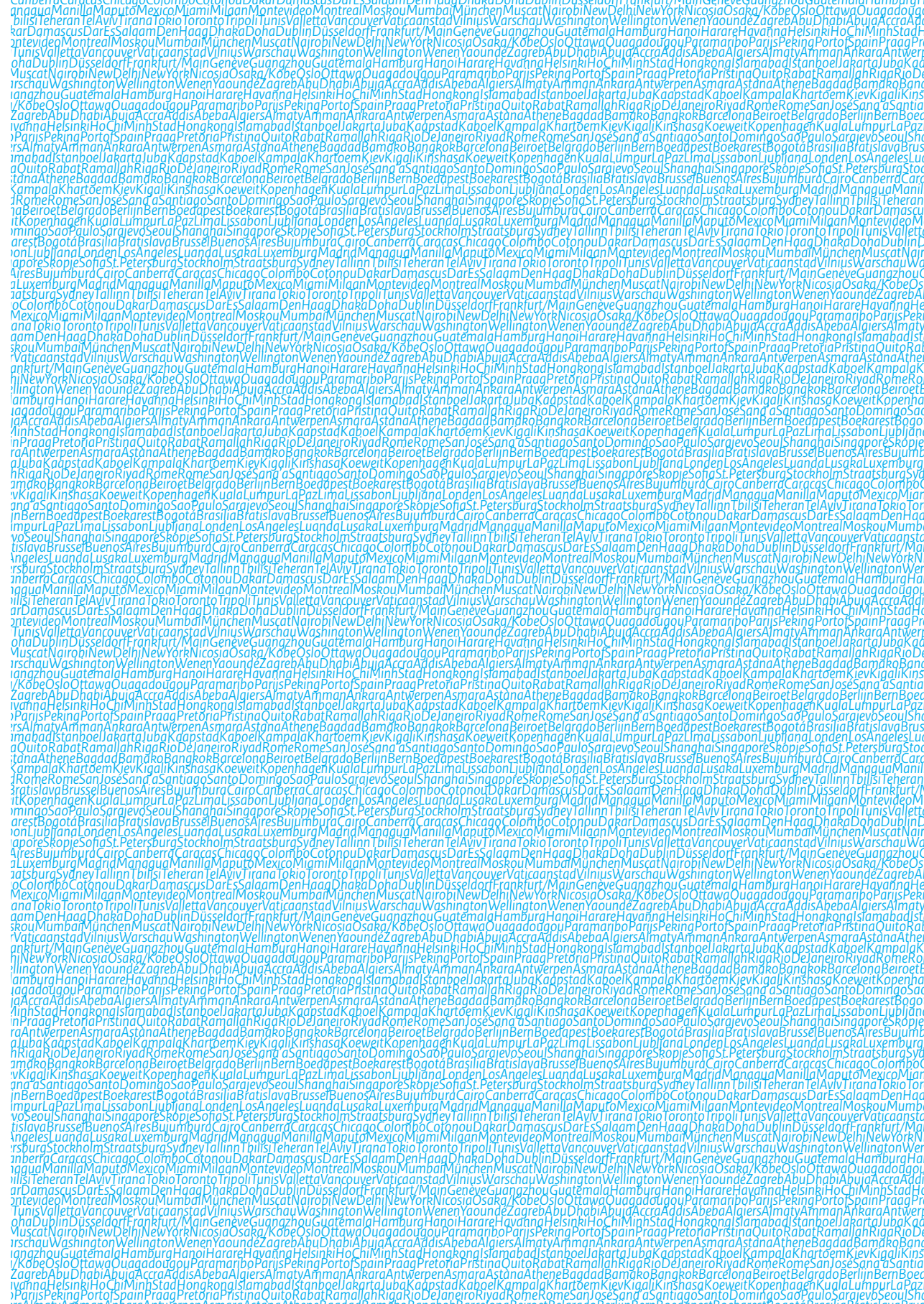
Development Cooperation
Ministry of Foreign Affairs

IOB Evaluation

Investing in infrastructure

Policy and Operations Evaluation Department | IOB Evaluations | no. 324 | July 2009 | Policy and Operations Evaluation Department | IOB Evaluations | no. 324 | July

Evaluation of the LDC Infrastructure Fund



IOB Evaluation

Investing in infrastructure

Evaluation of the LDC Infrastructure Fund

Preface

Evidence suggests that in many least developed countries underinvestment in infrastructure is a major constraint to growth. Lack of capital is an important cause of this underinvestment. In 2002, the Minister for Development Cooperation established the Least Developed Countries (LDC) Infrastructure Fund, to be managed by the Netherlands Development Finance Company (FMO). The objective of this fund is to provide financial instruments to stimulate private infrastructure investments in LDCs.

This report presents the findings of an evaluation of the functioning of the LDC Infrastructure Fund during its first six years of operations (2002-2007). The evaluation summarizes the development of the Fund and assesses the ways in which projects that were (partly) financed by the LDC Infrastructure Fund, contributed to economic, social and environmental development as well as the effectiveness of the Fund in promoting these projects. The evaluation includes an analysis of twelve case studies in Bangladesh, Tanzania, Mozambique, Sudan, Benin and Togo. Nine case studies were analysed by SEOR B.V. (Socio Economic Research, Erasmus University, Rotterdam); the others (for Sudan, Benin and Togo) by IOB.

IOB evaluator Antonie de Kemp is responsible for the evaluation. The following other persons have contributed to the evaluation:

Willem Cornelissen	Senior researcher, SEOR BV
Wouter Zant	Senior researcher, SEOR BV
Niek de Jong	Senior researcher, SEOR BV
Alberto Gianoli	Institute of Housing Studies, Rotterdam
Matthijs de Jong	Research assistant, SEOR BV
Bas van Tuijl	Research assistant, SEOR BV
Hassan Abdel Ati	Edge for Consultancy and Research, Sudan
Adalbertus Kamanzi	Consultant, Tanzania
Fernando Ribeiro	BioGlobal Ltd, Consultant Mozambique
Ifttekhar Ahmed Robin	Research assistant, Bangladesh

A reference group consisting of Henri Jorritsma (Deputy Director of IOB), Jan van Renselaar (Sustainable Economic Development Department), Ammarens Bruggenkanp, Stan Stavenuiter, Diana Wesselius and Robert Voskuilen (all FMO) commented and advised on this report. Piet de Lange and Hans Slot of IOB advised on a draft of the report.

IOB is responsible for the report's content.

Bram van Ojik
Director Policy and Operations Evaluation Department

Contents

Summary and conclusions

Summary

In many least developed countries, the economic and social infrastructure is highly inadequate or even absent. One of the reasons is that it is difficult for obtain long-term capital for investments in infrastructure. Local capital markets are non-existent or embryonic and therefore the financing of infrastructure projects by Development Finance Institutions (DFIs) is often critical. This was acknowledged in 2002 by the Minister for Development Cooperation when she established the Least Developed Countries (LDC) Infrastructure Fund, to be managed by the Dutch DFI *Financierings-maatschappij voor Ontwikkelingslanden* (FMO). What triggered the establishment of this fund was the decision in 2001 to untie aid to the least developed countries, which had as a consequence that exports to LDCs were no longer eligible for the tied development-oriented export promotion programme. The main objective of the new fund was to contribute to the construction and improvement of economic and social infrastructure in least developed countries by providing financing through loans, equity, grants and credit guarantees. The LDC Fund was intended to be additional to existing funds and initiatives and to provide financing to infrastructure projects considered too risky for the standard FMO products.

The LDC Infrastructure Fund portfolio built up gradually. It was expected that FMO would utilise the subsidy within a four-year period (2002-2005). However, initially the Fund developed more slowly than expected because the lead times of the projects were longer than foreseen. In 2005, the stringent selection criteria for eligibility for financing were relaxed somewhat, with the result that the portfolio expanded. In 2006, the decision to subsidise FMO was renewed and the subsidy period was extended to 2013. These activities support investments in energy generation and distribution, telecommunications and immobile infrastructure.

This report evaluates the LDC Infrastructure Fund in the 2002-2007 period. The evaluation considers the role of the Fund within the FMO product range and the need for such a fund. It also presents an assessment of the development impact of the financed projects, based on an analysis of twelve of the 30 projects. These twelve projects account for 63% of the total contracted amount and are representative of the country and sectoral distribution.

Many projects were financed late in the evaluation period and have only recently been completed or are still ongoing. It was therefore too early to evaluate the development impact of all the projects. In order to overcome this limitation, where relevant and opportune, the analysis was based on a comparison between the characteristic features of the projects and the results of comparable activities reported in the literature.

Conclusions

The conclusions follow the research questions as formulated in the Terms of Reference.[1] These conclusions are based on an evaluation of the total Fund and the twelve projects analysed.

1. *The LDC Infrastructure Fund adds value to the FMO product range.*

The portfolio of the LDC Infrastructure Fund has a higher risk profile than FMO's main activities and the Fund is instrumental in catalysing infrastructure investments by FMO. When FMO adopted the LDC Fund in 2002, FMO itself was hardly involved in infrastructure finance. Since 2002, this situation has changed enormously. The Fund promoted investments in new sectors and it is obvious that certain projects – new activities in particular – would never have been funded by FMO without a contribution from the LDC Infrastructure Fund. The LDC Infrastructure Fund itself is especially relevant for infrastructure investments in the least developed countries.

2. *The LDC Infrastructure Fund fills a gap in the financing of infrastructure projects in the least developed countries. In most cases, financing by the LDC Infrastructure Fund is additional to the market. However, in several projects, especially those that are long-standing, this additionality is not self-evident.*

Many least developed countries have an inadequate economic and social infrastructure and experience difficulty obtaining long-term capital for investments in infrastructure from the private sector. These are the cases in which financing from the LDC Infrastructure Fund will be additional.

The analysis of the financing of twelve projects indicates that in six projects financing by the LDC Infrastructure fund was additional and had a catalytic impact.[2] In two other projects, financing by the LDC Fund was additional, but did not have a (major) catalytic impact. For one of these two projects, a small water project that had received a grant from the LDC Fund, no significant catalytic impact was established. For the other project (in the telecommunications sector), catalytic impact appears to be limited. In the four remaining projects, all of which were approved before 2006, additionality and catalytic impact were not determined. Two of these were energy projects in which funding merely entailed the refinancing of existing commercial funding. The other two, also energy projects, entailed the funding of equity participation in a company set up to construct gas pipelines in West Africa. None of these four projects *actively* contributed to infrastructure development, nor did they have a catalysing impact.

1 See annexe 4.

2 See annexe 2 for an overview. *Additionality* refers to the necessity of funding by the LDC Infrastructure Fund or comparable funds. There would be no need for funding by the LDC Infrastructure Fund if the market is willing to finance the necessary investments (at reasonable market rates and at similar tenors). The catalytic impact is the attraction of other investors as a result of the contribution of the Fund.

Additionality and catalysing impact are most significant if financial means are given to junior companies, in particular to new activities and to projects with relatively high product, construction, and operating risks. Accordingly, the Fund has the largest impact if it finances projects of relatively small and new companies embarking on challenging new activities in as-yet-unexplored environments in emerging markets. In general, junior companies lacking financial resources for pre-investment experience difficulties preparing bankable proposals for infrastructure projects and forming consortia for equity participation and debt financing. Awarding LDC Infrastructure grants to such companies has demonstrably provided them with opportunities to prepare technical proposals and carry out financial engineering. Nevertheless, this conclusion does not mean that the LDC Fund should limit its role to these activities.

3. *Most the projects to which the LDC Infrastructure Fund contributed have an important effect on the infrastructure. These projects have a large development impact. Nevertheless, these effects cannot always be unequivocally attributed to the involvement of the LDC Infrastructure Fund.*

The evaluation assessed the impact of ten projects on the infrastructure of the specific countries. Six of these projects were operational before the end of 2008 and four projects were under construction. For two other projects (the most recent ones) an assessment appeared to be premature.

The overall conclusion is that of the six *operational* projects, five projects have a significant development impact.[3] The only exception is the small-scale water project in Mozambique. The five other projects include three energy projects and two telecommunication projects. The energy projects (two in Tanzania and one in Bangladesh) were highly *relevant* within the contexts of the two countries in question. In both countries, the projects contribute to an improved and more reliable power supply, cheaper energy and reduced dependence on energy imports. The three projects also have a significant positive effect on the environment in each of the four countries, as substituting oil-fuelled plants with gas-fuelled plants reduced CO_2 emissions. The two evaluated *telecommunication* projects involve two major companies (one active in several African countries and one in Bangladesh). They have grown very fast and have generated much employment in these regions. Most studies of the telecommunications sector in Africa and in Bangladesh conclude that mobile telecommunications have a major impact on economic and social development.

Of the four projects *under construction*, large positive effects are expected from three projects. The gas pipeline projects in Benin and Togo provide these countries access to cheap and relatively clean energy. The gas pipeline will contribute to an improvement of the energy supply in the country as soon as new thermal plants become operational. The third project involves the construction of a large drinking water treatment plant (DWTP) in Khartoum (Sudan). The plant will become operational in January 2010 and

3 Here, development impact refers to the contribution of an infrastructure project to the economic, social and environmental development and improvement of the living conditions of the poor. See also chapter 2.

will directly improve the drinking water situation in North Omdurman (Greater Khartoum). The project's pro-poor focus has contributed to a financing construction that keeps the cost price of water low and ensures that the poorest groups will have access to safe potable water. The fourth project involves the funding of *mining* activities in Mozambique. FMO decided to apply the LDC Fund because it anticipated that it would have direct and indirect positive effects on employment. FMO also assumed that the infrastructure that was to be created would also be accessible to the local population. In late 2008, however, expected benefits from expanded physical infrastructure were modest: the mine produced some direct employment effects, but benefits in terms of indirect employment are limited. The implementation of the project confirms that the mine has the characteristics of an enclave economy. Project activities are carried out in a remote area in the midst of a subsistence economy based on fishing and agriculture. Sponsors, investors, constructors, suppliers and buyers are all based outside Mozambique.

In sum, eight of the ten evaluated projects contribute to the development of the infrastructure in the countries involved and (will) have an important development impact. In four of the eight successful cases, LDC Infrastructure Fund financing has been decisive. In four other cases, the role of the LDC Infrastructure Fund was not decisive. In two cases the project did not contribute to the development of infrastructure and did (therefore) not have an important development impact.

It appears difficult to find suitable projects that strengthen infrastructure through private projects. Infrastructure is essentially a public good and most infrastructure projects are therefore realised by public companies. The two main exceptions are (mobile) telecommunications and energy projects. These two sectors accounted for 60%-70% of the portfolio of the Fund. Evidence suggests that the pressure to spend in the first years of the fund resulted in a situation where projects were approved even though they did not properly meet the fund's criteria. The development of a mine in Mozambique is not an infrastructure project. The grant for the water pumps in the same country does not fully comply to the LDC Infrastructure Fund Criteria, either. It would have been more logical for an NGO, private fund or embassy to participate in this project. In four other cases (in the energy sector), the funding by the LDC Infrastructure Fund was not decisive for the realisation of the project. For the funding of the drinking water treatment plant in Sudan, FMO, the (public) Khartoum State Water Company and the constructor had to establish a special purpose vehicle company (SPVC). Moreover, the realisation of this project would not have been possible without a large grant from ORET. Through this innovative financial structure, combining the establishment of a SPVC with a substantial grant, FMO could attract other investors and contribute to the realisation of this project with a high development impact.

In general, new infrastructure projects need a significant amount of time to mature and this is one of the main causes for relatively low expenditure levels during the first

years. Because many infrastructure projects require a long start-up period, disbursements occur later. The large sums involved, in combination with the relatively high risks and the focus on the objectives of the project, make it necessary for the appraisal procedure to be thorough. It is therefore important to develop a realistic plan for the implementation of a new Fund, which takes start-up problems and the time needed for the realisation of projects into account. Unrealistic planning contributes to a pressure to spend and therefore a suboptimal portfolio.

Abbreviations

AEF	Access to Energy Fund (FMO)
CD	Capacity Development (FMO)
DAC	Development Assistance Committee
DFI	Development Finance Institution
DGIS	Directorate for International Cooperation of the Netherlands Ministry of Foreign Affairs
DID	Development Impact Indicator
EDIS	Economic Development Impact Score
EIA	Environmental Impact Assessment
EIRR	Economic Internal Rate of Return
ERF	Environmental Risk factor
EU	European Union
FDI	Foreign Direct Investment
FIRR	Financial Internal Rate of Return
FMO	Netherlands Development Finance Company
FOM	Investment Facility Emerging Markets (FMO)
FSF	Financial Sustainability Factor
GDP	Gross Domestic Product
IOB	Policy and Operations Evaluation Department of the Netherlands Ministry of Foreign Affairs
LCL	Low Concessional Loans
LDC	Least Developed Countries
MASSIF	Micro and Small Scale Investment Fund (FMO)
NGO	Non-Governmental Organisation
ODA	Official Development Assistance
OECD	Organisation for Economic Co-operation and Development
ORET	Development-Related Export Transactions
SRF	Social Risk Factor

1
Introduction

In 2002, the Directorate-General for International Cooperation (DGIS) of the Netherlands Ministry of Foreign Affairs established the Least Developed Countries (LDC) Infrastructure Fund, to be managed by the Netherlands Development Finance Company (FMO). The objective of this fund is to provide financial instruments to stimulate private investments in infrastructure in LDCs. The Fund seeks to invest in infrastructure projects developed by private investors in order to promote the development and/or improvement of social and economic infrastructure: energy production and distribution, telecommunications, water, transport and environmental and social infrastructure. In its 2002 subsidy decision, DGIS made a commitment to a capital injection amounting to a maximum of EUR 182 mln. It was assumed that for the most part (85%) this capital would be a revolving fund.

The LDC Infrastructure Fund is an offspring of the Development-Related Export Transaction programme (ORET). By January 1, 2002 the OECD had banned the tying of aid to the least developed countries and therefore the tied-aid programme of ORET was no longer open to investments in LDCs. The new Fund provides untied development assistance, meaning that financing is not conditional on the procurement of capital goods, works or services in The Netherlands. By providing risk capital (either equity or debt) and grants, the Fund removes or diminishes risks for other investors.

This report presents the findings of an evaluation of the functioning of the LDC Infrastructure Fund during its first six years (2002-2007) of operations. The evaluation summarizes the development of the Fund and assesses the contribution of projects, (partly) financed by the LDC Infrastructure Fund, to economic, social and environmental development as well as the effectiveness of the Fund in promoting these projects.

The report is structured as follows: chapter 2 starts with a description of the evaluation methodology. Chapter 3 proceeds with a brief outline of the problem of financing infrastructure in developing countries. Chapter 4 elaborates on the development of the ministry's policies on the LDC Infrastructure Fund and chapter 5 describes the financial development of the Fund over time. The chapters 6 and 7 present the main findings of the evaluation. Chapter 6 deals with additionality and catalytic impacts of funding made available by the LDC Infrastructure Fund. This assessment is based on an analysis of twelve projects. Chapter 7 assesses the development impact of the activities financed by the LDC Infrastructure Fund. This analysis is based on a selection of ten projects.[4]

4 The ten case studies include two projects that are practically identical, but concern activities in two different countries (Benin and Togo). For two of the projects it is too early to assess their development impact.

2
Problem definition, research questions and method

2.1 Introduction

This chapter outlines the evaluation approach. Section 2.2 defines the research questions and section 2.3 explains the evaluation methodology and intervention logic. Section 2.4 describes the organisation of the evaluation and section 2.5 concludes with the selection of case studies.

2.2 Research questions

The evaluation aims to analyse the development of the LDC Infrastructure Fund, i.e. to determine the contributions the Fund has made to the development of infrastructure projects and to private sector development and, through these investments, to overall economic growth and poverty reduction.

The central evaluation questions are (see Terms of Reference, annexe 4):

1) Does the LDC Infrastructure Fund add value to the FMO product range?
2) Is there a demand for the LDC Infrastructure Fund within the Least Developed Countries?
3) What impact does the Fund have on the development of (private) infrastructure projects and the strengthening of infrastructure services in LDCs?
4) What impact have investments financed through the Fund had on infrastructure development, economic development and poverty reduction in LDCs?

Each of these main evaluation questions has been specified into several operative questions.

The evaluation analyses the ways in which the LDC Infrastructure Fund succeeded in breaking financial barriers for the implementation of infrastructure projects. The concept of *additionality* is essential in this regard (see chapter 6). *Additionality* relates to the necessity of funding by the LDC Infrastructure Fund or comparable funds. There would be no need for funding by the LDC Infrastructure Fund if the market is willing to finance the necessary investments (at reasonable market rates and at similar tenors). If that were the case, financing by the fund could actually be market disruptive.[5] The presence of other (commercial) sources does not necessarily point to non-additionality. On the contrary: financing by the Fund is likely to provoke the interest of other (commercial) investors, in which case the Fund would have a *catalytic* impact.

5 Several authors suggest that DFI financing of infrastructure projects in developing countries obstructs the development of a domestic capital market by assuming the risks (commercial, non-commercial, poor legal and regulatory framework, unstable macroeconomic conditions, problems of cashing payments) the domestic capital market is not willing to accept, in effect taking away the incentives to mitigate these risks (see Darche 2000).

The question whether funding has had a positive impact can only be answered by analysing the development impact of the project in question. Theoretically, it is possible that funding by the LDC Infrastructure Fund was necessary for the implementation of a certain project, though the project did not have any positive development impact. Next, the report assesses the ways in which projects have contributed to the improvement of the infrastructure in various countries. Chapter 7 presents an assessment of their development impact.

2.3 Development impact analysis

Evaluation of the Fund's development impact is based on an assessment of the development impact of individual projects that were (partly) funded by the LDC Infrastructure Fund. One of the methodological constraints is the scope of the evaluation. An impact evaluation requires the availability of base line data and the presence of a control group (or the possibility to construct such a control group ex post) in order to be able to provide a reliable and unbiased estimate of the effects of the investment. The scope of the evaluation did not allow extensive data collection, while baseline data were unavailable.

Consequently, the evaluation uses an alternative methodology. This methodology consists of a combination of the provisional findings on the project and insights from the (impact) literature. A large body of literature exists on the impact of investments in infrastructure. This literature has been taken as a starting point for the evaluation of the *expected* development impact of specific projects: a) for the development of an intervention framework for each project type and b) for analysis of the results.

Starting point for the evaluation is the development of a results chain to structure the expected processes and their results. Results chains reflect the specific relations between components (which outputs are expected to lead to which outcomes) and to (other) exogenous variables. The specific projects that are (partly) financed by the LDC Infrastructure Fund form the point of departure. In consequence:

- *inputs* are financial, human and material resources needed to produce intended outputs. The resources provided by the LDC Infrastructure Fund are inputs;
- *outputs* (deliverables) are the direct results of completed activities. In an electrifica tion programme, for instance, both the electricity plant and the electricity supply are outputs (the latter as the result of electricity generation);
- *outcomes* are the effects outputs have on the country's population, society or companies. For example, increased electricity use for productive activities or home use of electricity;
- *impacts* refer to the longer-term effects of an intervention. Among the longer-term impacts of increased electricity use for productive activities are economic growth, employment, higher income, poverty reduction and improved welfare.

Table 2.1 outlines the relations for investments in infrastructure. Annexe 6 presents the results chains for the analysed sectors.

Table 2.1	Evaluation matrix for the LDC Infrastructure Fund at programme level
Objective-means	**Indicators/variables**
Input	LDC Fund financial support, FMO advice and specific attention to corporate governance and management of social and environmental impacts, technology, policies
Output	Energy supply, immobile infrastructure (roads, airports, railways), mobile infrastructure (ships, trucks), telecommunications, social infrastructure, environmental infrastructure
Outcome	Enhanced economic activity (higher production, more trade, more and better employment), enhanced mobility, reduced imports, increased exports, tax revenues
Impact	Economic growth, poverty alleviation, reduced CO_2 emission, health effects, life expectancy

2.4 Organisation of the evaluation

The evaluation of the LDC Infrastructure Fund was conducted in three separate phases:

1) A *preparatory phase* of desk research and interviews in the Netherlands, in which policy documents and reports were studied and data was organised. Key stakeholders at the Ministry of Foreign Affairs and FMO (investment officers) were interviewed.

2) *Selection of case studies, field visits and desk studies*. Field studies were conducted in Bangladesh, Mozambique, Sudan and Tanzania. Two projects were evaluated by desk study only (Benin, Togo).[6] During field missions, both structured and open interviews were conducted with policy makers in Ministries, donors, companies involved, grassroots organisations linked to the programme, and national and foreign banks active in the respective countries. One of the specific goals of the field missions was to obtain insight into the domestic financial sector and the availability of resources to finance large high-risk infrastructure projects. Each field mission produced separate reports on the specific projects, encompassing an inventory of the activity, an analysis of additionality and catalytic impacts and an analysis of the development impact.

3) Production of the synthesis report constituted the third phase.

6 This was agreed with the reference group.

2.5 Selection of projects

The analysis of development impact was based on a selection of twelve case studies. These case studies are representative of the composition of the LDC Infrastructure Fund portfolio. Projects were selected based on a representative distribution of funding facilities (equity, loans and grants), (main) sectors and countries. Pragmatic considerations were also taken into account. First of all, the size of the contribution is important. The primary focus was on larger projects. Ten of the twelve projects were visited (in four countries: Bangladesh, Mozambique, Sudan and Tanzania). The evaluation of two projects (in Benin and Togo) was based on desk research only.[7] The presence of several different projects in Bangladesh, Tanzania and Mozambique was an argument for choosing these particular countries (based on efficiency arguments). Conversely, the presence of one or two large projects in a particular country (Mozambique) was an argument for also including a smaller project (Roundabout Playpumps) in the same country.

The energy, telecommunications and immobile infrastructure sectors are major sectors within the LDC Infrastructure Fund, while Tanzania, Mozambique, Bangladesh, Benin and Togo are major recipients (see chapter 5). Table 2.2 lists the projects selected for the evaluation. The selection contains a total of 12 projects: three in Bangladesh, three in Tanzania, three in Mozambique, one in Sudan, one in Benin and one in Togo. The case studies include the three projects that were evaluated internally by FMO (i.e. MSI/Celtel, AES Haripur and Songas).

For an analysis of the water project in Sudan, IOB developed a simulation model, based on the survey and results of a Social Impact Assessment (SIA) carried out by the Sudanese consultant *EDGE for Consultancy and Research*.

7 FMO conducts an evaluation five years after providing financing to a project.

Table 2.2 List of projects selected for the evaluation

Project	Country	Year of approval	Support by LDC Fund (and other FMO financing)
Energy production & distribution			
AES Haripur Private Limited	Bangladesh	2002	USD 10 mln subordinated loan; USD 5 mln FMO-B (parallel) (plus 12 mln FMO-A)
Songas	Tanzania	2003	EUR 13.5 mln in equity, converted into loan (EUR 9 mln) in 2007
Bengaz	Benin	2005	USD 21.9 mln loan
Sotogaz	Togo	2005	USD 22.3 mln loan
Artumas Tanzania	Tanzania	2006	USD 29.8 mln equity (plus USD 17.5 mln FMO-A)
Water supply and distribution			
Roundabout Playpumps	Mozambique	2005	USD 1 mln grant
Al Manara Water Company	Sudan	2006	EUR 23.7 mln subordinated loan
Telecommunications			
MSI/Celtel	Tanzania	2003	USD 15 in equity (plus USD 10 mln FMO-A for Tanzania and Nigeria)
Telekom Malaysia International (Bangladesh) Limited	Bangladesh	2005	EUR18 mln subordinated loan (plus USD 15 mln FMO-A)
Immobile infrastructure (mining)			
Kenmare-Moma	Mozambique	2004	EUR 7.1 mln subordinated loan; USD 10 mln equity; 4.0 mln in two stand-by loans (plus USD 19.5 mln in FMO-A loan)
Environmental infrastructure			
Grown Energy	Mozambique	2006	EUR 232,625 in grant (plus EUR 100,000 grant and EUR 3.2 mln convertible grant in 2008)
World Wide Recycling	Bangladesh	2007	EUR 428,572 equity, EUR 1,542,857 subordinated loan and EUR 3.9 mln subordinated loan in Taka equivalent

3
Infrastructure and economic growth

3.1 Infrastructure and economic growth

An enormous body of (empirical) literature exists on the determinants of economic growth. Even though the findings of these studies are not always consistent, most studies confirm a positive relation between investment in infrastructure and economic growth (Aschauer, 1989a, b; Easterly and Robelo, 1993; Esfahani and Ramirez, 2000; Calderon and Serven, 2004). The level of influence depends on type, location and context. Several studies show how the complementarity and synergy of different types of infrastructure stimulate economic growth and how the efficiency in maintenance and operation of infrastructure services contributes to economic growth (Hulten, 1996).

Infrastructure investments in transport appear to have the largest effects in fast-growing developing countries and emerging economies, especially at the first stages of the take-off (Canning and Bennathan, 2000). Evidence for Vietnam, for example, shows that a lack of transport infrastructure can be a major obstacle to economic growth.

Ndulu (2006) offers two explanations for slow African growth: a) a low investment rate (10% compared to 16% in other developing countries) and b) an underinvestment in infrastructure, which has a negative effect on trade and economic growth. Transport costs are very high in the landlocked countries of sub-Saharan Africa. Forty percent of the population lives in landlocked countries with high transport costs and poor trade facilities. The high transport costs in many African countries constitute a barrier to the development of manufactured exports (Collier, Sachs, Elbadawi). One of the factors explaining the low investment rate is the high price of investment goods relative to consumer goods; approximately 70% higher than for OECD or East Asian countries as a result of high transport costs, port inefficiencies and lack of scale economies. If relative prices would have been the same as in the OECD, economic growth would have been 0.4 percentage points higher. According to the author, differences in infrastructure resources explain more than 40% of the growth differential between low- and high-growth countries and 25% of the growth differential between Africa and East Asia (Ndulu 2006, p. 218).

Calderon and Serven (2004) show that infrastructure not only has a positive effect on economic growth, but also on income distribution. The authors found significant effects of both quantity and quality of infrastructure. They reported large effects of infrastructure on economic growth: a standard deviation increase in the sectors included in the model (telephone, power supply and roads and railways) would raise growth rates by 5.7 percentage points. For Latin American countries, a catch up with the region's leader would raise economic growth by 1.1 to 4.8 percentage point per year. Moreover, improvement of the infrastructure lowers income inequality because infrastructure lowers production and transaction costs, helps poorer individuals and underdeveloped areas to get connected to core economic activities and is likely to have

Artumas Mtwara Gas Project (Tanzania)

a positive impact on their job opportunities through improved education and better health (as a result of improved water and sanitation facilities). The authors therefore conclude that 'infrastructure should rank at the top of the poverty reduction agenda' (p. 28).[8] Studies on the comparative impact of investments on poverty reduction and GDP in India and China reveal that the largest impact can be expected from agricultural research and development, roads, and education (IFPRI research discussed in Willoughby, 2004). Christiaensen et al. (2003) show that location is a major determinant of the benefits households derive from infrastructure investments in transport, energy and water.

