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PERFORMANCE ASSESSMENT REPORT

BURKINA FASO

**NATIONAL ENVIRONMENTAL MANAGEMENT
(CREDIT-C2229-BUR)**

April 1, 2002

*Operations Evaluation Department
Sector and Thematic Evaluation Group*

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CURRENCY EQUIVALENTS (annual averages)

Currency Unit: CFA Franc (CFAF)

Exchange rate (CFAF per dollar)

1990	=	319	1991	=	282	1992	=	264
1993	=	283	1994	=	547*	1995	=	500
1996	=	511	1997	=	583	1998	=	590
1999	=	633	2000	=	680			

* In January 1994, the exchange rate between the CFA franc and the French franc was adjusted from 50 CFA francs = 1 FF to 100 CFA francs = 1 FF.

ABBREVIATIONS AND ACRONYMS

CFAF	Franc issued by the Central Bank of the West African nations
CVGT	<i>Commission Villageoise de Gestion des Terroirs</i> (Village Land Management Committee)
CVIGT	<i>Commission Intervillageoise de Gestion des Terroirs</i> (Intervillage Land Management Committee)
CBRDP	Community-Based Rural Development Project
FMU	Forest Management Unit
ICR	Implementation Completion Report
IGB	Burkinabè Geographic Institute
INERA	<i>Institut National de l'Environnement et des Recherches Agricoles</i> (National Agricultural Research Institute)
LPDRD	<i>Lettre de Politique de Developpement Rural Decentralise</i> (Policy Letter for Decentralized Rural Development)
MA	Monitoring and assessment
MMT	Mobile Multidisciplinary Team
MTR	Mid-Term Review
NGO	Nongovernmental organization
OMU	Operational Management Unit
PNGT	<i>Programme National de Gestion des Terroirs</i> (Environmental Management Project)
POMU	Provincial Operational Management Unit
PTCC	Provincial Technical Coordination Committee
SAR	Staff Appraisal Report
TFT	Technical Forestry Team

FISCAL YEAR

July 1- June 30

Director-General, Operations Evaluation	:	Mr. Robert Picciotto
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April 1, 2002

MEMORANDUM TO THE EXECUTIVE DIRECTORS AND THE PRESIDENT

Subject: Performance Assessment Report on Burkina Faso National Environmental Management Project (Credit C2229-BUR)

Attached is the Performance Assessment Report (PAR) on the Burkina Faso National Environmental Management Project, prepared by the Operations Evaluation Department (OED). The project was supported by a credit of US\$16.5 million that became effective on February 11, 1992, and closed on December 31, 1998. The proceeds were used in their entirety, the final disbursement taking place on April 22, 1999.

This project was the first five-year phase of a long-term program to halt and reverse natural resource degradation. The specific objectives of the project were to (i) pilot the application of the community land management (*gestion des terroirs*) approach on a larger scale by helping selected rural communities to design and carry out plans for the sustainable management of their land and natural resources, (ii) monitor these pilot natural resource management activities in order to disseminate best practices, and (iii) monitor changes in environmental conditions.

OED rates the outcome of the project as **moderately unsatisfactory**. OED agrees with the ICR that the objectives of this project were highly relevant and fit well with the country's environmental and rural development priorities, and that the project made substantial progress in piloting community land management activities in the target rural communities. However, the monitoring of these activities had only begun toward the end of the project. As a result, there is as yet no indication that these activities have had any impact on environmental conditions or that they are economically viable. OED's outcome rating has taken these significant shortcomings in the achievement of the project's objectives into account.

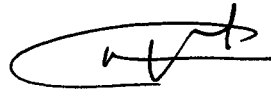
OED rates the sustainability as **not evaluable**. OED's rating is based on the fact that most of the activities initiated under the project had ceased or substantially slowed by the time of the PAR mission. On the other hand, it is acknowledged that the project only represents the first phase of a long-term program to halt and reverse the degradation of the natural resource base of the country and, provided the lessons from the first phase experience are reflected in the design of the second phase project, there is no reason to believe that the communal land management approach cannot be made sustainable.

The PAR rates the institutional development impact of the project as **modest**, and Bank and Borrower performance as **satisfactory**. Overall, the main value of the project has been in improving the enabling environment for sustainable rural development by fostering consensus on a community land management approach that focuses on effective decentralization through the empowerment of local community organizations. The lessons from the experience with this Phase I project should be useful for the design of the Phase II project, which is expected to continue to support the implementation and fine-tuning of the community land management approach.

In addition to the lessons drawn in the ICR, the PAR highlights three additional lessons:

- **Financial performance needs to be monitored:** The financial viability of the local activities initiated by the project has not been sufficiently considered and was not monitored during the implementation of the pilot project. Indications are that negative or insignificant returns for many of the activities contributed to their cessation once subsidies were discontinued at the end of the project.
- **Organizational characteristics need to be appraised and monitored:** The organizational characteristics of the community institution and associations created or used to implement the village investments have not been adequately considered and were not monitored, also partly explaining the cessation or slowing of many activities undertaken by the project when the subsidies stopped.
- **Environmental conditions need to be monitored:** No monitoring system was put in place to monitor the environmental impacts of the activities undertaken by the project until toward the end of the project. As a result, the effectiveness of the project-supported activities in halting and reversing the degradation of the country's natural resource base has not been established.

Attachment

A handwritten signature in black ink, consisting of a large, stylized 'C' or 'G' shape followed by a series of loops and a horizontal line.

About this Report

The Operations Evaluation Department assesses the programs and activities of the World Bank for two purposes: first, to ensure the integrity of the Bank's self-evaluation process and to verify that the Bank's work is producing the expected results, and second, to help develop improved directions, policies, and procedures through the dissemination of lessons drawn from experience. As part of this work, OED annually assesses about 25 percent of the Bank's lending operations. Assessments are conducted one to seven years after a project has closed. In selecting operations for assessment, preference is given to those that are innovative, large, or complex; those that are relevant to upcoming country evaluations; those for which Executive Directors or Bank management have requested assessments; and those that are likely to generate important lessons. The projects, topics, and analytical approaches selected for assessment support larger evaluation studies.

A Project Performance Assessment Report (PPAR) is based on a review of the Implementation Completion Report (a self-evaluation by the responsible Bank department) and field work conducted by OED. To prepare PPARs, OED staff examine project files and other documents, interview operational staff, and in most cases visit the borrowing country for onsite discussions with project staff and beneficiaries. The PPAR thereby seeks to validate and augment the information provided in the ICR, as well as examine issues of special interest to broader OED studies.

Each PPAR is subject to a peer review process and OED management approval. Once cleared internally, the PPAR is reviewed by the responsible Bank department and amended as necessary. The completed PPAR is then sent to the borrower for review; the borrowers' comments are incorporated into the document that is sent to the Bank's Board. When an assessment report is released to the Board, it is also widely distributed within the Bank and to concerned authorities in member countries.

About the OED Rating System

The time-tested evaluation methods used by OED are suited to the broad range of the World Bank's work. The methods offer both rigor and a necessary level of flexibility to adapt to lending instrument, project design, or sectoral approach. OED evaluators all apply the same basic method to arrive at their project ratings. Following is the definition and rating scale used for each evaluation criterion (more information is available on the OED website: <http://worldbank.org/oed/eta-mainpage.html>).

Relevance of Objectives: The extent to which the project's objectives are consistent with the country's current development priorities and with current Bank country and sectoral assistance strategies and corporate goals (expressed in Poverty Reduction Strategy Papers, Country Assistance Strategies, Sector Strategy Papers, Operational Policies). *Possible ratings:* High, Substantial, Modest, Negligible.

