: To Help Communities Build/Rebuild Community Physical Assets to Expand Economic Opportunities and Improve Access to and Increase Competitiveness of Markets

Non-Food Assistance	Food Assistance
The Title II program:	The Title II program:
• Provides and/or coordinates the provision of the complementary inputs needed for the successful completion of the relevant infrastructure, such as engineering drawings and services and cement; also provides or ensures the provision of the TA and training needed to ensure that the public works are operated properly and maintained	 Provides food through public works programs (food for work) to build community infrastructure, including roads, markets, and other public goods Monetizes food through small lot sales to support small traders and increase market competition

Source: This table is taken verbatim from the USAID/FFP Strategic Plan, p. 72.

¹⁴³ Additional information on the performance of the infrastructure components may be available from Layers, a tool that FANTA-2 developed to use to assess the quality of Awardees' operations. Layers was carried out in a few countries during the FAFSA-2 time period, but the data it generated were not included in the FAFSA-2.

Box 5.2. The Ethiopian Productive Safety Net Program

The USG has been contributing to the GFDRE's PSNP since its initiation in 2005, using Title II emergency resources during FY 2006 and FY 2007 and Title II development resources since then. The program, which has been described as sub-Saharan Africa's largest safety net program, has multiple objectives. These include providing labor-intensive employment during the slack agricultural season, preventing dependency and encouraging a work ethic, and creating community infrastructure to increase production and incomes and promote sustainable development through increased access to services. The PSNP accomplishes these objectives by paying individuals from food insecure households in food, cash, or some combination of food and cash for spending five days a month working on a public works project. These projects are labor intensive (the GFDRE's objective is that 80 percent of the costs go to unskilled labor) and include soil and water conservation activities and road rehabilitation and construction. Six Title II Awardees were involved in this program during the FAFSA-2 time period—CARE, CRS, FH, REST, SC US, and SC UK-through two separate program rounds (FY 2005-FY 2008 and FY 2008-FY 2011). In 2009, Title II programs covered about 18 percent of PSNP beneficiaries nationally and were active in 40 districts (woredas) and two pastoral areas. The USG's contribution was primarily in the form of food. Nine other bilateral and multilateral donors also contributed to the PSNP, in cash, and there was a growing emphasis within the GFDRE to move to a combined food and cash payment and eventually to all cash.

Source: Joint Final Evaluation (Robins and Tessema, 2011).

Box 5.3. Urban Food-for-Work Programs in Bolivia

Urban FFW activities were an important part of the Bolivian Title II development programs prior to USAID's 1995 Policy Paper. During the FAFSA-2 time period, two of the four programs included FFW activities in urban areas, in addition to their primary interventions, which were rural based. The FH/Bolivia urban FFW activities, which were part of the program from the start, were focused on the construction of water systems, storm drains, and sewer projects in two Bolivian cities—Potosi and Sucre. In the SC/Bolivia case, urban FFW activities were added to its program after several years of operation in an attempt to help the municipality of El Alto—the second largest city in Bolivia—cope with a major influx of immigrants from rural areas and the social tensions that were being created as a result of the lack of job opportunities for these recent migrants and their lack of access to public services. SC also used FFW to support the construction of water and sewer projects, plus parks and playgrounds, schools, and street improvements (including leveling, cobbling, and paving curbs, sidewalks, and streets). Both FH and SC worked closely with the cities' municipal governments and were able to leverage considerable additional financial, technical, and in-kind support for these programs. These programs were more professionalized than the earlier programs, and both FH and SC paid more attention to the quality of the works and their sustainability.

Source: Bolivia Joint Final Evaluation (van Haeften et al., 2009, pp. 249-251).

5.2 Basic Facts about Infrastructure Programs in the FAFSA-2 Universe

5.2.1 Projects and Countries

Some types of infrastructure activities (not including drinking water and sanitation infrastructure, which are discussed in Chapter 7) were implemented during the FAFSA-2 period in 61 programs in 23 countries: 3 programs in Asia (Bangladesh and India), 19 in LAC (Bolivia, Guatemala, Haiti, Honduras, and Nicaragua), and 39 in Africa (Burkina Faso, Cape Verde, Ethiopia, Ghana, Guinea, Kenya, Liberia, Madagascar, Malawi, Mauritania, Mozambique, Niger, Rwanda, Sierra Leone, Uganda, and Zambia). Programs were counted as including infrastructure activities if they reported on an infrastructure indicator in their IPTT and/or they reported the value and quantity of resources devoted to FFW activities in the USAID/FFP AERs.¹⁴⁴

5.2.2 Resources

Infrastructure activities implemented during the FAFSA-2 time period were supported with food and cash. Food was used to pay for unskilled workers, and cash was used to pay for skilled workers, including engineering staff and/or services, to rent and/or buy equipment, and to pay for construction to be done by private contractors. Cash was also used in some cases, in 100 percent monetization programs, for example, to pay for unskilled workers.

If one excludes the Ethiopia PSNP,¹⁴⁵ which is a special case, the value of the food devoted to FFW activities declined from approximately US\$50 million in FY 2003 to a little more than US\$20 million in FY 2009, despite the emphasis in the USAID/FFP Strategic Plan on the importance of

increasing the use of food in FFW public works programs (see Figure 5.1). The value of the food represents only a portion of the Title II development resources spent on infrastructure during the FAFSA-2 time period. But whether this was a small or large share or what the total amount of resources spent on infrastructure added up to is unknown, since USAID/FFP does not have an infrastructure category that Awardees can use to report on their annual expenditures on infrastructure, i.e., the amount of cash plus the value of food used, if any (see Table 5.2). The amount of cash spent could have been considerable, however. All the infrastructure built under the ACDI/VOCA/Cape Verde programs plus the four programs in Mozambique were financed with cash, since these were 100 percent monetization programs. Other projects also included infrastructure components financed completely with cash, including, for example, the ACDI/VOCA programs in Rwanda and Uganda.



Figure 5.1. Trends in the Use of Title II Resources

Table 5.2. Total Value of Title II DevelopmentResources Devoted to Infrastructure during theFAFSA-2 Time Period

	Food in FFW (million US\$)	Cash (million US\$)	Total
FY 2003	60.5	?	?
FY 2009	58.5	?	?

Source: USAID/FFP Annual AERs.

¹⁴⁴ This includes only programs completed during the FAFSA-2 time period.

¹⁴⁵ The substitution of Title II development food for emergency food in the Ethiopia PSNP program in FY 2008 and FY 2009 led to an increase in the total value of the resources being devoted to FFW in these years, but this is likely to change as the GFDRE continues to move to a more cash-dominated program.

5.3 Program Approaches and Interventions

5.3.1 Objectives

The Ethiopian PSNP, as the name suggests, has both an employment creation (the safety net) and a capital formation (the productive assets) dimension, as did the urban public works components in the FH and SC programs in Bolivia. In the roads program in Mozambique, which was an all-cash program, it was the asset—the road—that was more important. This was true for the majority of the infrastructure programs that were implemented during the FAFSA-2 time frame, i.e., the completion of the asset and its longer-term development effects were the primary objective.¹⁴⁶

5.3.2 Approaches

The approaches that the Awardees used to implement their infrastructure programs differed, with some Awardees taking responsibility for building the roads themselves (e.g., Africare in Uganda) and others contracting the work out to private contractors (e.g., ACDI/VOCA in Rwanda and Uganda). Awardees also developed different levels of technical capacity, with some hiring their own engineers, others contracting with consulting engineers to design and oversee the work, and still others relying on local governments for the design work and oversight of the actual construction. Some of these differences may have occurred in response to local conditions, but different Awardees also seemed to have developed their own preferred approaches.