3.2 Finance for infrastructure

Availability of finance is generally recognised as a determining factor to private sector growth (Ayyagari et al., 2008; Ndikumana, 2000). In most developing countries, lack of capital is an important impediment to private sector development. Supply of (formal) credit is incomplete and often practically non-existent. Commercial banks can only

8 In one of the earlier studies, Easterly and Levine (1995) did not find an effect of the initial stock of roads/railways and electricity generation. They did, however, find an effect of the number of telephones and considered this variable a good indicator of the poor state of infrastructure in Africa.

slowly increase the volume of resources available for credit (Aryeetey et al., 1998), in many countries even at a slower rate than the growth of GDP.

Beck et al. (2008) measured commercial sector credit provision as a percentage of GDP, and found the lowest levels in sub-Saharan countries, ranging from 1.9% (Mozambique) to 24.5% (Kenya). For developed countries, private sector credit to GDP is substantially higher and may reach values above 100% of GDP. Customers face higher barriers to banking services in countries where public sector banks are predominant and where there are more stringent restrictions on bank activities and entry, less disclosure and media freedom, and poorly developed physical infrastructure.

Instability and high risk lead to high interest rates and a stronger preference for short-term lending. Banks tend to avoid small borrowers because these are considered risky as well as difficult and costly to monitor. If attended, these clients are charged high interest rates. Consequently, the tendency is to offer expensive short-term, rather than long-term credit, preferably to large borrowers that can easily be monitored. Also, collateral requirements are used as a credit rationing device (Aryeetey et al., 1998).

Likewise, the banking sector in African countries is specialised in supplying credit to activities such as commerce, processing and marketing of agricultural products and domestic and international trade. It is hardly involved in complex large-scale and long-term infrastructure investment projects. Financing requirements of infrastructure are under-serviced by formal private sector banks in developing economies. Major investments in infrastructure (be it immobile infrastructure, energy or social infrastructure) are financed by the public sector, generally making use of international credit facilities. Private investment is restricted to specific niches, such as telecommunications or airports, while commercial banks rarely fund infrastructure works.

As a result, most financed activities have a very short turnaround time and only involve marginal physical investments in order to avoid long payback periods. Consequently, there is a large degree of self-financing, a strong focus on activities with short payback periods and negligible large-scale physical investment. Activities are often financed by own savings: internal savings constitute a major source of finance for the formation, consolidation and expansion of enterprises. Large-scale infrastructure projects that seek financing in the local market are rare. A coordinated approach is therefore needed to develop commercially viable infrastructure projects on the one hand, and an adequately functioning capital market on the other. Such an approach would thus simultaneously address demand and supply on the capital market (Darche, 2000).

Public policies in developing countries have concentrated on attracting foreign capital for infrastructure projects. This concentration may have jeopardised and delayed the creation of a domestic capital market. Involvement of development banks and governments in private sector infrastructure investment often takes the form of

project-specific support and is not focused on creating an adequate legal and regulatory environment or providing programme guarantees that allow the domestic capital market to emerge. However, a small number of countries, notably in Latin America, have made progress along these lines. Also, a number of initiatives have been launched by development banks in order to make specific attempts to intermediate in the mobilisation and triggering of domestic long-term credit for infrastructure investment (e.g. South Africa: INCA). A variety of mechanisms are used by governments and development banks to reduce the risks of infrastructure projects and to facilitate the supply of private-sector finance from the domestic capital market. These include the insurance of debt service payments, refinancing of existing debt, credit support to finance put or call options, extending debt maturities, reducing commercial and non-commercial risks by supplying credit lines, etc.

It is often considered necessary that Development Finance Institutions (DFIs) finance at least a portion of the capital needed for private infrastructure projects. Without such finance, it is difficult for concessionaires to attract private sector financing, either foreign or domestic, enabling them to close a transaction (Darche, 2000).

4
Policy Development

4.1 Introduction

This chapter gives a brief outline of the development of the LDC Infrastructure Fund. Section 4.2 outlines its establishment and section 4.3 describes the renewal of the subsidy decision in 2006. Section 4.3 summarizes the chapter.

4.2 Establishment of the Fund

Dutch policy on private sector development took shape in 2000 in the memorandum *In Business against Poverty*.[9] This document stressed the importance of private sector development with regard to pro-poor growth in developing countries. The memorandum sought to contribute to private sector development by:

1) creating the international conditions for private sector development (by trade, foreign direct investments, debt cancellation, reducing dependence on natural resources and more coherent international policies);
2) creating an 'enabling environment' with five nuclear roles for governments:
   the provision of a stable macro-economic climate;
   political stability, good governance and a constitutional state;
   stimulation of the free market;
   development of an adequate economic and social infrastructure;
   the creation of the preconditions for the protection of man and environment;
3) tackling specific problems in the private sector.

The memorandum recognised the importance of a good infrastructure for the development of the private sector. Good roads, communication facilities and stable energy and water supply are important conditions for the efficient functioning of markets, the continuity of production processes and the connection to international markets. Reduction of transaction and transport costs was expected to stimulate new economic activities and offer poor farmers access to new markets. Water and electricity would create new opportunities for the development of economic activities, especially in rural areas. Another expected result was a decrease in food prices as a result of lower transport costs and better functioning markets. The government also stressed the importance of private sector development and the need to address problems related to attracting (foreign) capital for investments: the knowledge gap, difficulties in generating sufficient return on investment (and therefore in obtaining funding for investment plans) and relatively high political and credit-related risks.

At the same time, the Minister for Development Cooperation had fostered a debate on the untying of aid. As an important trading nation, the Netherlands recognised the

9 Ondernemen tegen Armoede, TK 2000-2001, 27467, nr. 1.

importance of free trade and the elimination of trade barriers.[10] The ministry first of all reached an agreement on the untying of aid within the Benelux. Later, the 'Utstein Group', which initially consisted of ministers responsible for development cooperation in the Netherlands, the United Kingdom, Germany and Norway, followed.[11] This group actively supported the process of untying development assistance, because it would lead to increased efficiency, improved quality and more value for scarce funds. In the spring of 2001, the OECD adopted this initiative and decided that tied bilateral aid to the least developed countries (LDCs) would no longer be allowed by January 1, 2002. The Dutch government accordingly decided to abolish the tied-aid ORET/MILIEV programme for the least developed countries by October 1, 2001.[12] FMO, which administered the programme on behalf of the ministry, proposed to create a new fund to stimulate infrastructure investment in the least developed countries.

Based on this FMO proposal, the ministry formulated a memorandum proposing to establish such an infrastructure investment fund. The memorandum identified lack of infrastructure as one of the main obstacles for economic growth and poverty reduction in many developing countries. Among the main causes for this inadequate infrastructure were lack of financial resources and weak implementation and management capacities of LDC governments. Due to lower than expected returns and the fact that these countries had very limited access to the international capital market, public-private partnerships or private sector initiatives only had limited opportunities to develop infrastructure projects.

Adoption of the FMO proposal implied an important policy change that would have an important impact on Dutch enterprises: instead of subsidising exports, the fund would finance or facilitate investments. According to the ministry, it would be more efficient and effective to promote investments directly by the creation of financial facilities at the demand side, rather than to promote these investments indirectly at the supply side through export subsidies.

The memorandum also referred to other initiatives, like the Public Private Infrastructure Advisory Facility (PPIAF) founded by DFID, Japan and the World Bank, the Africa Private Infrastructure Financing Facility (APIFF), the Africa Infrastructure Fund of IFC and the infrastructure funds of AfDB. PPIAF advises and provides technical assistance. APIFF participates in infrastructure projects and catalyses private

10 IOB, *Aid for Trade, An evaluation of Trade-Related Technical Assistance*, Netherlands Ministry of Foreign Affairs, 2005.

11 The Utstein Group was formed in 1999, during a meeting at Utstein Abbey on the west coast of Norway. The Group aimed at driving the development agenda forward with a focus on international consensus.

12 This development and environment related export transactions programme enabled developing countries to buy investment goods or services in the Netherlands for commercially non-viable projects that would enhance employment and economic activity and protect the environment.

investments.[13] In 2002, APIFF was renamed the Emerging Africa Infrastructure Fund (EAIF) and became one of the facilities of the Private Infrastructure Development Group (PIDG) which the Netherlands helped set up in order to provide facilities such as funding, guarantees and project development, all of which focus on the fundamental problems of investing in infrastructure.

According to the ministry, the new LDC Infrastructure Fund would be additional to other specialised infrastructure funds active in Africa. These other funds focused primarily on the most profitable sectors.[14] The added value of the new fund would be the stimulation of investments in high-risk infrastructure projects with a high development impact. The fund was supposed to catalyse investments made by other infrastructure funds and commercial funds. The main difference with regular FMO financing would be that the LDC Infrastructure Fund would accept higher risks and/or lower returns.

In February 2002, the ministry signed the subsidy decision for the period between November 1, 2001 and December 31, 2005. The total subsidy amounted to EUR 181,512,084 (NLG 400 mln). The subsidy decision stipulated the subsidy period (four years) and FMO's financial and reporting obligations. The size of the fund was calculated based on the estimated annual amount of the ORET/MILIEV programme designed to support exports to the least developed countries. This was approximately one third of the programme or EUR 45.5 mln per year. The fund would concentrate on seven countries: Bangladesh, Mali, Burkina Faso, Mozambique, Tanzania, Uganda and Zambia. These are all partner countries for Dutch development cooperation and FMO already had a long experience in each of these countries.[15]

13 FMO had won the tender procedure for the management of APIFF (together with the South African Standard Bank).

14 The memorandum especially mentioned the telecommunications sector as a main example.

15 Even before the end of the first year of the LDC Infrastructure Fund, the portfolio also included projects in Benin, Equatorial Guinea, Ethiopia, Yemen, Cape Verde and Togo. In 2007, 50% of the portfolio was committed to post-conflict states and fragile states such as Haiti, Togo, Mozambique, Afghanistan, Sierra Leone and Sudan (Semi-Annual Report 2007).

Roundabout Playpump (South Africa)

4.3 Revision and new subsidy decision

In 2004 the ministry requested FMO to broaden its criteria and use of the LDC Infrastructure Fund in order to enhance its contribution to the MDGs. This meant a shift to the social sectors (including health and education). Moreover, it appeared that several appraisal criteria were unnecessarily restrictive. It was decided to raise the maximum share of LDC Infrastructure Fund financing to an individual project to 50% of the project value. Second, the maximum transaction limit was raised to 10% of the total fund value. Including revenues from the sale of Celtel (see chapter 7), the transaction limit increased to EUR 20.8 mln.[16]

The subsidy expired in 2005. By that time, FMO had used no more than approximately 50% of the total subsidy of EUR 182 mln. During the negotiations it was expressed that FMO was expected to need 2006 and 2007 to build up a portfolio covering the total sum specified in the subsidy decision. At the same time, the ministry showed interest in cooperation with FMO in order to realise the MDG output goals for water and sanitation and energy and electricity.[17] The subsidy decision of 2006 would facilitate the financing of non-commercial elements of projects financed by FMO and the development and/or feasibility stages of infrastructure projects that qualified for financing from the Fund.[18]

4.4 Summary

The Netherlands was one of the first countries that lobbied for the untying of aid to the least developed countries. With several other like-minded countries, the Netherlands concluded that the untying of aid would increase efficiency, improve quality and raise the value of scarce funds. In 2001, the OECD countries agreed to stop the tying of aid to the least developed countries. This decision put an end to the tied Dutch export programme for these countries. In reaction, the ministry set up a new infrastructure fund on behalf of the least developed countries. Its proposal implicated an important policy change: instead of subsidising exports, the fund was to subsidise investments. The new fund was to be *additional* to existing funds and initiatives. It was to have a larger 'risk appetite' and provide financing to infrastructure projects that were considered too risky for other funds.

16 See Activity Plan 2006.

17 See Private sector Development, DDE Working Paper Infrastructure, Netherlands Ministry of Foreign Affairs, 2007.

18 The subsidy was renewed in 2006 to cover the period until December 31, 2013. It was expected that the total amount of EUR 182 mln would be allocated by the end of 2007. The average investment term was estimated at five years and therefore the Fund was planned to run at least until 2012.

The total amount of funding, EUR 182 mln, was based on the estimated share of the least developed countries in the Dutch development and environment-related export programme (ORET/Miliev). It was expected that FMO would utilise the total subsidy within a period of four years. Therefore, the subsidy period expired by the end of 2005.

Because the Fund developed considerably slower than anticipated, a new subsidy decision was necessary in 2006. It was argued that the Fund's tight subsidy criteria were an important cause for its slow development during the first years. Moreover, the ministry demanded that FMO would finance more projects in the social sectors (including water) and that the Fund would specifically contribute to the realisation of the MDGs. Assuming that FMO would have utilised the total subsidy amount by 2007 and counting on an average investment term of five years, it was decided to extend the subsidy period until 2013.

5
Financial development of the Fund

5.1 Introduction

This chapter seeks to answer the first evaluation question: does the LDC Fund add value to the FMO product range? This central question from the Terms of Reference generates five specific research questions: [19]

1) What types of investments are supported through the Fund and is a specific trend discernable in the type of investments (region, sector, type of funding)?
2) Is the Fund portfolio in accordance with the criteria laid out in the annex to the subsidy decision?
3) What is the Fund's position within the product range and organisation of FMO?
4) Is the Fund compatible to the goals and product range of FMO?
5) Do projects financed by the LDC Infrastructure Fund have a risk profile that differs from those financed through FMO-A?

Section 5.2 starts with the development of the Fund between 2003 and 2007 and section 5.3 differentiates by sector and by country. Section 5.4 analyses compliance with the Fund criteria. Section 5.5 describes the Fund's position within the complete FMO product range. Section 5.6 ends with a brief summary and a number of conclusions.

5.2 Development of the LDC Infrastructure Fund, 2002-2008

Table 5.1 outlines the development of the LDC Infrastructure Fund in the period 2002-2007. The table shows that the Fund had a slow start in its initial years and grew more rapidly since 2005. Several factors explain this particular development. First of all, as with every new fund, the LDC Infrastructure Fund needed an introductory period. This was miscalculated in the first subsidy decision. The ministry had expected the disbursements to grow in four equal parts of approximately EUR 45 mln per year. In retrospect, this was not realistic. Moreover, the subsidy decision was signed in February 2002 and it was not realistic to expect large disbursements to be made that same year. Current experience shows that (large) infrastructure projects may require years of preparation before they can start and the first disbursements can be made. Several annual reports stress the impact of delays. Second, cancellations have had a major impact on the development of the Fund. Investment officers devoted a considerable amount of time to projects that were eventually cancelled, without any observable achievements to be added to the Fund portfolio. Third, it has become clear that Fund criteria were too tightly applied during the first years. A more flexible approach since 2005 has had immediate effects, as can be seen from the approved, contracted and disbursed amounts that year. For 2005, this increase was mainly caused by a small

19 The role of the Sustainable Economic Development Department of the Ministry of Foreign Affairs in the development of the Fund portfolio was discussed in chapter 4.

number of large projects (especially Bengaz and Sotogaz). Disbursements from the ministry vary from year to year and depend on the cash flow of the LDC Infrastructure Fund. By the end of 2007, the ministry had disbursed EUR 139.7 mln of its total commitment of EUR 181.5 mln.

Table 5.1 LDC Infrastructure Fund, investments (in number and value) by year

Investments	2002	2003	2004	2005	2006	2007	2008
Number of approved investments[1]	3	3	3	11	5	5	6
Contracted	0	6	2	9	10	7	5
Amount approved (EUR mln)	33.2	31.1	20.4	117.8	70.8	61.9	69.8
Amount contracted (EUR mln)	0.0	22.0	19.1	51.9	97.5	49.3	55.1
Amount disbursed (EUR mln)	0.0	22.0	28.3	40.9	73.3	41.4	43.0
Disbursements by the Ministry (EUR mln)	22.4	27.3	6.2	10.9	54.9	18.0	23.2

[1] *New projects/first disbursements, not including grants (for approval).*
Source: FMO, 'Verantwoordingen'; Annual reports LDC Infrastructure Fund.

The LDC Infrastructure Fund provides various forms of financing in order to create an optimal financing solution for the projects concerned, including long-term financing (tenors of up to 20 years) for infrastructure projects. The LDC Fund's maximum investment or financing is 49% of the total transaction amount (or a company's total assets if applicable). Moreover, the LDC Fund provides support through:

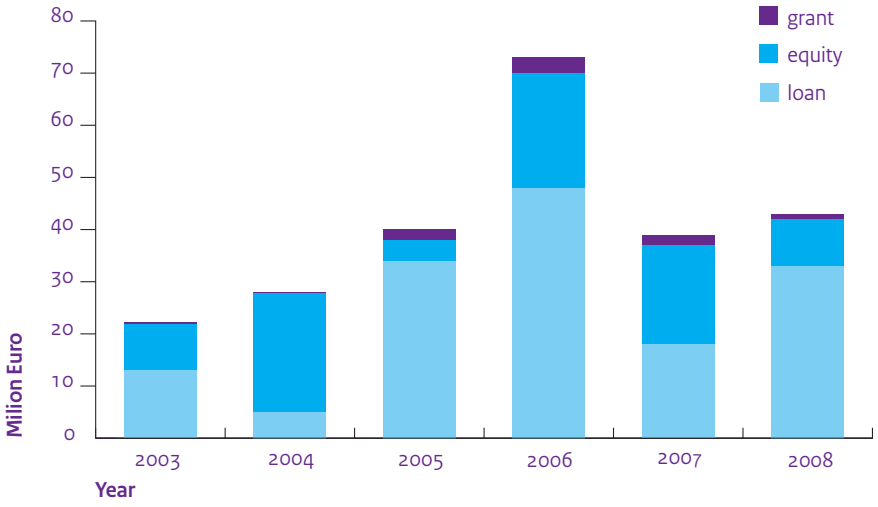
- *loans* up to 10%[20] (or EUR 20 mln[21]) of the total Fund size in either euros, US dollars or local currency;
- *equity investments* up to the lesser of 10% of the total Fund size (or EUR 20 mln) or 20% of the total transaction size. In exceptional cases this participation may increase to 49%. In case of equity investment, a well-defined exit strategy can be part of the negotiations;
- *grants* for: a) projects that would normally be covered by the public sector but cannot be taken up due to a shortage of funds, b) non-commercial elements of projects that are financed by FMO, or c) the development and/or feasibility stage of infrastructure projects that in principle qualify for financing from the Fund. Grants are normally linked to debt or equity financing from the Fund.

20 In exceptional cases a loan can be increased. Approval by the Fund Manager is required.
21 By mid-2008 the Fund had a volume of EUR 207 mln.

Investments in international or multilateral funds that in turn facilitate infrastructure projects as defined by the Fund are also eligible.

By the end of 2007, the Fund had participated in eleven projects with equity capital. These investments had an average size of approximately EUR 6.5 mln and included a number of small participations, but also two investments of approximately EUR 20 mln. Until the end of 2007, the Fund had signed contracts for 16 loans (involving 13 projects), with an average size of EUR 11.1 mln. Between 2003 and 2007 the Fund provided 27 grants with an average size of EUR 260,000. Excluding two grants of more than EUR 1 mln, their average size was approximately EUR 130,000. Most grants concern payments for feasibility studies and are part of a larger involvement of the LDC Infrastructure Fund. Certain grants will be converted into equity in case of success. Grants are also used to fund social projects, such as the Playpumps in Mozambique. The ministry has asked FMO to invest more in social projects (including water, health and education). It appears that opportunities to fund these, essentially public, sectors with loans and equity participation are rather limited. In practice, FMO finances these sectors with grants from the LDC Infrastructure Fund. Equity yields dividend if the investment is profitable, constitutes ownership (rights) and may be sold to other investors. Loans yield a certain amount of interest and debtors must repay their debts after a set period. Figure 5.1 presents the annual disbursements from the LDC Fund, broken down by type of financing.

Figure 5.1 *Disbursements from the LDC Infrastructure Fund by type of financing (2003-2008)*



Source: Elaboration based on data from Annual Reports on the LDC Infrastructure Fund.

The figure illustrates that the proportion of loans and equities in the total disbursements varies from year to year. This is due to the fact that the Fund only makes a small number of large disbursements each year and therefore one or two large loans or participations have a significant effect on the distribution. In 2004, for instance, the LDC Infrastructure Fund participated in Songas in Tanzania and in the Moma mine in Mozambique. These two participations accounted for 84% of the new disbursements that year. The next year, the Fund provided two large loans for the participation of companies in Benin and Togo in the West African Pipeline Company (WAPCo). These two loans constituted 60% of the total disbursements that year.[22] In 2006, loans to two telecommunication providers (in Bangladesh and Haiti) dominated the new disbursements. Grants only form a small part of annual disbursements. A similar pattern is found: in 2007, 78% of the grants was provided to a single project (a feasibility study for Bengaz). In 2005, two grants accounted for more than 90% of the total amount allocated.

5.3 Development by sector and by country

Financing from the LDC Infrastructure Fund is open to seven sectors:

- energy production and distribution
- telecommunications
- water provision and distribution
- immobile infrastructure (harbours, airports, railways, roads)
- mobile infrastructure (ships, trucks, wharfs)
- environmental infrastructure (waste management, water treatment, landfill)
- social infrastructure (health and education).

In practice, financial support is concentrated in three sectors: energy production and distribution, immobile infrastructure and telecommunications. A fourth 'sector', financial infrastructure, is supported through participation in African infrastructure funds (Grofin East Africa Limited, a fund that stimulates energy projects for small and medium enterprises, and GuarantCo, a fund that provides guarantees to infrastructure projects).

22 Source: Annual Report 2005.

Table 5.2 Sectoral distribution of the LDC Infrastructure Fund portfolio (2003-2008, percentages)[1]

	2003	2004	2005	2006	2007	2008
Energy production & distribution	39.7	47.5	61.2	41.4	52.8	52.3
Telecommunications	60.3	26.9		28.0	12.4	11.9
Water provision & distribution					5.4	7.5
Immobile infrastructure		25.6	30.5	16.9	12.5	10.1
Environmental infrastructure					0.1	0.6
Social Infrastructure						0.6
Financial Infrastructure			2.6	10.6	13.6	14.6
Tourism			5.7	3.1	3.2	2.4
Total	100.0	100.0	100.0	100.0	100.0	100.0

[1] *For 2007, excluding the fair value change of Kenmare, Mozambique.*
Source: Calculation based on FMO data.

Though most of the financing is divided over three sectors, a clear pattern cannot be established. In 2003, telecommunications was the main sector as a result of one major investment. In other years, the energy sector was dominant, with investments in gas-to-power projects and participation in the West African Pipeline Company (WAPCo). The exact share of a particular sector in the total portfolio is determined by only one or two new disbursements. The telecommunications sector is instructive in this regard. The relative significance in this sector in 2003 and 2004 was the result of a participation in MSI/Celtel in 2003. The share of the sector dropped in 2004 as a result of the financing of investments in other sectors and again in 2005 when FMO sold its participation in MSI/Celtel. In 2006, the sector became important again when loans were provided to operators in Bangladesh and Haiti. In 2007, Digitel Haiti unexpectedly repaid its loan from the fund.

Investments in all least developed countries (as defined by the OECD-DAC) are eligible for funding.[23] Nevertheless, the ministry and FMO agreed to focus on a limited number of countries.[24] A large share of the portfolio is in fact concentrated in selected partner countries: Tanzania (2007: 21%), Mozambique (17%), Bangladesh (2007: 15%) and Benin (2007: 10%). The relatively large investments in Benin and Togo are the result of a large energy project in Western Africa. This project covers Nigeria, Ghana, Benin and Togo. Investments in the African region are allocated to projects that cannot be ascribed to

23 For a list, see OECD-DAC 1: www.oecd.org/dataoecd/43/51/35832713.pdf.
24 Bangladesh, Angola, Benin, Burkina Faso, Mali, Mozambique, Senegal, Tanzania, Uganda and Zambia.

one country. The loan to MSI/Celtel is an example. An overall trend cannot be established. Approximately 80% of the investments are made in Africa and almost 20% goes to Asia, mainly Bangladesh.

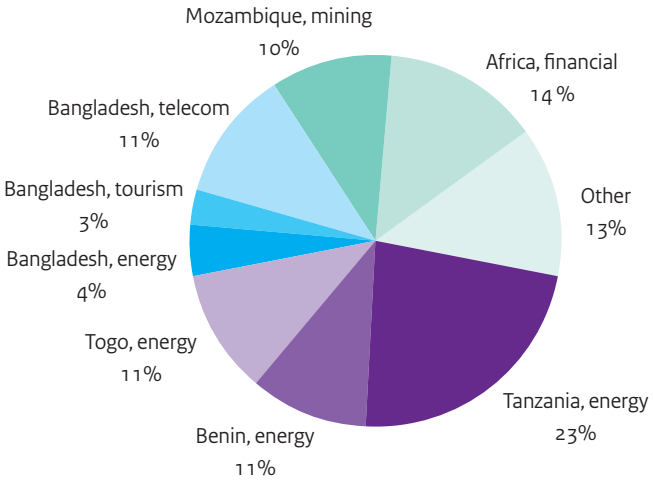
Table 5.3 Distribution of the LDC Infrastructure Fund portfolio (2003-2008) by country, in % of the portfolio*

	2003	2004	2005	2006	2007	2008
Benin			17%	9%	11%	9%
Mali	5%	2%	3%	1%	1%	1%
Mozambique		26%	22%	12%	10%	8%
Somalia						3%
Sudan					5%	8%
Tanzania		31%	14%	16%	23%	17%
Togo			17%	10%	11%	9%
Uganda						11%
Zambia					1%	1%
African Region	55%	24%	12%	16%	19%	16%
Total Africa	60%	83%	85%	64%	81%	83%
Afghanistan			6%	3%	3%	2%
Bangladesh	40%	17%	9%	18%	16%	15%
Nepal						0%
Total Asia	40%	17%	15%	21%	19%	17%
Haiti				15%		
Total Latin America				15%		
Total	100%	100%	100%	100%	100%	100%

** Excluding grants.*
Source: Calculation based on data provided by FMO.

Figure 5.2 combines country and sector data for 2007. In practice, a small number of large projects dominate the portfolio, making it impossible to discern trends. The figure shows the dominance of two energy projects in Tanzania.

Figure 5.2 *Distribution of the portfolio, 2007*[1]



[1] *Excluding the Fair value change of Kenmare, Mozambique.*
Source: Annual report LDC Infrastructure Fund, 2007.

5.4 Compliance with the criteria of the LDC Infrastructure Fund

The criteria for the financing of projects by the LDC Infrastructure Fund are defined in the annex of the subsidy decision. In addition, the subsidy decision states that proposals should also fit into the framework of the Poverty Reduction Strategy Paper (PRSP) of the country concerned. The annex specifies the following *funding criteria*:

- projects must contribute to the reduction of poverty, with a focus on employment opportunities and involvement of the local business community;
- projects must contribute to sustainable economical, ecological and social development;
- LDC funding must not be market disruptive but should be additional to local and international financial sources;
- LDC funding must have a catalysing function by lowering barriers for other commercial financiers;
- LDC Fund involvement must contribute to applicability of good governance principles;

- in the public sector, management should be independent, stay at arm's length and meet FMO requirements, for example in corporate governance.

The subsidy decision and the note do not stipulate whether each of these main criteria must be met. For instance, a certain project may have a high development impact but no significant catalytic impact.

The same holds for the *appraisal criteria*. These are:

- the project must be important for the country's economic development: it should create employment opportunities, contribute to the local business community, generate government income and/or improve the balance of payments;
- during its economic life, the project must at least generate sufficient income to cover the cost of capital and operational costs and to maintain/replace financing; for private sector companies, a per project minimum financial return applies;
- institutional sustainability must be guaranteed by professional management and project organisation, corporate governance principles and transparency at board and management levels;
- technical sustainability should be guaranteed by the introduction of functional, goal-oriented and high-quality production methods and materials. These are to optimize the opportunities for the local business community to participate in the construction and maintenance phases and allow the company/project to operate independently;
- large infrastructure projects in environmentally-sensitive areas must include an environmental impact assessment report. Assessments must be conducted according to international standards for environment and safety, as formulated by the World Bank;
- businesses and projects must meet international standards on social aspects as formulated by the ILO, OECD and the World Bank.

The case studies (see chapter 7) give examples of projects without a significant *direct* effect on economic development that did, however, have a large (social) development impact. Another remarkable aspect is the focus this criteria note puts on *direct* (measurable) effects such as (direct) employment generation, whereas the main argument for investing in infrastructure is related to its *indirect* effects, the effect improved roads, rural electrification, etc. have on economic activities in the region. FMO's EDIS score card, which is also used for the appraisal of projects, focuses on direct (economic) effects as well (see chapter 7).

In general, the projects comply (ex ante) with the criteria. The criteria of additionality and catalytic impact (see chapter 6) were not always met in the past. The other criteria are formulated in rather general and broad terms. One of the twelve projects that were analysed, a mining project in Mozambique, does not comply with a strict interpretation of the criteria.

5.5 Positioning the LDC Infrastructure Fund in the FMO product range

FMO is one of the largest bilateral development banks in the world. In 2008, its investment portfolio was approximately EUR 3.4 billion. General relations between the State of the Netherlands and the FMO are laid down in the Agreement State - FMO, dated November 16, 1998. This agreement focuses on developing countries. Article 1 defines the functions of FMO as 'contribution to the advancement of productive enterprises in developing countries to the benefit of their economic and social development by rendering assistance (...), to natural persons and legal entities engaged in a business or profession in a developing country, by inter alia: taking equity interests; advancing loans and furnishing guarantees; providing subsidies and appropriate forms of finance for technical assistance, training, investment promotion activities and other activities which may be conducive to the advancement of productive enterprises in developing countries; and executing programmes and/or projects commissioned by third parties'.