Efficacy: The extent to which the project's objectives were achieved, or expected to be achieved, taking into account their relative importance. *Possible ratings:* High, Substantial, Modest, Negligible.

Efficiency: The extent to which the project achieved, or is expected to achieve, a return higher than the opportunity cost of capital and benefits at least cost compared to alternatives. *Possible ratings:* High, Substantial, Modest, Negligible.

Sustainability: The resilience to risk of net benefits flows over time. *Possible ratings:* Highly Likely, Likely, Unlikely, Highly Unlikely, Not Evaluable.

Institutional Development Impact: The extent to which a project improves the ability of a country or region to make more efficient, equitable and sustainable use of its human, financial, and natural resources through: (a) better definition, stability, transparency, enforceability, and predictability of institutional arrangements and/or (b) better alignment of the mission and capacity of an organization with its mandate, which derives from these institutional arrangements. Institutional Development Impact includes both intended and unintended effects of a project. *Possible ratings:* High, Substantial, Modest, Negligible.

Outcome: The extent to which the project's major relevant objectives were achieved, or are expected to be achieved, efficiently. *Possible ratings:* Highly Satisfactory, Satisfactory, Moderately Satisfactory, Moderately Unsatisfactory, Unsatisfactory, Highly Unsatisfactory.

Bank Performance: The extent to which services provided by the Bank ensured quality at entry and supported implementation through appropriate supervision (including ensuring adequate transition arrangements for regular operation of the project). *Possible ratings:* Highly Satisfactory, Satisfactory, Unsatisfactory, Highly Unsatisfactory.

Borrower Performance: The extent to which the borrower assumed ownership and responsibility to ensure quality of preparation and implementation, and complied with covenants and agreements, towards the achievement of development objectives and sustainability. *Possible ratings:* Highly Satisfactory, Satisfactory, Unsatisfactory, Highly Unsatisfactory.

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<p>This report was prepared by Patrice Harou (Consultant), who assessed the project in May 2001. William B. Hurlbut edited the report. Soon-Won Pak provided administrative support.</p>
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Principal Ratings

	ICR*	ES*	PPAR
Outcome	Satisfactory	Marginally satisfactory	Moderately unsatisfactory
Sustainability	Uncertain	Uncertain	Not evaluable
Institutional Development Impact	Partial	Modest	Modest
Bank Performance	Satisfactory	Satisfactory	Satisfactory
Borrower Performance	Satisfactory	Satisfactory	Satisfactory

* The Implementation Completion Report (ICR) is a self-evaluation by the responsible operational division of the Bank. The Evaluation Summary (ES) is an intermediate OED product that seeks to independently verify the findings of the ICR.

Key Staff Responsible

Project	Task Manager/Leader	Division Chief/ Sector Director	Country Director
Appraisal	Dominique Lallement	David Steeds	Katherine Marshall
Completion	Emmanuel Nikiéma	Jean-Paul Chausse	Hasan Tuluy

Preface

This is a Project Performance Assessment Report (PPAR) on the National Environmental Management Project, for which CR-2229-BUR in the amount of SDR 11.5 million (US\$16.5 million equivalent) was approved on April 25, 1991, and became effective on February 11, 1992. The credit was closed on December 31, 1998. The governments of Germany, France, and Norway, as well as UN Development Program, provided cofinancing for the project.

The PPAR presents the findings of a mission to Burkina Faso in May-June 2001 by the World Bank Operations Evaluation Department (OED). The mission gathered data and interviewed officials of the Government of Burkina Faso, staff of the project and the Bank, as well as beneficiaries in all the areas of the project. The cooperation of these persons is gratefully acknowledged. In addition, the PPAR draws on the Staff Appraisal Report, Implementation Completion Report, and other studies mentioned in the text.

Following standard OED procedures, copies of the draft PPAR were sent to the relevant government officials and agencies for their review and comments, but no comments were received.

1. Introduction and Background

1.1 Burkina Faso is a landlocked country in the Sahel region of West Africa. It has a semi-arid climate, erratic rainfall, and limited natural resources. Burkina's GNP per capita of US\$240 (1997) makes it one of the poorest countries in the world; it is ranked 172 out of 175 countries in the UNDP 1997 Human Development Index and has the third-highest Human Poverty Index in the world. Per capita income growth is severely constrained by an annual population growth rate of 2.8 percent. Burkina's population of 11 million is heavily rural, and increasing population pressure is giving rise to growing environmental degradation. Primary school enrollment is low (40 percent overall, 30 percent for girls) and adult illiteracy is estimated to be 80 percent. Close to half of the population cannot afford a minimum standard of nutritional intake. One in 14 adults is infected with HIV.

1.2 Largely as consequence of its heavy dependence on drought-prone agricultural output and its landlocked geographical position, Burkina experienced slow GDP growth for much of the past three decades. Adjustment began in the agricultural sector in fiscal 1992, with an Agricultural Sector Adjustment Credit (ASAC). Although slow in starting, the ASAC made progress in liberalizing price and trade regimes, and dissolving, privatizing, or restructuring a number of agricultural parastatals. IDA has had 21 agricultural projects in Burkina including: cotton sector development, integrated rural development, research and extension services (train and visit system), reversing natural resource degradation, sectoral adjustment, food security, and a pilot program of private irrigation. IDA's agricultural lending program represents over one-quarter of the total (World Bank 2000). Cotton accounts for about 40 percent of the value of Burkina's exports and has thus been an important contributor to poverty reduction. Cereals are responsible for 90 percent of the calories in the Burkina diet and nearly that share of total crop area. The traditional cereals, sorghum and millet, are well suited to Burkina, due to their tolerance for drought and low soil fertility. Burkina has been a model for the introduction of low-input, labor-intensive technology in semiarid cereal production, with substantial IDA support through research and extension. However, these technologies give only very low yield increases and are not enough in the longer run to counteract the slow degradation of the natural resources base. They are also not enough to respond to the expected growth of traditional cereals demand of a population increasing at near 3 percent annually of which 45 percent are below an adequate nutritional intake. As income rises, the consumption of animal protein and grain is also expected to increase at around 5 percent annually over the next decade (World Bank 2000). The agricultural sector is essential to national food security and is the largest sector of Burkina Faso's economy and the main source of its exports. Ongoing growth of this sector is clearly a prerequisite for the country's balanced socioeconomic development. However, it is threatened by serious environmental problems.

1.3 Given the arid and semiarid climate, the recent droughts have made farmers and herders sensitive to risk management, to which they respond by more extensive land use. Soils are generally poor and deteriorating. In the central area, reduced vegetative cover has exposed the soils to increased water erosion through run-off in the rainy season and to wind erosion during the dry season. Water infiltration declined, worsening revegetation and further contributing to soil degradation. Sporadic evidence indicates that the shallow water tables are falling, but there is no systematic monitoring of groundwater to confirm and quantify this. Water is nowhere easily accessible. In the south, slash-and-burn cultivation methods used by settlers also increase erosion. Nationwide, arable land is estimated at 90,000 km², or one-third of the total area. This represents one hectare per person, low by African standards. Pastureland is estimated at one-half and forest area at one-sixth the total area. Fuelwood is the main source of energy, with around 5 million cubic meters consumed annually. This consumption level is far above the annual incremental

growth of existing vegetation (around 2 million cubic meters), pointing to the potential for rapid deforestation aggravating the erosion and aridity issues.