5.3.3 Interventions and Outcomes

The Title II development programs implemented during the FAFSA-2 time period were basically

consistent with USAID/FFP policy in that most focused on the development of public-type infrastructure (i.e., infrastructure usually financed and constructed by governments), including roads, bridges, dams, canals, soil and water conservation structures, and other structures that augment physical assets in an area.¹⁴⁷

5.3.3.1 Roads

Road improvements were among the most common infrastructure activities funded under the Title II development program during the FAFSA-2 time frame, and in isolated rural areas roads are often among communities' highest priorities. There are many examples from the FAFSA-2 time period of Title II-supported road improvements helping improve farmers' access to markets, reducing the time that it takes to get goods to markets, expanding access to markets further afield, and helping reduce product losses. Roads also provide social benefits, as many of the Title II evaluations attested to, making it easier for people to get to schools and health posts and for social service providers to get to communities and helping decrease social isolation.

Thirty programs completed during the FAFSA-2 time frame included road indicators in their IPTTs. This included 10 programs in LAC (Bolivia, Guatemala, Honduras, and Nicaragua) and 20 programs in Africa (Ethiopia, Ghana, Guinea, Kenya, Madagascar, Malawi, Mozambique, Rwanda, Sierra Leone, and Uganda).

Most of the roads worked on could be categorized as farm-to-market or feeder roads,¹⁴⁸ and the types of improvements described included rehabilitation

¹⁴⁶ This puts most of the infrastructure developed under the Title II development programs during the FAFSA-2 time frame into the labor-intensive public works category that Clay and Singer refer to as "[1]ow cost infrastructure programmes" that put the main emphasis on assets created rather than the incomes of those employed to construct the asset. The other three categories are: relief works, long-term employment programs, and income-augmenting programs (Clay and Singer, 1985, p. 69).

¹⁴⁷ A few Title II programs also used relatively small amounts of resources to fund small-scale, family-level infrastructure (e.g., grain storage facilities and animal pens and stables). The difficulties associated with the use of Title II funds to support the creation of private assets are discussed in Sections 5.3.3.3 and 5.4.5. Other activities, also small in scale, involved the rehabilitation of buildings for use as agricultural warehouses and social facilities, such as schools and clinics.

¹⁴⁸ Some reports also refer to some of these roads as "low volume roads." These types of roads have relatively low use (e.g., an average daily traffic of less than 400 vehicles per day), low design speeds (e.g., less than 80 kmh), and corresponding geometry (Keller, 2003, p. 21).

and upgrades. Although building feeder or farmto-market roads is not as demanding as building a major highway, these are still complex activities, as illustrated in the brief description in Box 5.4 of the Title II road improvements implemented in Bolivia. A certain level of technical capacity is also required to produce a road that meets basic technical standards in a cost-effective manner. Poorly planned and constructed roads can have high maintenance and repair costs, contribute to excessive erosion, fail to meet the needs of the users, and deteriorate rapidly.

Although creation of the asset—the road—was the primary objective, many Title II programs were also sensitive to the value of providing part-time employment opportunities in the areas where they worked. WV/Mozambique referred to its approach to building roads as "labor-based technology" (LBT), which it described as "maximizing opportunities for the employment of labor (skilled and unskilled)," but also one supported by basic equipment, including tractors and trailers for hauling gravel and tractordrawn rollers for compacting soil. This approach, WV argued, was the most appropriate given the availability of labor in the areas where it worked and its relative lack of financial resources.

In Uganda, Africare and ACDI/VOCA adopted an approach fairly similar to the LBT approach WV used in Mozambique, with Africare ultimately buying the basic equipment it needed and ACDI/ VOCA contracting the work out to local firms. MC/ Uganda took a slightly different, somewhat more labor intensive approach to its road improvement efforts, opting to buy five small roller compactors (at

Box 5.4. Road Improvements in Bolivia

According to the Title II program's final evaluation, making improvements in rural roads in Bolivia usually involved making corrections to the horizontal and vertical alignments and transversal sections. The purposes of these activities are to correct the horizontal curves, making them wider; the vertical curves, to improve visibility; and the slopes along the road, so that they are not too steep. Road platforms are widened and their stability and durability increased and the slopes are corrected to reduce the likelihood of landslides. Putting in or improving drainage systems is another important component of a road improvement project to help avoid the destruction of the road platform. The construction of roadside ditches, brow ditches, culverts, fords, and bridges can all help channel water from streams or rainfall off the road platform. Controlling ravines and gullies, building retaining walls, and constructing other environmental mitigation works also help ensure the stability and durability of a road.

Source: Bolivia Joint Final Evaluation (van Haeften et al., 2009, p. 151).



A Title II-Improved Road in Bolivia Reduced the Time to Market from a Week to Half an Hour



Check Dams Controlling Erosion along a Title II-Improved Road in Bolivia

a cost of approximately US\$17,000 each) when its arrangements with the district government to access some of its heavy equipment fell through. In MC's case, the road grading is being done by hand, using FFW. But the quality of the roadbed produced by these small roller compactors, verified on site by the FAFSA-2 team, was much better than what could have been achieved with manual labor alone.

The challenges involved in finding the right balance between employment creation and quality are also reflected in the "Lessons Learned" section of the final evaluation of the four Bolivian Title II development programs (van Haeften et al., 2009, pp. 154–155). The basic point made here is that some "heavy equipment" is likely to be needed in road improvement programs, especially when one needs to compact roadbeds and to move large quantities of soil, "to insure that all the necessary technical, engineering and quality requirements are met." "Making quality improvements in roads," the final evaluation concluded, is not possible using only local manual labor "equipped with picks, shovels, and wheelbarrows and paid with food rations." "Food can be used to cover the costs of unskilled labor, but money is needed to pay for the costs of design, skilled personnel, heavy equipment, and non-local materials."149

The roads projects in Ethiopia, on the other hand, were/are highly labor intensive, as a result of the GFDRE's requirement that 80 percent of the costs of all projects built under the PSNP go to unskilled labor. This policy may help explain some of the quality issues raised in the 2011 joint final evaluation of the two rounds of Title II programs implemented during the 2005–2011 time frame. Most soil and water conservation activities were well engineered, according to this evaluation, but the evaluators were concerned about the quality of the road construction and, in particular, about the fact that several areas had been identified where

Roller Compactors Being Used to Compact a Roadbed in Northern Uganda



Eamonn Kilmartin

improved access roads were regularly damaged by seasonal rainfall. This could have been a result of poor compaction of the roadbed and/or the fact that many roads were constructed without storm drainage systems, side ditches, or culverts, which made them "highly vulnerable" to soil erosion (Robins and Tessema, 2011, p. 35). The evaluation also questioned the advisability of relying so heavily on manual labor, particularly when trying to construct roads in rough terrain.

Outcomes. The results in terms of kilometers of roads built, rehabilitated, upgraded, repaired and/or maintained¹⁵⁰ were mixed, with only 18 of 30 programs exceeding their targets. A larger percentage of the programs in the LAC region exceeded their targets (more than three-quarters), and three of the nine programs in Africa that did not meet their targets were in Uganda. Based on estimates provided in the IPTTs, approximately 13,060 km of roads were built, repaired, rehabilitated, upgraded, repaired, and/or maintained under the Title II development program between 2002 and 2009. A few programs also attempted to report on some measure of maintenance, including ADRA/Madagascar, Africare/Uganda, CARE/ Madagascar, and WV in Ethiopia and Mozambique,

¹⁴⁹ Civil engineers were included as part of the evaluation teams for both the joint mid-term and final evaluations of the four Bolivian Title II development programs, a staffing pattern that was not common even in cases where programs included significant amounts of infrastructure.