The LDC Infrastructure Fund is one of the special so-called government funds supplied by the Dutch Government that are managed by FMO in addition to the activities it finances from its own resources (FMO-A). The other government funds are the Micro and Small Scale Investment Fund (MASSIF), the Access to Energy Fund (AEF), the Investment Facility Emerging Markets (FOM) and the Capacity Development programme (CD).[25]

Guidelines and approval processes that apply to FMO-A also apply to transactions financed from these government funds. However, there are differences as well:

- 'FMO-A is an AAA, flexible long term financier, offering a wide variety of products for financial sector and infrastructure development, recently including – on a limited scale – local currency financing, excluding straight subsidies.'
- 'LDC Infrastructure Fund provides risk capital to a variety of public and/or private(-ly run) infrastructure projects, in least developed countries only.'[26]

Whereas FMO-A excludes straight subsidies, the LDC Fund may provide a proportion of its resources in the form of subsidies to projects and companies which either have been or will be financed by the fund. Grants are used to contribute to the development phase of projects, for instance by financing feasibility studies. They are also used to finance feasibility studies or to contribute to social projects that do not generate financial returns.

25 Strictly speaking, the latter two are not funds but a government facility and a government programme, respectively.

26 FMO note Government Funds – FMO-A of 25 July, 2007.

Moma Mine (Mozambique)

The main differences between FMO-A and the LDC Fund (as well as other government funds) are summarized in table 5.4. Projects (co-)financed from the LDC Fund generally have a higher risk profile than those (exclusively) financed by FMO-A. The LDC Infrastructure Fund accepts higher risks (such as country risks, company risks and currency risks) and more likely to assume a subordinate position (in order to catalyse other finance). Consequently, the LDC Infrastructure Fund is in a better position to catalyse investments in infrastructure in the least developed countries. An example of complementary finance is the Mtwara project in Tanzania (see chapter 7). In this case, the LDC Infrastructure Fund financed the development phase, whereas FMO-A provided senior debt. There appears to be an overlap with the Access to Energy Fund (AEF) created in 2006. The AEF also offers untied development assistance by equity financing or (subordinated) loans. However, the fund is restricted to energy, whereas the LDC Infrastructure Fund is restricted to the least developed countries.

Table 5.4 FMO-A versus LDC Fund and other Government Funds

	FMO-A	LDC Fund	AEF	MASSIF	FOM
Purpose	Miscellaneous	Improving infrastructure	Improving energy infrastructure to achieve sustainable access to energy	Strengthening the financial sector	Stimulating Dutch investments in LDCs/ emerging markets by financing local companies
Subsidies allowed	No	Yes	Yes	No	No
Higher client/ product risk allowed than FMO-A	-	Yes	Yes	Yes	Yes
Expected return	Minimum for each product; higher for higher-risk products	In line with other (private) financiers	In line with other (private) financiers	In line with other (private) financiers	In line with other (private) financiers
All FMO-A criteria apply	Yes	Not absolutely necessary*	Not absolutely necessary*	Not absolutely necessary*	Not absolutely necessary*
Subordinated position	Depends on product type	Almost standard practice	Almost standard practice	Risk capital	Risk capital, but Dutch mother company provides comfort to FMO
Local currency loan	On limited scale	May be preferred, depending on project	May be preferred, depending on project	Local currency preferred	
Public sector project	Rarely	Rarely	Rarely	Rarely	Rarely; only if government has minority stake in company

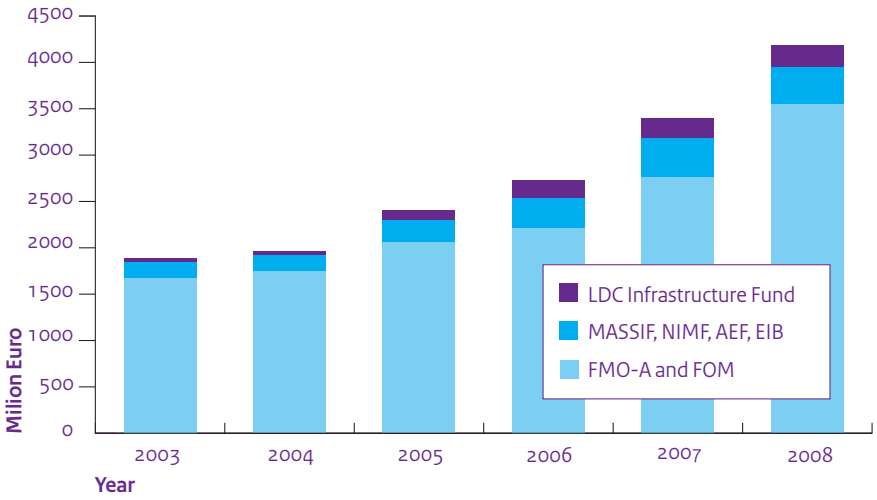
** Projects meeting all FMO-A criteria are normally financed by FMO-A. Fund criteria related to a Subsidy Decision prevail in all cases.*
Source: Elaboration based on FMO (2007).

It should be noted that differences between FMO-A and government funds are not static and that criteria need to be applied flexibly Furthermore, there are cases in which a combination is made between financing from FMO-A and the LDC Fund (or another government fund). Overlap between the funds makes the product range more flexible.

The LDC Fund in perspective of FMO's portfolio in Infrastructure

Figure 5.3 shows the total committed portfolio of all FMO funds, separately specifying FMO-A/FOM, the LDC Infrastructure Fund and the sub-total of the other government funds. It should be noted that the funds in the figure are not exactly the same as the ones referred to above and that FOM added to FMO-A. Notwithstanding these differences, it is clear that in 2007 nearly 20% of the FMO committed portfolio stemmed from government funds. The LDC Infrastructure Fund constituted 35% of the government funds in the FMO portfolio. Hence, the LDC Fund made up 7% of FMO's total committed portfolio in 2007.

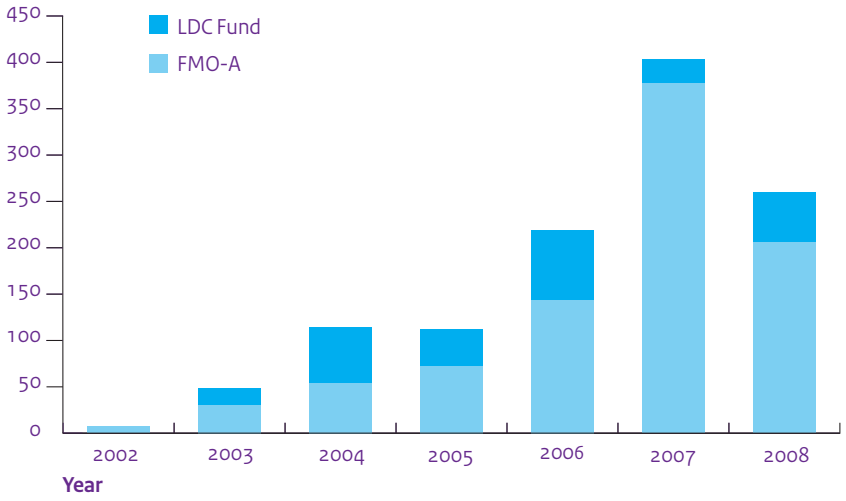
Figure 5.3 *FMO-A and FMO-managed government funds: committed portfolio (2003-2008)*



Source: Elaboration based on data provided by FMO.

The LDC Infrastructure Fund's growing share of the total portfolio points to the increasing significance of infrastructure in the FMO portfolio. Nevertheless, the significance of the Fund goes beyond this observation. When FMO adopted the LDC Fund in 2002, FMO itself was hardly involved in infrastructure finance. In 2002, total contracts amounted to no more than USD 7.4 mln. Figure 5.4 shows the strong increase in FMO's involvement in infrastructure finance, which suggests that the LDC Infrastructure Fund catalysed FMO-A investments in infrastructure.

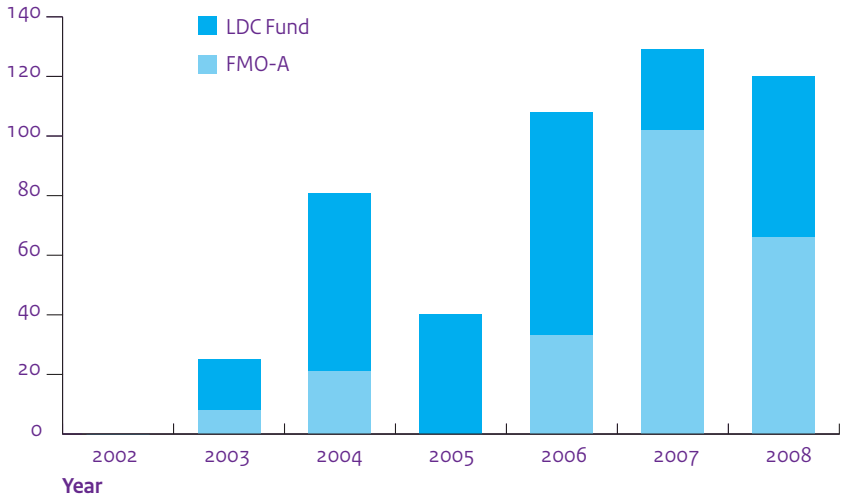
Figure 5.4 *Infrastructure contracts of the LDC Infrastructure Fund and FMO-A (2002-2008, in mln EUR)*



Source: FMO.

Not surprisingly, the share of the LDC Fund is significantly larger if the analysis is limited to the least developed countries (see figure 5.5). In more recent years, FMO is financing in LDC's from its own balance sheet in much higher percentages of the portfolio. The volatility of the shares is caused by the influence of a small number of large projects (see the previous sections). Moreover, it should be noted that FMO-A was involved as funding source together with the LDC Fund in several transactions (for instance, a mining project in 2004 in Mozambique and a telecommunications project in 2005 in Bangladesh).

Figure 5.5 *Infrastructure contracts of the LDC Infrastructure Fund and FMO-A in LDCs (2002-2008, in mln EUR)*



Source: FMO.

An important difference between the two sources is the type of financing. For the LDC Infrastructure Fund, high risk funding is much more important than for FMO-A. FMO-A was mostly involved in LDC countries through commercial loans. Between 2003 and 2008, 64% of the infrastructure contracts of the LDC Infrastructure Fund involved mezzanine or equity. For FMO-A this was no more than 9%.

Table 5.5 Distribution of infrastructure contracts in LDCs by funding type (2003-2008)

	2003	2004	2005	2006	2007	2008
LDC Infrastructure Fund						
Commercial loans	36%		41%	57%	21%	41%
Mezzanine	57%	19%	45%		79%	17%
Equity	7%	81%	14%	43%		41%
FMO-A						
Guarantee					15%	
Commercial loans	21%	100%		88%	75%	100%
Mezzanine	79%			11%	10%	
Equity				1%		

Source: FMO.

5.6 Summary and conclusions

The LDC Infrastructure Fund had a slow start in its first years (2002-2004). Disbursements were much lower than anticipated. First of all, it seems that FMO and the ministry had been overly optimistic and had underestimated the start-up problems. Moreover, it appears that initially the criteria were too strict. The broadening of the funding criteria in 2004 allowed for a more pro-active policy. The portfolio expanded rapidly in 2005, 2006 and 2007, although in 2005 a large part of the disbursements went to one single project. Nevertheless, in August 2006 DGIS stated that FMO had not realised the ambitions of the LDC Infrastructure Fund during the first half of that year. According to FMO, this was due to their more active involvement in the social sectors since 2006 (including health care and education). At the same time, the 2006 Annual Report noted that it was difficult to find suitable projects in these sectors. In the end, 2006 still turned out to be a successful year. However, by the end of 2007, FMO still had not allocated the total sum committed to the LDC Infrastructure Fund. One of the explanations is the large profits that FMO had realised with the sale of MSI/Celtel in 2005 (see chapter 7). Another explanation is that a considerable number of infrastructure projects need a long start-up period, causing disbursements to lag behind. Moreover, the large sums involved – in combination with the relatively high risks and the focus on the objectives of the project – require a thorough appraisal procedure.

In general, the projects comply (ex ante) with the criteria of the LDC Infrastructure Fund. The criteria of additionality and catalytic impact were not always met in the past (see chapter 6). One of the twelve projects analysed does not comply with a strict interpretation of the other criteria. It appears that the spending pressure in the first years, together with the time needed to develop the portfolio, contributed to the approval of projects that did not fully comply with the Fund's criteria.

The final section of this chapter presented an analysis of the position of the LDC Infrastructure Fund within the FMO product range. The main conclusion, confirmed by a comparison of the figures, was that the fund has an important function within FMO. The LDC Fund is instrumental in catalysing FMO's focus on infrastructure finance and catalysing infrastructure investments by FMO-A. The Fund promoted investments in new sectors (including water, rural electrification and housing).

6
Additionality and catalytic impact

6.1 Introduction

This chapter focuses on the additionality and catalytic impact of the LDC Infrastructure Fund. The chapter answers four of the questions raised in the Terms of Reference:

1. Does the Fund fulfil its catalysing function of enhancing the financing of infra structure projects with a high risk profile?
2. What is the relevance of grants as a catalysing component of financial instruments designed to enhance the financial feasibility of complex and risky infrastructure projects?
3. Is the funding additional to the market?
4. Which factors contribute to the success of the Fund and which factors hinder its effective utilisation?

Section 6.2 starts with a description of the financing principles, followed by a section (6.3) on the measurement of additionality and catalytic impact. Section 6.4 proceeds with the evaluation of the additionality and catalytic impact of the twelve analysed cases studies. Section 6.5 presents an assessment of the catalytic impact of grants. Section 6.6 summarises and concludes.

6.2 Financing principles

All FMO financing is bound by the 1998 Agreement between the State of the Netherlands and FMO. This agreement requires that FMO will provide financial services that are not, or insufficiently, or on unreasonable terms, provided by the market. The operational policy laid down in the 1998 Agreement is based on the following principles:

- *additionality*: providing financial services that the market does not provide, or does not provide on an adequate scale or on reasonable terms;
- *catalytic impact*: maximizing the flow of finance to FMO's target group. This requires FMO to maximize the growth in and utilization of its equity and the leverage provided by its financing activities;
- *good governance*: adherence to the principles of good governance in the widest sense. FMO sets the standard in several areas of its operations, including social policy and environmental policy.

These general principles also apply to the LDC Infrastructure Fund. The annex to the subsidy decision states that the use of the LDC Fund should not be market disruptive, but additional to local and international financial sources. The main criteria also state that it should have a catalysing function by lowering barriers for other commercial investors. Government-backed capital enables FMO to accept high risks that would not be acceptable to commercial finance providers. This encompasses the danger of unfair competition with respect to commercial financiers. Financing should neither 'crowd out' present sources of commercial finance, nor hinder the possible emergence or development of markets for investment finance. If an investment meets these conditions, one could label it *financially* additional.

Apart from financial additionality, FMO and other international organisations also identify other forms of additionality. FMO provides specialist advice and expertise at project management level to improve a venture's design or functioning. This role may be qualified as *operationally* additional. Third, FMO insists on applying corporate governance best practices, environmental policies and social responsibilities as an integral part of the finance it offers. If FMO's involvement promotes adherence to standards of corporate governance and environmental and social codes, this is qualified as *institutional* additionality.

6.3 Measuring additionality and catalytic impact

Despite international agreement that financing by DFIs must be additional, no operational definitions of the concept have been formulated. For instance, in its recent evaluation of the additionality of funding by the International Finance Corporation (IFC), the Independent Evaluation Group (IEG) of the World Bank defines the concept of additionality as 'the unique inputs and services that a development institution provides in addition to those delivered by market or nonmarket institutions' (IEG, 2008).

The concepts additionality and catalysis are difficult to narrow down to crystal-clear appraisal criteria. In finance literature, various definitions can be found, while DFIs apply an array of different interpretations.[27] Additionality and, to a lesser extent, catalytic impact hinge on the lack of commercial financing opportunities for the investment in question. In order to determine whether there would have been any opportunity, one must have full insight in all aspects of local and international capital markets. In many LDCs, the limited stock of funds available for credit and small bond markets in combination with an incipient banking system makes it highly unlikely for

27 The LDC Infrastructure Fund description of catalytic impact is not equivalent to the one used in the 1998 Agreements between the State and FMO and also deviates from the one applied in the note on the difference between the LDC Fund and FMO-A (FMO 2007). Whereas the 1998 Agreement only referred to commercial parties, the 2006 Agreement for the LDC Fund refers to all financial sources.

commercial players to be able to provide funds (see chapter 2). At the international level, it may be more difficult to determine whether no commercial parties were willing to either participate with venture capital or provide loans at reasonable conditions.

Another factor complicating the assessment of additionality and catalytic impact is that financing plans for larger infrastructure works are usually the product of complex financial engineering in which potentially interested parties work together from the start. Each of these parties has its own strategy and the 'go - no go' decision is made as a consortium. If the project initiator (sponsor), or his financial brokers and advisors, would have a preference for DFI financing, it is thinkable that the finance consortium overlooks or ignores potential commercial partners that could also be interested. On the other hand, there are many instances where FMO, or other DFIs, have actively sought the participation of commercial banks.

Additionality

Taking the restrictions mentioned above into consideration, the concept of additionality is narrowed down to financial additionality in this evaluation, in accordance to the interpretation of the original and renewed LDC Fund Agreements between the State and FMO (of 2002 and 2006, respectively). Nevertheless, where relevant, operational or institutional forms of additionality were taken into account. First of all, there are instances in which FMO's expertise is appreciated and forms a precondition for other banks to participate. In such case, expertise cannot be delinked from financial involvement. Second, the fact that investors are prepared to accept specific governance principles and social and environmental obligations may be an indication that FMO funding was additional.

Support by other DFIs can also be an indication of additionality. In cases where FMO and commercial investors co-finance the investment, the presence of commercial financiers may be an indicator that the project has sufficient appeal to commercial parties, so other commercial parties could have participated instead of a DFI. On the other hand, it is also likely that funding by a DFI triggers commercial parties to participate. If FMO's involvement is considered crucial to attract other (commercial) financiers to the project, it is said to have a catalytic impact (see below).

Taking the preceding discussion into account, the assessment of the additionality of LDC Infrastructure Fund financing was based on the following criteria:

1) the project involves a relatively high risk (political, financial, currency risk, new sector / no experience with a particular kind of project);
2) foreign direct investments in the sector and country in question are very small;
3) commercial banks are not active in the sector;

4) commercial banks are active in the sector, but cannot provide the required financing due to liquidity or regulatory constraints;
5) it proved to be difficult to find other investors for the project;
6) other investors were only prepared to participate in case of FMO involvement;
7) other DFIs are involved;
8) Involvement of the Fund has a higher risk than the investments made by other sources (for instance through subordinated loans or mezzanine finance).

Catalytic impact

The concepts of additionality and catalytic impact are closely linked. LDC Fund financing has a catalytic impact if it induces other parties to invest in the same project. This description includes commercial investors as well as other DFIs. A precondition to catalytic impact is the presence of different risk levels or different rounds of financing within the same project. The LDC Fund enables FMO to persuade other investors to participate by accepting a disproportionally large part of the total risk. By exposing itself through subordinated loans or equity participation, the LDC Fund may provide others with the comfort they need to join in with senior loans. FMO may also fund the pre-investment stages of projects (for example, by means of a grant) and subsequent initial investment stages (for example, by means of equity participation). By doing so, the initial project risk is reduced and other investors may become interested in funding the main construction stage. At a higher level of aggregation, providing incentives to the development of capital markets also falls under the concept of catalytic impact.

In order to assess catalytic impact, three main variables were taken into consideration: 1) the financing risk structure; 2) the sequence of investor involvement and 3) the financing phase. If FMO has taken a high risk position and/or is joined by other investors in later stages, its contribution is considered to have a possible catalytic impact.

The following questions were central to the evaluation of the assessment of catalytic impact:

1) Do the relevant FMO documents defend the catalytic impact FMO funding?
2) Is there evidence to support the arguments presented?
3) Is there evidence that FMO funding mobilised other investors for the project?
4) Is there evidence that FMO funding brought other investors to the country for these kinds of projects?
5) Is there other evidence of the catalytic impact of FMO funding?
6) Is there evidence that the project has had a catalytic function in raising investments for this type of project?
7) Is there reason to expect that FMO funding and/or the project will trigger investments in comparable projects in the (near) future?

Selling prepaid cards for mobile phones (Tanzania)

6.4 Assessment of additionality and catalytic impact

This section discusses the assessment of the additionality and catalytic impact of twelve case studies. Table 6.1 summarizes the assessment of the additionality and catalytic impact of each of the twelve projects. In six cases, the LDC Infrastructure Fund did not catalyse other parties to invest in the same project. Four of these projects were also not additional.

Two of the projects in which LDC funding did not have a catalytic impact and was not additional were among the first projects of the Fund. In both cases, the Fund took over existing shares or loans. In the case of Songas (Tanzania), the government of Tanzania feared that the main investor in the project would become too dominant and therefore requested this private company to sell part of its shares to a DFI. FMO's funding did not catalyse the finance of other banks.[28] The funding can also not be considered additional: a commercial party owned these shares. Funding by the LDC Infrastructure Fund was only additional in a very narrow sense: no other bank was willing to take over these shares.

28 The IMR advice of the Songas finance proposal (July 27, 2003) acknowledges that the condition that the FMO-LDC fund should have a catalytic impact on other funding of at least the same size is not met. Lack of catalytic impact is also acknowledged in the ex-post 5-year evaluation (FMO Evaluation Form 2008, Songas, date finalized: July 2, 2008).

A similar situation occurred in the second project. For this project, FMO was approached by an international commercial bank that acted as a finance arranger. It asked FMO to substitute a subordinated loan from the private parent company of an existing plant. The parent (AES) had run into trouble as a result of the ENRON crisis in 2001. At that time, the plant in question was fully operational and financial and technical operations had been fully satisfactory. For that reason, funding was not additional, even though it would have been difficult for the parent company to find commercial investors.

In the case of two other energy projects (Bengaz and Sotogaz), financing from the LDC Infrastructure Fund was not additional either, nor did it have a catalytic impact. In these cases, FMO provided loans to both companies in order to enable them to participate in the West African Pipeline Company (WAPCo). Each of the two companies had an option to buy 2% of the shares of WAPCo, but they were unable to raise the funds they needed. Other DFIs were unwilling to step in and the LDC Infrastructure Fund financed 100% of the participation of Bengaz and Sotogaz in WAPCo with loans. Funding of the other 96% of WAPCo had already been secured and the other investors had prefinanced the participation of Bengaz and Sotogaz. The construction of the gas pipelines to Benin and Togo did not depend on the participation of Bengaz and Sotogaz in the project. WAPCo had contracts with the governments in Benin and Togo and with the main client in the two countries, the Communauté Electrique du Bénin (CEB). The loans only enabled Bengaz and Sotogaz to participate in a project that would have been carried out anyway. Funding was only additional in the sense that no other bank was prepared to finance the participation of Bengaz and Sotogaz in WAPCo. FMO expects the project to have a catalysing effect in the long run, as the increased availability of gas in Benin and Togo will eventually generate spin-off investments. However, this is not necessarily an effect of the participation of Bengaz and Sotogaz in the project.

The fifth example (Roundabout Playpumps) is a project in Mozambique. This project was very successful in South Africa, which triggered others to replicate the project in Mozambique. FMO's contribution consisted of a USD 1 mln grant from the LDC Infrastructure Fund. The funding did not have a catalytic impact, because the contribution of FMO did not trigger other investors. There were other investors, another DFI (IFC) and a foundation, but their contributions did not depend on the FMO grant. According to FMO, however, the FMO contribution did have a catalytic impact, because Playpumps is currently active in nine countries with a total investment of approximately USD 20 mln. Nevertheless, the success of the project in South Africa probably played a major role in this. In Mozambique, the project was less successful.

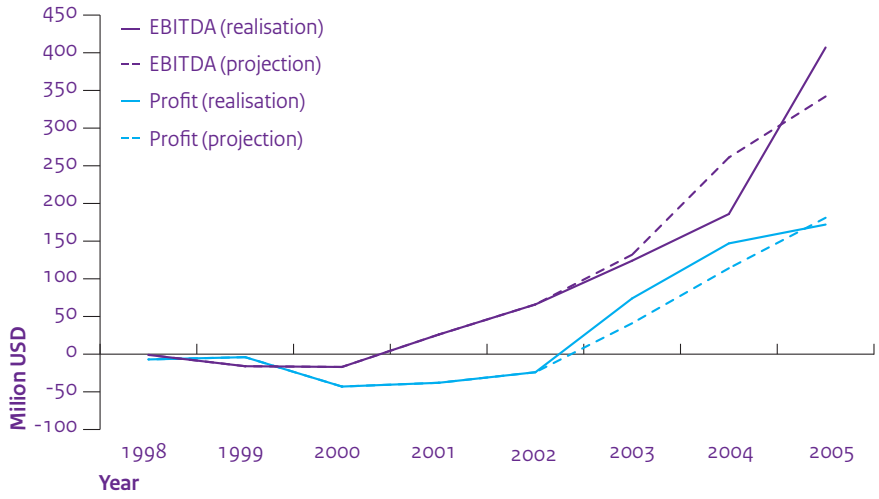
For the other cases, the assessment of the additionality and catalytic impact (with one exception) is positive. In one specific case in the telecommunications sector it is difficult to ascertain the catalytic impact. The LDC Infrastructure Fund contributed to the funding of the project together with FMO-A and DEG. According to FMO, the

Table 6.1 Summary of additionality and catalytic impact of 12 evaluated projects

Project	Country	Sector	Year of approval	Type	Funding (x 1 mln)	Catalytic impact	Additionality	Remarks
AES Haripur Private Ltd	Bangladesh	Energy	2002	Subordinated loan	USD 10	0	0	Refinancing
Songas	Tanzania	Energy	2003	Equity	EUR 13.5	0	0	Refinancing
MSI/Celtel	Tanzania	Telecom	2003	Equity	USD 15	+	+	
Kenmare-Moma	Mozambique	Mining	2004	Subordinated loan & Equity	EUR 7.1 + USD 14	+	+	
Roundabout Playpumps	Mozambique	Water	2005	Grant	USD 1	0	+	
Bengaz	Benin	Energy	2005	Loan	USD 21.9	0	0	100% funding
Sotogaz	Togo	Energy	2005	Loan	USD 22.3	0	0	100% funding
TM International Bangladesh	Bangladesh	Telecom	2005	Subordinated loan	EUR 18	0 / +	+	
Artumas	Tanzania	Energy	2006	Convertible grant & equity	USD 29.8	+	+	
Al Manara Water Company	Sudan	Water	2006	Subordinated loan	EUR 23.7	+	+	
Grown energy	Tanzania	Bio-energy	2006	Convertible grant	EUR 3.5	+	+	
World Wide Recycling	Bangladesh	Waste disposal	2007	Equity & subordinated loan	EUR 5.8	+	+	

subordinated loan from the LDC Infrastructure Fund was decisive for the participation of DEG. Additionality is not always obvious, either. The contributions made to the telecommunications sector are striking examples. The literature confirms that telecommunications is a highly profitable sector. In 2001, the ministry had already concluded that the new infrastructure fund was to be additional to existing funds that focus on the most profitable sectors. The telecommunications sector was explicitly mentioned as one of these more profitable sectors. Contrary to this conclusion, telecommunications was chosen as one of the eligible sectors. One of the first investments the LDC Infrastructure Fund made in the telecommunications sector was participation in MSI/Celtel. In 2002 and 2003, MSI/Celtel had tried to raise funds to finance a necessary capacity expansion, but failed due to high-risk perceptions of the African telecommunication market and depressed world credit markets. Moreover, by that time Celtel's financial position contributed to the hesitations of other investors. FMO had worked with MSI/Celtel before and provided loans to the company in 2001 and in 2002. The catalytic impact of the 2003 FMO-LDC funding is confirmed by the USD 40 mln investment from a commercial bank in December 2003, shortly following the FMO equity participation. After 2005, the African market accelerated, but it is unlikely that anyone could have anticipated this exponential growth.

Figure 6.1 *Net profits and EBITDA of MSI-CI/Celtel International holding*



Source: FMO, Finance proposal August 15, 2003, annexe 10 and data supplied by FMO on request.

Like MSI/Celtel, Telekom Malaysia International (Bangladesh) Limited (TMIB) wanted to scale up its activities. Company risks were low, but country and currency risks were considered high. Compared with other Asian countries, the telecommunications market developed slowly in Bangladesh. FMO arranged the financing in association

with an international commercial bank. Of the total USD 372 mln, 13% (USD 48 mln) was contributed by DFIs. FMO-LDC financed 4.8% with a subordinated local currency loan, FMO-A and the other DFI each financed 4% in senior loans. By providing a subordinated loan in local currency FMO-LDC, accepted the biggest risks; it is unlikely that any commercial player would have been willing to do this.[29] It would have been impossible for local commercial banks to provide local currency financing of a similar total amount at such a long tenor. Local banks could not have received the required approvals. Nevertheless, this case does not give indications that the LDC loan actually catalysed the contributions of other investors.

The loans of the LDC Infrastructure Fund for a drinking water treatment plant in Omdurman (Khartoum) in Sudan are an example of a case where catalytic impact and additionality are beyond any doubt. The country's political situation is hostile to foreign direct investment. Returns on investments are highly uncertain and investments therefore require high margins. The country ranks 162 on the Institutional Investor list (of 172 countries), comparable with countries such as Ivory Coast and Congo. The history of the project confirms that it is difficult to obtain funding for these kinds of projects in Sudan. The role of FMO was necessary to get other banks (a DFI and a commercial bank) on board. The subordinated loan from the LDC Infrastructure Fund was additional and had a catalytic impact: without the LDC loan, the project would not have been financed and other banks would not have stepped in. With private finance – if possible at all – the price of potable water would have become prohibitive for a large part of the population in Omdurman. The project therefore needed additional finance from other sources. FMO contributed a crucial 51% of the necessary financing through an ORET grant and a subordinated loan from the LDC Fund.