1.4 To slow and reverse these deteriorating trends in the resource base, a new strategy was tested with donor support, namely the community-based land management (CLM) approach to natural resource management, or *gestion des terroirs* (Box 1). This approach uses as its primary tool a *terroir* (community land) management plan designed by the community with the help of a multidisciplinary team. Preliminary tests of this approach served as background to prepare the project. Ownership of the plan by the community is crucial, since plan implementation is the responsibility of the community. The plan includes land-use rules governing access to and exploitation of common assets such as pasture, forest, and water, and specific land improvement works, mainly on common lands but also on individual holdings. The CLM approach has been specially recommended for managing natural resources in arid/semiarid ecosystems (GECJ 2001, see also Harou 2001). The government's *Programme National de Gestion des Terroirs* (PNGT, fiscal 1991) follows the CLM approach. Its main feature is participation, whereby local communities are assisted to define and implement land management plans for their lands and natural resources or "*terroir*." The National Environmental Management Project (Credit C2229-BUR) consists of the pilot phase of a long-term program to support the PNGT. This pilot project attempted to develop a

Box 1. The Community Land Management (*Gestion des Terroirs*) Approach

The community land management (CLM), or *gestion des terroirs* approach is community-based, participatory, and holistic. Its main instrument is the *Terroir* Management Plan designed by a community with the assistance of a multidisciplinary team of technicians. The plan includes land-use rules governing access to and exploitation of common assets such as pasture, forests, and water. Specific land improvement investments are made mainly on common lands but also on individual holdings. The community consists of a group of families sharing, on a commonly agreed basis, the same territory on which they may live permanently or seasonally and regularly carry out agricultural/livestock production activities or any other activities related to the use of renewable natural resources on the land. Such a community can be part or all of a village, a group of villages, a pastoral community, fishing or hunting community, or a combination of these groups that are sharing the same community land. The *terroir* management plan is developed through a multi-step process summarized in the SAR as follows:

- Awareness and trust building focusing on the relationships between local ecosystem management and natural resources depletion and soil degradation. The emphasis is on bottom-up approach in which communities and the CVGT (*Commission Villageoise de Gestion des Terroirs*) become the central initiator of the actions and investments to be carried on the territory. They are helped by the Management Support Team of the project in collaboration with the Provincial Technical Coordination Committee (*Cadre de Concertation Technique Provinciale -CCTP*), who decided also annually on the villages that will enter the program.
- Diagnosis of the *terroir* situation is made participatively. Objectives are set and available resources to better manage the resources are assessed with regard to new, more-productive, and sustainable production systems.
- CVGT groups are organized and made responsible by the community for the implementation of *terroir* management plans.
- Communities undertake the *terroir* management plan in a participative way balancing their aspirations with the availability of resources.
- Community-government agreements are signed to provide support and investments funds against guarantee that the *terroir* management plans will be implemented as agreed.
- Implementation plans are made with private, government, or NGOs' technical and/or organizational help.
- Close monitoring of the investments allows a better learning-by-doing process.

Source: Environmental Management Project—Burkina Faso. Staff Appraisal Report #9094-BUR. March 12, 1991. Washington D.C.: The World Bank.

bottom-up approach to land management, and has accumulated enough experience now to attempt to move the program out of the pilot stage. A follow-up Phase II project, known as Community-Based Rural Development Project (CBRDP), is being prepared to continue supporting the PNGT on a larger scale.

1.5 This Project Performance Assessment Report (PPAR) follows the standard OED methodology. Relevance, efficacy, and efficiency are used to assess the project outcome. The sustainability of the outcome is assessed and linked to the observed institutional development impact. Finally, the Bank and borrower performance are assessed. The report concludes with lessons learned and some directions for the future. This assessment provides further information on the financial and institutional arrangements to implement the community land management (*Gestion des Terroirs*) approach. Both aspects are closely related to the sustainability of the project and the redesign of the activities for the follow-on Phase II.

2. Project Objectives and Relevance

The objectives of this project were and still are in line with the Country Assistance Strategy (CAS) and Poverty Reduction Strategy Paper (PRSP) goal of maintaining the natural resource base on which two-thirds of the population, mostly poor, depends for their survival and agriculture income. The Mid-Term Review allowed the project to finance socioeconomic investments that were the communities' first priorities. By doing so, it broadened the scope of the community land management (gestion des terroirs) concept in a manner fully consistent with the original objective. The project relevance is rated high.

2.1 The project initiated the first 5-year phase of a program designed to last 15 to 20 years. The main objective of the program was "to halt and reverse the current process of degradation of natural resources in order to ensure lasting agricultural growth, restore biological diversity, and establish a long-term approach of forest and wildlife management" (SAR, World Bank 1991) with the underlying goal of reaching the majority of the country's rural communities within the program period. Within the framework of this program, the specific objectives of the project were to (i) pilot the application of the community land management approach by helping selected rural communities to design and carry out plans for the sustainable management of their land and natural resources; (ii) monitor these pilot natural resources management activities in order to disseminate best practices; and (iii) monitor changes in environmental conditions. The project initially had six components: (i) definition, preparation, and implementation of community land management plans in three provinces representing the country's distinct agricultural and ecological regions; (ii) preparation and implementation, in two provinces, of combined land management plans for reserve forests and surrounding land; (iii) provision of technical support for natural resource management operations already in progress in 18 provinces (supplementary and limited support in the areas of training, environmental monitoring, selective surveys or studies, and mapmaking, targeting 1,000 communities); (iv) creation of a national environmental monitoring system and of a system for assessing impact at the project level; (v) human resources development; and (vi) project management and studies. A seventh component on communication, environmental education, and documentation, was added in 1992 with German support and cooperation.

2.2 The project objectives are consistent with the CAS and the poverty alleviation strategy of the PRSP. The rural sector is Burkina's primary source of exports, and sustainability of the sector is jeopardized by the fragility of the country's arid/semiarid ecosystems and high population growth. The objectives were broadly defined but responsive to the country's needs and to Bank strategy. The objectives were also ambitious for the institutional capacity of the country.

Project Design

2.3 The activities proposed to support the project objectives were the preparation of *terroir* management plans in 167 communities and support to natural resources management in 1,000 communities, as well as the monitoring of all these activities. These activities consist essentially of micro-projects very similar to the ones carried out in previous rural development projects in the country. Investments were to be defined during project implementation based on the priorities established by the *terroir* management plans. Two important aspects piloted in the project were *terroir* management plan and the use of a new village-level organization, known as village land management committees (*Commission Villageoise de Gestion des Terroirs, CVGT*) to define and implement villages' priorities using the plan. The Bank's decision at the design stage to exclude social and socioeconomic investments, the real priorities of the communities, contributed to the slow pace of implementation, as did onerous procurement procedures with very low ex-ante review thresholds. Furthermore, at the design stage, no provision had been made for implementing a monitoring and evaluation (M&E) system.

2.4 The Mid-Term Review (MTR) of November 1994 attempted to correct these shortcomings. The main recommendations of the MTR mission—to make socioeconomic investments eligible for funding and to use contractual services to implement the project—were followed.¹ Initially this change of policy created a split personality for the project, but it eventually evolved into a normal participatory prioritization process at the local level to ensure sustainable economic development of the community. The *terroir* management plan remained a precondition for receiving any funding and served as a useful means for raising the environmental awareness of the community and to prioritize its development and environmental activities. In the PPAR's view, the MTR's decision to broaden the eligibility for funding to include support of socioeconomic infrastructure was entirely consistent with the objectives of the project and its pilot nature. The MTR also led to the establishment of an M&E unit and laid the framework for its mandate, but the PAR mission observed no effective M&E system in the field and found no useful monitoring data at project's end.