¹⁵⁰ The definitions of each of these terms varies and definitions also vary by Awardees and country programs.

but these indicators are not similar enough to be able to draw any program-level conclusions.

The 2002 FAFSA found that few Title II development programs provided information on the broader food-access impacts of their roads activities, with only a few programs providing information on changes in road use and commodity flows. This remained a problem during the FAFSA-2 time frame. A few programs implemented during the FAFSA-2 time period—Africare and ACDI/ VOCA in Uganda-did track and report on changes in the amount of vehicular traffic on the roads they rehabilitated. Several Awardees also provided information from rapid surveys commissioned to assess the socioeconomic impacts of their road work on the surrounding communities. The final evaluation of the Africare program in southwestern Uganda describes some of the impacts of the roads it upgraded in Kabale as follows: More than 100 houses were constructed along the road, as were a new primary school, a nursery, two clinics, and one government health center; numerous businesses also flourished, including two grinding mills, a fish farming facility, and brick and stone quarrying, plus several shops, including five groceries, three butcheries, eight roadside food stalls selling fresh vegetables and dry agricultural produce. numerous local brew bars, and three locations for weekly markets selling household items and farm inputs (Anderson, 2006, p. 73). Both types of reporting-on changes in vehicular traffic and on the availability of businesses and services-are "better" practices. None of the programs reported on changes in the seasonal variability in commodity prices and transportation times and fees, which had been identified in the 2002 FAFSA as other "important food-access impacts of rural roads" (Bonnard, 2002, p. 46).

5.3.3.2 Water Management Structures

Irrigation

As discussed in more detail in Chapter 4, a number of programs implemented during the FAFSA-2 time period also helped their client farmers and communities build simple irrigation systems. Some interventions could be considered public works, because they included the construction of dams (REST in Ethiopia), relatively large intake structures (FH in Bolivia), canals (CARE and FH in Bolivia and Kenya), and overnight storage reservoirs (CARE and SC in Bolivia and CRS in Malawi). Title II Awardees helped with the engineering designs, provided FFW as pay for unskilled workers, and helped organize and train the water user groups that are needed to take over the responsibility for operating and maintaining the systems.

Water Harvesting Structures

Water scarcity is a major problem in many Title II target areas. A number of programs used food and/or cash for work and/or TA to support the construction of a variety of structures designed to make more effective use of the limited water resources that are available. This included the construction of ponds to harvest water for animals (Bolivia and Ethiopia) and a variety of structures designed to slow water runoff and increase water retention. The latter included the construction of low check dams and contour stone bunds (referred to as *banquettes* in Niger), which are constructed along contour lines, to slow water runoff and allow more time for the water and organic matter to soak into the fields to increase water retention, replenish the water table, and help recuperate agricultural land (Niger and Burkina Faso).



Example of a Newly Built Stone Bund or Banquette in Niger

Water Control Structures

In other areas, too much water was/is the biggest problem. Recurrent flooding is a major problem in the areas where CARE/Bangladesh works, for example. So CARE helps poor households in some of the most vulnerable communities in the north raise their homesteads above normal flood levels. In the Haor area in the northeast, where entire villages are built on mounds that are surrounded by water during the rainy season, CARE/Bangladesh has helped communities build retaining walls around their villages to protect them from damage by wave erosion. SC/Bolivia included defense walls along river banks among its infrastructure activities in the first years of its program. CARE/Kenya also used FFW to rehabilitate drainage canals, clean stream beds, and raise and reinforce stream banks as part of a flood mitigation program.

Outcomes. Few Awardees reported on the water management structures constructed under the auspices of their programs in their IPTTs. This may be due in part to the considerable variety of types of infrastructure that fall under this category and inconsistencies in definitions. Although the little available information is interesting, it is not enough to use as a basis for any program-level conclusions. For example, ACDI/VOCA/Cape Verde reported on the number of reservoirs constructed (153 against a length of activity [LOA] target of 130) and number of check dams constructed (768 against a target of 118) (FY 2003-FY 2008). CARE/Kenya reported on the kilometers of irrigation and drainage canals rehabilitated under its program (820 against an LOA target of 210) and kilometers of seasonal rivers and streams rehabilitated (430 against an LOA target of 200). And CARE/Madagascar reported on the number of small dams rehabilitated (187 against an LOA target of 100) and number of meters of canals rehabilitated (539,431 against an LOA target of 550,000).

5.3.3.3 Natural Resource Management Interventions

Ten programs in the FAFSA-2 universe had separate SOs focused on improving the management of the natural resources in their target areas—five in

Africa (Chad/Mali, Ghana, Guinea, Ethiopia, and Malawi) and five in LAC (Bolivia and Guatemala). Numerous other programs included NRM components. Most programs included a mix of activities focused on improving the management of soil, water, forests, and grasslands. Many included a strong focus on the construction of soil and water conservation structures, including live and dead barriers, gully plugs, terracing, infiltration trenches, micro dams, dikes, and water harvest ponds. These types of activities accounted for an important share of the infrastructure activities included in the Ethiopia PSNP and the ACDI/VOCA/Cape Verde program, for example. Some programs also included the development of area enclosures to rehabilitate pasture land and the production of tree seedlings (in project-supported nurseries, which are discussed in more detail in Box 5.5) and planting of tree seedlings to help regenerate community forests. To help communities better manage their natural resources, some Title II Awardees also worked with communities and local governments on the development and implementation of watershed and conservation area management plans.

NRM activities, when implemented on community land, are clearly a public good, in that large numbers of community members are likely to benefit. It is also clear that, with the exception of some cultures that still have a tradition of community members contributing a prescribed amount of free labor to their communities in a given time period, this work would not be done in most poor communities because most members are too poor to devote scarce time to activities that are not going to provide them a relatively immediate return.

On the other hand, using food to encourage farmers to apply NRM practices on their own land is not a better practice, for reasons discussed in Section 5.4.5. One exception may be when the work to be done is on private land that is interspersed with community land and not applying the NRM practices on the private land could reduce the effectiveness of the whole program. In other words, there may be cases where not paying for work done on private land could have adverse effects on the creation of a public good. Behind this argument is the

Box 5.5. The Role of Project Nurseries

Project-supported nurseries were critical components in many NRM programs, when large numbers of tree seedlings were needed to supply a reforestation component, for example, but sufficient quantities were not available from government sources or the private sector. Some nurseries were project-run, but the more common strategy was to organize and train community groups to produce the planting materials and to reimburse workers for their time with FFW. These programs can have technical problems. The Bolivian mid-term evaluation team, which included an environmental specialist with experience running tree nurseries, found technical problems related to nursery management in all the nurseries visited and the absence of tree seedling production best practices. Sustainability can also be an issue. It is debatable whether sustainability of these nurseries should even be a program objective and, if so, what approaches are more likely to be sustainable. Although fewer in number, the family nurseries that FH supported in Bolivia and the private producer of horticulture seedlings that ADRA worked with in Nicaragua had some chance of being sustainable after these projects ended. Community-based nurseries, on the other hand, are unlikely to continue operating once FFW ends, and private sector takeovers of these nurseries, as some Title II programs began to entertain as they neared completion, were/are highly unlikely.

recognition that, to be effective, many soil and water conservation structures and other NRM treatments need to be located close together and constructed in sufficient numbers to have an effect at a landscape level (i.e., on an entire watershed, micro watershed, hillside, or gully). If these structures and plantings are not implemented in a contiguous area, their impact will be limited and community members will have less incentive to maintain them in the absence of additional payments. In these situations, programs could end up generating short-term employment and little else.