For the four remaining cases, the assessment of the additionality and catalytic impact is (also) positive. In these cases, the LDC Infrastructure Fund participated in greenfield activities. First of these was an activity (titanium mine) carried out by a junior company in a market with volatile prices (Kenmare-Moma in Mozambique). The project was financed with a mixture of DFI loans and private equity. LDC funding formed part of a broad-based financing plan to attract equity capital from the main sponsors and raise capital at the London and Dublin stock exchanges. Several DFIs (including FMO) provided loans. ABSA was the only commercial partner in a group of DFIs. FMO contributed approximately 7% of the loans and purchased approximately 6% of the shares. The subordinated loan from the LDC Infrastructure Fund lowered the threshold for another DFI. In conclusion: the FMO contribution was additional and had a catalytic impact.
A second example of the funding of a greenfield activity is the contribution made to a gas-to-power project in the southeast of Tanzania (Mtwara). The project included the realisation of gas production facilities and the construction of a pipeline and power

29 Other shareholders have expressed the view that replacing FMO's contribution with commercial financing would have been possible but would also have been more expensive. This suggestion could not be checked.

generation facilities. Initially, risks for this project were high, since the activity was undertaken by a junior company (Artumas). In order to become profitable, the project either needed a large power generation plant or the export of a substantial part of the gas. For both options, the role of the government of Tanzania was critical. Thus, the project's political risks were substantial, which scared off most commercial parties and consequently increased the role of government-owned DFIs such as FMO. Local circumstances raised operational risks and the currency risk was significant as well. The LDC Infrastructure Fund provided a convertible grant at the start of the project (2004) to cover 20% of the projected development costs. Two other DFIs covered another 45% of these costs.[30]

The Grown Energy project in Mozambique, a bio-ethanol project, is the third example of a junior company financing a greenfield activity. The project owner went to great lengths to obtain commercial and DFI financing, but with limited success due to the large uncertainties involved. Several investors dropped out during the initial stages. Currently, the project is still in its developing stage. FMO has provided convertible grants for different feasibility studies. A large private company has been found willing to finance 51% of the necessary equity capital with FMO purchasing 20%. An additional investor still needs to be found to cover the remaining 19%.[31]

The fourth example of the funding of a greenfield activity involves the construction and operation of large-scale facilities for composting organic waste near Dhaka, Bangladesh. The project is financed by commercial investors and DFIs. The holding company (World Wide Recycling) provided a large share of the equity required. FMO and another DFI purchased minority shares in equity and provided subordinated loans. In addition, FMO convinced a local bank to provide a senior loan for this project.[32] FMO contributed EUR 5.8 mln of the required total of EUR 12 mln. The funding of these projects was additional and catalysed funding by other sources.

6.5 The relevance of grants

Grants are intended for a) projects that would normally be covered by the public sector but cannot be taken up due to a shortage of funds, b) non-commercial elements of projects that are financed by FMO, or c) the development and/or feasibility stage of infrastructure projects that in principle qualify for financing from the Fund. These grants may also be allocated to one-time investments that are not expected to contribute to the project's profitability. Grants are normally linked to debt or equity financing.

30 In 2006 and 2007, FMO purchased additional equity shares when the project expanded into new fields. Artumas was also able to raise funds from commercials sources, but not enough to bring the project to full commercialization.

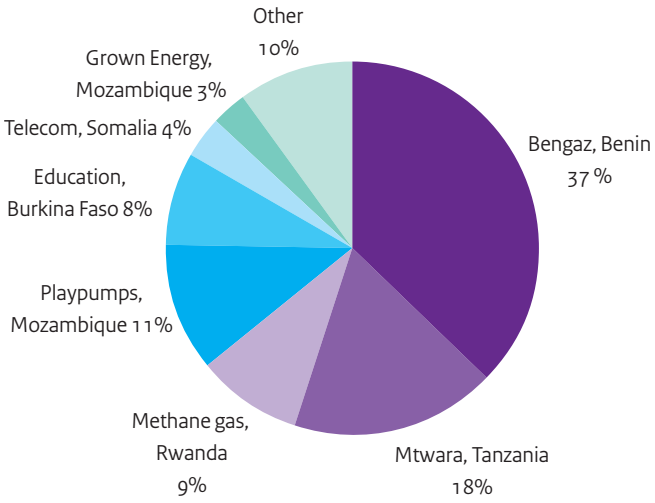
31 The entrepreneur and his advisor will receive free equity for 5% each.

32 FMO and the local bank have a history together. FMO was one of the founders of this bank and a 34% shareholder before its position was scaled back to less than 1%. This relation enhances FMO's catalytic role.

Figure 6.2 shows the distribution of all grants disbursed until the end of 2007. Convertible grants constituted 68% of the total amount disbursed until the end of 2007. FMO provided grants in four of the twelve cases studied in the context of this evaluation: the Roundabout Playpumps in Mozambique, the Mtwara (gas) and Grown Energy (bio-ethanol) projects in Mozambique and the grant to Bengaz. Of these four projects, the grants for three projects were linked to further investments. The only exception was Roundabout Playpumps. The (convertible) grants to Artumas (Mtwara) and Grown Energy played an important catalytic role in the development and financing of the two (greenfield) projects.

It is too early to assess the effects of the grant for Bengaz. This grant was provided to finance a feasibility study for a power plant. The LDC Infrastructure Fund provided a (convertible) grant of EUR 3 mln to Bengaz for the development of a power plant in Benin. The grant is not directly linked to the (previous) loans that enabled the company to participate in the West African Pipeline Company. Its main objective is to finance the development of a power plant in Benin.

Figure 6.2 *Grants (disbursements 2003-2007)*



Source: Calculation based on data provided by FMO.

The LDC Infrastructure Fund's annual reports provide information on the convertible grants and the new disbursements but they do not substantiate their grant information by details. More information is needed in order to be able to understand the assignment criteria, especially as grants may develop into large projects.

6.6 Summary and conclusions

This chapter assessed the additionality and catalytic impact of the LDC Infrastructure Fund. Four questions guided the analysis:

1) Does the Fund fulfil its catalysing function of enhancing the financing of infra structure projects with a high risk profile?
2) What is the relevance of grants as a catalysing component of financial instruments designed to enhance the financial feasibility of complex and risky infrastructure projects?
3) Is the funding additional to the market?
4) Which factors contribute to the success of the Fund and which factors hinder its effective utilisation?

The evaluation was based on an assessment of twelve projects in six countries (Bangladesh, Mozambique, Tanzania, Benin, Togo and Sudan).

The chapter's overall conclusion is that the Fund has not always fulfilled its catalysing function of promoting the financing of high-risk infrastructure projects. No catalytic impact was established for five of the 12 projects. Four of these were projects that were already running when FMO got involved. Two projects, in 2002 and in 2003, concerned the refinancing of existing funding (AES Haripur and Songas). In 2005, FMO funded 100% of the participations of Sotogaz and Bengaz (2% each) in the West African Pipeline Company. In this case, funding did not achieve catalytic impact, either. The grant for the Roundabout Playpumps in Mozambique was also unsuccessful in catalysing other (commercial) investors. FMO claims that its funding of Roundabout Playpumps in 2005 did have a catalysing impact on investments in other countries. Nevertheless, it is difficult to substantiate this claim. It is more likely that it was the successful introduction of Playpumps in South Africa that made other parties interested.

In the other six cases, funding catalysed contributions of other parties. In each of these projects, FMO joined the financing procedure at an early phase. This gave FMO a better chance of making a catalytic impact by using its development financing network to attract additional investors. The fact that its funding structure allows FMO to accept high risks greatly facilitated these efforts. Four of the successful cases were greenfield activities, most involving cooperation with junior partners. In these instances, grants proved of particular importance as the examples of Mtwara (energy) and Grown Energy (bio-ethanol) show. The grants were used for feasibility studies and other development costs and significantly contributed to the viability of the projects.

Even more important than the question of catalytic impact is the question of additionality. Projects with a catalytic impact are by definition additional, but projects may also be additional without having a catalysing impact. Additionality basically

refers to the question whether the market would have funded a particular project at reasonable rates if a DFI had not made a (subordinated) contribution.

Four projects were not additional. First of all (again) the two projects refinanced in 2002 and 2003: these were only additional in the sense that commercial banks (or even DFIs) were unwilling to take over these loans and shares. However, the LDC Fund did not contribute to the realisation of these projects and therefore funding was not additional. For the same reasons, funding of Bengaz and Sotogaz was not additional, either.

Evidence suggests that during the first years FMO struggled with the additionality of projects funded by the LDC Infrastructure Fund. Each of the four cases in which the financing of the Fund was not additional and had no catalytic impact were approved at a moment when investment officers were eagerly looking for investment opportunities for the Fund. LDC Financing not only helped four companies (two of them foreign), but also contributed to the development of the Fund's portfolio. Disbursements to AES Haripur and Songas were among the Fund's first major payments. The financing of Bengaz and Sotogaz in 2005 constituted 60% of the disbursements of that year. These projects were approved when spending pressure was high.

Since 2006, all projects have been additional. In some cases (Artumas, Al Manara Water Company, Grown Energy, World Wide Recycling) this additionality is more obvious than in others (TMIB). The cases in which additionality of LDC funding was most significant include all junior companies, all greenfield activities, all but one starting phase projects and those cases involving relatively high product, construction, and operating risks. A comparison of between the conclusions on catalytic impact and those on additionality shows that in four of the five cases where FMO financing did not have a catalytic impact, funding was not additional, either. In these cases, the LDC Infrastructure Fund had no development impact because it did not contribute to the realisation of the project.

Evidence suggests that spending pressure can be an incentive for investing in projects that can be realised relatively easily. In general, new infrastructure projects need a significant amount of time to mature and this is one of the main causes for relatively low expenditure levels during the first years. In several annual reports of the LDC Infrastructure Fund, FMO stresses that delays and cancellations of unpredictable infrastructure transactions have a major impact on final production. Hence, management fees, which focus on new disbursements and grants, may give the wrong incentives.[33]

33 The subsidy decision of March 31, 2006 specifies the following management fee: a compensation of 1.2% of the total portfolio, a compensation of 2.6% on new disbursements and a compensation of 19% of the value of new grants.

7
Assessment of development impact

7.1 Introduction

This chapter assesses the development impact of projects that are funded by the LDC Infrastructure Fund. The evaluation is guided by the following questions:

1) What impact does the Fund have on the development of (private) infrastructure projects and on the strengthening of infrastructure services in LDCs?
2) What impact have investments financed through the Fund on economic develop ment and poverty reduction in LDCs?

The evaluation presented in this chapter is based on an assessment of ten projects:

- *Energy*: AES Haripur (Bangladesh), Songas (Tanzania), Artumas (Tanzania), Bengaz (Benin) and Sotogaz (Togo);
- *Water*: Al Manara Water Company (Sudan) and Roundabout Playpumps (Mozambique);
- *Telecommunications*: MSI/Celtel (Africa) and TMIB (Bangladesh);
- *Immobile Infrastructure*: Kenmare-Moma in Mozambique.

For two of the cases studies analysed in the context of this evaluation (Grown Energy and World Wide Recycling), it is too early to be able to assess their development impact.

The next sections present an assessment of the impact of five energy projects (section 7.2), two water projects (section 7.3), two telecommunications projects (section 7.4) and a mining project (section 7.5), all financed (partly) by the LDC Infrastructure Fund. Section 7.6 discusses the way FMO measures these effects. The chapter ends with a summary and a number of conclusions.

7.2 Energy

The evaluation of the LDC Infrastructure Fund includes three similar gas-to-power-to-consumer projects (one in Bangladesh and two in Tanzania) and two gas transport projects (Benin and Togo).

In 2003, a World Bank report concluded that the power supply in Bangladesh was notoriously unreliable and that power outages were common. According to the same report, access to reliable power is a prime concern for most manufacturing firms.[34] Only 4% of enterprises did not experience problems. Firms reported that they were

34 World Bank, Improving the Investment Climate in Bangladesh; An Investment Climate Assessment based on an Enterprise Survey Carried Out by the Bangladesh Enterprise Institute and the World Bank, Washington DC, 2003, pp 13-15.

confronted with power outages and surges about 250 days a year on average – many of them facing problems each day of operation. On average, they lost more than 3% of production as a result of problems in the electricity grid. A large proportion (72%) of enterprises had to rely on costly generators. The AES-Haripur project for a 360 MW natural gas-fired power plant close to Dhaka, Bangladesh increased generation capacity by nearly 10% and improved the reliability of supply. The plant provides approximately 5 to 10 million people in Dhaka with highly reliable and low-cost power. When the AES Haripur power plant was completed in December 2001, it was considered one of the lowest-cost energy producers in the world. Financial and technical operations have since been fully satisfactory.

Two other energy projects are situated in Tanzania. In Tanzania, households are highly underserved with power and their total consumption of energy is dominated by the use of fuel wood and charcoal from both natural forest and plantations. Only three quarters of the country (mainly urban areas) is connected to the national grid. The Songas project is the first of the two projects that tried to improve this situation. This is a natural gas-to-power project that came into development by the end of the 1990s. Natural gas is pumped from the Songo Songo Island gas field, processed on the island and transported through a pipeline to Dar es Salaam. There, a 180 MW power plant converts gas into electricity. This Ubungo plant (Songas) produces approximately 20% of the total power fed to the grid. The Songas project first produced gas in 2004. The second project in Tanzania is Mtwara/Artumas in the Southeast of the country. The project created gas production facilities at Msimbati Peninsula and an 11.4 MW power plant at Mtwara town. Power supplies to Mtwara town and Lindi amounted to 20,400 MWh in 2007 and 29,300 MWh in 2008. It is expected that eventually the *Artumas* project in Tanzania will connect more than 45,000 households, an increase of 7%. The two gas-to-power projects contribute to a reduction of energy prices and a more reliable energy supply. It is estimated that in 2006 Songas saved the Tanzanian economy approximately USD 90 million as compared to diesel oil fuelled electricity generation. Gas consumption by industrial consumers is growing fast, both in quantity and value. The number of industrial users has doubled between 2004 and 2007. Figures on revenues are scarce: in 2006 revenues were approximately USD 30 mln, a large and fast-growing part of which came from industrial users. The Mtwara project in Tanzania created approximately 3,000 jobs.

The following energy projects are FMO's contributions to Bengaz and Sotogaz, enabling them to participate in the West African Pipeline Company (WAPCo). This company is responsible for the construction and operation of the West African Gas Pipeline Project (WAGP). The project was set up to deliver gas from Nigeria to Benin, Togo and Ghana through a pipeline. The pipeline is to improve the competitiveness of the energy sectors in these four countries by promoting the use of cheaper and environmentally cleaner gas from Nigeria for power generation and other industrial and commercial

use as well as diversify energy supply sources.[35] Benin and Togo almost completely (for 80%) depend on Ghana and Côte d'Ivoire for their electricity, while these countries are themselves struggling to maintain supply. Load shedding (a deliberate temporary restriction of power supply in regions or towns for a number of hours per day) and outages are common but devastating for most industrial processes. The gas supply to the two countries will ultimately be more than enough to allow for the conversion and relocation of two existing 25 MW power stations as well as the addition of two net 25 MW power stations (with a possibility to increase total supply to 100 MW). The pipeline became operational by the end of 2008.

The five projects provide cheap and efficient fuel to the consuming countries, lowering their cost of power and thus promoting economic development and improving the competitiveness of goods and services. Bangladesh and Tanzania are able to use their indigenous natural resource (gas) to produce highly demanded electricity. The use of gas also translates into savings in the country's foreign currency reserves, because the other fuel used to produce power is oil, which must be imported and paid in USD. The project's main benefits for Benin and Togo will be the sharp reduction in energy costs, diversification of energy sources, lower dependence on the import of energy from Ghana and Côte d'Ivoire and improved reliability and stability of the energy provision. Based on the WAPCo report, the World Bank calculated savings for the Communauté Electrique du Bénin (CEB) ranging from USD 96 mln in the low demand scenario and USD 108 mln in the high demand scenario (present value).[36] Lower energy costs also imply savings on foreign exchange and therefore an improvement of the balance of payments. It is estimated that for Benin and Togo gas supplied through the West African Gas Pipeline is competitive as long as oil is above USD 17 per bbl. For the West African Gas Pipeline project, more than 30% of the total projects cost during construction went to local constructors. During operations, WAPCO will employ 50 people. Bengaz and Sotogaz will remain small companies and therefore will also not generate much employment. Indirect employment effects will be substantially larger.

Distribution of power to *households* (power-to-consumer) has a wide range of impacts at the level of communities, households and individuals. A study in Bangladesh (Human Development Research Centre / NRECA International Ltd, 2002) revealed that electrified households show higher income, expenditure, food consumption and health care expenditure than non-electrified households. Part of the income of electrified households can be attributed to their access to electricity. The *education benefit* of electrification is substantial: children in electrified households have higher education

35 Project Appraisal Document on a Proposed IDA Political Risk Guarantee in the Amount of USD 50 Million for Ghana and a Proposed MIGA Guarantee in the Amount of USD 75 Million for Sponsors Equity to the West African Gas Pipeline Company Limited for the West African Gas Pipeline Project, November 2, 2004, p. 10.

36 World Bank Project Appraisal, November 2, 2004, p. 102. It should be noted that the calculations are based on a comparison with relatively expensive and inefficient plants in Cotonou and Lomé.

Haripur Power Plant in Dhaka (Bangladesh)

levels than those without electricity, even if factors such as parental education and income are taken into account. This may be explained by better teaching, as there is some evidence (Ghana) that availability of electricity makes rural positions more attractive to teachers. The significant direct impact in several countries can also be due to the increase in reading and studying hours as a result of illumination. More time-use data is required to confirm these conclusions. Electrification also improves the likelihood that a child stays in school due to its mother's knowledge and education.

Knowledge on health issues, treatment by medically competent persons and natal care are better in those households that have access to electricity. Electricity improves *health and family planning* knowledge as it implies better access to TV. The use of hygienic latrines and soap is higher in electrified households. A health impact evaluation in Bangladesh showed that electrification has a significant and direct impact on mortality.[37] Electrified households also engage more frequently and more efficiently in home businesses compared to non-electrified households.

A World Bank study (2008) shows that the willingness to pay for electricity is generally high and exceeds the long-term marginal costs of supply. However, high connection charges often hinder access to electricity, in some cases causing 20-25% of the households to remain unconnected. The main reasons for this result are absence of

37 IEG Impact Evaluation Series, 2005.

credit markets, lack of supporting credit facilities to customers in most projects and the impossibility to spread payments for the connection charge over a number of years. So far, the West African Gas Pipeline (WAGP) has had a negative effect on the poorest groups in Nigeria. In 2008, a World Bank Inspection Panel concluded that the implementation of the project in Nigeria had serious shortcomings. Populations that were forced to resettle (involuntarily) were not properly compensated.

The five energy projects have significant effects on the environment. In the context of the Mtwara/Artumas project, all outdated diesel-fired power supply facilities were dismantled. The transfer to natural gas-fired power generation reduced CO_2 emissions with 5.5 MT in 2006 and 7.9 MT in 2007. A World Bank project appraisal of the AES Haripur power plant estimated that if the Haripur plant were to replace all outdated power plants, annual reduction in CO_2 emission would amount to 1,568,000 MT per year. If the old power plants were to continue at half the 2000 level, this would still mean a net Co_2 reduction of 784,000 MT per year. It is argued that by facilitating a fuel switch, the WAGP project in West Africa helps to reduce greenhouse gas emissions, both by substituting oil by gas and by using associated gas that would otherwise be flared. Whereas the former argument is very valid, it appears that the latter was a selling point. The argument of effective use of associated gas is gradually losing weight. In 2008, a World Bank Inspection Panel observed that the documents on gas flaring that were produced in the context of this project were actually imprecise and overestimated the benefits.

7.3 Water

Access to clean drinking water is essential to addressing a wide range of health, education, gender and economic issues. More than 450 million people in Africa do not have access to clean water (WHO, 2005), whereas 40 billion work hours are lost in Africa every year to the need to fetch drinking water. The introduction of safe drinking water facilities is therefore highly relevant. The evaluation of the LDC Infrastructure Fund includes two entirely different projects in the water sector. The first project involves the provision of safe drinking water in rural areas in the southern part of Mozambique. According to the World Bank, approximately 37% (2004) of Mozambique's total population of 18 million has access to safe water. In rural areas, this was merely 26%. An alarming 54% of the rural population even lacked access to a well to fetch water. In 2005, FMO granted USD 1 mln for 61 'Roundabout Playpumps', to be installed at primary schools. These Playpumps couple a low-maintenance pump with a roundabout (or 'merry-go-round') children can play on. As the roundabout rotates, water gets pumped from a borehole into a 2,500 litre water storage tank. An additional ingenious idea of the constructor was to use the four sides of the storage tank for advertisements, with two sides for consumer advertising and the other two for health and educational messages. The revenues of the advertisements can be used for maintenance of the pumps.

An evaluation of the Roundabout Playpumps in Mozambique shows that the outputs of the project are below expectations (Erpf and Obiols, 2008). First of all, fewer pumps were installed than envisaged, due to higher installation and material costs. The FMO grant was planned to finance 61 pumps but in the end only 49 were installed. In terms of capacity, the output was also less than envisaged, due to various reasons (in 17% of the cases the pumps were too heavy to be handled by children, a third produced too little water and in over 20% of the cases the Playpumps installed replaced existing capacity). Actually, approximately half of the pumps functioned well. Maintenance showed serious flaws, however, as expressed by long down-times (60-100 days) before repair. Only half of the pumps worked well. 30% produced insufficient water to satisfy local needs. Demand for advertisement space is low. Only 22% of the Playpumps contain commercial advertisements. In addition, requesting for maintenance is problematic in rural areas in Mozambique. The survey conducted by Erpf and Obiols (2008) indicates that water quality was not checked prior to installation (pH measurement, chemical composition) for any of the Playpumps analysed. Approximately 39% of the pumps produced water that was reddish ('rusty water'), whereas pumps produced water with a bad smell (rotten eggs) in a quarter of the cases. In a quarter of the cases the water had high sand contents, not only affecting taste but also resulting in early wear and tear of the installation. Moreover, adult women felt embarrassed to use the Playpumps and preferred the traditional pumps. At village level the Playpump became a gathering place for adolescent youth, who not always moved aside for the women coming to fetch water. Erpf and Obiols describe cases of women who fetched water from unsafe sources at longer distances rather than using the Playpumps.

Nevertheless, it goes without saying that the installation of pumps is important for the water supply in rural areas in Mozambique. The Playpumps have a capacity of approximately 9,000 litres (based on 12 hours of operation per day). Effective use is likely to be lower. Installations at primary schools are usually operated for 5-6 hours a day, leading to an effective use of approximately 4,000 litres per day. Assuming that all pumps procured through the LDC Fund were installed at schools, and taking into consideration that 12% was permanently out of order, the 49 Playpumps provide approximately 172,000 litres per day. If every pupil uses 5 litres per day, this quantity is enough for 34,000 pupils.

The second project is entirely different. It involves a loan for the construction of a large (2,000,000 m^3 water per day) drinking water treatment plant in Omdurman, one of the three cities of Greater Khartoum. Sudan faces water shortages in rural as well as urban areas. There is a deficit in water supply for Khartoum as a whole, but it is particularly acute for the poorest households in North Omdurman. Many households are not connected to the piped water system (estimates ranging from 40%-60%), whereas other households do not have access to piped water during a large part of the day. These households depend on boreholes and supplies from water vendors who charge prices that range up to five to ten times the regular water price. Water from these boreholes is of poor quality and does not meet international standards.

Construction of the Drinking Water Treatment Plant in Omdurman (Sudan)

The new plant will directly improve access to clean and affordable drinking water for approximately two million people. The project proceeds as planned and it is expected that the construction will be completed by January 2010. The construction involves proven technology and time-tested low-tech processes and does not rely on high-tech technology or the use of mechanical parts (as far as possible). As a result, maintenance will not be demanding and this, in addition to the training of Khartoum State Water Company (KSWC) personnel, enhances the sustainability of the water supply. The project employs 300-350 people during the construction of the drinking water treatment plant (DWTP) and around 70 once the plant is in operation. The project works with local subcontractors and only employs only a few (three to five) expats. The construction of the DTWP has a positive effect on the experience of local subcontractors. This experience not only consists of technical skills but also to safety and health standards at the construction site. Moreover, the constructor (Biwater) trains the Khartoum State Water Company (KSWC) personnel. This (public) company will take over the operation of the pant once the loans have been repaid (in approximately ten years). Capacity building in the context of this project is also achieved through the Water Asset Management Programme (WAM), which seeks to reduce the amount non-revenue water. This programme includes a distribution network designed to ensure the optimum distribution of the water produced at the treatment plant through information gathering, creation of network models and a geographic information system (GIS), leakage control and pressure management.

The new plant will not be completely additional, as it also replaces existing boreholes. These boreholes are expensive to operate and relatively unreliable. Not only is the quality of the boreholes low, they also have negative environmental effects. Part of the new capacity will be needed to cope with the fast growth of the Omdurman population. It is expected that within a number of years, the population will have increased by 25%-30% and that the demand for drinking water will grow proportionally. Overall, a substantial part of the new supply (approximately 65%-70%) will be needed to respond to increasing demand. KSWC is currently realising 250,000 new connections, especially in new residential areas. A point of concern is that the Khartoum State Water Company applies fixed rates for water consumption. These fixed rates will lead to inefficient use of the new water supply.

The new plant will have a large effect on the total water supply and consumption. Simulations (see annex VII) suggest that the new plant will raise water consumption by 25%-30%. The effects of this improved supply will be largest for the poorest groups without a connection to the network. These people (approximately 35%-40% of the households in North Omdurman) have an income below USD 200 per month. They live in mud houses with one or two rooms. Many of them are migrants coming from Western Sudan. They do not have formal jobs but are unemployed or work in the informal sector. According to the estimates, these households (with an average of 6-7 members) without a connection to the network consume an average of 200 litres per day, or approximately 30 litres per person per day. This is considerably less than the minimum consumption rate of 75 litres per day. They are forced to buy an average of 70%-75% of their water from vendors at high prices. Due to the new plant, their consumption may increase by 50%-100%. As a result of increased supply, households no longer rely on water supplied by vendors thus spending less on water. The poorest groups, who are not connected to the network, are most likely to profit most, although many of them did not buy much water from vendors in the first place (Edge, 2007). If they were billed, this would have a negative impact on their other expenditures.

Approximately 40%-45% of the poorest households will benefit from the new situation; costs will be higher for 25% of them. Overall, about 15%-20% of the households will have to pay more (as a result of the improved billing system and their connection to the network), whereas water expenditures will decrease for 35% of the households. For part of the poorest population in Omdurman, the costs of improved water facilities may be too high. This means that they will continue to use (unsafe) secondary sources. In the short run, the costs of water will increase for almost 30% of the poorest households. Many of these households (72%) are not connected to the drinking water system. For 8%, expenditures will rise to more than 10% of their income.

One of the main effects of the improved water supply is improved health. The impact literature mainly focuses on diarrhoea and more severe diseases with diarrhoeal symptoms (such as cholera and typhoid) (IEG, 2008; WHO 2008), which lead to

dehydration and malnutrition. The World Health Organisation concluded that improvement of water supply may reduce the incidence of diarrhoeal diseases by 25%. Lack of water has even more detrimental effects than low quality. Mozambique has one of the highest mortality rates in the region. According to UNICEF (2004), 246 out of every 1,000 children born in Mozambique die within the first five years. Thirteen percent of these deaths are attributable to a lack of clean water, proper sanitation and poor hygiene practices. According to the same study, 55 children die every day from diarrhoea caused by drinking dirty or contaminated water.[38] In Sudan, approximately 11% of all deaths are caused by water-related diseases, most notably diarrhoeal diseases. Approximately 20,000 people die from diarrhoea each year. Another 9,000 people die from the effects of malnutrition. In 2006, a total of more than 2,000 cases of acute watery diarrhoea, including 77 deaths, were reported in northern Sudan within a period of two months. Approximately 35% of these cases occurred in the Khartoum State. In all, 37% of admissions to the four local hospitals are for acute diarrhoea diseases.

If this health situation is to be improved, it is first of all required that water quality and quantity are guaranteed. This is not the case with the Roundabout Playpumps in Mozambique. In Omdurman in Sudan, the greatest risks are caused by existing boreholes. New supplies will replace the worst functioning and most polluted boreholes and thus improve the health situation. Biwater has operated the drinking water treatment plant for ten years and guarantees the quality of the water. Moreover, the company trains KSWC personnel to take over the plant after these first ten years. Training these personnel to maintain the network and inform the public is an important aspect of the Water Asset Management Programme (WAM). Moreover, KSWC plans to replace old pipelines, which will reduce contamination risks during transport. Health effects will be increased if coupled with training. In Mozambique, social advertisements on the billboards are expected raise awareness of health issues (including HIV/AIDS), but the programme does not include hygiene training. In Omdurman, this kind of training is included in the programme. Overall, it is to be expected that the project's health effects are larger in Sudan than in Mozambique: the increase in supply is larger, water quality controls are better and the programme is coupled with hygiene training.

7.4 Telecommunications

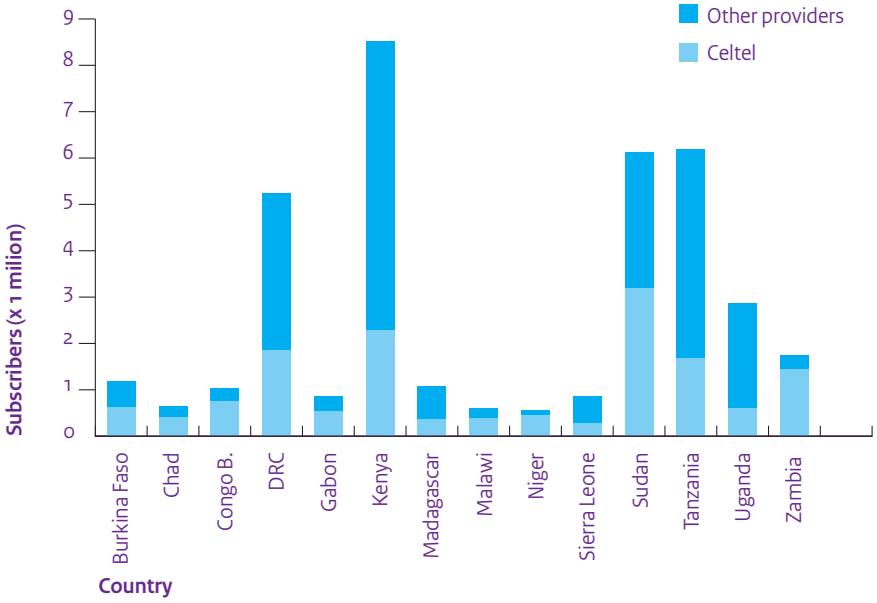
Telecommunications is one of the main investment sectors of the LDC Infrastructure Fund. The evaluation includes two of the main projects within the telecommunications sector: MSI/Celtel and Telekom Malaysia International (Bangladesh) Limited (TMIB). MSI/Celtel is one of FMO's success stories. The company, with headquarters in the

38 Of all cases of diarrhea worldwide, 88 percent is attributable to unsafe water, inadequate sanitation or insufficient hygiene. WHO: Safer water, better health, 2008.

Netherlands, was established in 1998 by Mo Ibrahim to engage in the supply of mobile telephone services in Africa. FMO closed its first transaction with the Celtel group in 2000/2001, when the organisation provided a loan to companies of Celtel in Zambia and the Congo.[39] In 2003, FMO-LDC provided USD 15 mln in equity capital to support the financing of the expansion and upgrading of existing networks in the Democratic Republic of the Congo, Uganda, Tanzania and Burkina Faso. In Africa, MSI/Celtel obtained licenses at an early stage of development of the African mobile phone industry.