3. Efficacy

The project made substantial progress toward the objective of piloting community land management in selected rural communities. However, while most of the output targets were met, the activities had practically stopped with the end of the project. In addition, the project failed to monitor changes in environmental conditions. As a result, the impact of the project on the environment is not obvious and there is no evidence that the project has made any contribution to halting and reversing natural resource degradation. On this basis, the efficacy of the project is rated modest.

3.1 The project produced substantial outputs in terms of piloting the community land management approach. More than 75 percent of the selected villages built rock bunds and dug manure pits and are reported to be satisfied with the results. Close to 170,000 seedlings have been produced in village nurseries and planted in individual reforestation areas or collective reforestation areas (200 hectares), with a survival rate of approximately 50 percent. In terms of

1. It is to be deplored that only in mid-project, did the Bank realize that communities were much more concerned with water, health, education, and roads than with soil depletion and other agriculture type micro-projects, since in Africa this has been a widespread finding for some time. It is not usually feasible to improve a community's natural resources management without first improving its socioeconomic conditions in an integrated manner, unless important income transfers are made to that community.

pasture management and support for animal production, 30,153 hectares were managed in five areas of pasture or mixed woods and pasture in or between villages in three provinces, 110 kilometers of seasonal migration corridors were created, 110 kilometers of livestock paths and watering areas were created, four vaccination centers were established, and many stock-fattening operations were supported (13,000 head of cattle and sheep). In addition, 6,000 village inhabitants, including women, benefited from technical training, generally related to the investments made or to institutional capacity building.

3.2 The achievement of the outputs by villages can be assessed from the key indicators provided by the ICR (World Bank 1999) and given in Table 1. The data for the post-project period 1999–2000 are estimates obtained by the PPAR mission from personal communication and partial reports provided to the mission during field visits. Table 1A provides some information on the number of villages with *terroir* management plans in the provinces where the project was implemented, and Table 1B shows the frequency of the various activities carried out to implement the plan on community lands. Reforestation undertaken by private individuals was the most popular activity followed by manure pits (*Zai*) and rock bunds. The poor recording system did not allow receiving more information. The PPAR mission's field visits found that most activities initiated under the project had ceased. Only a few, particularly the construction of rock bunds, were continued sporadically in the participating villages, with the support of the scaled-down PNGT, even after the completion of the project. This was done to keep their interest alive until the beginning of the expected Phase II project. The regional PNGT offices are also involved, though with limited budgetary means, in contacting new villages and initiating participatory diagnostic plans so they will be ready when the Phase II investments start.

3.3 The implementation of forest management plans was successful in arousing the surrounding villages' interest in protecting the forests. However, most of the activities the PPAR mission visited have consisted of harvesting past plantations made in these forests with IDA and other donors' funding. Only very limited investments have been made in silvicultural operations. The price of timber and fuelwood is fixed by the forest service and intermediaries generate a comfortable profit for the merchant /transporter, but not the community associations, by reselling at a much higher market price.

3.4 The major shortcoming of the project was in failing to monitor the changes in environmental conditions. Following the MTR, a monitoring and evaluation (M&E) unit was added to the PNGT, which increasingly has been able to take on the environmental monitoring task. However, since this unit only became functional at the end of the project, the information available to the PPAR mission is not yet adequate to ascertain the impact of the project in terms of an improved resources base or a more sustainable agriculture. During visits to the sites, the PPAR mission could not detect any major environmental difference between villages that were under the project and those that were not. However, this may be explained by the short duration of the project and the long time required in reestablishing productivity and vegetative cover in arid/semiarid ecosystems. While the environmental impacts should be more perceptible and quantifiable during the Phase II project, the monitoring of impacts for the pilot phase was an important objective that was not achieved.

3.5 Following the Mid-Term Review in 1994, project implementation accelerated markedly through the use of contractors and NGOs and acceptance for funding of socioeconomic micro-projects such as the construction of schools, health centers, and other infrastructure. Almost half the village investments were only made in 1998, the last year of the project (see Table 1A). At present, NGOs and private contractors under the supervision of the PNGT management unit are still sporadically following up on the activities supported by the project, including the *terroir* management plans. The PNGT management unit benefits today from a computerized database of

potential contractors by area of expertise and regional expertise. Software was developed to inform potential bidders and speed up the procurement process with greater transparency (PNGT 2001).

Table 1. Key Indicators for Project Implementation

A: General Data

	Targets	Achieved end-December 1997	Achieved end-December 1998	Achieved end-December 2000
Community land management in 3 provinces	120 villages (December 31, 1996)	45	203	223
Gnagna		15	81	81
Kouritenga		16	52	52
Houet		14	70	90 (61 with plan)
Combined land and forest management plans	47 villages (December 31, 1996)	46	233	253
Houet		19	78	98
Bougouriba		27	155	155
Technical support for projects in progress in other provinces	1,000 villages	not available	not available	Not available

B: Main Types of Investments

Category	Number of Villages 1998	Number of Villages 2000
Reforestation (individual)	135	
Manure pits	80	
Reforestation (collective)	64	
Rock bunds	62	
Beehives	33	Same as before; Only
Support for marketing of wood products	32	consolidation of
Identification of pasture areas	29	existing villages and
Feed crop production	27	approach of around
Plant production	26	20 new villages for
Centers for monitoring and marketing of wood products	26	Phase II project
Demarcation of pasture areas	26	
Opening/maintenance of reserve forests	26	
Vegetable gardens	25	
Grazing	23	

Source: ICR and PAR Mission

4. Efficiency

The absence of monitoring data does not allow an ex-post economic analysis of the profitability of project activities. Based on very tentative assumptions, most soil and water conservation activities show insignificant and sometimes negative financial returns. However, after the Mid-Term Review, the newly eligible investments in socioeconomic activities, health, education, and water should increase the overall efficiency of the project. On this basis, the project's efficiency is rated modest.

4.1 No economic analysis was presented for this project in the SAR. The project did not follow-up regularly on the financial aspects of the productive investments and, therefore, it is not possible to calculate the profitability of investments or estimate the impact of the micro-projects on income. The breakdown of the costs reporting does not allow calculating cost effectiveness for each component of the project. The M&E unit carried out a participatory survey of villages in 1998 to measure project impact using four indicators (living conditions, local capacity development, status of natural resources, and the institutional environment). The survey concluded that for each of these indicators, beneficiaries felt there was a positive change of

between 10 to 35 percent as a result of the project. The PPAR mission was not able to confirm these results or to look at the details of the survey.

4.2 The PPAR mission was provided with tentative estimates of the financial rate of return for most project activities based on representative assumptions, not on monitoring data (Konate 2000), and discussed the results with the consultant. These estimates indicate that most activities would result in negative financial profitability. However, the financial analyses focused mostly on the investments in soil and water conservation. Many of the project investments following the MTR supported socioeconomic activities for which not even tentative financial or economic analyses were available.

4.3 Improved access to social infrastructure (roads, water, education, health facilities) was the priority of the communities, which suggests that the benefits would be greater for them than for investments in soil and water conservation activities. Labor-intensive implementation of basic infrastructure also increased income through additional employment. That ranking of priorities by the communities themselves should be respected because it is the communities that managed the funds and made the decision. In that sense, the MTR decision to allow the socioeconomic investments was probably good economics. Rural roads, for instance, could increase access to markets and social services such as health care and education. Access to markets would generate economic benefits from increased market transactions and trade opportunities. Access to health care and education would increase the well being of the poorest and their productivity, and so their income. The environmental objective is not lost, even if fewer investments are strictly environmental, since funds are only available to communities that have produced land management plans and established their investment priorities according to this plan. The building of a school for example, as the PPAR mission observed in the field, may be accompanied by a stronger environmental curriculum and activities such as tree plantation around the school by the students to build environmental awareness. Furthermore, the better education of the villages' youth should undeniably improve their ability to cope with a worsening environment and offer better possibility of out-migration. On this basis, the PPAR mission concludes that this holistic approach is an appropriate way to mainstream the environment into the daily life of villagers while respecting their real priorities for economic development. It is also responding to the CAS and PRSP strategies and goals of alleviating poverty and sustainable economic development.