This focus on a landscape effect is often discussed in the context of taking an integrated approach to watershed management. This emerged during the FAFSA-2 time period as a popular approach to designing and implementing soil and water conservation activities, including in Title II development programs. The issues with respect to taking a landscape effect approach include program size and resource availability, and whether having an impact at the watershed or even sub-watershed level is a feasible objective for most Title II programs.

This approach does seem to be a valid one for the programs that support the PSNP in Ethiopia, where soil and water conservation and other NRM activities, including regenerating forests and pastures, are being implemented under a "Community-Based Participatory Watershed Development" approach (Robins and Tessema, 2011, p. 32). These programs are designed to have an impact at the watershed level, and there is some evidence that water tables are rising due to improved water retention after highland drainage areas have been closed, terraced, and reforested. But these are large programs in terms of financial and human resources and time (they have been under way for more than 20 years in some areas in northern Ethiopia, such as Tigray). REST, an Ethiopian-based Title II implementer, has made a commitment to this approach. CRS has also adopted the concept of integrated watershed management in Ethiopia, using it as a way to focus and organize all its program activities (Herbert et al., 2010, p. 1). The final evaluation of the CRS and WV programs in Ethiopia that were implemented between FY 2003 and FY 2005 also reported that these programs, which were applying physical and biological treatments consistently throughout sub-watersheds, could have a noticeable impact on reducing the rates of soil erosion and increasing water retention and availability in only a few years (see Box 5.6).

Box 5.6. Lessons Learned from the CRS and WV NRM Programs in Ethiopia

"The new approach to land rehabilitation [that] combines physical soil and water conservation structures with biological measures and applies them consistently throughout a sub-watershed to have a landscape effect can have a noticeable impact even in a few years in reducing the rates of soil erosion and increasing water retention in the soil and water availability for domestic consumption and agriculture..."

Source: Final Evaluation of the CRS and WV Programs (van Haeften et al., 2006, p. 53).

On the other hand, most Title II programs do not have enough money or locally available labor to be able to apply soil and water conservation measures to all watersheds, or even the most important watersheds, in their target areas. Under these conditions, the better practice is to focus the resources available for the implementation of environmental protection measures on the protection of economic assets important to communities, a strategy that should also increase the likelihood of their sustainability. The four programs in Bolivia used FFW to support a variety of environmental protection measures, including stream protection, terraces, gully plugs, check dams, vegetative barriers, and other soil and water conservation structures and plantings, to protect sources of water for irrigation and household use, for example, and valued feeder roads. In Malawi, the FAFSA-2 team saw members of the CRS consortium using FFW to pay community members to construct gully plugs and vegetative barriers to protect water sources and fields the project was also helping to bring under irrigation. In Niger, the team saw some of the mechanical and biological structures that CPI/Niger was helping communities put in place to stabilize sand dunes that were encroaching on valuable

wetlands (which the project was also helping develop), nearby houses, and roads.

Outcomes. Thirty-two of the programs included in the FAFSA-2 AG/NRM universe reported on the "number of hectares of land conserved" or had "new/improved NRM practices applied to them," and three-quarters of these programs reported exceeding their targets. Based on the estimates provided in the IPTTs, approximately 60,000 hectares were conserved or had new/ improved NRM practices applied to them¹⁵¹ under Title II development programs between FY 2002 and FY 2009. Millions of tree seedlings were also produced under these Title II programs, usually in project-run or -supported nurseries, and planted during this same time period.¹⁵² Without further documentation, these numbers tell us very little about the nature of these achievements, however, or how they were obtained. It is not clear, for example, whether all these hectares were public land or whether any food and/or cash was used to encourage farmers to build these structures, apply these practices, or plant these trees on their own or on public land.

5.3.3.4 Buildings

Relatively few buildings were included in the infrastructure programs, and the few that were were usually built to satisfy specific project objectives (e.g., stores and warehouses to store agricultural products, markets, and storm shelters for emergency use). In many cases, buildings were rehabilitated rather than newly constructed. In Bangladesh, CARE and SC helped develop flood and cyclone shelters in their target areas. Many of these were actually schools that had been rehabilitated to

¹⁵¹ The definition of each of these terms varies; definitions also vary by Awardees and country programs.

¹⁵² Very few programs reported in their IPTTs on the number of tree seedlings produced and/or planted, but the numbers can be substantial. ACDI/VOCA reported planting more than 700,000 forestry, fruit, and coffee seedlings in its Cape Verde program (FY 2003–FY 2008), for example, and at least 500,000 forestry and fruit tree seedlings in its Rwanda program (FY 2000–FY 2005). CRS reported planting more than 5.2 million tree seedlings in its Ethiopia program (FY 2003– FY 2005) and more than 500,000 in its Kenya program (FY 2001–FY 2006).

Dune Stabilization in Niger to Protect the Development of a Title II-Supported Agricultural Wetland and an Adjacent Village



a higher standard, while also maintaining their original function as schools. Floor elevations for these structures were designed to be higher than the anticipated maximum flood level, and, in some cases, the ground floor was left open, with all rooms located on upper levels. This enabled people to use the ground level to shelter their livestock.

5.4 Cross-Cutting Issues and Opportunities

5.4.1 The Role of Infrastructure in Title II Development Programs

Infrastructure development continued to play an important role in a number of countries during the FAFSA-2 time period. Infrastructure activities were particularly crucial in countries where the focus was on the repair and rehabilitation of infrastructure damaged or destroyed by natural disasters or complex emergencies. In other countries and programs, the immediate challenges to the implementation of successful infrastructure components appeared to drive many Awardees' decision-making processes about whether to do infrastructure, rather than their longer-term benefits. Challenges frequently cited by Awardee staff included: problems in meeting technical standards; the need for a completely different set of technical skills (e.g., engineers) than needed for other interventions: the need for more human

resources to properly oversee construction and other management problems; the high cost, taking scarce resources from other important activities; the inherent sustainability issues; and, particularly, the susceptibility to fraud.

The decision whether or not to include an infrastructure component in a project appeared to be a dilemma for some. Infrastructure can be difficult to implement, and adding infrastructure to a project may require Awardees to make adjustments in their organization and staffing, adding more engineers, for example, and improving supervision, which some have done. However, there are also downsides to de-emphasizing infrastructure, especially if one is interested in promoting the longer-term developmental impact of Title II programs. The nature of this dilemma was illustrated during a discussion with one Title II program director with whom the FAFSA-2 team spoke during one of its African field visits. The discussion began with the director listing all the difficulties one has to deal with when working on infrastructure, roads in particular. Later in the discussion, however, and in response to a question about what types of activities were likely to make the biggest and longest-lasting difference in people's lives, infrastructure was at the top of his list.