Within several years after start-up, the company had installed, and was operating, mobile phone networks in 12 countries. The total number of MSI/Celtel subscriptions reached 15 million in 2007. In the majority of countries where MSI/Celtel operates, there are either two or three major mobile operators with MSI/Celtel ranking first or second.

Figure 7.1 *Market shares in African mobile telecommunications (subscriptions)*



Source: Africa Mobile Factbook 2008.

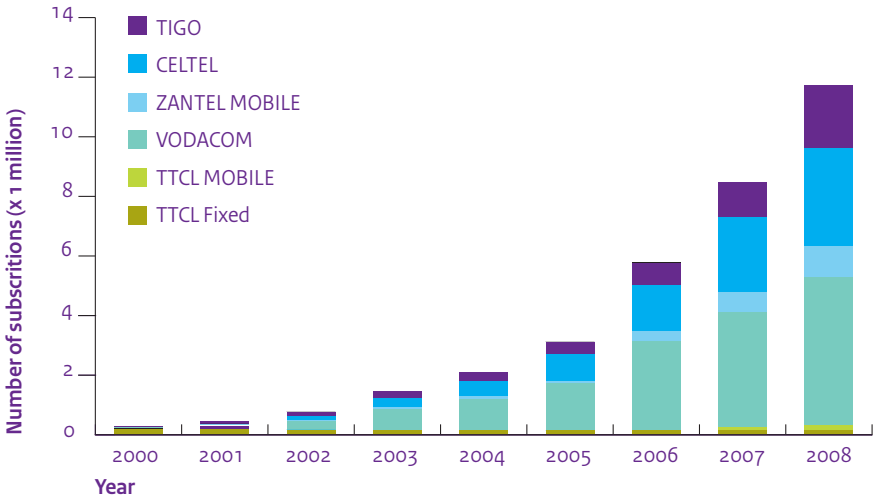
MSI-CI/Celtel International is an example of successful private sector development in Africa. The company first started to generate positive and increasingly positive EBITDA[40]

39 Source: FMO, Evaluation MSI/Celtel, 2006.
40 Earnings Before Income Tax, Depreciation and Amortization.

in 2001 and positive net profits followed in 2003. In March 2005, Celtel was sold to MTC, a telecom investor from Kuwait. By that time, the price of MSI/Celtel shares had tripled and FMO made realised a profit of USD 34 mln for the LDC Infrastructure Fund.[41]

In Tanzania, MSI/Celtel's market share was slightly above 20% in 2003 and gradually grew to 28% (3.3 million subscribers) in 2008. Vodacom is market leader with a market share of 42% in 2008 (see figure 7.2). Rates in the Tanzanian telecommunication market decreased, reflecting both competition between operators and economies of scale. Depending on the type of phone call, rates decreased by an average of 9.5% to 13.5% in the period 2001-2007.

Figure 7.2 *Market shares in Tanzanian telecommunication (subscriptions)*



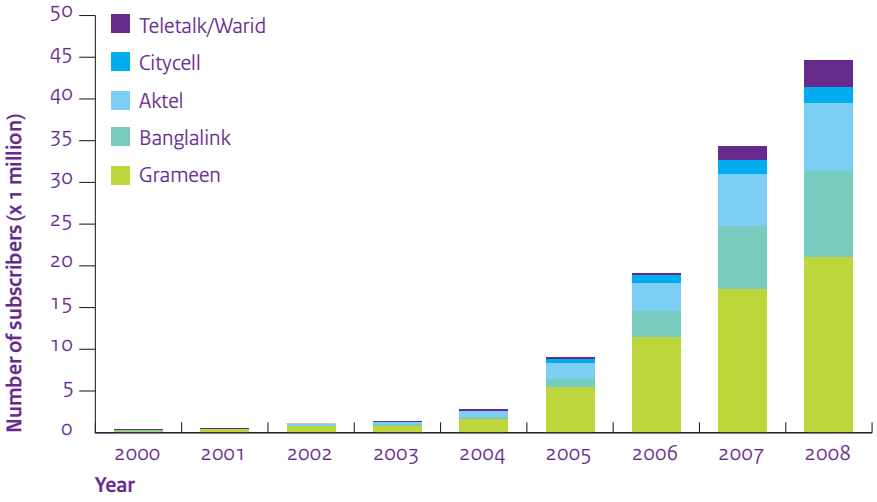
Source: Tanzanian Telecommunication Regulatory Authority (www.tcra.go.tz).

The second project included in the evaluation is the investment LDC Infrastructure Fund made in *Telekom Malaysia International Bangladesh* (TMIB), one of the largest mobile phone companies in Bangladesh, operating under the brand name Aktel. In Bangladesh, deregulation of the telecommunications sector also caused the mobile phone industry to grow. Deregulation attracted (foreign) investors and increasing competition between investors resulted in a sharp reduction of the retail price of mobile calls (Deloitte 2008, p. 147). By December 2008, there were almost 45 million mobile subscribers in Bangladesh.[42] By that time, the penetration rate reached nearly 30%.

41 FMO evaluation of MSI/Celtel, 2006, p. 3.
42 See www.btrc.org.bd.

By the end of 2004, TMIB's market share had increased to 29% with 1.1 million subscribers. In order to support further growth, TMIB intended to attract new financing to expand and upgrade its existing network. In 2006 FMO contributed a 10-year subordinated loan from the LDC Fund. The number of TMIB subscribers increased from 17,000 in 1998 to over 8 million in 2008.[43] Growth was particularly high in the period between 2001 and 2004, with annual growth rates exceeding 100%. TMIB's market share increased rapidly between 2001 and 2004, but then fell to 18% in 2006. Of the mobile players, GrameenPhone (47%) remained the market leader in 2008 with fast-growing Banglalink (23% in 2008) in second place. Deloitte (2008, p. 142) concluded that the fast growth of the mobile phone market in recent years in Bangladesh was caused by relatively low prices, greater population coverage by network operators, the ease of sharing handsets and shorter waiting times. Mobile phone services have become significantly cheaper. Nevertheless, the penetration rate in Bangladesh (approximately 20% in 2007) is low compared with other Asian countries (approximately 40% in Pakistan, Sri Lanka, China and Indonesia).

Figure 7.3 *Number of Mobile Phone Subscriptions in Bangladesh(2000-2008)*



Sources: World Development Indicators, 2007; Bangladesh Economic Review 2008.

In Africa and Bangladesh, the investments made by the LDC Infrastructure Fund were important for the development of the telecommunications market. Both in Africa and in Bangladesh, the number of providers is limited. Most markets in Africa are still not very competitive. In the majority of countries where MSI/Celtel operates, there are either two or three major mobile operators with MSI/Celtel ranking first or second.

43 According to the GSMA Market Tracking Study, TMIB had 7,183,000 connections by the end of 2007.

Private sector investment was, and is, the main driver of the growth of the mobile phone sector. Liberalisation of the market and the availability of pre-paid subscriptions were also of major importance (Souter 2005; Bhavnani 2008). Prepayment is an important determinant for commercial sustainability: payment problems are a major cause of the poor performance of the fixed line business. Pre-paid subscriptions account for nearly 95% of all mobile subscriptions in Africa and Bangladesh (Blycroft, 2008; Deloitte, 2008).

Celtel and TMIB have grown very fast and have become important employers with large direct contributions to the economic development of Africa and Bangladesh. The FMO finance proposal for TMIB estimated that the investment would create 1,250 direct jobs. TMIB did not provide any figures for this evaluation, but direct employment can be estimated based on a different source. Deloitte (2008) estimates that mobile network operators account for 9,400 jobs in Bangladesh. Taking the market share of TMIB (approximately 18%) into account, the direct employment created by TMIB is approximately 1,700 jobs.

Bhavnani et al. (2008, p. 13) noted that that mobile phone operators only create limited direct employment, but these jobs are highly paid and there is a major knock-on effect in retail. Cell phone kiosks, repair shops and unlocking or decoding services offer small business opportunities (Cardogy 2008, p. 20). In a report by Deloitte (2008) it is estimated that the mobile industry in Bangladesh created 82,000 jobs. Taking into account the market share of TMIB, the total employment creation by TMIB is about 15,000 jobs. Deloitte estimated the total added value of the sector in 2007 to be 57 billion BDT (EUR 577 mln), approximately 1% of the GDP. Including suppliers and multiplier effects, total added value is calculated at EUR 1.3 billion. TMIB accounts for approximately 18% of these results. Mobile companies are among the largest corporate tax payers (Cardogy 2008, p. 20). These taxes are largely made up of VAT and SIM activation taxes.

Several studies suggest that the introduction of mobile phones has had a large effect in developing countries. Song and Mueller Falcke (2006) reported that a survey conducted in Tanzania showed that the majority of firms considered cell phones the most significant contributor to regional market expansion. Estimated overall economic impact of the mobile industry relative to GDP varies from 1% to 5% for a range of African countries (see GSM Association, 2008). Deloitte (2008) estimates an effect of more than 6% for Bangladesh.[44] A brief analysis of the estimated effects shows that the figure for Bangladesh (and expectedly also for other countries) is doctored in some way.

44 Deloitte, 2008, Economic Impact of Mobile Communications in Serbia, Ukraine, Malaysia, Thailand, Bangladesh and Pakistan, London.

First of all, the GDP estimate appears too low. Based on the correct GDP figure, the estimate for 2007 is not 6.2% but 5.6%:[45] In addition, the estimate includes 'intangible benefits' (1.3%), but these are not part of the GDP. The estimated productivity gains (approximately 1.5%) are not based on empirical research and appear to be too high. Estimated multiplier effects (approximately 0.8%) also appear rather high. Therefore, a safer estimate of the mobile phone industry's contribution to GDP ranges between 2% and 3%.

A different approach to estimate the impact of mobile telecommunications is based on econometric techniques (regression analysis) and panel data. This kind of analysis has several pitfalls. For instance, a high correlation between telecommunications and income does not say anything about the direction of causation.[46] Several studies are concerned with telephony in general, whereas others specifically deal with mobile phones. Waverman et al. (2005) use a sample of 92 countries (high income as well as low income) with data for the period between 1980 and 2003. They found that mobile phones have a positive effect on economic growth and that this effect depends on penetration rate. A developing country in which the number of mobile phones increased with an average of 10 per 100 persons over the period between 1996 and 2003 achieved (annual) per capita GDP growth that was 0.6% higher than an otherwise identical country. According to the authors, the effects of mobile phones are twice as large in developing countries compared to developed countries. An important explanation is that developed countries already had extensive fixed networks in place, whereas developing countries had not. Torrero et al. (2005) found more modest effects. According to them, a 1% increase in the telecommunication penetration rate is associated with a 0.03% increase in GDP. They also found that the impact differed across groups of countries, with the impact being most pronounced for countries with low penetration rates as well as for low-middle income and high-middle income countries.

Investments in mobile telecommunications primarily targeted densely populated urban markets. Rural ICT infrastructure is often underdeveloped due to high connection costs and unreliable power (Bhavnani et al., 2008, p. 4). Mobile phone prices and lack of electricity still constitute obstacles for the poor, particularly in rural areas. However, the value of mobile phone services and associated benefits may also be much higher in rural areas (Bhavnani et al., 2008, p. 3). In rural areas, people lack access to information and mobile telephone services would give them this access. Mobile services are a substitution for transport. Especially in rural areas, mobile

45 The 5.6% estimate is based on the World Bank GDP figure for 2007 for Bangladesh. IMF estimates suggest an even lower figure.

46 The majority of studies on the impact of telephony on poverty and economic growth are either based on perceptions of users collected through sample surveys (e.g. Song and Bedi 2005, Souter et al. 2005, de Silva and Zainudeen 2007) or on cross-country regression analyses (such as Hudson et al. 1982, Röller and Waverman 2001, Torrero et al. 2005, Waverman et al. 2005).

phones help to maintain social networks (Carmody 2008, p. 14). They allow people to communicate with their relatives in situations where travelling time and costs are prohibitive (Song and Mueller Falcke, 2006). Fathers who work far from home, for instance, are enabled to communicate with their families and maintain close relations.

7.5 Immobile infrastructure

Investments in immobile infrastructure encompass construction and improvement of harbour facilities, airports, railways and roads. Between 2002 and 2007, the LDC Infrastructure Fund supported immobile infrastructure investments in Benin, Tanzania and Mozambique. The contribution to the finance of a titanium dioxide mine in Moma in Mozambique was the largest of these projects. Mining activities do not qualify as immobile infrastructure, but FMO funded three 'eligible' components of the project: the construction of an electricity line, road construction and rehabilitation and the construction of a jetty, an airstrip and social infrastructure. The mine is located in a remote and isolated area.

Mining started in April 2007 and the first ilmenite exports started in December 2007. By late 2008, the mining installations were almost completed. All necessary immobile infrastructure components were in place: roads had been constructed, electricity lines had been connected to the mine installations, the jetty had been constructed and was operative for the import of fuel and the export of products and the airstrip was operational. Moma township was connected to the electricity grid. The project's main result was stabilisation of electricity supply: outages were reduced from approximately 35% of the time to less than 5%. By late 2008, the electricity company had constructed distribution lines to a number of villages, but so far, these villages have not been supplied. Newly constructed or rehabilitated roads are open to the local population and are functional to the mine. They do not necessarily connect market places or link rural areas to urban centres. The jetty is operative but was built for the mining barge and fuel delivery ships and cannot be used by either small vessels or local fishermen. Moreover, the jetty is a no-go area for outsiders and forms part of the industrial free zone created exclusively for the mine. The airstrip is not open to the public and cannot be used without Kenmare's permission.

The mining project in Mozambique employed a total number of 1,000 people during construction, 300 of whom were recruited locally. Together with personnel of all subcontractors, the workforce consisted of approximately 1,500 people for a period of approximately 12 months. Kenmare staff employed for mining activities increased over time. By October 2008, Kenmare employed 443 people, including 105 expatriates. Permanent contractors employed approximately 30-40 people at any moment in time.

According to the Implementation Agreement with the Government of Mozambique, the number of expatriate staff were to be reduced to 15% of the total workforce by

2009. The Ministry of Labour supervises this reduction in expatriate staff. Some 200 staff members were recruited and trained in 2007. A Mozambican trade union was proactively engaged in this process. It is to be expected that indirect employment effects will be limited.

For a developing country, mining is an attractive industry because it converts readily available primary input (i.e. natural resources) into domestic financial capital flows. Investments in mining can be profitable for both the host country (royalties and taxes) and the mining firm[47]. The benefits of an inflow of foreign direct investment (FDI) in the mining industry partly overlap with the advantages of FDI in general. Mining is the first step in the value chain; it neither requires a sophisticated supply chain, nor developed local markets.[48] An accompanying factor that is often highlighted is the positive influence infrastructure investments have on the mining industry.[49] Other industries may also profit from the power and transport infrastructure that built around mines. FMO used this argument to allocate resources from the LDC Infrastructure Fund to the Kenmare mine.

Nevertheless, there is a large body of empirical research suggesting that mining activities do not necessarily have a positive impact on economic development. In many instances, foreign parties enjoy the main benefits. In many cases, mining is an enclave industry for which a substantial part of the necessary equipment and supplies are imported. Ore is processed abroad and foreign expert workers supply the necessary labour. A study on mining in Chile showed that the contribution of mining to GDP was below average as compared to investments in other sectors, although its contribution to employment was above average.[50] The study distinguishes between 'enclave' mines and 'local' mines and shows that in the enclave situation almost all benefits were reaped outside Chile. Like many other mining activities in the world, the project activities in Moma are carried out in a remote area in the middle of a subsistence economy based on fisheries and agriculture. Moma is an 'enclave' industry: sponsors, financiers, constructors, suppliers and buyers are all based outside Mozambique. The Moma Titanium Sands area has been declared an Industrial Tax Free zone. This implies that equipment, spares and supplies can be imported and exported free of border taxes.

Export of mining products is also free of taxation. Kenmare-Moma is exempt from company income tax for the first 10 years of operation. Companies that participate in the project and the Development Association KMAD do pay withholding taxes. No

47 Kasatuka, C. & Minnitt, R.C.A. Investment and non-commercial risks in developing countries. The Journal of Southern African Institute of Mining and Metallurgy. Volume 106. December 2006.

48 Humphreys, D. Mining as a Sustainable Economic Activity. Paper presented for presentation to an informal seminar on the mining and metals industry at the OECD, Paris. February 9, 2000.

49 Weber-Fahr, M. The World Bank Group's Mining Department. Treasure or trouble? Mining in Developing Countries. 2002.

50 Source: Aroca, P. (1999) 119-134.

taxes are paid over the higher remuneration levels, since most expatriate staff are paid either in their country of origin or offshore. Royalties are based on the quantity of heavy mineral concentrate (HMC) extracted. In 2008, taxes paid amounted to USD 1.1 mln and were paid in local currency. Export revenues from titanium sand exports are estimated at around USD 97 mln annually (estimate 2007), but most foreign exchange does not enter Mozambique since accounts are held abroad (Mauritius and Ireland). Tax and royalty payments are currently approximately 1% of export earnings and may increase to 2% of export earnings at full production levels. Temporary employment generation was substantial, but permanent employment of local staff is modest (300-350 people) compared to the investments made (USD 422 mln). In addition, the 'nationalisation of knowledge' was behind schedule, although Kenmare invested substantially in the formal education of Mozambican staff. The Kenmare mine showed its willingness to purchase products locally, but the kind of products that can be bought locally is limited and mainly consists of food products and bags for sand samples. A small number of local producers supply the mine with broilers, eggs and agricultural produce.

With regard to the infrastructure component, the Moma township is connected to the grid, leading to higher stability in its electricity supply. The number of additional beneficiaries is unknown, but Moma had access to electricity prior to the installation of the transmission line, while neighbouring villages are still not connected. Roads were constructed, improved or rehabilitated, but few roads are useful to the local inhabitants, since they do not connect villages to markets but to the mine. The jetty and the airstrip are only accessible to Kenmare staff.

The mining project in Mozambique was also defended on the ground of its social programme. Kenmare's corporate social responsibility programme, implemented by the Kenmare Development Association, has been very active. The KMAD counts with approximately USD 350,000 per annum and has supported:

- capacity building and economic development projects with a focus on supply to the Moma mine (agricultural produce, poultry, credit facilities);
- socio-cultural development projects (education, HIV/AIDS awareness programme, sports development);
- infrastructure development (educational facilities, water pumps).

Access to social infrastructure has improved due to KMAD's small-scale activities: primary schools were constructed (under the condition that the Ministry of Education accepts responsibility for the teachers and teaching materials) and health centres were improved. The malaria problem received considerable attention and special HIV/AIDS campaigns were carried out. Access to drinking water was improved, particularly in the relocated villages. However, in other villages the number of wells and pumps installed is limited (9 pumps over a period of 3 years).

7.6 FMO's measurement of the development impact

In order to appraise the (expected) development impact of projects supported through the LDC Infrastructure Fund, FMO uses the same methodology as for other projects. For each project, FMO conducts an assessment of its sustainable development impact. This assessment is carried out at the start of a project and repeated after five years. The assessment covers economic development impact (EDIS), ecological development impact, and social development impact. In practice, EDIS is the main score for the measurement of development impact. The Annual Reports of the LDC Infrastructure Fund give the EDIS score, but not the Ecological or Social Development Impact Scores.

The total development impact is calculated as the product of EDIS and the FMO investment. Table 7.1 presents the different categories and their weights.

Table 7.1 Sustainable development impact analysis

Economic Development Impact	Score estimate	Weighing	Score
Financial sustainability / impact on shareholders and financiers	3	10	30
Impact on employees	3	4	12
Impact on customers and final consumers	3	4	12
Impact on suppliers of inputs and services	3	4	12
Impact on suppliers of complementary products	3	2	6
Impact on competitors/potential new entrants)	3	3	9
Impact on society through taxes and tariffs	3	3	9
Impact on the balance of payments	3	3	9
Total score for economic development impact			**99**
Ecological Development Impact	**Score estimate**	**Weighing**	**Score**
Initial Environmental Risk Score	3	5	15
Exploitation/Conservation of Non-Renewable Resources	3	10	30
Product/Service Stewardship (up- & down-stream chain-effects)	3	10	30
Eco-Efficiency	3	8	24
Total score for ecological development impact			**99**
Social Development Impact	**Score estimate**	**Weighing**	**Score**
Initial Social Risk Score	3	5	15
Labour Relations Development Impact	3	10	30
Community Development Impact	3	10	30
Civil Society Stakeholder Participation	3	8	24
Total score for social development impact			**99**

Source: FMO.

The projects funded by the LDC Infrastructure Fund are evaluated within FMO's regular evaluation calendar. The same scoring mechanism is followed to measure development impact. Evaluations are drafted by the responsible officer and assessed by the FMO evaluation unit. At this moment, FMO has evaluated three projects from the LDC Infrastructure Fund: MSI/Celtel (2006), AES Haripur (2007) and Songas (2008). The

MSI/Celtel evaluation was very positive about the development impact achieved and raised the EDIS from 57 to 70. The evaluation of AES Haripur did not provide much details on development impact. The evaluation did not revise the EDIS of 56, even though it concludes that contributions made to (economic) development were excellent. For Songas, the evaluator concluded that the relatively poor returns to shareholders justified a low EDIS score. Table 7.2 lists the EDIS scores of each of the twelve case studies.

Table 7.2 EDIS scores of the cases studies

Sector /project	Country	Year	EDIS	Evaluation
Energy				
AES Haripur Private Limited	Bangladesh	2002	56	56
Songas	Tanzania	2003	64	54
Artumas Tanzania	Tanzania	2006	63	
Bengaz	Benin	2005	63	
Sotogaz	Togo	2005	63	
Water supply and distribution				
Al Manara Water Company	Sudan	2006	52	
Roundabout Playpumps	Mozambique	2005	-	
Telecommunications				
Telekom Malaysia International (Bangladesh) Limited	Bangladesh	2005	69	
MSI/Celtel	Tanzania	2003	57	70
Immobile infrastructure (mining)				
Kenmare-Moma	Mozambique	2004	53	
Environmental infrastructure				
Grown Energy	Mozambique	2006	56	
World Wide Recycling	Bangladesh	2007	66	

Telecommunications, energy and the recycling project in Bangladesh achieved the highest EDIS. The drinking water treatment plant in Sudan and the Moma mine and Grown Energy project in Mozambique have a much lower EDIS. This may be an effect of the specific weights of the EDIS. The scorecard was developed for FMO-A projects and has not been adapted for the LDC Infrastructure Fund. This could have important consequences for the projects. The development impact of the project in Sudan is expected to be very positive, but this is not reflected in a very high score. Even though project's main objective is to provide clean water at an affordable price, its EDIS score is based on a maximum score of 12 for (final) customers (beneficiaries), whereas the maximum score for shareholders and financiers is 30. The same holds for its social development impact (with a score of 44 out of 100). Social development impact does not refer to the effects on the beneficiaries but mainly focuses on the employees of the main client, the Khartoum State Water Company. It must therefore be concluded that due to the fact that the scoring system is based on FMO-A criteria, the real development effects of (social) infrastructure projects may be underestimated.

Social and environmental impact assessments are major sources for the FMO assessment. The criteria of the LDC Infrastructure Fund require compliance with internationally agreed social standards. Contractors may therefore be required to develop a social action plan. Large infrastructure projects in environmentally sensitive areas must include an environmental impact assessment in accordance with World Bank standards. Occasionally, FMO demands a social impact assessment report. The contract for the drinking water treatment plant in Sudan includes an extensive Environmental and Social Action Plan (ESAP). This plan includes sections on occupational health and safety, social issues and pollution. The plan encourages the use of local labour and subcontractors and includes the FMO Model Code of Labour Practices and model agreements for subcontractors. During construction, FMO ensures compliance with international standards and (World Bank) guidelines through quarterly monitoring by a consultant. This consultant monitors and reviews the construction process and is responsible for a quarterly review of the payment applications. FMO's Environmental and Social Expert monitors progress and regularly visits the plant. These visits particularly focus on those components with a status or progress that lags behind expected. The contract with Biwater also includes a Social Impact Assessment, which was carried out in 2007.

Comparable assessments were also carried out for other projects (such as Environmental & Social Impact Assessments (ESIA) for Mtwara/Artumas and for the World Wide Recycling Project in Bangladesh). For other projects (such as AES Haripur in Bangladesh, Songas in Tanzania and the West African Gas Pipeline) FMO relied on existing impact assessments.

7.7 Summary and conclusions

This chapter analysed the development impact of the investments in ten projects that were financed by the LDC Infrastructure Fund. Most of these projects have had a large effect on the infrastructure in the respective countries. The energy projects in Bangladesh and Tanzania have had a significant effect on the power supply in these countries. The West African Gas Pipeline (WAGP) is expected to have a major effect on the energy supply in Benin and Togo. The five projects are highly *relevant* within the specific contexts of these four countries. These countries face enormous challenges with regard to their power supply and these challenges (have) negatively affected their economic development. Improved power supply in Bangladesh (AES Haripur) and Tanzania (Songas and Artumas) significantly contributes to the reduction of power shortages and the reliability of power supplies. Bangladesh and Tanzania are able to use their indigenous natural resource (gas) to produce highly demanded electricity. Gas consumption by industrial consumers is growing rapidly. Among the main benefits for Benin and Togo are the sharp reduction in energy costs, diversification of energy sources, reduced dependence on the import of energy from Ghana and Côte d'Ivoire and improved reliability and stability of energy provisions. Lower energy costs also imply savings on foreign exchange and therefore an improvement of the balance of payments.

The energy projects also have positive effects on the environment. The substitution of oil-fuelled plants with gas-fuelled plants reduces annual CO_2 emissions. Evidence suggests, however, that the gas pipeline project in West Africa does not significantly contribute to a reduction of gas flaring in Nigeria.

Though the overall impact assessment of the energy projects is positive (see also chapter 6) it must be added that FMO did not participate in the launch of the large energy projects (AES Haripur and Songas). FMO took over part of the finance of existing projects that had already started. For Bengaz and Sotogaz, FMO provided loans for a project (the construction of a gas pipeline to Benin and Togo) that would have been carried out anyway. FMO will also have a role in the financing of future investments in Bengaz and Sotogaz (including the construction of a new power plant in Benin). In each of the four energy projects, FMO had no influence on social and environmental conditions. The example of the West African Pipeline Company shows how FMO got involved in a project in which large multinationals did not always meet their social and environmental requirements.

In Sudan, FMO played a leading role in the realisation of a drinking water treatment plant. The combination of FMO funding, specialist advice and social and environmental demands created the conditions for a successful project with a high development impact. The new plant will directly contribute to an enormous improvement of the drinking water situation in North Omdurman. The financing construction, the choice for simple and proven technology, the training of KSWC staff

and management by the Al Manara Water Company for a period of ten years all contribute to a water supply that is financially and technically sustainable. The Water Asset Management Programme promotes the efficient use of the scarce resource by helping to reduce leakages and non-revenue water. The constructor, Biwater, guarantees the quality of the water and plays a positive role training KSWC personnel and informing households. Efficiency could have been increased if the programme had also included the installation of water meters. The system of fixed monthly rates does not offer any incentive to reduce (unnecessary) water consumption.

Investments in the telecommunications sector in Bangladesh and Africa contributed to the expansive growth of the sector. MSI/Celtel gained a large market share in 14 African countries and TMIB was able to retain its position in the Bangladeshi telecommunications market. MSI/Celtel International is an example of successful private sector development in Africa. Without Celtel, other large providers, such as Vodacom and South African MTN would have had a more dominant position in the market. In Bangladesh, TMIB ranks third. The economic impact of the two telecommunications projects (in Bangladesh and Africa) is beyond expectations.

Estimates of the overall economic impact of the mobile industry relative to GDP vary from 1% to 5% for a range of African countries. For Bangladesh, the total contribution of the (mobile) telecommunications sector is estimated at 2% to 3% of GDP. Surveys show that mobile phones promote regional market expansion, allow people to communicate with family and friends, provide access to business information and are used business purposes and are useful in case of emergencies. Especially in the poorest rural communities, mobile phones allow people to communicate with their relatives in cases when travelling time and costs are prohibitive.

Two projects in Mozambique have not made a clear contribution to infrastructure development. The largest, a mining project, is actually not an infrastructure project. It was defended because a certain level of infrastructure had to be developed for the mine (such as roads, a harbour and electricity). However, the effects for people living in the vicinity are minimal. The available evidence confirms that the mine has the characteristics of an enclave economy with limited trickle down effects. The much smaller water project to which the LDC Infrastructure Fund contributed with a grant, involved the installation of 49 water pumps (Roundabout Playpumps). The success of this project in South Africa proved to be no guarantee for success in Mozambique. The 'best practice' did not work the same way here and should have been adapted to local circumstances. External studies revealed quality problems with the installations, social problems and no guarantee that the Playpumps produced safe and clean drinking water. Donor pressure is the most likely reason why Playpumps designed for schools were instead installed in communities where their results were disappointing.

Returning to the main evaluation question posed in this chapter – what contribution has the LDC Infrastructure Fund made to the strengthening of infrastructure – the first

conclusion is that FMO should get involved in projects at an early stage. Successful examples include MSI/Celtel and the drinking water treatment plant in Sudan. Several projects had an important effect on the development of infrastructure, but in these cases the role of FMO was not decisive (AES Haripur, Songas, Bengaz and Sotogas). A second conclusion is that FMO must adhere to the Fund criteria. The example of the mining project in Mozambique suggests that a better and more critical environmental and impact assessment is needed before LDC Infrastructure Fund resources are allocated to activities that are only remotely related to the Fund's main objectives.

It appears that the main instrument used to assess the development impact of projects (EDIS) cannot be adequately applied to infrastructure projects. EDIS primarily focuses on direct effects and less on additional objectives. Especially the large weight given to the impact on shareholders and financers is not in accordance with the higher risk profile of the LDC Infrastructure Fund. For Songas, for example, the evaluator concluded that the (new) EDIS was reduced by the relatively poor returns to shareholders. At the same time, the project has a major effect on the improvement of the power supply in Tanzania. The Al Manara Water Company (Sudan) has a low EDIS. Yet, the international water community has nominated the project for the global water awards as one of the four most sustainable water projects in the world.

Annexes

Annexe 1 About IOB

Objectives

The objective of the Policy and Operations Evaluation Department (IOB) is to increase insight into the implementation and effects of Dutch foreign policy. IOB meets the need for independent evaluation of policy and operations in all policy fields falling under the Homogenous Budget for International Cooperation (HGIS). IOB also advises on the planning and implementation of the evaluations for which policy departments and embassies are responsible. Its evaluations enable the Minister of Foreign Affairs and the Minister for Development Cooperation to account to parliament for policy and the allocation of resources. In addition, the evaluations aim to derive lessons for the future.