5. Outcome

The objectives of this project are highly relevant and fit well with the country's environmental and decentralization policies. However, while most of the target outputs have been delivered, progress on achieving the overall objective of halting and reversing natural resources degradation is not yet evident, hence its efficacy was modest. Also, while preliminary estimates suggests negative financial viability of project activities, the more holistic approach adopted following the Mid-Term Review should have led to the financing of more viable activities. Hence, the project's efficiency can be deemed modest. On this basis, the outcome of the project is rated moderately unsatisfactory.

5.1 On the positive side, after a slow start, the project implemented the community land management approach in 203 villages in three provinces; combined land and forest management plans were implemented in 43 villages in two provinces; and technical support was provided to additional villages in 18 provinces, but no information was available on that support. The project had no component specifically designed to support women, but women were involved in all project activities. The project helped to redirect the rural development policy of natural resources

toward an emphasis on improving both natural resources management and living conditions of the rural population through a shift toward more socioeconomic investments but still within the framework of a *terroir* management plan.

5.2 However, the major shortcoming was that an M&E unit was only established toward the end of the project. As a result, the monitoring of natural resource management activities funded under the project has so far yielded only very limited indications of their impact on environmental conditions. At this point, there is still no adequate evidence to indicate whether the project has made a good start toward achieving its main objective of halting and reversing the degradation of natural resources. No surveys are available indicating that the revegetation or soil conditions of the project villages are any different from non-participating villages, and the PPAR mission did not observe any differences either. Given the very short time that has elapsed since the investments were made and the long-term objective of the program, this could be understandable. On the organizational aspects of the associations implementing the project activities, no monitoring was attempted. Given their importance for the profitability and sustainability of the investments financed by the project, this should be a priority in the future. In the PPAR mission's view, based on the experience in other similar countries, the economic returns of such a mix of soil/water and socioeconomic investments could well be in the acceptable range, especially if the managerial capacity of the local institutions in charge of their implementation is strengthened over time. Yet this needs to be ascertained through a proper monitoring system

6. Sustainability

*The PPAR mission found that most of the activities initiated under the project had been discontinued. However, since the project only represented the pilot phase of a long-term program, it is too early to make a judgment on its sustainability and provided the lessons from its experience are incorporated in the Phase II project, this rating should not be extended to the communal land management approach as a whole. On this basis, the sustainability of the project is rated **not evaluable**.*

The sustainability of this first phase project is unlikely. However, success in bolstering the capacity of village-based organizations to manage the investments made through the project is bound to be a long-term process that could not possibly be completed during the pilot phase of this long-term program, so the lack of sustainability of this project should not be arbitrarily extended to the communal land management approach as a whole. Sustainability is more likely to be assured if the Phase II project takes the lessons of the experience with the pilot project into account and continues the process of strengthening village CVGTs' capability by employing an *integrated development approach* (literacy, management, organization, etc.) including socioeconomic investments, as tested in this project. The PPAR mission observed that different donors have followed up the community land management approach and various activities in different regions by providing technical and financial support. The wide imitation of the PNGT organizational arrangement is one demonstration of its potential sustainability. This could ensure continuation of the activities in some of the villages that benefited from the project, and so enhance their chance of sustainability.

6.1 Government ownership of the program is well established and corresponds well with the PRSP emphasis on improving revenues and living conditions of the rural population, particularly crop producers, who account for 75 percent of the rural poor. The recent reaffirmation in the "Lettre de Politique de Developpement Rural Decentralise" (LPDRD), of government commitment to decentralization policy is crucial for this program to continue in the future. The CVGT, the village institutions created by the project, need to be strengthened further to be able to manage contracting

parties and prepare budgets reflecting the communities' relative priorities. As the first phase of a long-term program, the project contributed to designing this new approach of working more closely with communities, understanding better their priorities and in improving their management.

6.2 Sustainability of natural resources management programs and policies should reckon with the difficulty of working in Sudano-Sahelian ecosystems. Since the trend data and modeling indicate increased aridity for the future in these regions, the decentralized activities implemented during the project and to be pursued in Phase II are appropriate adjustments. It is also the best way for each community to adapt to risk inherent to agriculture in these regions. In that context also, the inclusion of education-related investments in the project package to the communities could contribute toward the mobility of rural youth to a more sustainable way of life while at the same time decreasing pressure on natural resources.

7. Institutional Development

The project contributed to improving the enabling environment for rural development by fostering consensus on a rural development strategy that focuses on effective decentralization and the establishment of rural municipalities. While the PNGT management unit was isolated from the Ministry of Agriculture and contributed little to the improvement of the ministry's functioning, positive experiences with community land management (gestion des terroirs) eventually have filtered throughout the ministry and outside. The project worked closely with the Ministry of Local Communities and the decentralization and cadastre offices, and helped reinforce privatization in the implementation of its activities and strengthen both the contractors and the local communities in the process. On the other hand, the PNGT management unit, its regional offices, and the CVGTs only continue to operate on a very modest scale. On this basis, the institutional development impact is rated modest.

7.1 As the project evolved, it made a significant contribution to improving the enabling environment for rural development by fostering a more participatory approach to the development of village-level institutions and, through these institutions, a more decentralized approach to decision-making on village socioeconomic investments. This approach was reinforced through the project's influence on new policies of the Ministry of Agriculture, for instance, through their active participation in the elaboration of the Letter for Decentralized Rural Development, LPDRD. Unfortunately, the monitoring component to be installed for the entire ministry was implemented only at the end of the project and could not be used to monitor the impact and profitability of the project activities on the environment nor on the associations fostered by the project. The National Agricultural Research Institute (INERA), which had to monitor the ecological impacts of the project, does not seem to have benefited much from the project, though the Burkinabè Geographic Institute (IGB) did.

7.2 Project management shifted during the project from a rather top-down approach to a more participatory process to establish communities' priorities. The decentralization of activities increased during the project. Local institutions and associations to implement the activities were identified and strengthened. The institutional arrangements were changed to ensure greater decentralization. The Provincial Technical Coordination Committee (*Cadre de Concertation Technique Provinciale*) decides on the provincial allocation of resources to the villages once those have created a local institution. For the creation of local institutions, the project experimented with the use of CVGTs and their Special Action Committees (*Comite d'Action Specifique*) to implement project activities. An Interministerial decree (February 2000) has now officially established these committees, as well as the CIVGT (*Commission Intervillageoise de Gestion des Terroirs*), which covers a group of villages having some common forest, range, or

water resources. The *terroir* management plan is to be prepared in advance by all the villages owning the common resources. This decree is to become the base for the main local decision-making and executing institutions during the transition preceding the creation of rural municipalities. Devolution of responsibilities toward the local level during the project and the use of contractors and NGOs to implement the activities have forced these local institutions to follow a new and, if properly managed, more efficient mode of working. At present, many village organizations still have weak institutional capacity to implement the project's activities, but the institutional capacity improved during the pilot project and will serve as a good base for the creation of the rural commune called for in the new decentralization policy embodied in the *Textes d'Orientation de la Decentralisation*.