5.4.2 Technical Efficiency and Cost Effectiveness

Public works programs, according to Clay and Singer, "have had a poor record with respect to the quality of the assets created and the efficiency with which the work is done," and this lack of quality and cost-effectiveness lessens their development impact (Clay and Singer, 1985, p. 77). Several factors are responsible for these quality and efficiency problems, including insufficient complementary inputs (including design, management resources, equipment, and materials); lack of or poor maintenance; and low labor productivity and poor work. While these problems have also been evident in Title II-supported public works programs, steps can be taken, according to Clay and Singer, to increase the likelihood that the assets created will be productive. These steps, which are outlined in

Box 5.7, are still relevant for guiding the design and implementation of infrastructure created under the Title II development programs.

To deal with issues of cost-effectiveness, more information is needed on program costs and effectiveness. The Title II development program, following the lead of the rest of USAID, has focused its attention on improving the availability of information on indicators of performance and has paid relatively little attention to collecting data on and assessing the costs and relative costeffectiveness of alternative interventions.¹⁵³ The CRS/Ethiopia evaluation of its integrated watershed management programs is a good, but rare, example of an attempt to assess not only the relative contribution of each program component to overall program performance, but also its relative costeffectiveness. Lack of data on the relative costs of various program components and on the number of households targeted by various interventions were two of the biggest hurdles the evaluators faced (Herbert et al., 2010).¹⁵⁴

5.4.3 Collaborating with Communities and Local Governments

Awardees typically tried to work closely with target communities on infrastructure programming, to get their support early, with the expectation that this would lead to the communities taking responsibility for the maintenance of the infrastructure once the projects ended. Many also tried to collaborate with local governments, for example, the districts (*woredas*) in Ethiopia and the municipalities in Bolivia. In some cases, the programs were able

Box 5.7. Suggested Guidelines for Enhancing the Productivity of Public Works

To be productive, assets created through public works programs need to:

- Use technology appropriate to the environment
- Be technically and economically feasible
- Conform to acceptable minimum engineering standards
- Not present costly maintenance problems
- Be consistent with economic priorities
- Use labor in amounts that are sensitive to the employment needs in the locality but also consistent with the need to ensure that the infrastructure meets basic quality standards
- Be effectively utilized and maintained

Source: Adapted from Clay and Singer, 1985, p. 78.

to work in cooperation with local representatives of central government agencies, such as technical staff from the ministries responsible for water resources and the environment in Niger. In this case, government engineers provided the designs for some of the structures (e.g., dams) and oversaw the construction work, with the Title II program covering their expenses in the field. In Uganda, local officials often had master plans for rehabilitating and/or upgrading rural and community feeder roads and were usually involved along with target communities in the road selection process. In Bolivia, the four Awardees were able to leverage considerable monies from the local municipalities to support their infrastructure programs, roads in particular.

Collaborating with communities and local governments in the selection, design, and

¹⁵³ USAID recently began to re-emphasize the importance of cost-benefit and cost-effectiveness analyses "to direct practitioners to the most promising and sustainable paths to development" and "to insure that we use scarce funds to benefit the poor by intervening where necessary and leveraging private funds and untapped sources of capital wherever possible" (Bahn and Lane, 2012, pp. 192–195).

¹⁵⁴ CARE/Bangladesh also financed an assessment of the costeffectiveness of its homestead raising and mound protection programs in northern Bangladesh, concluding, for example, that the homestead raising program was a sound financial investment as long as the homesteads remained for at least seven years in the North Char and five years in the Mid-Char (Todd, 2008, p. 30).

implementation of infrastructure projects is a better practice, in part because of the important role communities and local governments will have to play in any Awardee's exit strategy and to enhance the likelihood of sustainability. There can be downsides to these arrangements, however, particularly when local governments cannot and/ or do not meet their commitments, whether these include providing the initial engineering designs, taking over the responsibility for on-site supervision, or supplying the heavy equipment needed in the case of roads projects. Awardees have found that they also need to be realistic about what they can and cannot expect from target communities and local governments and agencies to avoid delays and poor quality work.

For example, SC/Bolivia decided at the beginning of its program to rely on municipal governments to prepare the technical proposals for their communitylevel infrastructure projects. Unfortunately, this resulted in projects that were of poor quality and not completed on time. To deal with these problems, SC created a separate infrastructure unit and hired additional staff for this unit that were given responsibility for the design and supervision of all its infrastructure activities. Creating this in-house capacity enabled SC to improve the technical quality of its projects and eliminated the need to contract with outside consultants to correct the technical proposals that it had been receiving from the municipal governments. It also reduced the number of problems that SC staff had to solve on-site. SC also found that having an in-house engineering capacity improved coordination between the engineers and the other project components, making it easier to get input from the MCHN, AG, and NRM staff in the process of identifying infrastructure. It also helped ensure that environmental considerations were built into each infrastructure project from the beginning.

Road work was also delayed in a number of programs, including in Bolivia, Kenya, and Uganda, because the governments did not make good on their commitment to provide the Title II Awardees with the heavy equipment that they had promised. Sometimes the equipment was old and/or poorly maintained; in other cases, it was simply not made available. This happened to Africare in Uganda. As a result, Africare decided to buy its own heavy equipment (including road graders, compactors, trucks, and excavators), which it used to complete the road work in southwestern Uganda and is now using in northern Uganda in the FY 2007-FY 2011 ACDI/VOCA-headed program. In Kenya, the Ministry of Public Works failed to provide gravel and heavy machinery to compact the roads CARE was rehabilitating, as was agreed to. This had a negative effect on the quality of the roads, according to the final evaluation, and resulted in the roads being passable only during the dry season (CARE, 2009, p. 4). ACDI/VOCA/Uganda also faced delays in its road-building activities in northern Uganda because many of the local districts with which it had planned to collaborate were new and did not have the necessary equipment. ACDI/VOCA eventually decided to contract out all its road-building activities to private sector contractors, contracting with a consulting engineer to handle the design and supervisory functions.

Program documents and field visits also provided several examples of successful links between Title II infrastructure programs and other donor programs. Careful planning and some element of luck can sometimes tie a project intervention into a larger project being implemented by another agency, thus leveraging a relatively small amount of funding into an overall impact of some significance. This was the case with a road project that the FAFSA-2 team visited in Guatemala. The road, which was financed with World Bank funds administered through the central and municipal governments, was designed by department highway engineers and built by a construction company contracted by the department. The SHARE/Guatemala Title II program assisted with project supervision and also provided FFW as payment for some of the labor used in building the road. The SHARE engineer estimated that SHARE's contribution of FFW accounted for around 10 percent of the total cost of the road. The project began in the spring of 2010 and took about 12 months to complete. Some FFW was used to pay to have strategic slopes along the road planted with trees and grass as erosion control.

5.4.4 Infrastructure Priorities: Project- and/or Community-Driven

Some programs in the FAFSA-2 universe—those with road components in particular—started out with a relatively clear idea of what types of infrastructure they were going to focus on and what their targets were going to be. Others took a more decentralized approach, allowing more decisions to be made at the individual community level. Both approaches had their challenges. To be successful, programs had to find an appropriate balance between being responsive to communities' perceptions of needs and achieving overall project impact as well as community-level impact.

Involving communities starting at the planning stage is important-project designers may not have the same priorities as community members. On the other hand, if one tries to be too responsive to community requests, one could end up supporting activities that are not cost-effective. Two communities may want their own road connection to the main road, when, from a project perspective, one road connecting them to each other and to the main road might be more cost-effective, as was the case in Bolivia. Providing community members with FFW to clean up a road—an activity that they should have been willing to do themselves—because the project had made a commitment to supporting an FFW activity in that community is another example (from Guatemala) of an inappropriate balance between trying to be responsive to a community and overall project effectiveness.