Efforts are accordingly made to incorporate the findings of evaluations into the Ministry of Foreign Affairs' policy cycle. Evaluation reports are used to provide targeted feedback, with a view to improving both policy intentions and implementation. Insight into the outcome of implemented policy allows policymakers to devise measures that are more effective and focused.

Approach and methodology

IOB has a staff of experienced evaluators and its own budget. When carrying out evaluations, it calls on the assistance of external experts with specialised knowledge of the topic under investigation. To monitor its own quality, it sets up a reference group for each evaluation, which includes not only external experts but also interested parties from within the Ministry.

Programme

The evaluation programme of IOB is part of the programmed evaluations annexe of the explanatory memorandum to the budget of the Ministry of Foreign Affairs.

An organisation in development

Since IOB's establishment in 1977, major shifts have taken place in its approach, areas of focus and responsibilities. In its early years, its activities took the form of separate project evaluations for the Minister for Development Cooperation. Around 1985, evaluations became more comprehensive, taking in sectors, themes and countries. Moreover, IOB's reports were submitted to parliament, thus entering the public domain.

1996 saw a review of foreign policy and a reorganisation of the Ministry of Foreign Affairs. As a result, IOB's mandate was extended to the Dutch government's entire foreign policy. In recent years, it has extended its partnerships with similar departments in other countries, for instance through joint evaluations.

Finally, IOB also aims to expand its methodological repertoire. This includes greater emphasis on statistical methods of impact evaluation. As of 2007 IOB undertakes policy reviews as a type of evaluation.

Annexe 2 Overall assesment of the case studies

Project	Country	Sector	Year of approval	Catalytic impact	Additionality	Effect on infrastructure*	Development impact*
AES Haripur Private Ltd	Bangladesh	Energy	2002	0	0	+	+
Songas	Tanzania	Energy	2003	0	0	+	+
Bengaz	Benin	Energy	2005	0	0	+	+
Sotogaz	Togo	Energy	2005	0	0	+	+
Artumas	Tanzania	Energy	2006	+	+	+	+
MSI/Celtel	Tanzania	Telecom	2003	+	+	+	+
TM International Bangladesh	Bangladesh	Telecom	2005	0 / +	+	+	+
Kenmare-Moma	Mozambique	Mining	2004	+	+	0	0
Roundabout Playpumps	Mozambique	Water	2005	0	+	0	0
Al Manara Water Comp.	Sudan	Water	2006	+	+	+	+
Grown energy	Tanzania	Bio-energy	2006	+	+	n.a.	n.a.
World Wide Recycling	Bangladesh	Waste disposal	2007	+	+	n.a	n.a.

** The effect on the infrastructure refers to the output of the project, while the development impact refers to the contribution o this new infrastructure to the economic, social and environmental development or the improvement in the livelihood of the poor (see also chapter two).*

Annexe 3 Selection and approval process

Potential projects are submitted to the FMO through the network of investment officers or directly by firms that approach FMO or FMO's fund managers. After a quick scan of these leads and project ideas against FMO and LDC Fund criteria, a decision is taken to follow up on the project. Additional information will then be requested from the potential client and reviewed by IO, including full business plan, financial model, main relevant contracts if available, etc. Once the investment officer has an idea of the general financing structure that is needed for the project, he prepares a short note (labelled FINPRE) within a period of four to six weeks, depending on the complexity of the project. For the LDC Infrastructure Fund, the FINPRE also includes a 'one-page' evaluation note from the Fund Manager. This evaluation sheet, the so-called NOTE LDC FUND, indicates whether the proposed financing meets the criteria for LDC funding. The FINPRE is discussed in the weekly meeting of the FINPRE committee. This committee consists of representatives (managers) from each of the regional departments and the private equity department and assesses the project idea based on its compatibility with the FMO programme and criteria, and the soundness of the proposed financial structure.

At submission of the FINPRE, a deal team for the project is installed. This team normally consists of an investment officer as the deal team leader, a second investment officer, a legal specialist, an environmental and/or social specialist, and (if required) a tax specialist and knowledge street member.[51]

The deal team remains together during whole tenor of the loan or the period the investment is outstanding. A transfer from the 'new clients' team to the 'existing clients' team only takes place after the first disbursement when the investment officers are replaced. Within the scope of the project approval, the investment officer and legal specialist can decide on most aspects related to the transaction. Material changes, such as changes in tenor, repayment schedules, pricing, security package, etc. must all be approved by the Investment & Mission Review (IMR) department.

Once the investment officer gets the green light to proceed, he makes a term sheet for negotiation with the client. Negotiation of a term sheet generally takes about two months. In case of a complex transaction, it will take longer. Once the client and FMO have reached agreement on the term sheet, the investment officer will perform a full due diligence on the project (including detailed research on location) in order to become more familiar with the details of the project and to assess all potential risks. In

51 The organisation has changed as of the 1st of January 2009 to a sectoral organization. There are no longer regional departments and limited knowledge streets.

this phase an Environmental Social Impact Assessment (ESIA) is performed on account of the client, which is usually outsourced to an external consultant (in some cases the ESIA is conducted later, after FINPRO has been submitted). This part generally takes around two to three months (if the process progresses smoothly) and results in the FINPRO document. The FINPRO follows a standardised format and covers: summary and conclusion, project evaluation, client, organisation, financial analysis, FMO financing, development impact and role FMO. The FINPRO is subsequently assessed by a risk management analyst from the Investment & Mission Review (IMR) department. IMR uses a scorecard assessment and specifically considers risks, environmental and social impact and the project's development impact. Finally, IMR offers a recommendation on the proposed funding to the credit committee and, if required, includes a number of conditions. The IMR recommendation (either positive or negative) is generally completed one week after FINPRO is submitted. If capacity is limited or in case of a complex transaction, it might take two weeks for IMR to prepare its recommendation. Both the FINPRO and the IMR recommendations are then submitted to the Investment Committee. The Investment Committee consists of three to four members. It is chaired by the Director IMR while the Manager Credit Analysis is deputy chair. Other representatives include the Director Risk Management, Director Special Operations or their deputies and may also include other managers or senior investment officers. The approval authority of the Investment Committee is limited to certain exposures for different types of transactions. If within approval limit, the Investment Committee will decide and inform the Management Board of its decision. If not within approval limit, the Investment Committee will submit a recommendation to the Management Board.

The Investment Committee's decision or recommendation consists of a summary of the proposed funding, the IC recommendation, the underlying scorecard assessment and further considerations on the project, and is submitted to the Management Board, regardless of the type of recommendation. The Management Board decides to accept or reject the Investment Committee's recommendations. In case of a positive recommendation that is accepted by the Management Board, the contracting of the proposed funding will start. Implementation of this component is partly outsourced to external financial and legal experts and partly done by FMO legal staff. The draft contract will be assessed by risk management staff, by investment officers and by FMO legal staff. It will then be signed by a representative of the legal department as well as a representative of the regional department, both authorised signatories of FMO.

After the contracts are signed, the disbursements will take place and the follow-up of the funding is reviewed annually. After first disbursement the responsibility for a project is transferred within FMO from the investment officer that initiated the project ('new clients' team) to an investment officer responsible for the follow-up ('existing clients' team).

Grants follow a different procedure. The normal approval process for grants does not include a FINPRE phase nor (normally) a term sheet phase (as a grant contract is more straightforward than equity or debt contracts and requires less negotiation). The Grant Proposal replaces FINPRO. Due diligence on location is also not always required, depending on the status of the project and the size of the grant. There is a strong propensity within FMO to link grants to (future) loan or equity participation (convertible grant). Grant Proposals are assessed by the Grant Committee. For grants below EUR 500,000 this committee consists of a Fund Manager and the Director Africa and for higher grants it is extended with the Director IMR. The Grant Committee only meets when required. It normally meets about a week after a Grant Proposal has been submitted. Management Board approval is not required for grants.

Annexe 4 Terms of Reference

Impact Evaluation LDC Infrastructure Fund

1 Introduction

The LDC Infrastructure Fund (hereafter the Fund) aims to support the development and improvement of the social-economic infrastructure in Least Developed Countries (LDCs). The Fund was created in 2002 when the ORET tied-aid programme was no longer open to investments in least developed countries after it was decided to discontinue tied aid in these countries. That year, the Directorate-General for International Cooperation of the Netherlands Ministry of Foreign Affairs provided a subsidy of EUR 182 mln to the Netherlands Development Finance Company (Dutch acronym FMO) to set up this revolving fund. The subsidy expired in 2005, but it was renewed in 2006 until December 31, 2013.

In the subsidy decision of 2006, it was stated that the Fund was to be evaluated in 2008. This (external) evaluation is additional to the regular reports issued by FMO. This note specifies the Terms of Reference (ToR) for the evaluation, which aims to analyse the Fund's contribution to the provision of infrastructure services in LDCs. The evaluation must determine what contributions the Fund has made to the goals stated in the subsidy decision and assess the impact of projects that were financed by the Fund. The results will be used for decision-making on the further development of the Fund. The evaluation will focus on the investments made between 2002 and 2007.

2 Characteristics

The Netherlands Development Finance Company (FMO) supports the private sector in developing countries and emerging markets in Asia, Africa, Latin America and Central and Eastern Europe. For this purpose, FMO provides loans, participations, guarantees and other investment promotion activities. Its goal is to contribute to the structural and sustainable development of these countries and, together with the private sector, obtain healthy returns.

Through the LDC Infrastructure Fund, the Netherlands Ministry of Foreign Affairs and FMO aim to stimulate private investors to invest in private or public-private infrastructure projects in these countries. Within the group of LDCs, FMO primarily focuses on Bangladesh in Asia and on Angola, Benin, Burkina Faso, Mali, Mozambique, Senegal, Tanzania, Uganda and Zambia in Africa. A criteria paper defines the specific criteria for the use of the Fund.

By providing risk capital, the LDC Infrastructure Fund removes a definite risk for other investors and consequently catalyses additional private funds. The Fund provides various forms of long-term financing (tenors of up to 20 years) for infrastructure projects in LDCs:

- *loans* up to 10% of the total Fund size;
- *equity* investments up to the lesser of 10% of the total Fund size or 49% of the total transaction size;
- *grants* for a) projects that would normally be covered by the public sector, but which cannot be taken up due to a shortage of funds, b) non-commercial elements of projects that are financed by FMO, or c) the development and/or feasibility stage of infrastructure projects that in principle qualify for financing from the Fund.

Investments in international or multilateral funds that in turn facilitate infrastructure projects as defined by the Fund are also feasible.

LDC Infrastructure funding is available for infrastructure projects that contribute to the development and/or improvement of social-economic infrastructure (power, telecom, water, transport and environmental or social infrastructure). In order to be eligible for funding, a project must meet FMO's investment policy in terms of sectors and countries. Projects will be reviewed according to FMO's standard review procedures. In addition to financial-economic performance, projects are scrutinized in terms of corporate governance, environmental and social impact. FMO evaluates proposals based on the investment plan, a market analysis, a due diligence study, the expected returns and the commitment of management and co-financiers.

3 Objectives of the evaluation and evaluation questions

The evaluation aims to determine the Fund's development impact. After a period of six years, it must be possible to determine what contributions the Fund has thus far made to the development of infrastructure projects and the private sector, and thus to economic growth and poverty reduction in general. The main evaluation questions are:

1) Does the LDC Infrastructure Fund add value to the FMO product range?
2) Is there a demand for the Fund within the least developed countries?
3) What impact does the Fund have on the development of (private) infrastructure projects and the strengthening of infrastructure services in LDCs?
4) What impact have investments financed through the Fund had on the infrastruc ture, economic development and poverty reduction in LDCs?

These four main evaluation questions have been elaborated into a number of specific research questions:

1 Does the LDC Fund add value to the FMO product range?
1.1 What is the Fund's position within the product range and organisation of FMO?

1.2 Is the Fund compatible to the goals and product range of FMO?
1.3 What types of investments are supported through the Fund and is a specific trend discernable in the type of investments (region, sector, type of funding)?
1.4 What is the role of the Sustainable Economic Development Department of the Ministry of Foreign Affairs in the development of the Fund's portfolio?
1.5 Do projects financed through the LDC Infrastructure Fund have a risk profile that differs from those financed by FMO-A?
1.6 Is the Fund portfolio in accordance with the criteria laid out in the annex to the subsidy decision?
2 Is there a demand for the Fund within the least developed countries?
2.1 What investments were funded with the LDC Infrastructure Fund?
2.2 Does the Fund fulfil its catalysing function of enhancing the financing of infra structure projects with a high risk profile?
2.3 What is the relevance of grants as a catalysing component of financial instruments designed to enhance the financial feasibility of complex and risky infrastructure projects?
2.4 Is the funding additional to the market?
2.5 Which factors contribute to the success of the Fund and which factors hinder its effective utilisation?

3 What impact does the Fund have on the development of (private) infrastructure projects and the strengthening of infrastructure services in LDCs?
3.1 How does FMO measure the direct impact of projects?
3.2 To what infrastructural projects has the Fund made a contribution?
3.3 What is the direct impact of these projects in terms of:
a) strengthening of infrastructure;
b) direct employment effects;
c) social effects;
d) environmental effects;
e) capacity and staff development;
f) financial viability of the companies involved.

4 What impact have investments financed through the Fund had on economic growth and poverty reduction in LDCs?
4.1 Is it possible to give an indication of the indirect contribution of the projects to:
a) the infrastructure in the country;
b) macro-economic effects;
c) the economic independence of the country;
4.2 Is it possible to give an indication of the contribution of the projects to poverty reduction in the country?

4 Methodology

The evaluation focuses on the Fund's contribution to the strengthening of the infrastructure in least developed countries through the funding of specific

infrastructure projects. In order to be able to assess this contribution, it is first of all necessary to analyse the role of the LDC Infrastructure Fund within FMO and the FMO product range. The first cluster of questions deals with this role. This part of the evaluation will be mainly descriptive. Questions will be answered by desk research, an analysis of the LDC Infrastructure Fund portfolio and interviews within FMO and the Ministry. FMO will provide the necessary documents.

The second cluster of questions focuses on the additionality of the Fund and the need its activities in LDCs. These questions are answered through an analysis of project documents, client files, internal evaluations by FMO, interviews with stakeholders and risk analyses of infrastructure projects in the selected countries.

Cluster 3 forms the heart of the analysis. The evaluation starts with an analysis of evaluations conducted by FMO and is based on FMO monitoring and evaluation reports and (semi-)annual reports in order to evaluate the Fund's impact.[52] In addition, field work will also be required to be able to answer the questions of clusters 2, 3 and 4. The evaluation will use a multi-stage approach, starting with an inventory and analysis of the portfolio, a (meta-)evaluation based on the FMO evaluations and, third, additional fieldwork in several countries. These countries will be selected based on type of funding (especially loans and equity participation), regional distribution and volume of the portfolio.

5 Organisation

The Policy and Operations Evaluation Department (Dutch acronym IOB) of the Netherlands Ministry of Foreign Affairs is responsible for the realisation of the evaluation and the final evaluation report. IOB will contract an external consultant for the evaluation and will be involved in the analysis and drafting of the report.

A reference group consisting of representatives of the Sustainable Economic Development Department of the Netherlands Ministry of Foreign Affairs, representatives of FMO and one or two external experts will supervise the evaluation process. The deputy-director of IOB will chair the reference group. An internal quality control group of IOB, consisting of two IOB officers, will guide the process internally.

52 Note that only a small number of evaluations are available, because internal 5-year evaluations have only been conducted of committed projects that started in the first year of the Fund (2002).

The consultant selected to conduct the evaluation must have specific knowledge of and experience with:

- financing of infrastructure projects;
- development cooperation;
- the evaluation of development projects;
- international financial institutions;
- the private sector in developing countries.

Moreover, the consultant must establish contacts with local institutions in the countries that are chosen for the fieldwork. A thorough knowledge of the English language is therefore required.

The report will be written in English.

Annexe 5 List of Interviews

Ministry of Foreign Affairs

Jan van Renselaar	Senior Policy Officer, Sustainable Economic Development Department, Netherlands Ministry of Foreign Affairs
Steef van den Berg	First Secretary, Royal Netherlands Embassy, Dar es Salaam
Marjon Durang	First Secretary Private Sector, Royal Netherlands Embassy, Maputo
Kees Konstapel	First Secretary Water and Sanitation, Royal Netherlands Embassy, Maputo
Ali Awad Abas	Political, Economic and Trade Advisor, Royal Netherlands Embassy, Khartoum

FMO

Diana Wesselius	Manager LDC Infrastructure Fund and Energy Fund
Clem Bibo	Portfolio Officer Africa
Angelica Ortiz de Haas	Director Mid Office
Marc Buiting	Senior Investment Officer
Jeroen Blum	Senior Investment Officer
Bernard Westerouen van Meeteren	Senior Investment Officer
Gerhard Engel	Senior Investment Officer
Karin Bouwmeester	Senior Investment Officer
Arno de Vette	Senior Investment Officer
Bas Rekvelt	Senior Investment Officer
Monisha Hermans	Senior Investment Officer
Per van Swaay	Senior Investment Officer
Frederik Jan van den Bosch	Manager Emerging Markets Fund
Karin Verstralen	Senior Social Specialist, Africa
Martin F. de Jong	Senior Policy Advisor Corporate Affairs
Stan Stavenuiter	Senior Evaluation Officer

Not project related

Bas Nierop	Chief Commercial Officer, NMB Dar es Salaam
Md. Azizul Islam	Joint Director, Statistics Department, Bangladesh Bank
Muhammed Ali	Deputy General Manager, Statistics Department, Bangladesh Bank

Muhammad G. Sarwar	Joint Chief General Economics Division, Planning Commission, Bangladesh
Bazlul Hague Khondker	Professor, Department of Economics, University of Dhaka

Artumas

Brock Buchanan	Director Business Development
Richard Tainton	General Manager
Ali Killa	Commercial Relations Manager
Arbogast Oiso	Government Relations Manager
Decklan Mhaiki	General Manager Transmission, TANESCO
Chirag Tanna	General Manager, Vinmart

Songas

Chris Ford	Managing Director
Rama Krishna	Power Plant Manager
Peter Clutterbuck	President and CEO ORCA/PAE
Israel Chasosa	Managing Director, ABC
Decklan Maiki	General Manager Transmission, TANESCO

MSI/Celtel

Heiko Schlittke	Finance Director, ZAIN

Roundabout Playpumps

Geoff Hopkins,	Managing Director, Water for All, Johannesburg
Jill Rademacher	President, Water for All, Johannesburg
Ana Lucia Obiols	Evaluator Roundabout Playpumps, RWSN Consultants, Maputo

Grown Energy

Hercilia Estrela Hamela	Forestry Officer, Ministry of Agriculture, CEPAGRI, Maputo
Nurdine Salé	Agro-business Officer, Ministry of Agriculture, CEPAGRI, Maputo
Rademan Janse van Rensburg	Director General, Investor, Maputo
Wayne Reichard	Campsite Manager, Chembe, Zambezi
Claudio James	Agropetrols Officer, PETROMOC, Maputo
Shirin Cooper	Environmentalist, Tata Chemicals, Maputo / Chembe
Fernando Ribeiro	Consultant to Grown Energy, Bio Global Lda, Maputo/ Chembe

Kenmare Moma

Tony McCluskey	Financial Director Kenmare Resources, Dublin
Salazar Mangumo	National Directorate of Mines, Ministry of Geological Resources, Maputo
Gareth Clifton	Mozambique manager, Kenmare Resources, Maputo
David W. Brown	General Manager, Kenmare Moma, Moma
Terry Fitzpatrick	Chief Operating Officer, Moma Titanium mine, Kenmare Resources, Moma
Mbuzo Nmbata	Human Resources manager, Kenmare Resources, Moma
Tom Steytler	Manager Environmental Affairs, Kenmare Resources, Moma
Regina Macuácua	Associacao de desenvolvimiento Kenmare, Moma
KMAD staff	Associacao de desenvolvimiento Kenmare, Moma

TMIB

Syed Abu Toha	Senior Assistant Manager, Corporate Finance, TMIB
Dewan Nazmul Hasan	Head of Corporate Finance & Credit Control, TMIB
Tawfiq Ali	Head of Financial Institutions, CitiBank
Md. Abdul Akher	GSS product manager, CitiBank
Kazi Ziaul Islam	Director Banks, Origination & Client Coverage, Standard Chartered Bank
Md. Tanzir Islam	Associate Director, Origination & Client Coverage, Standard Chartered Bank

AES Haripur

Faisal Mubin Chaudhury	Regional Country Manager, Pendekar Energy, Haripur Power Ltd.
R. R. Sadique Masum	Plant Manager, Pendekar Energy, Haripur Power Ltd.
Nazrul Islam	Operations Manager, Pendekar Energy, Haripur Power Ltd.
Linda Ferdows Kakoli	Manager PR Affairs & Community Relations, Pendekar Energy, Haripur Power Ltd.

World Wide Recycling

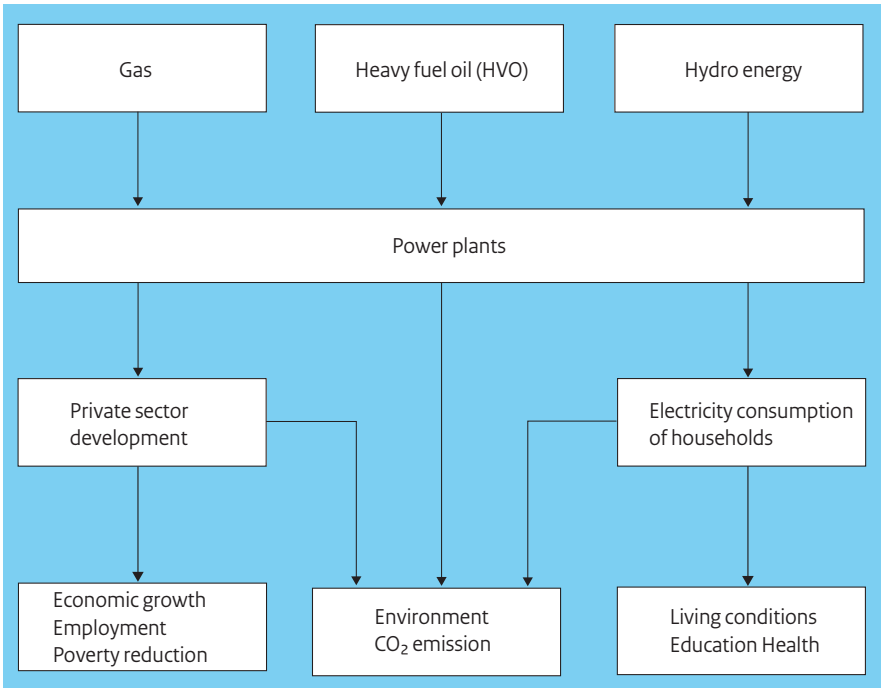
Jan Boone	Director, World Wide Recycling BV
Ruud van Schaik	Expert, VAR
Mohammed Reazuddin	Director, Department of Environment, Ministry of Environment & Forest, Bangladesh
Farhad Ahmed Khan	Ass. Vice President, Credit Division, Dutch Bangla-Bank Ltd.
Tanvir Shaikat	Senior Officer Credit Division, Dutch Bangla-bank Ltd.

Omdurman

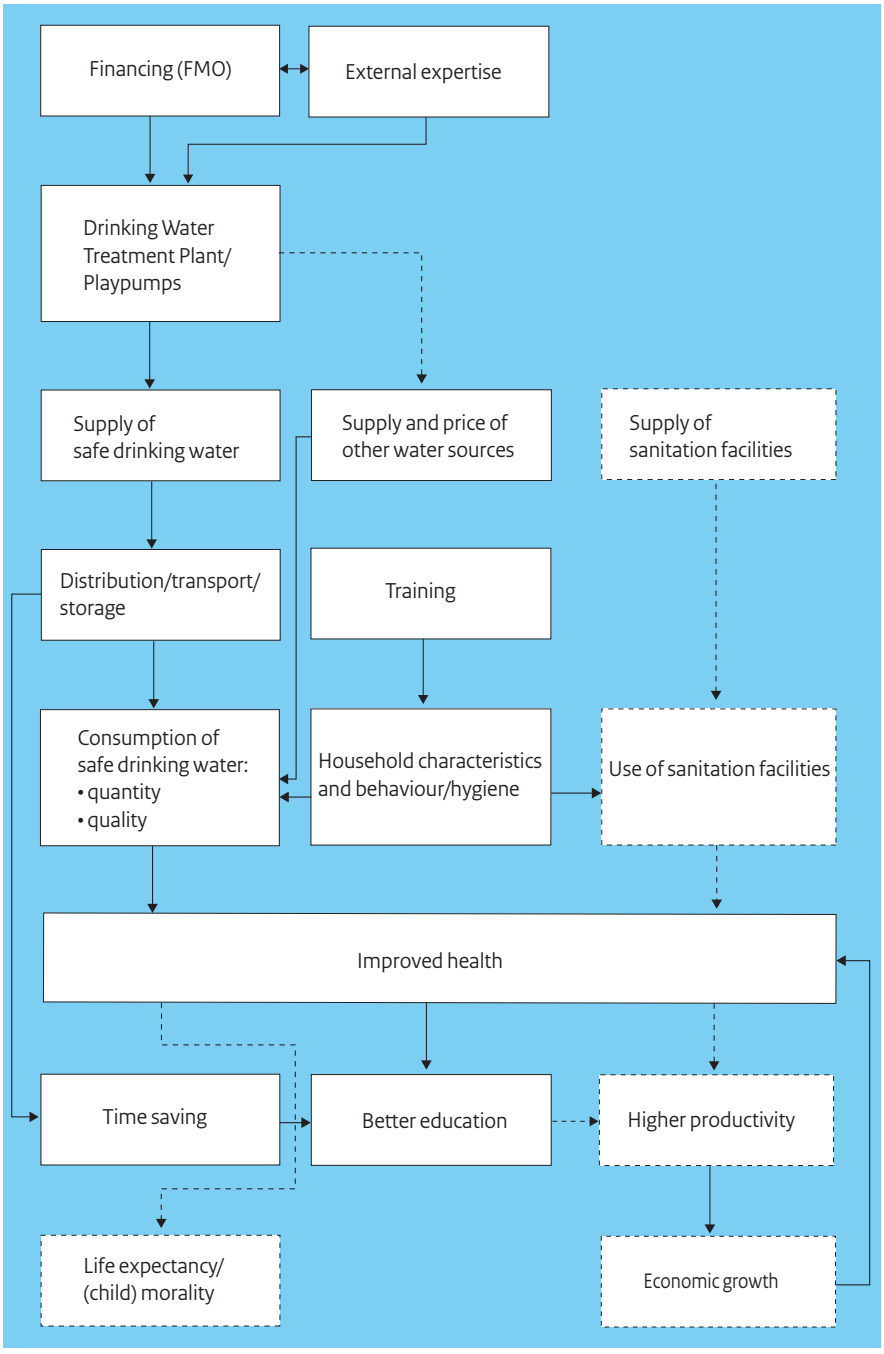
Paul Bergsma	Senior Consultant Water Projects, Royal Haskoning
Martin Littlemore	Project Director, Omdurman Water Supply and Optimisation Project, Biwater, Sudan
Jonathan Park	Project Manager, Farrer Consulting
Omar Khidir	Dep. General manager, Khartoum State Water Corporation
Zaki Osman Mohamed Ali	Networks Control Unit Manager
Hassan Abdel Ati	EDGE for Consultancy and Research, Sudan

Annexe 6 Results chains for the analysed sectors

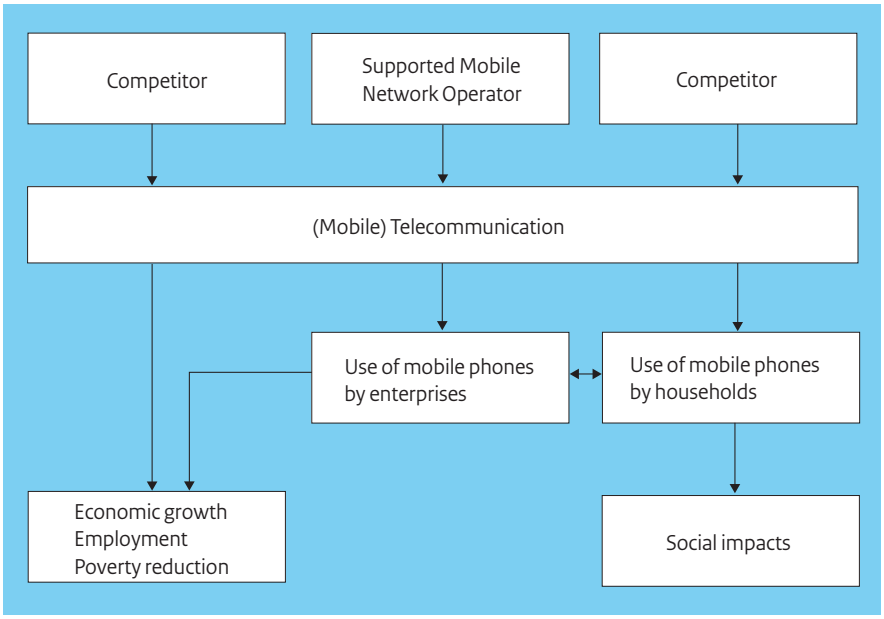
IV.1 Energy



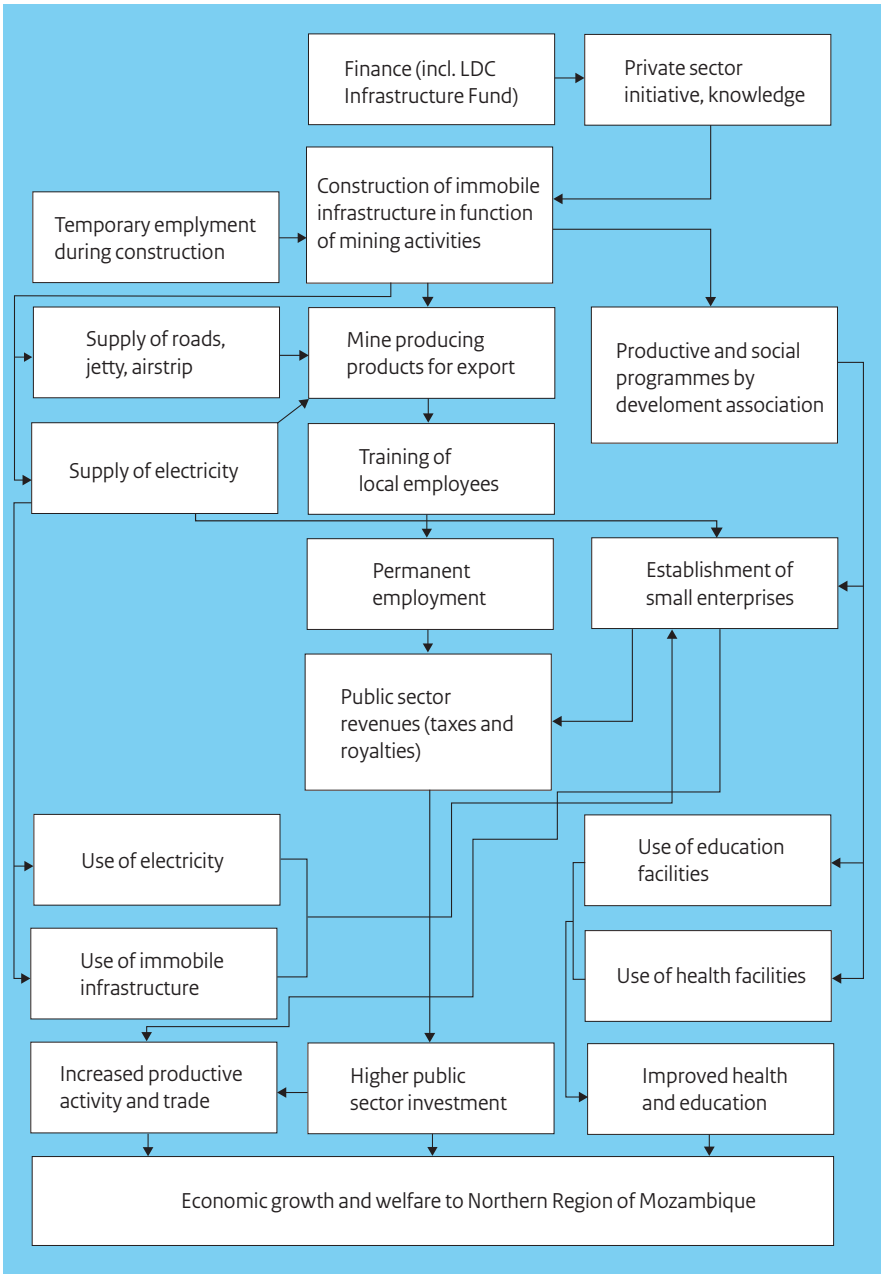
IV.2 Water


Financing (FMO)
External expertise
Drinking Water Treatment Plant/ Playpumps
Supply of safe drinking water
Supply and price of other water sources
Supply of sanitation facilities
Distribution/transport/ storage
Training
Consumption of safe drinking water:
• quantity
• quality
Household characteristics and behaviour/hygiene
Use of sanitation facilities
Improved health
Time saving
Better education
Higher productivity
Life expectancy/ (child) morality
Economic growth

IV.3 Telecommunications



IV.4 Mining


Finance (incl. LDC Infrastructure Fund)
Private sector initiative, knowledge
Construction of immobile infrastructure in function of mining activities
Temporary emplyment during construction
Supply of roads, jetty, airstrip
Mine producing products for export
Productive and social programmes by develoment association
Supply of electricity
Training of local employees
Permanent employment
Establishment of small enterprises
Public sector revenues (taxes and royalties)
Use of electricity
Use of education facilities
Use of immobile infrastructure
Use of health facilities
Increased productive activity and trade
Higher public sector investment
Improved health and education
Economic growth and welfare to Northern Region of Mozambique

Annexe 7 Case studies

1 Omdurman Water Supply & Optimisation Project

Key data

Project name:	Omdurman Water Supply and Optimisation Project, Sudan.
Applicant:	Al Manara Water Company.
Sector:	Water.
LDC Fund contribution:	Subordinated loan of EUR 23.7 mln. Equity EUR 18,400 (2006).