7.3 The project did not tackle security of land tenure, an acute issue in some project areas. Officially, the land is property of the State, but in practice, customary rights continue to be the *de facto* rule of law. The *Reorganisation Agraire et Fonciere* (Agrarian Reform, 1996) recognized customary modes of land management, but rising pressure on lands has led to increased conflicts that the project was not able to address satisfactorily and for the long term. The government recognizes this problem and will initiate several coordinated experiments to improve land tenure security in the Phase II project.

8. Bank Performance

The overall performance of the Bank was satisfactory despite the modest quality of the project at entry. The project team should be commended for reacting with flexibility and to adapt this pilot project to the field reality. The Mid-Term Review solved many of the project's bottlenecks.

8.1 The overall Bank performance was satisfactory despite the shortcomings in the design conception and preparation of the project. The omission of socioeconomic investments and an effective M&E system were project design weaknesses. In the course of supervision, the Bank's performance was substantial in adapting the project to the reality encountered in the implementation of the pilot project, but modest in solving the procurement issues. The distribution of specialties in the supervision missions was appropriate, with the exception of procurement, and sufficient time was devoted to on-site visits, in particular during the first crucial years of execution. The amendment of the Development Credit Agreement following the Mid-Term Review corrected major project design weakness by allowing socioeconomic investments and the implementations of the activities by contracting firms and NGOs. The assistance in procurement, in establishing the M&E system, and in carrying out the recommendations of studies was slow according to the ICR (World Bank 1999).

9. Borrower Performance

The overall performance of the borrower is rated satisfactory.

9.1 The performance of the borrower in the preparation and execution of the project was *satisfactory*. The government participated regularly in project preparation, appraisal, and supervision missions. The project management committee held regular meetings to examine and approve planning documents and financial statements. The government also ensured that sufficient human resources were placed at the disposal of the project and that supervision mission recommendations were implemented. The three weak points in the government's performance were delays in making national counterpart funds available; failure on the part of INERA and

IGB to respect the agreements on environmental monitoring; and application of national procurement procedures to relatively low-value contracts.

9.2 The performance of the PNGT's Operational Management Unit (OMU) was *satisfactory*. Execution of the components under the control of the OMU was effective. However, this arrangement did not provide for great institutional impact on the ministry. The outputs of the community land management and combined land and forest management components exceeded the project targets, but the monitoring of project activities and their environmental impacts were not achieved. The OMU now has an M&E unit that has started monitoring the impact of village investment activities. Financial management was satisfactory. The delays in execution of the environmental monitoring component were beyond the control of the OMU. The main weakness of the OMU was in carrying out the recommendations of some of the studies. The OMU would have contributed more to the strengthening of the Ministry of Agriculture had it been integrated into the regular administration and standard annual budgeting procedure rather than treated as an "aid management unit" and an "aid budget."

10. Lessons Learned and Future Directions

10.1 The *Programme National de Gestion des Terroirs* (PNGT) of Burkina Faso, a community-based natural resources management program whose pilot phase was supported by the project evaluated here, is considered by some a landmark in the Sahel for developing and systematizing the *gestion des terroirs* approach, which turns over part of the responsibility for managing natural resources to the communities. The communities identify needs, set priorities and manage the implementation of these priorities with reference to a land plan. The participatory approach proved to be successful and four lessons were identified in the Mid-Term Review and the ICR (World Bank 2000):

- Community organizations should have been given greater responsibility and more capacity earlier on to establish their own budgetary priorities. Initially, the devolution of responsibilities to communities was incomplete as the project retained important implementation responsibilities on behalf of the communities resulting in a slow implementation of the project.
- Centralization of responsibilities and the extensive use of project personnel to implement capacity building activities by the OMU's hampered the scaling up of the activities. In view of this, the OMU's role was shifted to the coordination of intermediaries (private sector and NGOs) responsible for the execution and to greater emphasis on institutional capacity building of both public and private service providers.
- The top down approach in setting priorities toward natural resource management activities *stricte sensu* was not responding to community demand. This problem was solved by broadening the scope of investment options to include social infrastructures;
- Finally, the strategy developed by the PNGT was not fully integrated into the national institutional framework raising questions about its sustainability. New legislation has now been passed and the PNGT program is now fully integrated into the national decentralization strategy and will become an active instrument of its implementation, contributing to the creation of the *Commune Rurale*.

10.2 The PPAR highlights three additional lessons from this pilot project:

- The financial aspects of the project have not been sufficiently considered and were not monitored during the implementation of the pilot project, partly contributing to the cessation of the activities at project's end.
- The social aspects of the local institution and associations created or used to implement the village investment have not been adequately considered and were not monitored, also partly explaining the cessation or slowing of many activities undertaken by the project when the subsidies stopped.
- Finally no monitoring system was put in place to gauge over the long run the environmental impacts of the activities undertaken by the project. This reduced the value of the project as the pilot phase of a long-term program to halt and reverse the degradation of the country's natural resource base.

These seven lessons suggest three possible future directions for the managers of the Phase II projects:

10.2 *Ensure that community land management plans lead quickly to the assumption of responsibility by villages and communities to establish their own priorities and control the implementation of investments.* The pilot activities supported by the project highlighted the need to ensure that villages and communities quickly assume responsibility in the implementation of the project activities to benefit from the momentum and feel in charge of their own destiny and choice of priorities. This will motivate villagers and ensure better implementation of the activities. Operationally, this requires strengthening the technical, financial, and organizational capabilities of the communities. The experience with the pilot phase shows that community organizations need to be given greater responsibility to establish priorities and avoid investments of limited benefit to the majority. For communities to be able to decide on long-term investment priorities, it is important to incorporate the financial dimension of natural resource management and to strengthen the capabilities of target communities in this respect (preparation of budgets, cash management, reporting activities expenses, monitoring, procurement, etc.) so that community investments can be identified, planned, and managed at the local level to the extent possible. Good practice in local investment funds will have to be developed for the project and could serve as a starting point for the development of future communal budgeting exercises.

10.3 *The level of organization, equality, and participation in the associations and communities that implement project activities determine the profitability and sustainability of the activities undertaken by the project.* The success of the institutional arrangement depends on the level of participation of all the members of the community and the associations involved in their implementation. The important factors to look for in establishing a community land management association (CVGT) are the degree of transparency and level of participation that exists in a community (see Annex D for an analysis of the correlations between these factors and the activities' financial success). An absence of these characteristics will require correction through capacity building. Monitoring the evolution of these institutions carefully to ensure the profitability and sustainability of the investments undertaken is as important as monitoring the physical implementation of the activities. Community-driven rural development has been proved the best way to implement investments in soil and water conservation as well as socioeconomic rural investments. However, it does not automatically lead to the inclusion of marginalized groups. The experience of other donors, including IFAD, in targeting these groups should be used in the Phase II project.

10.4 *A proper institutional framework should be put in place at the local level and backed up by an effective government support system to nurture the creation of the rural commune, which could develop from the CVGT and CIVGT.* A key to successful and sustainable natural resource management operations is reform in decentralization and land administration. As new laws are put

in place to decentralize, the Phase II project should help strengthening the capacity of local institutions to manage their own development in an equitable and sustainable way and to evolve into a rural municipality. In this respect, the work with the CVGTs and CIVGTs shows the centrality of good local institution management supported by the central government, especially in their first year of existence, and the need for a clear land tenure framework for natural resource management, or at least a process to work out land administration conflicts and promote tenure security.