Several evaluations reviewed contain information on the criteria that the programs used to identify the roads that they worked on. The criteria used by Africare/Uganda (see Box 5.8) and WV/ Mozambique (see Box 5.9) demonstrate a concern for the economic benefits to be gained from a road, but also recognize the importance of obtaining local support (the Africare criteria were applied to the lists of proposed roads provided by the districts). Both programs also went through a lengthy consultative process with key stakeholders, including communities and local governments, before final decisions were made. One did not get such clear answers in the field to questions about

Box 5.8. Uganda: Criteria Used by Africare to Select Project Roads

- The roads must link inaccessible areas.
- The roads must connect the targeted communities in other parts of the Africare program.
- The roads must be economically viable and feasible.
- The total road length must be in accordance with the budget.

Source: Africare/Uganda Final Evaluation (Anderson, 2006, p. 71).

Box 5.9. Mozambique: Criteria Used by WV to Select Project Roads

- Roads that serve areas of high agricultural potential with large populations.
- Roads that are suggested by District Administrators.
- Roads that link populations in need of agriculture or health services.
- Roads that serve as potential links to other markets, cities, or districts.

Source: Mozambique Final Evaluation (WV, 2006, p. 12).

the process or criteria used to select specific roads or other infrastructure activities. This may be because the people involved in the initial selections were no longer around. On the other hand, it could also suggest a certain lack of transparency in the selection process, which, if true, could be a sign of other potential issues, including manipulation of the process by certain interests and underlying dissatisfaction on the part of others. The final evaluation of the ACDI/VOCA/Cape Verde program identified some of the shortcomings of trying to be too specific up front about the types and number of public works that a project is going to support. The practice of setting specific targets for specific types of soil and water conservation activities at the beginning of the project, the evaluation argued, was inconsistent with the association-led planning process, which ACDI/ VOCA had also adopted as a way "to better reflect the needs of the communities and to give more ownership of the works by the communities so they will have a more direct interest in maintaining the works" (Langworthy et al., 2005, p. 6).

On the other hand, the final joint evaluation of the four Guatemala Title II programs expressed a number of concerns related to the consequences of Awardees not having a clear vision up front of the real infrastructure needs in their target areas or of the contributions that these infrastructure activities should make to their overall project objectives. Specific concerns included: (1) the lack of a clear process for selecting infrastructure activities (FFW projects, it was noted, were often generated at the suggestion of technical staff); (2) the lack of a standardized approach to the use of food in the four programs (two used food to encourage project participants to adopt the projectrecommended practices on their own lands, which in itself is not a good practice, and two did not); and (3) the impression that some of the infrastructure activities may have been supported primarily to meet food distribution goals. The final evaluation also recommended that the Awardees consider using a competitive selection process for identifying their infrastructure projects in the future "so that communities will see themselves as obtaining these resources on merit rather than as a gift" (Schnell et al., 2006, p. 4 and pp. 47–56).

5.4.5 Using Food-for-Work in Infrastructure Programs

Some programs included in the FAFSA-2 universe used food in their infrastructure programs, usually to pay for unskilled labor. This was the case in the Ethiopia PSNP and the Bolivian urban public works programs (see Box 5.2 and Box 5.3). In Cape Verde and Mozambique, all infrastructure activities were paid for with monetization funds, including payments to unskilled labor, since these were 100 percent monetization programs. Some cash will always be needed in all infrastructure programs (e.g., to pay for technical staff; skilled manual labor; and non-local materials, including cement, pipes, and iron sheeting for roofs), as was emphasized in the USAID/FFP Strategic Plan.

FFW programs were such a common feature of past food aid programs that Clay and Singer suggest that "food aid has become almost synonymous in much writing with food for work" (Clay and Singer, 1985, p. 80). The use of food in the form of FFW has also generated considerable controversy over the years. Two issues of particular importance with respect to the use of FFW during the FAFSA-2 time frame were the use of food as FFW to support the creation of private assets and the use of food (in lieu of cash) to pay the workers for time spent working on public works project.

Normally, one should avoid using food (or cash) to reward farmers for undertaking activities on their own land and from which they are expected to receive direct economic benefits. This includes various land preparation activities, planting fruit trees around their houses, and making individual compost pits, activities that were still being supported with food in some of the Title II programs that were under way during the FAFSA-2 time frame.¹⁵⁵ Using food can make an activity profitable for farmers to undertake in the short run, as long as the food is available. But if activities are not profitable in the absence of food, farmers will not continue them or will not continue to maintain the structures built once the food is no longer available. Using food to promote the adoption of activities that are not economic in the absence of food has the additional disadvantage of diverting people's time and attention from other potentially profitable

¹⁵⁵ These criticisms were raised in the 2006 joint final evaluation of several of the Title II programs implemented in Guatemala from FY 2001 to FY 2006 (Schnell et al., 2006, pp. 47–52).

activities. (Some of these issues are also discussed in Section 4.3.2.2 on "Natural Resource Management at the Farm Level.")

Roads are clearly a public good, and there are numerous examples during the FAFSA-2 time frame of Title II development programs making good use of FFW in their roads programs. One of the more attractive uses of food has been to pay community members to carry out the relatively labor-intensive environmental mitigation measures along the sides of the roads, including planting trees and grasses to stabilize road banks and adjacent slopes. Some of the quality issues associated with the use of food in a public works program can also be true of the use of cash for work, and are more likely to stem from the desire to include a large labor component in the project than from the actual payment method.

Irrigation systems, on the other hand, can have both private and public dimensions, a fact that was recognized in many of the small-scale irrigation systems implemented during the FAFSA-2 time frame, some of which were developed without using food (or cash) for work. In these cases, Awardees helped organize the communities and/or the user group(s), did the design work, and helped provide purchased inputs (e.g., cement, polyvinyl chloride [PVC] pipe, and pumps), and users contributed labor and some local materials for free. This is the preferable approach in the case of smaller systems, where participants are able to directly capture the economic benefits of their own work (e.g., from digging feeder canals to their own plots). Cases also exist where FFW is an appropriate approach, e.g., to reimburse community members for time spent working on the larger-scale infrastructure that is part of some irrigation systems (e.g., the dams, major canals, and night storage reservoirs that are more in the nature of public goods).

There has also been extensive debate over the years over the advantages and disadvantages of using food as a wage good. These issues fall into several categories, according to Clay and Singer, including the advantages of a food element in wages, the risks of disincentives to local agriculture, handling

problems with bulky food commodities, the acceptability to workers of food aid commodities, and non-food wage components (Clay and Singer, 1985, p. 81). These issues were still being debated during the FAFSA-2 time frame, with an increasing number of stakeholders expressing a preference for cash payments. This preference also extended to some governments, including the Ethiopian government. The Government of Niger went further and, in 2007, banned the use of FFW activities in non-emergency programs. This decision left the Africare/Niger and CRS/Niger Title II development programs scrambling to try to find appropriate alternative uses for the food that they had already programmed as FFW, with some of the food being used to stock CCBs (see Box 4.11 for additional information on these interventions) and as Food for Literacy. However, the Clay and Singer conclusions remain relevant. "Findings about the performance of food for work more generally appear contradictory," they write, "and suggest that success is a local phenomenon dictated by the need for and design of projects, the socio-political climate and the ability and integrity of officials, not the type of remuneration" (Clay and Singer, 1985, p. 84).