1 Description of the project

This section describes the expected effects of investments in a large drinking water treatment plant in Omdurman, one of the three cities of Greater Khartoum with an estimated population of between 2 and 3 million with an expected growth to approximately 3 to 4 million by 2010. Large numbers of migrants live in Omdurman, as a result of three decades of extensive migration to Khartoum State due to drought (mainly in western Sudan), civil wars and conflicts and unbalanced regional development (EDGE, 2007, p. 10). A large part of the population is poor.

The supply of drinking water in North Omdurman is not sufficient to meet the (rapidly increasing) demand. Currently, a substantial part of the total water supply comes from Khartoum and Khartoum North. Moreover, stations suffer from problems caused by power cuts and irregular electricity supply, technical failures caused by lack of spare parts and insufficient maintenance, in addition to the old age of the network and the ever-increasing demand (EDGE 2007, p. 6). A considerable number of households are not connected to the water distribution network (estimates range from 40% to 60%). Those who are not connected either buy water from street vendors who sell water at much higher prices, or must find other (contaminated) sources. Most of the potable water is of poor quality and does not meet international standards.

FMO contributes to the financing of a new drinking water treatment plant (DWTP) in Omdurman with a loan from the LDC Infrastructure Fund. It is built by the British company Biwater. The project includes a 13-year build-own-operate-transfer contract to construct and operate a 200,000 m3 per day drinking water treatment plant (DWTP) plus infrastructure to provide potable water to the Omdurman district of Khartoum. Biwater, FMO and the Khartoum State Water Corporation (KSWC) set up a joint venture, the Al Manara Water Company, to organise the project. This company constructs, owns and operates the plant, which will directly improve the access to clean and affordable drinking water for approximately 2.5 million people. It is expected that the construction will be completed in January 2010.

The contract includes an extensive Environmental and Social Action Plan (ESAP), consisting of two parts: a construction period and an operational period. It contains sections on occupational health and safety, social issues and pollution. In addition, it encourages the employment of local labour and subcontractors and includes the FMO Model code for Labour Practices and model agreements for subcontractors. Part of the agreement was that KSWC was to develop a policy on environmental and social issues.[53]

2 Size and funding of the project

The total project costs USD 104.5 mln (EUR 88.3 mln) and includes the drinking water treatment plant as well as a water asset management programme (WAM, USD 7.5 mln). The result of FMO's negotiations with Biwater, KSWC and its other partners was a hybrid lease financing structure including an ORET grant, an LDC subordinated loan and senior loans provided by IDC and Calyon. For FMO, ORET was a first source to contribute to the financing of the project. The maximum ORET contribution is 50%, with a maximum investment of EUR 49 mln.

After several years of negotiations, the project was financed by an ORET grant and loans from three banks (FMO, IDC and Calyon):

1)	a grant from ORET	EUR 24.4 mln
2)	a loan from IDC	EUR 18.1 mln
3)	a loan from Calyon	EUR 25.0 mln
4)	a loan from the LDC Infrastructure Fund	EUR 20.8 mln
Total		EUR 88.3 mln

The LDC Fund loan is subordinated to the other loans. However, the risk involved is small. KSWC has a positive cash flow and its creditworthiness is favourable compared to other public companies in Sudan. Moreover, the Ministry of Finance provided a guarantee through the Central Bank of Sudan for KSWC's obligations under the water supply agreement. The contract with Biwater has a fixed price and the parent company guarantees completion and performance.

FMO, KSWC and Biwater negotiated a private sector structure that consists of a Special Purpose Vehicle Company (SPVC) that is called the Al Manara Water Company. The Al Manara Water Company is responsible for the financing of the project, its design, construction, commissioning and operation for the duration of the Water Purchase Agreement (WPA) period. At the end of this BOOT period, after the loans are repaid, the company will transfer the facilities to KSWC in good working order without charge. The company has no employees and only acts as a financial vehicle. The Al Manara Water

53 At the time this report was drafted, KSWC had prepared this policy. However, it had not yet been translated into English.

Company is owned by Biwater (49%), KSWC (5%) and FMO (46%). The equity contribution of FMO is EUR 18,400.

This finance package was designed to reduce water rates to a level deemed sustainable for the Omdurman community. KSWC is expected to sell the water at a positive margin of 15%. During the repayment period, KSWC will buy the water from SPVC at a price of USD 0.292 per m^3.

3 Compliance to LDC Fund criteria

The project meets most LDC Infrastructure criteria:

- *Infrastructure:* water provision and distribution are among the selected infrastructure sectors
- *Limits:* the project respects the LDC Fund limit. The total investment is approximately 10% of the total Fund size (which is the maximum percentage), other investors are involved in the project and the management of the Al Manara Water Company is independent from KSWC.
- *Main criteria:* the project relies almost completely on local subcontractors and local labour for its construction. Nevertheless, though the project generates employment for a small number of people, its main objective will be to make safe potable water available to the people in Omdurman at an affordable price.
- *Appraisal criteria:* evidence suggests that the project is financially sustainable and that the FMO made a positive contribution to its social and environmental effects. The construction involves proven technology. As a result, maintenance will not be demanding and this contributes to the project's technical sustainability.

4 Additionality and catalytic impact

It is difficult to finance a project like this in Sudan. Foreign investors do not invest in Sudan, except for the oil industry. The country ranks 162 on the Institutional Investor list (of 172 countries), comparable with countries such as Côte d'Ivoire or Congo. The fact that funding is in dollars or Euros while KSWG will eventually repay in Sudanese pounds constitutes a significant currency risk. In the current circumstances, private investors would demand interest rates in excess of 25%. Private financing would thus have led to much higher costs and water that is too expensive for a large part of the (poor) Omdurman population.

The history of the project confirms that it is difficult to obtain funding for these kinds of projects. ORET requires that at least 50% of the total investment is financed from other sources. The role of FMO was necessary to get other banks (IDC and Calyon) on board. IDC considered the project (politically) very risky and consequently halved its contribution to USD 24 mln. Moreover, the IDC loan was made dependent on the subordinated loan contributed by FMO. EAIF refused to contribute unless its loans would be guaranteed by a commercial bank.

5 Development impact

The new plant will have a major effect on the livelihood of the poor in (North) Omdurman. More than 75% of the households have an income below USD 400 per month, with an average of USD 215. Approximately 50% of these households have no connection to the network. These households depend on other sources, primarily services provided by water vendors who charge up to five to ten times the regular water price. The Baseline survey conducted by EDGE shows that the poorest groups have the most problems getting access to potable water.

At the start of the project, Omdurman had 94,000 connections. Two in three households were not connected. Moreover, in a population that is growing rapidly due to migration, the risk is that new settlers are the least likely to get connected. KSWC realises 250,000 new connections, also by laying pipelines in new residential areas. The poorest households (consisting of 6-7 persons) consume an average of 200 litres per day, or approximately 30 litres per person per day. This is considerably less than the minimum consumption rate of 75 litres per day. They are forced to buy an average of about 70%-75% of their water from vendors at high prices. Based on a simulation model, we estimate that the total consumption of this group will increase from an average of 200 litres per day to an average of 350 litres per day. Overall, total consumption may increase by approximately 25%. This figure is equivalent to the estimated consumption deficit of approximately 25%.

The project indirectly contributes to poverty reduction by subsidising the price of potable water. Together with the extension of the existing network, the realisation of new connections and the improvement of the billing system, the new plant will significantly improve the financial situation of a large number of households. Overall, the effects will be positive, provided that the fixed rates will not change. Approximately 17% of the households will have to pay more (as a result of the improved billing system and their connection to the network), whereas water expenditure will decrease for 35%. The effects will be most significant for the poorest households. Approximately 42% of the poorest households will benefit from the new situation. Costs will be higher for those households that are the not connected and do not buy water from water vendors (25% of the poorest households). Still, these households, too, will have better access to safe drinking water and consume more water.

These figures do not take the SDG 225 (USD 110) installation costs into account. Households are allowed to pay these costs in instalments of SDG 10 per month. Total water costs will thus be higher during the first two years. Including these costs in the calculation, 30% of the poorest households will be faced with higher costs in the first two years, against only 39% who will pay less. A second comment to be made on these figures is that increased water supply will lead to increased consumption. If the fixed rates do not change, this increase will lower the price per m^3. In terms of KSWC's

turnover, this relative price reduction will be offset by the reduction of unaccounted water (from 40% to 30%) and a total number of 100,000 new connections.[54]

Health

In Sudan, about 11% of deaths are caused by water-related diseases, first among which are diarrhoeal diseases. Each year, approximately 20,000 people die from diarrhoea; another 9,000 die from the effects of malnutrition. In 2006, more than 2,000 cases of acute watery diarrhoea, including 77 deaths, were reported in northern Sudan within a period of two months. Approximately 35% of these cases occurred in the Khartoum State. In all, 37% of admissions to the four local hospitals are related to acute diarrhoea diseases. A large part of the poorest population will not be able to afford access to improved water facilities, with the effect that they will continue to use (unsafe) secondary sources. In the short run, water costs will increase for almost 30% of the poorest households. A large proportion of these households (72%) are not connected to the drinking water system. For 8%, water costs will constitute more than 10% of their income.

Employment

According to the financial proposal, the project will significantly contribute to private sector development in Sudan. However, the whole project is carried out by a foreign company (Biwater). The *direct* employment impact is relatively small. The project employs approximately 300-350 people during the construction phase and approximately 70 during the operations phase. Nevertheless, the project works with local subcontractors and only involves a small number of expats.

Environmental impact

The project will reduce extensive use of groundwater (through boreholes) that leads to dangerously low groundwater levels. Many boreholes already pump salt groundwater. Evidence is also found of high levels of Ammoniacal Nitrogen, indicating pollution by organic waste.

54 Reduction of unaccounted water from 40% to 30% in North Omdurman will save approximately 15,000 m^3 per day, whereas the total increase in consumption is estimated at 20,000-25,000 m^3 per day.

6 Conclusions

This section evaluates the role of FMO in the financing of the drinking water treatment plant built by the British company Biwater in North Omdurman on the eastern side of the Nile in Khartoum, Sudan. The contract includes a 13 year-year build-own-operate-transfer contract to construct and operate a 200,000 m3 per day drinking water treatment plant (DWTP) plus infrastructure to provide potable water to the Omdurman district of Khartoum. The plant will directly improve the access to clean and affordable drinking water for approximately 2 mln people. It is expected that the construction will be completed in January 2010. FMO contributes to the financing by providing an ORET grant and a subordinated loan from the LDC Infrastructure Fund.

The evaluation concludes that the subordinated loan from the LDC Infrastructure Fund is *additional*: it is highly unlikely that the project would have been financed without the LDC loan. The history of the project shows how difficult is to obtain the necessary funds. Foreign investors are not interested in investing in private sector water projects in Africa, especially in Sudan. The subordinated loan from the LDC Infrastructure Fund also had a *catalytic* impact: without FMO, IDC and Calyon would not have funded the project. The central role of FMO in the financing and management of the project also has positive social effects due to the social plan incorporated into the contract.

Direct and indirect employment effects (during the plant's construction and operation) will be limited to 300-350 people during construction and 70 for the operation of the plant. Nevertheless, only a small number of foreign workers are involved in the construction phase and this will have a positive impact on subcontractors. Moreover, the financing construction, the chosen technology, the training of the KSWC staff and management by the Al Manara Water Company for a ten-year period all contribute to the financial and technical sustainability of the water supply. The Water Asset Management Programme promotes the efficient use of the scarce resource by helping to reduce leakages and non-revenue water.

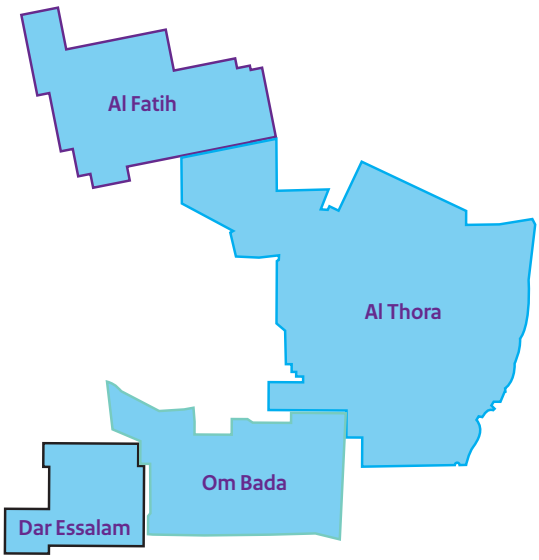
The new plant will directly contribute to an enormous improvement of the drinking water situation in North Omdurman. The project's pro-poor focus has resulted in a financing construction that keeps the cost price of the water low to ensure that the poorest groups have access to safe potable water. The new supply will increase the water consumption of the poorest groups from 200 to 350 litres per household per day. This means a major improvement in the semi-arid climate. Yet, for some, the project will have negative (financial) effects. The poorest groups are currently unconnected to the network. Whereas many of them buy water from vendors, others cannot afford it. Assuming that all of these households will eventually be connected to the network, the cost of water is likely to rise for these households.

Simulations Omdurman

Characteristics of the population in North Omdurman

In order to be able to assess the project's outcome and impact, it is instructive to outline the socioeconomic composition of the target area (North Omdurman). The city lies on the western banks of the river Nile, opposite Khartoum and Khartoum North. Large numbers of migrants, especially from Western Sudan, live in this town as a result of three decades of extensive migration to Khartoum State due to drought, conflicts and unbalanced regional development (EDGE, 2007, p. 10). North Omdurman covers four smaller areas: Dar Essalam, Om Bada, Al Thora and Al Fatih. Of these four areas, Al Fatih and Dar Essalam are relatively new, harbouring a migrant population coming from South and West Sudan.

Figure 1.1 *North Omdurman*



EDGE (2007) makes a slightly different division and discerns three zones: the Eastern Zone (or Eastern Strip) covering the area along the river Nile, the Central Zone covering Old Thawrat and North (or New) Thawrat and the Western Zone, including Dar Essalam and Om Bada. Most people in the Eastern Strip and Old Thawrat originate from Khartoum (35%) or North Sudan (35%-40%). Most migrants live in New Thawrat (including Al Fatih), Om Bada and Dar Essalam. In New Thawrat, almost 50% of the population comes from West Sudan (25% from North Sudan and 20% from Central Sudan). In Om Bada, 65% of the people are from West Sudan. These migrants belong to the poorest groups in Omdurman.

EDGE discerns four types of residential classes. The best houses belong to residential classes 1 and 2. They are made of bricks or concrete. More than 70% of the surveyed population live in third- and fourth-class houses and 57% in mud houses (and no less than 92% in Om Bada).

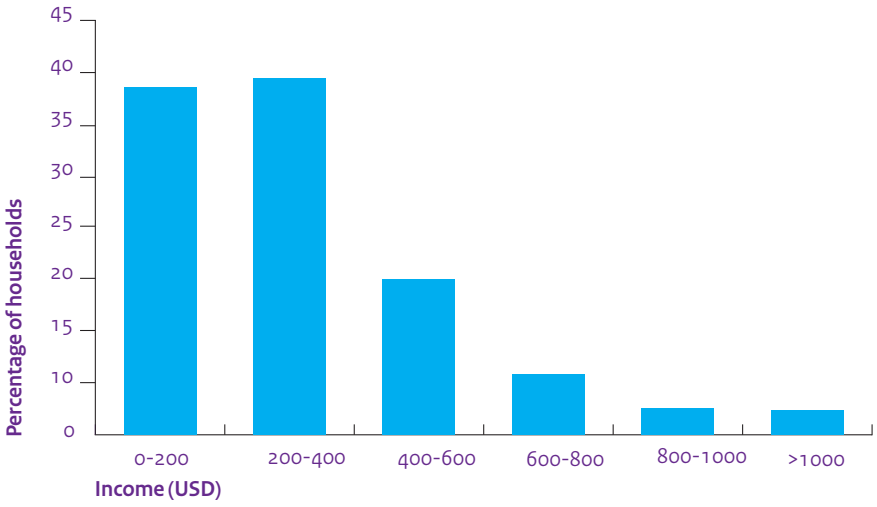
Table 1.1 Percentage distribution of households by residential class

	Eastern Strip	Old Thawrat	North Thawrat	Om Bada / Dar Essalam	Total %
Class 1	9%	22%	1%	0%	8%
Class 2	25%	37%	16%	2%	20%
Class 3	47%	40%	82%	38%	51%
Class 4	18%	1%	1%	60%	20%

Source: EDGE (2007).

Based on the EDGE survey, it is calculated that more than 75% of the households have an income below USD 400 per month with an average of USD 215.

Figure 1.2 *Income distribution in North Omdurman (USD)*



Computations based on EDGE (2007).

Ranked according to economic conditions, the population of Old Thawrat are the relatively better off, followed by the Eastern Strip, the New Thawrat and Ombudda; Dar El Salam comes at the bottom. Among the poorest groups (with an income below USD 400) approximately 50% is not connected to the network (estimates ranging from 40% to 60% for Omdurman as a whole). They depend on other sources, primarily on the services provided by water vendors. Each day, these households spend approximately USD 1-2 on their water, compared to USD 8-22 per month for households connected to the KSWC network.

Table 1.2 Percentage distribution of HHS by water sources

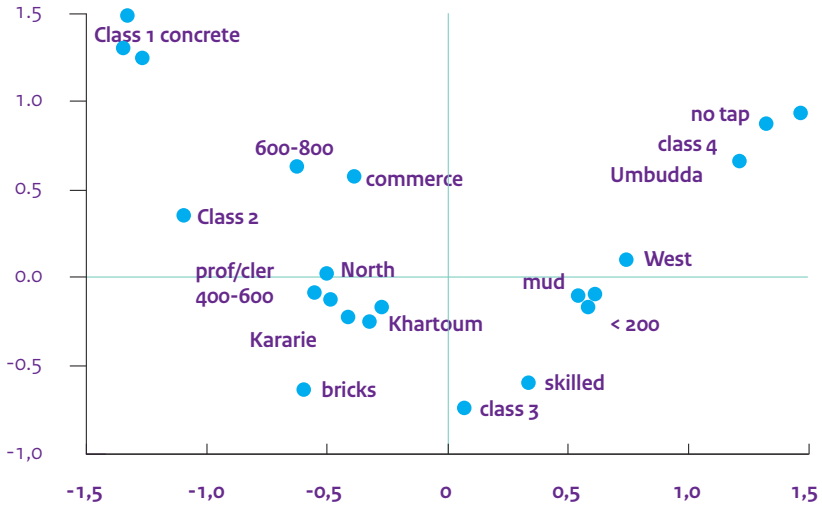
	Eastern Strip	Old Thawrat	North Thawrat	Om Bada / Dar Essalam	Total %
Tap within house	94.7	97.4	88.7	56.2	84.1
Tap outside house	3.8	0.7	1.3	0.8	1.5
Well within hai	0.0	0.0	1.7	0.0	0.4
Donkey cart	0.5	0.4	6.3	42.2	12.6
Tanker	0.0	0.0	0.0	0.4	0.1
Other	1.0	1.5	2.5	0.0	1.2

Source: EDGE (2007).

Figure 1.3 presents the characteristics of the Omdurman population.[55] People living in class 1 and 2 houses have the highest incomes, live in concrete houses and many of them work in the commercial sector. A second category in North Omdurman are 'middle incomes' (400-600 USD/month). These people originate from (Greater) Khartoum or the northern part of the country and live in brick houses in (the older part of) Al Thora. People in the third group are skilled manual labourers who earn an income of USD 200-400 per month. Their (class 3) houses are connected to the water distribution network. The poorest groups are found in Om Bada, Dar Essalam and Al Fatih. Many of these people are migrants from Western Sudan. They live in mud houses, work in the informal sector, have unskilled jobs and earn an income below USD 200.

55 The figure is created using Homals. This programme groups categories of (nominal) variables and records (households) based on the algorithm of alternating least squares. The figure presents a solution in two dimensions.

Figure 1.3 *Characteristics of the population in North Omdurman*



Estimated changes in water consumption

In order to be able to assess the effect of the project, we have used a simulation model to calculate the expected effects. Table 1.3 gives an estimation of the average water use by connection and residential class.[56] These figures include the total amount of water obtained from other sources. A large proportion is supplied by water vendors.

The table shows that it is the poorest groups in particular (living in residential classes 3 and 4) who buy water from water vendors. For the households that are connected to the distribution network, this dependence on water vendors is due to the fact that water pressure is very low during a large part of the day. Wealthier people can afford electrical pumps to obtain water from the network. As a result, the poorest groups pay the highest price for water.

56 Average estimates by KSWC class are 1,000 l/d, 825 l/d and 390 l/d, respectively (and 200 l/d for unconnected households).

Table 1.3 Estimated and expected water use (litres per day) per household by connection and residential class

	Connected	Not connected	Total
Current situation			
Class 1	750	-	750
Class 2	460	-	460
Class 3	390	240	380
Class 4	380	200	230
Total	415	210	330
With new plant and new connections			
Class 1	830	-	830
Class 2	520	-	520
Class 3	470	350	450
Class 4	460	340	360
Total	480	345	425
Current dependence on water vendors			
Class 1	10	-	10
Class 2	10	-	10
Class 3	35	120	45
Class 4	55	145	130
Total	35	140	80

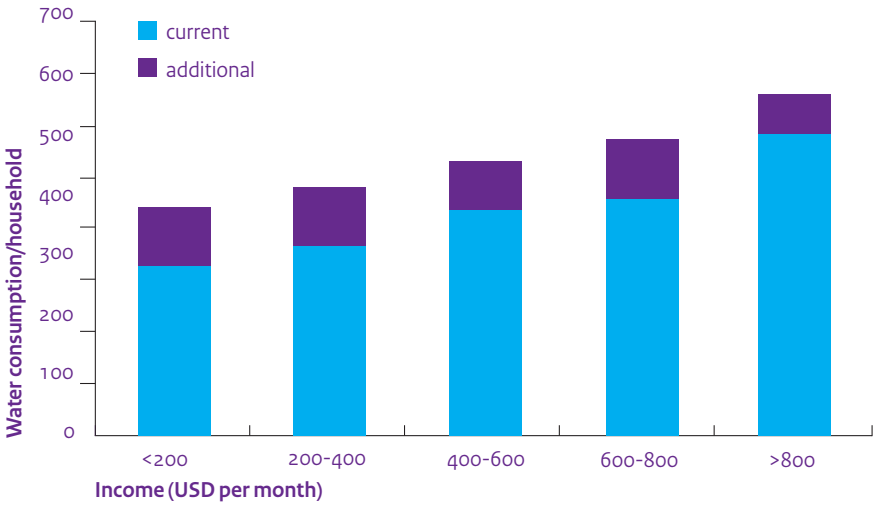
Computations based on EDGE (2007).

According to our estimates, the poorest households (consisting of 6-7 persons) without a connection to the network consume an average of 200 litres per day, or approximately 30 litres per person per day. This is considerably less than the minimum consumption rate of 75 litres per day. They are forced to buy an average of about 70%-75% of their water from water vendors at high prices. Based on a simulation model, we estimate that the total consumption of this group will increase from an average of 200 litres per day to an average of 350 litres per day. Overall, total consumption may increase by almost 30%. This figure is equivalent to the estimated consumption deficit of approximately 25%. Figure 1.4 presents the estimated effects by household income (per month).

The figure illustrates that there is a relatively large effect for households with an income of USD 600-800 per month. This is a relatively small group (approximately 7% of the total in the sample) half of which lives in houses of residential classes 3 and 4. 85% of these households complain of the water distribution network.

The estimated total water use is 80,000 m³ per day and when the new plant is in operation this amount increases to more than 100,000 m³ per day. This is substantially less than the average supply for Omdurman (240,000 m³), the estimated demand (300,000 m³) or the capacity of the new drinking water treatment plant (200,000 m³). However, the estimated figures only refer to North Omdurman. The demand in North Omdurman is estimated at approximately 60% of the demand in Omdurman as whole.[57]

Figure 1.4 *Effects of the new plant by residential class and income group.*



Computations based on EDGE survey (2007).

57 There are no (reliable) estimates of the population size of Omdurman or North Omdurman. For this simulation, the size of the North Omdurman population was estimated at 1.5 million and of Omdurman as a whole at 2.5 million.

According to Farrer and KSWC estimates, approximately 40%-45% of the total water use is 'unaccounted for', mainly due to leakages. This would imply that the real consumption in North Omdurman is 0.6 x 0.6 x 240,000 = 86,000 m³ (including the consumption of the industrial and commercial area and public facilities). The simulations calculated an additional consumption of approximately 25%-30%. This will have a negative effect on the price per m³. For KSWC, however, this price reduction will be offset by the reduction of non-revenue water (from 40% to 30%) and the total number of 100,000 new connections.[58] KSWC estimates a consumption deficit of approximately 25%. Simulations confirm this assumption.

Effects on household expenditures

Together with the extension of the existing network, the realisation of new connections and the improvement of the billing system, the new plant will significantly improve the financial situation of a large number of households. Based on the EDGE report, Royal Haskoning concluded that the rates charged by KSWC are affordable to most households and that they will be considerably lower than alternative sources. Consequently there are no obstacles for poorer people to gain access to the water supply (Quarterly Report 4, 2008, p. 16). According to this consultant, this conclusion is supported by recent experience in areas where new water distribution networks were constructed. In these areas, almost 100% of the new households have applied for connection to the network.

Financial calculations are based on an average price of USD 0.335 per m³. However, 90% of the total water flow is not metered. Only commercial customers and government institutions have water meters and are charged based on actual consumption. Consequently, KSWC charges users flat fees, based on a classification of connections. In residential areas, there are three classes (mainly) determined by the diameter of the tube.[59] Households in the first category normally have a 1-inch pipe and pay a fixed rate of SDG 45 (approximately USD 22). The second category, with 3/4 inch pipes, pay a rate of SDG 25 and for the lowest class (½ inch pipes) the rate is SDG 15.

Households in KSWC category 3 pay approximately USD 8 for 30 x 350 litres = USD 0.75 per m³. This price is substantially higher than the calculated average price of USD 0.335 per m³. Nevertheless, water vendors charge much more so the poorest households in particular will benefit from the improved water supply. On the other hand, many poor households currently pay nothing for their water (EDGE, 2007). Once they are billed, this may have a negative impact on their other expenditures.

58 The reduction of non-revenue water from 40% to 30% in North Omdurman will save approximately 15,000 m³ per day, whereas the total increase in consumption is estimated at 20,000-25,000 m³ per day.

59 The three KSWC classes do not correspond to the residential classes of the EDGE survey. They may, however, overlap. In general, KSWC class 1 may be found in residential classes 1 and 2 and KSWC class 2 in residential classes 1 to 3. KSWC class 3 consists of houses in residential classes 2 to 4.

Based on the EDGE survey, we simulated the expected financial effects for households. This simulation is based on the following assumptions:

1. as a result of the improved billing system, each household will pay a fixed rate in accordance with its KSWC classification;
2. each household will be connected to the network;
3. new connections will be classified as category 3;
4. households will no longer buy from vendors.