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Annex A. Basic Data Sheet

NATIONAL ENVIRONMENTAL MANAGEMENT (CREDIT 2229-BUR)

Key Project Data (amounts in US\$ million)

	<i>Appraisal estimate</i>	<i>Actual or current estimate</i>	<i>Actual as % of appraisal estimate</i>
Total project costs	25.2	19.6	77.8
Loan amount	16.5	15.0	90.1
Cofinancing	6.9	3.6	52.2
Cancellation	-	-	

Cumulative Estimated and Actual Disbursements (US\$ million)

	<i>FY92</i>	<i>FY93</i>	<i>FY94</i>	<i>FY95</i>	<i>FY96</i>	<i>FY97</i>	<i>FY98</i>	<i>FY99</i>
Appraisal estimate	2.00	3.80	6.00	9.00	12.00	15.00	16.50	16.50
Revised Estimate	0.83	1.76	3.22	4.71	7.15	9.90	13.90	16.50
Actual	0.83	1.76	3.23	4.73	7.68	10.44	13.06	14.58
Actual as % of estimate	41.5	46.3	53.7	52.3	64.0	69.6	79.2	88.4
Actual as % of revised estimate	41.5	46.3	53.7	52.3	64.0	69.6	79.2	88.4

Date of final disbursement: April 22, 1999

Project Dates

	<i>Original</i>	<i>Actual</i>
Initiating memorandum		14 January, 1987
Preparation		1987-1990
Appraisal		June 1990
Negotiations		February, 1991
Letters of Development Policy		-
Board approval		25 April, 1991
Signing		15 May, 1991
Effectiveness	15 August 1991	11 February, 1991
Closing date	31 December 1998	31 December 1998

Staff Inputs (staff weeks) and Costs

	<i>Weeks</i>	<i>Total (US\$)</i>
Preappraisal	131	236,865
Appraisal	43	92,908
Negotiations	15	34,209
Supervision	164	410,114
Other	-	
Total	353	754,096

Other Project Data

Borrower/Executing Agency:

FOLLOW-ON OPERATIONS

<i>Operation</i>	<i>Credit no.</i>	<i>Amount (US\$ million)</i>	<i>Board date</i>
Community-Based Rural Development Project	-	66.7	

Mission Data

Stage of project cycle	Month/Year	No. of Persons	Days in Field	Specialization ¹	Performance Rating ²		Types of Problems ³
					Imple. Status	Dev. Objectives	
Identification	04/86	8	7	Leader, Land surveys, Geographer, Agriculturalist (3), Economist	NR	NR	
Preparation	11/86	4	15	Agriculturalist, CCE, FAO/CP, FED	NR	NR	
	03/87		N.A.				
	08/87		N.A.				
	11/87	3		Agroeconomist, Rep of Norwegian Govt.	NR	NR	
	7/88	3	13	Agroeconomist, GTZ, CCCE	NR	NR	
	11/88	9	14	Agroeconomist, GTZ, FAO/CP, IFAD, CCE, PATE CORE-GTZ	NR	NR	
	06/89				NR	NR	
	11/89	6	25	Anthropologist, Mission Leader, RDS (2), Rural Sociologist, Project Manager	NR	NR	
	01/90				NR	NR	
Appraisal Mission	06/90		N.A.				
Supervision	05/91	1		Env. Specialist	1	1	
	03/92	2		Env. Specialist, Agroeconomist	1	1	
	11/92	1		Agroeconomist	1	1	
	05/93	2		Env. Specialist, Agroeconomist	2	1	P
	11/93	1		Agroeconomist			
	03/94	1					
	10/94	7		FMS, Lawyer, Agr. Services Specialist, Task Manager, Rep from Mali, Rep. of CFD, Ecological Mon.	2	HS	
	10/95	6		FMS, NRMS (2), Agr. Services Specialist, Task manager, Environmental Inf. Specialist, .	S	S	
	05/96	2		Natural Resource Management Spec., Task Manager	S	S	
	11/96	2	6	Natural Resource Management Specialist, Ecologist (TTL)	S	S	
	03/97	5	11	Advisor (2), Ecologist, Natural Resource Specialist, Researcher,	S	M	M&E
	10/97	3	6	Ecologist (TTL), Natural Resource Management Specialist, Agriculturalist	S	S	
	04/98	2	6	Task Team Leader, Natural Resource Specialist	S	S	
Completion							

FMS=Financial management specialist; NRMS=Nat. resources management specialist; RDS=Rural development specialist; S=Satisfactory; M=P= Procurement; M&E=Monitoring and evaluation

Annex B. Environmental Indicators

	Burkina Faso	Region	Low- income group
Population (millions), 1999	11.0	643	2,417
Urban population (% of total), 1999	18.0	33.8	31.4
GDP (\$ billions), 1999	2.6	324	1,033
GNI per capita, Atlas method (\$), 1999	240	490	420
Environmental strategy or action plan (year prepared)	1993		
Agriculture			
Land area (,000 sq. km)	274	23,605	33,008
Agricultural land (% of land area)	34.5	7.3	14.4
Irrigated land (% of crop land)	0.7	4.2	26.6
Fertilizer consumption (100 grams/ ha of arable land)	148	134	670
Food production index (1989-91=100)	136.0	131.6	130.9
Population density, rural (people/ sq km of arable land)	260	369	507
Forests			
Forest area (,000 sq. km)	71	6,436	8,840
Forest area (% of total land area)	25.9	27.3	26.8
Annual deforestation (% change, 1990-2000)	0.2	0.8	0.8
Biodiversity			
Mammal species, total known	147		
Mammal species, threatened	7		
Bird species, total known	335		
Bird species, threatened	2		
Nationally protected area (% of land area)	10.4	6.2	5.7
Energy			
GDP per unit of energy use (PPP \$ per kg of oil equivalent)	..	2.4	3.4
Commercial energy use per capita (kg of oil equivalent)	..	700	550
Traditional fuel use (% of total energy use)	87	63	30
Energy imports, net (% of commercial energy use)	-9
Electric power consumption per capita (kWh)	..	453.6	362.3
Share of electricity generated by coal (%)	..	71.2	43.5
Emissions and pollution			
CO ₂ emissions per unit of GDP (kg per PPP \$ of GDP)	0.1	0.6	0.6
Total CO ₂ emissions, industrial (,000 kt)	1.0	501.8	2,527.5
CO ₂ emissions per capita (mt)	0.1	0.8	1.1
Suspended particulate in capital city (microgr/m ³)
Passenger cars (per ,000 people)	4	14	5

	Burkina Faso	Region	Low- income group
Water & Sanitation			
Access to improved water source(% of total population)	..	55	76
Access to improved water source (% of rural population)	..	41	70
Access to improved water source (% of urban population)	84	82	88
Freshwater resources per capita (cubic meters)	1,592	8,248	6,203
Total freshwater withdrawal (% of total water resources)	2.2		
Withdrawal for agriculture (% of total freshwater withdrawal)	81	87	87
Access to sanitation in urban areas (% of urban population)	88	81	79
Access to sanitation in rural areas (% of rural population)	16	41	31
Under-5 mortality rate (per ,000 live births)	210	161	116
National accounting aggregates - 1999			
Gross domestic savings (% of GDP)	9.8	15.3	20.3
Consumption of fixed capital (% of GDP)	6.5	9.3	8.3
Net domestic savings (% of GDP)	3.2	6.0	12.0
Education expenditure (% of GDP)	1.4	4.7	2.9
Energy depletion (% of GDP)	0.0	4.3	4.0
Mineral depletion (% of GDP)	0.0	0.6	0.4
Net forest depletion (% of GDP)	4.0	1.1	1.5
CO ₂ damage (% of GDP)	0.2	0.9	1.4
Genuine domestic savings (% of GDP)	0.3	3.8	7.6

Annex C. Organizational and Social Context for the Profitability of Activities

QUANTITATIVE ANALYSIS & RESULTS: IMPACT OF HIGH PERFORMING LOCAL LEVEL INSTITUTIONS ON EQUITY AND POVERTY IN BURKINA FASO

The qualitative finding that a balanced mix of different types of LLIs/SAMs brings a more inclusive development is shown in the quantitative measurement of inequality. The results of this research validate the qualitative identification of effective LLIs and their accomplishments. However, the validation only becomes clear when the quantitative measurement lens is changed to reflect equity and poverty reduction. The materialization of intangibles, mainly the four institutional dimensions and locally anchored participation, is evident in both individual (mean expenditure per capita) and relational (inequality) economic indicators. A multivariate regression analysis reported in Table 1 is used to further validate the qualitative results. First regression is a Probit model, using poverty status as the dependent variable (poor=1, nonpoor=0). This model focuses on how different independent variables are associated with the possibility of being poor. The second regression is a Tobit model, using logarithm of income gap per capita as the dependent variable.¹ This model investigates how different independent variables are associated with the depth of the poverty. Finally, the third is an OLS model, using logarithm expenditure per capita as dependent variable. This model examines associations between the dependent variables and the household well-being, as measured by expenditure per capita. Table 1 illustrates the regression estimates.