The potential for FFW programs to have disincentive effects on local agriculture is a particularly important issue given the context. That is, the programs are being implemented in conjunction with broader agricultural development programs and are expected to make a positive contribution to the production and livelihood/income objectives of these programs. For example, FFW programs have to be particularly careful to avoid creating perverse economic incentives and having adverse effects on local labor and product markets. The timing of the work can be important, for example, and may place practical limits on the size of a FFW program that can be implemented. It may be difficult to do road work in the rainy season, for example, and the work should not be undertaken during the times when farmers need to be working in their fields, even when some of these activities could be undertaken during the so-called "lean season." Most poor rural households, which are the targets of Title II development programs, are also heavily

dependent on agriculture as their main (sometimes only) source of income, and they need to have time to invest in their own assets and livelihoods to ensure longer-term survival. One also needs to be careful in setting the ration, keeping its value below the prevailing wage rate to avoid having the program interfere with the functioning of local labor markets. Food aid commodities distributed through MCHN and/or safety net programs, if they are relatively large with respect to the market in the area where the distribution is taking place and not managed well, can also have disincentive effects on local production and markets. Title II development programs also need to be aware that some types of FFW activities that have been used effectively in emergency environments, when markets were likely in disarray, may no longer be appropriate once production levels have been restored and markets have returned to more normal conditions.

5.4.6 Capacity Strengthening

Most Awardees also included capacity strengthening efforts in their infrastructure programs, including activities designed to sensitize community members to the importance of maintaining the roads and training them in simple road maintenance techniques. Several other capacity strengthening efforts that took place during the FAFSA-2 time period are also of interest. In Cape Verde, ACDI/ VOCA/Cape Verde decided it would be more cost-effective to implement its soil and water conservation activities through contracts with rural associations rather than through the government and government road gangs. ACDI/VOCA provided these associations with technical training and training in organization, management, and financial control systems, to strengthen the organizations and improve their performance. Later in the project, it added a focus on business development, internal income-generating activities, and partnering with other organizations as part of its exit strategy. In Mozambique, one of WV/Mozambique's specific objectives was to improve the capacity of the small-scale local firms that it contracted with to rehabilitate the local access roads. WV supplied these firms with the machinery (including tractors,

compaction rollers, and tractor-towed graders) needed to rehabilitate these roads,¹⁵⁶ plus training in business management to help the firms improve their operations. Over time, according to the project's final evaluation, these firms were able to buy additional road construction equipment using income earned from the road works, open up offices and workshops, become licensed enterprises, compete for road works outside the WV program, and diversify their businesses into other incomegenerating activities unrelated to road construction (WV, 2006, p. 22). To improve targeting and the timeliness and scheduling of food and cash transfers, the six Awardees in Ethiopia worked with local governments to strengthen their capacities to manage and utilize computerized systems for beneficiary tracking, in early warning activities, for M&E, and for commodity management.

5.4.7 Sustainability

The factors that influence whether infrastructure built under the Title II development programs will be sustainable differ depending on the type of infrastructure. Roads are a public good, and whether the roads that were built, rehabilitated, upgraded, and/or repaired are sustained depends largely on whether the communities that benefit from these roads and/or some government entity (e.g., a local roads department) take responsibility for maintaining them. Proper maintenance is particularly important for rural roads, which can quickly fall into disrepair if the roadbeds are not kept in good shape and their drainage systems are not regularly and properly cleaned.

As part of their sustainability strategies, many Awardees devoted considerable time and attention to building local commitment and capacity to take over

¹⁵⁶ WV/Mozambique set up a facility for contractors to use to help them purchase equipment. At the beginning of the project, some of the equipment that was initially used by WV was transferred to these contractors and the payments for this equipment were deducted from the payments that they received for work performed. Contractors were then encouraged to buy more essential construction equipment, using funds generated from their contracts (WV, 2006, p. 4).

responsibility for maintaining the roads once they were finished. As they began to better understand the value of environmental mitigation activities, many Awardees also began to pay more attention to ensuring that appropriate environmental mitigation measures were incorporated into the design and implementation of their roads components.

Most programs in the FAFSA-2 time frame appear to have tried to get communities and local governments to take over responsibility for maintaining the roads and the drainage systems that they helped construct. These efforts seemed to work well in some cases, such as in Bolivia, where the municipalities had access to resources. In these cases, the Title II Awardees worked with the communities and municipalities to ensure that the funds needed to maintain the roads were written into the municipalities' annual operating budgets. In other countries and programs, arrangements ended up not working out, for a variety of reasons, including situations where the agencies did not have the necessary technical staff, equipment, resources, and/ or political will.

Alternatives to local governments taking over responsibility for the maintenance of these roads may also be available, but it is usually a better practice to try to identify and firm up these arrangements early on. In one case-the road that the FAFSA-2 team inspected in the CRS/Niger program-the community was charging tolls on the road to help pay for maintenance costs. In another case, the final evaluation of the ACDI/ VOCA/Rwanda project suggested that, in the future, ACDI/VOCA should consider aligning its road rehabilitation interventions directly with the specific transportation needs and constraints identified by the cooperatives, associations, and other agribusinesses it plans to work with to get their support for road maintenance (Swanson, 2004, p. 39). The final evaluation of the Africare program in southwestern Uganda also supported Africare's attempt to get funding for road maintenance from a Forest Conservation Trust that was benefiting from

one of the roads that it helped upgrade.¹⁵⁷ This final evaluation also recommended that Africare continue the practice of looking for other possible partners to contribute to construction and maintenance costs (see Box 5.10).

Title II development programs can also do much to train local people in road maintenance techniques and sensitize them to the critical nature of these interventions and the process of planning and carrying out these repairs. In Bolivia, for example, all four Awardees worked to organize and train roads committees in the participating communities, which they initially used to coordinate with the communities on aspects related to the design and later the construction of the roads. Once construction was completed, the Awardees trained the construction committees and communities in routine road maintenance. This included filling potholes and cleaning and maintaining roadside ditches, culverts, and gully controls. Evaluations of all the programs that included major road components (Bolivia, Ethiopia, Mozambique, and Uganda) paid particular attention to this subject in the "best practices" section of these reports.

The sustainability of some of the other types of infrastructure that were being built under Title II development programs will depend on whether the people that are affected by the infrastructure feel that the benefits they are receiving, especially the economic benefits, are worth the costs in time and money to do the necessary repairs and maintenance. This is true for the irrigation systems that were constructed under the Title II programs, whose sustainability depends on whether the water users associations that were developed continue to function and how effective they are in carrying out their operation and maintenance tasks (see Section 4.3.2.3 on "Irrigation"). NRM structures are also more likely to be effective and sustainable if they are tied to income generation activities. These include activities designed to help protect

¹⁵⁷ According to the final evaluation, the time that it would take tourists to reach this site was cut in half as a result of the road improvements Africare made (Anderson, 2006, p. 87).

water sources, wetland areas, and roads, as well as communities themselves (see Box 5.11).