The regression figures validate some important findings with high statistical significance. The results indicate that the villages assessed as higher in organizational level are associated with a lower likelihood of being poor (regression 1). For the poor, the higher level of village organization is also linked with being less impoverished (smaller income gap, regression 2). Also, results indicate that both the *household level* social capital generated by LLIs (i.e., memberships and/or leaderships in village institutions) and the *village level* social capital (i.e., level of village organization and number of village institutions) are linked to a lower chance of being poor and smaller income gaps. This, combined with the sociological assessment, indicates that village level local institutions benefit not only households who have memberships, but also benefit those in the village without memberships².

The parameter estimates for different combinations of memberships, such as value/production or SAM/production groups, are not statistically significant in the regression. Some of the more complex features of LLIs — including the four institutional dimensions and locally anchored participation — cannot be explicitly measured, but they have been identified as main contributors to the effectiveness of high performing LLIs.³ This is consistent with the tabulation results, which indicate that, for the time being, the quantitative results can only illustrate the equity aspects of SAM impacts. However, one can predict with confidence that this high degree of equity will lead

1. Income gap is defined as the absolute value of expenditure per capita below the poverty line. Here, the income gap actually means the shortfall of expenditure. However, it is customary to call it income gap.

2. For causality argument please see footnote 6.

3. We did attempt to use interactive variables between kinds of LLIs and level of village organization to evaluate their impact on poverty. The combination of high level village organization and the service-management group did show positive impact on poverty reduction, however, not statistically significant. However, we decided not to pursue it further because the number of observations in each defined category was getting too small.

to a higher growth and more rapid poverty reduction in the near future. This suggests that, in future LLI initiatives, more effort should be put into measuring the traditionally non-measurable indicators.

Another social capital indicator in the regressions is the existence of state or NGO initiated institutions in the village. The regression estimates show that having state or NGO initiated institutions in the village increased the chances of being poor and of a greater income gap. This probably means that the state and NGOs tend to provide aid in villages with more poor people.⁴ Interestingly enough, the levels of village economy and services, assessed by the provincial officials, do not show any statistically consistent association with poverty or consumption at the individual household level.

4. Most of other regression estimates have the signs that we had expected. However, the explanations of these estimates are not relevant to this study. They are available upon request.

Table 1. Regression estimates

<i>Independent variable</i>	<i>Regression 1: Probit model^{a)} (dep var=poverity statu)</i>	<i>Regression 2: Tobit model^{b)} (dep var=log exp gap)</i>	<i>Regression 3: OLS model^{b)} (dep var=log exp per capita)</i>
Provincial inequality index, E(1)	0.013*	0.36*	-0.01*
Measurement of household level social capital			
Number of active members in LLIs	-0.041*	-1.19*	0.05*
Holding elected position in LLIs	-0.116*	-3.85*	0.12*
Household participating in			
Service/management group etc.	0.114	3.01	-0.06
Production group only	-0.002	-0.15	0.002
Value group etc.	-0.003	-0.13	-0.01
Group de Naam etc.	-0.034	-0.85	0.04
Measurement of Village level social capital			
Level of village organization			
Medium	-0.071*	-2.00**	0.09*
High	-0.105*	-3.10*	0.10*
Level of village economy			
Medium	-0.018	1.57	0.01*
High	0.053	1.64	-0.12
Level of village services			
Medium	0.050	-0.61	-0.17
High	0.065	1.49	-0.07*
(Low level is the default)			
Number of institutions in the village	-0.014*	-0.44*	0.02*
State or NGO initiated institutions	0.136*	4.49*	-0.20*
Household characteristics			
Household size	0.029*	0.84*	-0.05*
Sex of household head (1=male)	-0.133*	-3.91*	0.25*
Years of education	-0.124*	-4.18*	0.13*
Number of big animals owned	-0.005*	-0.15*	0.01*
Number of medium animals owned	-0.004*	-0.10**	0.002
Number of small animals owned	-0.002*	-0.07*	0.003*
Hectares of land owned	-0.005	-0.14	0.02*
Own plough	-0.022	-0.56	-0.02
Own motored transportation	-0.062**	-1.84**	0.14*
Own bicycles	-0.055	-1.67	0.07
Own radio/tv	-0.055**	-1.42	0.08*
Own other unspecified assets	-0.031	-1.17	0.07**
Community characteristics			
Existence of all season road	-0.086*	-2.82*	0.07
Distance to market	0.013*	0.31*	-0.03*
Distance to health center	0.002	0.04	-0.001
	LL= - 438	LL= -1170	R-square=0.35

Note; (*) indicates statistically significant at 95 percent level, (**) indicates statistically significant at 90% level.

^{a)} Numbers in the column show marginal effect of respective independent variables.

^{b)} Numbers in the column are coefficient estimates of respective independent variables.

Key quantitative results

This quantitative study has validated with statistical significance the main results of the qualitative analysis observed in the field. The first step to quantitatively understand and capture LLIs/SAM achievement (identified by the qualitative study) is to shift the focus from a utilitarian economic to a relational economic point of view, that is, to measure both the individual and the social return. Individual return is reflected mostly in the differences in expenditure per capita, while the social return is seen mainly in the differences in inequality. The magnitude of inequality is simply a manifestation of the underlying social structures, values, power arrangements and resources/assets distribution. Only when we understand inequality within its social context, do the findings become applicable to real world operations.

Differences in poverty and the poverty gap reflect both individual and relational welfare. Given this balanced emphasis on both individual and social or relational returns, the actual achievements of village level local institutions become clearer. Following are the main findings:

- A higher level of village internal organization is linked to lower inequality and lower poverty in the communities.
- Highly organized villages are associated with much higher growth elasticity, indicating a faster poverty reduction in the near future.
- Service-assets-management groups (SAMs) are linked to lower inequality among LLI participating households.
- A higher level of village organization is linked to a lower possibility of being poor, a smaller poverty gap, and a moderately higher expenditure per capita for the households living in the villages.
- Based on the regression results, local institutions contribute to the well being of all households in the community, who may or may not have memberships in SAMs or other LLI groups.

This evidence reveals an emerging development institution in Africa that simultaneously incorporates growth and lowers inequality. Past experience has shown that reasonably distributed wealth/income in a society is a basis for sustained growth. And the achievements of LLI/SAM in Burkina Faso have confirmed a real capacity to eradicate poverty in Africa by managing an inclusive growth pattern, named, for the purpose of this study, “relational growth.” The PNGT evaluated here contributed to that objective of economic growth through lower inequality by investing in LLI/SAM organizations as well as direct investment in productive assets