5.4.8 Basic Principles for Guiding Infrastructure Development

The USAID/FFP Strategic Plan is clear about the importance of public infrastructure components in Title II development programs and that these programs should be designed and implemented in ways that support the broader objectives of the Title II program, contributing to improvements in agricultural productivity and access to food and to reductions in vulnerability. The FAFSA-2 team found examples, in the documents reviewed and during the field visits, of Title II-supported infrastructure activities that were well designed and implemented. The team also found examples of activities that were not consistent with some of the most basic principles for the implementation of successful infrastructure components in the context in which the Title II development programs work. One of the most basic principles and the one that was emphasized in the USAID/FFP Strategic Plan

Box 5.10. Road Sustainability: One Example from Uganda

The FAFSA-2 team engineer visited the area in southwestern Uganda where Africare was active during its FY 2002–FY 2006 project to get an idea of the impact and sustainability of what had been an extensive and ambitious infrastructure project. According to the IPTT summaries, Africare built approximately 88 km of roads during this period. A representative sample of roads equivalent to about a third of the total length built was visited in three days in five districts around Kabale city. In general, the condition of the roads was not bad, and the communities had been fairly consistent in carrying out rudimentary upkeep of road surfaces and drainage systems. Environmental mitigation measures had matured well, and vegetation on slopes and roadsides had stabilized nicely. The roads projects had been well integrated with the agriculture and income generation program components and many of the communities along the routes seemed to be thriving, with many small businesses, such as shops and fruit stands. Many of those interviewed had moved to the area because of the improved conditions, and because the communities now had easy access to employment opportunities in neighboring towns. The program was also able to involve the communities in helping sustain the roads by implementing training and awareness programs to sensitize the target populations to the need to maintain their new roadway access systems. Other projects trained residents in the basic skills involved in road maintenance. Since the routes chosen were feeder roads, built according to Government of Uganda standards, they were eligible for adoption by local authorities and their maintenance crews were already upgrading and/or maintaining sections of some of the roads visited.

Box 5.11. Lessons Learned on Sustainability from the CRS and WV NRM Programs in Ethiopia

"Incentives are crucial in determining the extent to which community members will participate in natural resource management activities and they will have to continue to receive tangible benefits from these activities or they will not be sustained. These incentives and their effects need to be understood when designing, implementing and phasing out of any conservation and natural resource management activity."

Source: Final Evaluation of the CRS and WV Programs (van Haeften et al., 2006, p. 89).

is the need to give priority to the development of productive assets at the community level. A broader set of principles that were originally developed for use in the Malawi Food Security Programming Strategy for FY 2008–FY 2014 (see Box 5.12) are directly applicable to Title II infrastructure activities.

5.5 Conclusions and Recommendations

5.5.1 Conclusions

• A strong case can be made that small-scale public infrastructure activities should continue to play an important role in Title II development programs. Most areas where Title II development programs work are relatively isolated geographically, and their lack of productive infrastructure is frequently a major constraint to their development over the longer term. Agricultural development programs often falter because farmers, and in particular the resource-poor farmers with whom the Title II programs work, are not able to access inputs from or transport their products to markets, as one example. In other words, well-chosen and -implemented infrastructure can also increase the likelihood that Title II development programs are able to achieve their other objectives, including their agricultural productivity and income objectives.

- The Title II program is somewhat unique within USAID in its ability to support small-scale infrastructure activities. During the FAFSA-2 time period, few other USAID projects had the resources needed to help poor rural communities improve their basic productive infrastructure and their links to markets. However, many implementers seemed reluctant to use this capability for a variety of reasons, including the technical complexities of these activities, the additional technical staffing required, and the additional efforts needed to respond to the increased emphasis on quality and sustainability.
- Issues with respect to the quality of the infrastructure still exist, but there is evidence from a number of programs in the FAFSA-2

Box 5.12. Suggested Principles for Implementing Infrastructure Activities in a Title II Development Program

- Give priority to (1) the creation of assets rather than the generation of temporary employment, (2) productive assets rather than social assets, and (3) community assets (public goods) rather than private assets.
- Involve communities in the identification, design, and implementation of the infrastructure, recognizing that communities are more likely to contribute to and maintain assets they recognize as having an economic value.
- Enhance the likelihood of sustainability by (1) ensuring quality, (2) building in appropriate environmental mitigation measures, and (3) strengthening local commitment and capacity to operate and maintain any infrastructure that is constructed.
- Avoid selecting activities or implementing activities in ways that are likely to distort participants' economic incentives in perverse ways and/or have adverse effects on local labor and product markets (e.g., by setting wage rates below the locally prevailing rates).

Source: Malawi Food Security Programming Strategy FY 2008–FY 2014 (USAID/Malawi, 2007); Bangladesh Food Security Country Framework FY 2010–FY 2014 (van Haeften and Moses, 2009).

Box 5.13. Infrastructure Policy Implications

- Title II development programs should continue to take advantage of their capacity to support the development of small-scale public infrastructure to help reduce key constraints in the poor and often relatively isolated rural areas where many Title II development programs are concentrated.
- These infrastructure activities should be designed and implemented consistent with the principles outlined in Box 5.12.

universe (including the SC/Bolivia program, the WV/Mozambique program, and the Africare/ Uganda program) that the Title II implementers have the capacity to deal effectively with them.

- More information is needed on the costs and benefits of the infrastructure being implemented under Title II development programs. This is especially true for larger interventions or in cases where a whole series of similar interventions are involved (e.g., support to the *banquettes* in Niger). Awardees need more information on these costs and benefits to be able to make wiser choices among alternative interventions in their programs. USAID/FFP also needs more information on the costs and effectiveness of alternative interventions to guide its own decisions and to help build support for the overall Title II development program.
- During the FAFSA-2 time period, a number of organizations involved in food assistance programs, including WFP, began to make a distinction between FFW and Food for Assets, presumably as a way to distinguish between programs whose basic objective was to transfer resources to the food insecure and those whose primary focus was on asset creation. In a Title II development program, one should not have to make this distinction. All FFW programs—and

all infrastructure programs—should be giving priority to the creation of productive, public assets.

5.5.2 Recommendations

In the future, USAID/FFP should:

- Encourage Awardees to include smallscale infrastructure activities in their Title II development programs in recognition of the fact that there are many situations in which infrastructure can help reduce key constraints in the poor and relatively isolated rural areas where the Title II development programs are concentrated. (**Recommendation 29**)¹⁵⁸
- Make it clear in its guidance that Title II development programs should give priority to (1) the creation of assets rather than the generation of temporary employment, (2) the creation of productive assets rather than social assets, and (3) the creation of community assets (public goods) rather than private assets. (**Recommendation 29**)
- Restore the FFW category to the AER and add a program element for infrastructure to the Resources and Beneficiaries Tracking Tables, so that USAID/FFP will know and be able to report on the amount of Title II development resources being spent on infrastructure activities. (**Recommendation 30**)
- Require Awardees to devote more attention to the assessment of costs and benefits of their infrastructure interventions, as a basis for making and adjusting decisions about project priorities, especially in cases where a whole series of similar interventions are involved (e.g., support to the stock ponds in Bolivia, homestead raising in Bangladesh, and the *banquettes* in Niger). As part of this requirement, Awardees also need to collect more information on the socioeconomic effects of roads (see the discussion on outcomes in Section 5.3.3.1).

¹⁵⁸ The numbers after certain recommendations are the same as those assigned to the major recommendations in the FAFSA-2 summary report.

- Require Awardees engaged in infrastructure activities to report on concrete measures of performance on an annual basis (e.g., kilometers of roads built, rehabilitated, upgraded, and/or repaired; numbers of bridges, canals constructed; and hectares of public land brought under irrigation). This amount of detail may not be necessary for reporting on program performance, but it is essential for effective program oversight. (**Recommendation 31**)
- Require that mid-term and final evaluations pay more attention to infrastructure components, when they exist, especially in cases when the component is substantial or when questions have been raised about performance. There are also likely to be more cases when including a local engineer on an evaluation team would add value, as was the case with the Bolivian mid-term and final evaluations.

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