Overall effects will be positive, assuming that the fixed rates will remain unchanged. Approximately 17% of the households will have to pay more (as a result of an improved billing system and their connection to the network), whereas for 35% of the households water expenditures will decrease (see figure 1.5). Effects will be most significant for the poorest households. Approximately 42% of the poorest households will benefit from the new situation. Costs will be higher for those households that are not connected and do not buy water from water vendors (25% of the poorest households). Still, these households, too, will have better access to safe drinking water and will consume more water.

Figure 1.5 *Financial effects for households by income**

* *Estimated effect as % of household income.*

These figures do not take the SDG 225 (USD 110) installation costs into account. Households are allowed to pay these costs in instalments of SDG 10 per month. Total water costs will thus be higher during the first two years. Taking these costs into account, 30% of the poorest households will be faced with higher costs in the first two years, against only 39% who will pay less. Table 1.4 presents the estimated average effects by income category.

Table 1.4 Estimated average financial effects for households by income

Changed water expenditures / income		
Income (USD)	**Temporary (2 years)**	**After 2 years**
<200	-6%	-11%
200-400	-15%	-19%
400-600	-19%	-22%
600-800	-9%	-12%
>800	-3%	-4%
All	-11%	-15%

The positive effects appear to be largest for the middle income groups (USD 400-600 per month). A large proportion of households in this category buy a large part of their water from vendors in addition to the water they obtain from the network.

The increased water supply will also lead to increased consumption. If the fixed rates do not change, this increase will lower the price per m^3. Table 1.5 presents the estimated average effects by household income. Note that the estimated average price in the current situation includes the water bought from vendors.

Table 1.5 Estimated average water price (USD m^3) by household by income

Income category (USD)	Current situation	Temporary (2 years)	After 2 years
<200	1.05	0.70	0.61
200-400	1.00	0.63	0.58
400-600	0.87	0.56	0.54
600-800	0.74	0.55	0.54
>800	0.58	0.56	0.56
All households	0.90	0.62	0.57

2 Roundabout Playpumps, Mozambique

Key data

Project name:	Roundabout Playpumps, Mozambique.
Applicant:	Roundabout Playpumps (Public Benefit Organisation), South Africa.
Sector:	Water.
LDC Fund contribution:	September 6, 2005: grant approval for USD 1 mln.

1 Description of the investment

The South African company Roundabout Outdoor (established in 1996) is the developer of the Playpumps. The Playpump couples a low-maintenance pump with a roundabout (or 'merry-go-round') children can play on. As the roundabout rotates, water gets pumped from a borehole into a water storage tank. In 2003, a patent was obtained for an improved design. Since 2000, the PlayPump® water system has been tested and proven throughout South Africa. In 2004, a separate organisation was established for fundraising: Roundabout Playpumps (later Playpumps International Africa).

Initially (1999- 2002) the company relied on international aid for its investments, while revenues from sales of advertisement space on the elevated tanks was used to cover the maintenance costs of the installations. In 2000, Roundabout Outdoor won the World Bank Development Marketplace Award and the Playpump gained international attention (and financial support) as an appropriate technology for water supply programmes. In 2003, a brief evaluation of the Playpumps installed in South Africa showed positive results. Interested donors, including UNICEF, insisted on expanding activities outside the borders of South Africa. In March 2008, the organisation of related companies split up and new companies and organisations emerged that intended to install pumps not only in South Africa, but all over Africa.

2 Size and funding of the investment

In 2005, FMO granted USD 1 mln to support the replication of the South African project in Mozambique. The LDC Grant Proposal of September 2005 justified the grant by claiming that 'FMO's grant will strengthen the business concept of Roundabout and will likely lead to more donor funding in the future'. The grant was not intended to cover development costs, since the plans for operations outside South Africa were already put in place. In 2005, there were two major donors apart from FMO, that shared the 'expansion' objective: a) TPG (Netherlands Postal Group), assuming the costs for drilling of 30 wells; b) the Lemelson Foundation (USA) in combination with the International Finance Corporation (World Bank Group). A smaller donor also participated: BAT (British American Tobacco Company) assumed the cost for three pumps.

According to the 2005 Grant Agreement, USD 1 mln would allow for the procurement and installation of a minimum of 61 pumps (envisaged remainder funds could be used for additional pumps). In practice, 49 pumps were installed from the LDC Fund grant, since the unit price sharply increased over time. Over the period between 2003 and 2008, the relative contributions by commercial banks and development banks decreased, whereas private sector sponsorship initially increased and later dropped. The relative share of non-governmental organisations (NGOs) in total funding increased over time.

The expansion of activities outside South Africa was based on the interests of international organisations rather than commercial considerations. FMO allocated its grant to the fundraising organisation Roundabout Playpumps, actually 'purchasing' pumps from the company Roundabout Outdoor to subsequently donate them to schools and communities in Mozambique. FMO's support to the 'strengthening of the business concept' in the water sector has been indirect at the best.

3 Compliance to LDC Fund criteria

In 2005, the Ministry of Foreign Affairs stressed the importance of a special focus on water projects within the LDC Infrastructure Fund. FMO was eager to identify potential projects in the water sector in Africa and Playpumps provided the opportunity to support a private sector initiative. The major risks of the project were not explicitly identified in the grant proposal. Still, two risks were explicitly mentioned: the possibility that the pumps would not be socially acceptable in Mozambique and the risk that children would get hurt while playing. The FMO Grant Committee required technical modifications in the design in order to avoid injuries.

The grant was in accordance with the LDC Fund criteria: it was an activity with financial return though not commercially viable (only the maintenance costs were to be covered by revenue generated from sales of advertisement space) and it contained a social development aspect (providing access to safe drinking water; reducing health risks and reducing the time children and women spend fetching water).

4 Additionality and catalytic impact

The World Bank Development Marketplace Award (2000) was important in drawing attention from both bilateral and multilateral donors. Since 2002, Roundabout has been able to attract sponsorship from the private sector for the installation of Playpumps. Since contributions can be easily fragmented into smaller amounts (donation of a single pump) Playpumps are appealing to both companies who want to show their corporate social responsibility and charity organizations (and even individuals) alike.

The Grant Proposal formulated FMO's objective for the subsidy as follows: 'to show that the Playpump concept which has already achieved widespread acceptance in South Africa can successfully be replicated in a much more challenging environment, such as

Mozambique'. The proposal referred to Roundabout's efforts to obtain finance for activities outside South Africa, indicating that '[o]ver the last two years [...] Roundabout had discussions with the World Food Programme, UNICEF, FAO, TPG, Danida and officials from the Mozambican Department of Education regarding its expansion into the rest of Africa'. Various donors (including UNICEF, Save the Children Fund, and USAID) showed interest, but of all official donors only IFC and FMO responded positively at short notice. According to Playpumps International Africa 'FMO's contribution was 'leading' in getting the Playpumps installed outside South Africa and to move into more difficult environment in Mozambique'.[60] This role, however, was not recognised by others. FMO is not mentioned as one of the funding agencies in the Ministry of Public Works' register of water systems, whereas a 2008 evaluation[61] of the Playpumps in Mozambique omitted to refer to FMO.

The additionality of the LDC Fund grant should be assessed exclusively in relation to the funding of Playpumps in Mozambique (and not in relation to the funding of activities in South Africa). FMO was among the first to invest, while others, including UNICEF, WFP and USAID that were invited at the same time, required more response time due to their internal funding processes.

5 Development impact

The plan for installing pumps outside South Africa comprised a first wave of 30 pumps in 2005 and a consecutive wave of approximately 100 pumps in 2006. FMO agreed to finance 11 pumps of the 2005 lot and 50 pumps in 2006, amounting to 45% of the total plan (61 out of 130 pumps). Due to changing responsibilities for the drilling of boreholes, as well as changes in international steel prices, the unit price for a single pump increased from USD 9,700 for the first 30 pumps to USD 17,400 for the pumps installed in 2006. One of the major differences with the South African system was that pumps were not only installed at schools but also in communities. In Mozambique, numerous Playpumps were installed without proper coordination with village authorities or school administrations. Due to social reasons (adult women feeling embarrassed using the pump) the utilisation of the pumps was less successful than in South Africa: many users only pumped for personal use and did not fill the tank.

Initially, maintenance remained below expectations, since the demand for advertising space in Mozambique turned out to be less than in South Africa. Only 22% of the Playpumps (2008) contained commercial advertisement. In addition, calling for maintenance happened to be problematic: in many cases there was no telephone or internet available in the villages or no information was left behind regarding whom to contact in case of system failure (36% of the cases). Maintenance was seriously deficient, expressed by long down times (60-100 days). Consequently, users looked for

60 Interview Water for All, November 2008.

61 Mission Report on the Evaluation of the PlayPumps installed in Mozambique. Ana Lucia Obiols and Karl Erpf, April 2008.

alternatives. Later in 2008, several of these maintenance problems were solved by involving more local companies.

The expected output of the Playpumps is clean drinking water. In a survey conducted by Erpf and Obiols (2008) water quality had not been checked prior to installation (pH measurement, chemical composition) in any of the systems sampled. Thirty percent of the pumps produced insufficient water to satisfy local needs. Even worse was the quality: 39% of the pumps produced slightly red ('rusty') water, whereas the pumps produced water with a bad smell (rotten eggs) in a quarter of the cases. In a quarter of the cases the water had a high sand content, not only affecting taste but also resulting in early wear and tear of the installation. In 17% of the cases the pumps were too heavy to be handled by children, a third produced too little water and in over 20% of the cases Playpumps replaced existing capacity (AfriDev pump).[62]

It is not evident that Playpumps in Mozambique led to comparable time savings. Time was only saved in cases where there was no pump before (which was not always the case). Actually, fetching water at a Playpump sometimes required even more time (due to the separation of the pump from the tap). In a number of cases, women felt embarrassed to use the pump and opted to fetch water elsewhere.

One of the positive outcomes of the Playpumps in Mozambique was that they provided the opportunity to play, particularly in rural areas. Negative effects included communication loss (social gathering) as a result of the physical separation between pumping and tapping water and the dismantling of the social organisation around drinking water (water committees). Since maintenance is granted free of charge and village water committees were dismantled, water quality control is no longer carried out.

6. Conclusions

The LDC Fund grant to the Roundabout Playpumps reflects FMO's search for opportunities to support private sector activity in the water sector in Africa, an explicit intention expressed by the Ministry of Foreign Affairs (DDE) in 2005.

The Playpumps are particularly appealing to commercial parties and non-governmental organisations. There is no evidence that the grant played any catalytic role by triggering other donors. All main investors had been approached before, or at the same time as, FMO, though they were unable to make a firm commitment as early as FMO. The grants from the United States were provided independently of FMO's contribution or presence.

FMO's objective to show that the Playpumps concept could be replicated elsewhere was achieved. However, the Playpump story shows that 'best practices' do not guarantee

62 Several of the replaced AfriDev pumps could (partly) be reused elsewhere, so in practice the replacement factor was less than 20%.

success elsewhere. The impact in Mozambique was less than in South Africa due to different physical, commercial (less interest in advertisement space), and social conditions. Nevertheless, the replication triggered the search for solutions to practical problems, for example in maintenance.

For the financing of this particular activity the LDC Fund had no particular comparative advantage over other funding mechanisms. From the Dutch perspective, the same activity could have been funded by means of other mechanisms, such as Dutch co-funded NGO's or through bilateral water programmes.

3 Songas

Key data

Project name:	Songas, Tanzania.
Applicant:	Songas.
Sector:	Energy.
LDC Fund contribution:	2003: EUR 13.5 mln in equity capital.

1 Description of the investment

The Songas project is a natural gas-to-power project that was initiated as early as 1972, but it was not until the end of the 1990s that it seriously came into development. Natural gas is pumped from the Songo Songo Island (SSI) gas field, processed on the island and transported to Dar es Salaam through a 225-km marine and onshore pipeline. An earmarked quantity of natural gas, so-called protected gas, is used as input for the Songas power plant at Ubungo, Dar es Salaam. A small share of total gas supply is for the Wazo Hill Cement Industry and the remaining gas, so-called additional gas, is sold to other industrial consumers. The 180 MW power plant at Ubungo delivers power to the state-owned power distribution utility TANESCO under a 20-year Power Purchase Agreement (PPA). The plant generates approximately 20% of the national grid's total power capacity. Songas' supply of TANESCO takes place under a guarantee of the Government of Tanzania. Ownership and operation of the various activities are shared between Songas, ORCA Exploration, TPDC and TANESCO. The whole project became commercially operational in July 2004.

2 Size and funding of the investment

The total costs of the Songas investment project amounted to USD 256 mln, which was USD 52 mln less than initially budgeted. CDC Globeleq has been involved in Songas as major sponsor, owner and entrepreneur since 1994. While already owning approximately 54% of the common shares and preferred B shares, CDC Globeleq also acquired the bulk of the remaining shares, including preferred A shares from AES in 2003. AES had to pull out of Songas as a result of the ENRON crisis. When this happened, the Tanzanian Government expressed clear preference that CDC Globeleq should sell its preferred B shares to a development finance institute (DFI) as these B shares were intended to serve as a balancing factor in the project. They would allow for an independent shareholder to be represented in the board of directors next to the representatives of the manager/operator that could carefully and critically monitor Songas operations. During the first stages of FMO involvement in 2003, both DEG and FMO indicated that they were interested in taking over the B shares. However, shortly after the FMO-LDC proposal was presented, DEG pulled out because it considered the combination of the TANESCO risk and the Government risk too high.

The FMO-LDC Fund acquired promissory note (a loan) of CDC Globeleq prior to the pipeline investments. Equity investments were made in 2003 (contract signed, EUR 13.5 mln). In the course of 2004, after the Commercial Operations date was achieved, the

promissory note was converted into preferred B shares as foreseen in the Shareholders Agreement. By the end of 2007, the loan was reduced to EUR 9 mln due to repayment and value adjustments.

3 Compliance to FMO-LDC criteria

On September 2, 2003 the FMO-LDC Infrastructure Fund participation in the Songas B shares was approved and funds were disbursed in 2004. At the time FMO acquired the Songas equity, the construction phase of the Songas investment was nearly completed (COD: July 2004). It is therefore difficult to maintain that the funding contributed to the build-up of infrastructure. Apart from the additionality and catalytic impact of this FMO-LDC investment, which are discussed below, all other FMO-LDC criteria for funding were met.

4 Additionality and catalytic impact

FMO-LDC invested in Songas preferred B shares after the Government of Tanzania had expressed its wish to have an independent observer in the board of directors of Songas. The available documentation suggests that CDC Globeleq was requested to sell its B shares. Under these circumstances (a private sector party willing to participate in B prefs but requested by the Government to sell them) the FMO-LDC participation was not additional to the market. The fact that no other party (other than FMO and CDC Globeleq) was willing to fund the B shares suggests that FMO was additional. However, the only reason for CDC Globeleq to search for an interested party was to accommodate the request of the Tanzanian Government.

In the FMO-LDC assessment of this project, the participation of DEG was identified as the catalytic impact of FMO-LDC funding. However, DEG eventually decided not to take over the B shares (leaving FMO on its own). DEG rejected the proposal because the combination of the TANESCO risk and the Government risk was considered too high. In its advice on the Songas finance proposal (July 27, 2003) IMR acknowledged that the condition that the FMO-LDC Fund should have a catalytic impact on other funding of at least the same size was not met. Lack of catalytic impact is also acknowledged in the ex-post 5-year evaluation (FMO Evaluation Form 2008, Songas, date finalized: July 2, 2008) because FMO-LDC funding did not trigger DEG to participate as well.

5 Development impact

The Songas gas-to-power project was initiated as early as 1972, but it was really speeded up by the end of the 1990s. Full explorations and appraisal of the natural gas resources at Songo Songo Island (SSI) were completed around 2000 and demonstrated sufficient quantities of natural gas for commercial exploitation. A total number of five production wells were installed. On the island, a production facility was constructed to process the natural gas. The natural gas is pumped from the SSI gas field to the processing plant and then transported to Dar es Salaam through a 225-km pipeline. The 110 MW diesel-fuelled Ubungo power plant in Dar es Salaam was transformed to a

natural gas-fuelled power plant. Halfway 2005, less than one year after the Ubungo power plant first generated electricity using natural gas from the Songas project, an expansion of 65 MW was realized, which increased Ubungo's total power generating capacity from 115 MW to 180 MW. Currently, six turbines account for the total capacity of the Songas power plant at Ubungo. On July 20, 2004 the Ubungo power plant in Dar es Salaam received the first gas and the Commercial Operation Date (COD) of the gas-to-power project was achieved. Finally, a modest 34-km natural gas distribution network was constructed in Dar es Salaam in order to supply natural gas to a number of industrial gas users.

Natural gas production started in July 2004. Total gas production increased from around 5 bcf in 2004 to 15 bcf in 2005, gradually rising to around 20 bcf in 2008. A fixed quantity of natural gas goes to the Ubungo power plant (approximately 14 bcf per year). Gas consumption by industrial consumer is growing rapidly, both in quantity and value. In addition, the number of industrial users doubled from between 2004 and 2007. Figures on revenues are limited: in 2006 revenues amounted to approximately USD 30 mln, a large and fast-growing part of which came from industrial users. In July 2004, power production and gas production commenced simultaneously. Since 2005, approximately 1 mln MWh has been generated each year. Under the heading of corporate responsibility, Songas supplies free water, electricity, student bursaries, jobs to the several hundred islanders, an upgrade of the local dispensary and gas to villages along the pipeline. Songas also established HIV/AIDS guidelines and provides treatment to affected employees.

The project reduces Tanzania's dependence on diesel fuel imports and the country's foreign exchange requirements, hence improving the country's macroeconomic stability and reducing CO_2 emissions. Finally, it is also claimed that a diversification of Tanzania's power supply base, away from hydropower towards natural gas and coal-fired power supply, reduces power shortages and increases the reliability and stability of its power supply. However, due to the fact that the Songas project substituted gas-fired power generation for diesel-fired power generation, it is difficult to establish whether this improvement in stability actually occurred.

6 Conclusions

FMO-LDC participated in Songas after the Government of Tanzania had expressed its wish to have an independent observer in the board of directors of Songas and requested CDC-Globeleq, the main sponsor of Songas, to sell its preferred B shares. Under these circumstances, FMO-LDC participation could not be additional to the market. There is also no evidence of any catalytic impact of the FMO-LDC equity participation in Songas. It is doubtful whether funding of the Songas investment contributed to the build-up of infrastructure, since the investment was nearly completed at the time FMO got involved.

The major outcomes of the Songas investment project are: development of a natural gas market for commercial and industrial users and creation of a natural gas infrastructure; stable, reliable and affordable power for households and businesses; establishment of a platform for power generation capacity, for either domestic use or export; reduction of cost of power by substituting high-cost imported oil with low-cost domestically produced gas in power generation; reduction in CO_2 emissions by substituting oil with gas in power generation; reduction of foreign exchange needs and generation of tax and exploitation income and private sector development (Songas entered the electricity market as a public/private company side by side with the national electricity company and now supplies natural gas to several commercial companies along the pipeline).

The development impact of the Songas project is very high and reaches far beyond natural gas generation, pipeline gas transport and gas supply to industrial users and power generation. Its development impact will most likely be reflected in a per capita growth of GDP and poverty reduction.

4 Artumas/Mtwara, Tanzania

Key data

Project name:	Artumas/Mtwara, Tanzania.
Applicant:	Artumas.
Sector:	Energy.
LDC Fund contribution:	2006: USD 29.8 mln equity. In addition, a senior loan of USD 17.5 mln was provided by FMO-A in 2007.

1 Description of the investment

The Mtwara project is a fully integrated off-grid gas-to-power-to-consumer project in Mtwara Province (Southeast Tanzania). The project is implemented by Artumas, a junior Canadian independent oil and gas exploration and production company that (only) operates in the Ruvuma Delta Basin in Tanzania and Mozambique. The project consists of two parts: exploration, transport and marketing of natural gas, and natural gas-fired power generation, transmission and distribution. Implementation of the project involves the following components:

- Development of an existing natural gas field located at Mnazi Bay and construction of a gas processing plant at a production site at Msimbati. So far, four wells have been constructed (one in the bay and the remaining three on land). Of these wells, only one is currently (October 2008) used for production. Current gas production is a small part of feasible production. Gas pumped from the wells is directly processed.
- Construction, operation and maintenance of a 27-km pipeline. The pipeline runs from the production site at Msimbati, Mnazi Bay to a power plant at Mtwara town. Installation, operation and maintenance of a natural gas-fired 11.4 MW power plant. The gas is processed in a gas cleaning facility before being fed into the power plant. In 2008, power generation was achieved by 6 Catarpillar generators of 1.9 MW each. Arrangements are made for an immediate increase of generating capacity by either placing three additional 1.9 MW Catarpillar generators in the current production hall (raising the total power generation capacity up to 17.1 MW) or building a duplicate of the current production hall next to the existing one (raising the total power genera tion capacity up to 34.2 MW).
- Upgrade, operation and maintenance of approximately 275 km of pipeline that is part of an existing off-grid transmission and distribution system that supplies power to Mtwara, Lindi and Masasi (the so-called Mtwara Energy Project (MEP)). Over 45,000 new households will be connected in the course of this project. The total number of connections in Tanzania ranging between 600,000 and 700,000, this implies an increase of 6.3% to 7.5%.

2 Size and funding of the investment

At the start of the activities (2003-2004) total project expenditures were estimated at USD 97 mln. Artumas anticipated that future expenditures would be funded through a combination of Artumas equity, a debt facility of USD 35 mln from the Emerging Africa Infrastructure Fund, a USD 10 mln infrastructure grant from the World Bank and the participation of FMO in up to 20% of the project costs. Artumas also anticipated that it might enter into a joint venture agreement with a suitable partner to share the costs and risks of the drilling operations. Total invested funds increased to USD 123 mln by the end of 2006 and USD185 mln by the end of 2007. The World Bank infrastructure grant did not materialize. The EAIF lead arranging mandate for USD 35 mln was terminated in the first quarter of 2008. Artumas approached Stanbic Bank for debt funding to close the USD 17.5 mln gap, but it was turned down in February 2009.

In 2003, FMO was requested to fund 17% of the gas exploration programme of the Mtwara project and by early 2004 FMO-LDC participated in the finance of development costs (seismic programme, well testing and completion, etc.) by providing a grant in the form of a warrant to be converted into equity once the project was in operation. The warrants entitled FMO to obtain up to 20% of the shareholding, subject to contributing a proportionate share of the development cost. In 2006 the FMO-LDC Fund participated in Artumas Tanzania Jersey Limited (AJTL) share capital with USD 14.5 mln thus acquiring a 19.65% position in ATJL. Funds were used for further exploration and marketing of natural gas and power generation, transmission and distribution. In 2007, an additional FMO-LDC participation in ATJL also stemmed from maintaining FMO's 19.65% equity investment from the LDC Fund in ATJL for which USD 15.3 mln was requested. Additionally, a senior secured 15-year loan of USD 17.5 mln from FMO-A (18-month grace period) at a margin of 4.6% was approved in 2007.

3 Compliance to LDC Fund criteria

After the 2007 investment, the total investment of USD 28.1 mln slightly exceeded the maximum limit of USD 27.1 for the FMO-LDC Fund (i.e. 10% of the total FMO-LDC Fund size). This limit was waived by the LDC Fund Manager.

4 Additionality and catalytic impact

The FMO-LDC contribution to Artumas Tanzania Jersey Limited was additional. At the time of the first FMO disbursement in 2004, the strategic shareholder, AGI, was identified as a junior company, with no cash flow generating activities. In its internal documents, FMO refers to AGI as a sponsor that is not particularly strong or solid, notwithstanding its strong commitment to the Mtwara project: 'The company is still in its infancy, without cash flow generation' (see e.g. IMR, 23/8/2006). This increased the completion risk of the investment project. In addition to its greenfield character, this risk added to the reluctance of private sector investors to co-finance the early phases of the project. These are reasonable grounds to support the additionality of FMO-LDC finance.

The gas processing facilities at Mnazi Bay, as well as the gas pipeline, gas receiving station and power plant at Mtwara town, were constructed in 2005 and 2006. In 2006 and 2007 the upgrade of the power network in Mtwara and Lindi was also taken up. The gas supply facility came into operation in December 2006 and the power generation facility was commissioned for full commercial operations in March 2007. The FMO-LDC equity participations were approved on August 29, 2006 (USD 14.5 mln) and May 29, 2007 (USD 15.3 mln), closely preceding and following the completion of the development phase.

5 Development impact

During the first half of 2005, Artumas completed sourcing well service and seismic equipment and mobilization of a 100-person camp at Msimbati Peninsula. Production tests of the Mnazi Bay 1 well were carried out to confirm natural gas reserves. During the second half of 2006, Artumas drilled, tested and completed Mnazi Bay 2 and 3. Artumas completed drilling the (Msimbati) MS-1X exploration well in the first quarter of 2007. Appraisal results of the Mnazi Bay wells and Msimbati Gas Fields demonstrated sufficient commercial quantities of gas to supply the Mtwara Energy Project and other commercialization initiatives. During 2006, gas production facilities at Msimbati Peninsula were installed and a 27-kilometre marine and onshore pipeline running from the production facilities site at Msimbati Peninsula to the power generation facilities at Mtwara town was constructed. The same year, a gas receiving facility, including gas processing, was installed at the Mtwara power generation site as well as an 11.4 MW power plant consisting of six Catarpillar generators of 1.9 MW each. Capacity can quickly be increased to 17.1 MW (within the current production hall), and then to 34.2 MW (copying the current facility on the same compound). Possible further extensions will have to be built on alternative sites. The upgrade, operation and maintenance of approximately 275 km of an existing off-grid transmission and distribution system in the Mtwara and Lindi regions were implemented by the local authority, TANESCO.

Natural gas production started in December 2006. Currently, the Mnazi Bay facility has a natural gas production capacity of approximately 60 MMcf per day and average supply is less than 1 MMcf per day. Hence, the natural gas facility produces at approximately 1.7% of its capacity.

The gas-to-power-to-consumer project started full commercial operations on March 5, 2007 (commercial operating date (COD)) when 24/7 electrical power was provided to the towns of Mtwara and Lindi. Power production closely follows natural gas production. Approximately 10% of the generated power is needed for in-house use; the remaining part is delivered for distribution. Power supplies to Mtwara town and Lindi amounted to 20,397 MWh in 2007 and 29,284 MWh in 2008. Monthly power production figures indicate a conversion of approximately 10 cf natural gas per KWh. Artumas/Mtwara is the sole producer of natural gas and power in Mtwara Province: all TANESCO diesel-fired power supply facilities have been dismantled.

Impacts of the Mtwara gas-to-power-to-consumer project are divided into a power supply component and a power distribution component. The power supply component (gas-to-power) has a number of impacts that can be quantified, even at the current stage (2008). The project substituted liquid fuel with natural gas as the energy source for power generation, which reduced Tanzania's dependence on diesel fuel imports and the country's foreign exchange requirements, and hence improved the country's macroeconomic stability and reduced CO2 emissions. Finally, it is also claimed that a diversification of Tanzania's power supply base, away from hydropower towards natural gas and coal-fired power supply, reduces power shortages and increases the reliability and stability of its power supply. The reduction of diesel imports due to the Mtwara project amounted to 5,915 m3 in 2006 and 8,492.5 m3 in 2007. The transfer to natural gas-fired power generation reduced CO2 emissions by 5,524 MT in 2006 and 7,932 MT in 2007.

The second component of the Mtwara project, power distribution to households (power-to-consumer), has a wide range of impacts at the level of communities, households and individuals. Most of these impacts are indirect and take a number of years to become fully established. A number of expected impacts can be derived from the impact evaluation literature on similar rural electrification projects (see Songas).

6 Conclusions

The FMO-LDC contribution to Artumas Tanzania Jersey Limited was additional to the market, mainly on the grounds of the large completion risk involved in this greenfield investment project, which was increased by the limited experience of Artumas, a junior company with no track record and no cash-flow generating activities.

The major (expected) outcomes of the Artumas Tanzania Jersey Limited investment project are: stable, reliable and affordable power for households and businesses in Mtwara Province (Mtwara, Lindi, Masasi); reduced costs of power by substitution of high-cost oil imports with low cost domestically produced gas in power generation; reduced CO2 emissions; hard currency savings by substitution of oil imports with gas, reduction of government subsidies on power and generation of tax and exploitation income and private sector development (Artumas Tanzania Jersey Limited entered the electricity market as a public/private company in an off-grid province of Tanzania).

The development impact of the Artumas Tanzania Jersey Limited project is very high and reaches far beyond natural gas generation, pipeline gas transport and power generation. Eventually, it will be reflected in a per capita growth of GDP and poverty reduction. For the Mtwara project it is, however, too early to fully identify these impacts. Based on a review of impact evaluation studies on rural electrification, we may expect the Artumas/Mtwara project to bring major benefits to households in terms of light and TV, education, health, efficiency improvement in implementing household chores and related timesaving due to the use of electrical appliances.

5 AES Haripur Private Limited

Key data

Project name:	AES Haripur Private Limited, Bangladesh.
Applicant:	AES Haripur Private Limited.
Sector:	Energy infrastructure.
LDC Fund contribution:	2002: Subordinated loan of USD 10 mln. Additional FMO funding: USD 12 mln FMO-A loan and USD 5 mln FMO-B loan (with Swedfund).

1 Description of the investment

The AES Haripur power project is a 360 MW combined cycle natural gas-fired power plant located in the district of Nrayanganj, Haripur, approximately 22 km southeast of Dhaka, Bangladesh. The project aims to increase power supply through low-cost private generation. The combined cycle gas turbine plant includes a gas-fired combustion turbine and its generator, a heat recovery boiler using the waste heat of the combustion turbine, a steam turbine and its generator and all necessary auxiliary facilities.

Gas supply to the AES Haripur plant is guaranteed by a Gas Supply Agreement with Titas, which is the state-owned gas transmission and distribution company. The power produced in the plant is delivered to the Bangladesh Power Development Board (BPDB), also state owned, under a 22-year Power Purchase Agreement. Payment obligations for the off-taker BPDB are guaranteed by the Government of Bangladesh. Other commercial aspects of the project are outlined in an Implementation Agreement and a Land Lease Agreement.

The AES Haripur plant was constructed in response to the increasing gap between electricity demand and supply in Bangladesh. An independent study commissioned by the World Bank in 1999 showed that power shortages constrain gross domestic product (GDP) growth at a rate of between 0.3% and 0.5% per annum (World Bank 2000). Upon its completion in December 2001, the AES Haripur plant was considered the lowest-cost energy producer in Bangladesh and among the cheapest in the world. Since the start of its commercial operation, financial and technical operations have been fully satisfactory.

2 Size and funding of the investment

The total investment of approximately USD 176.4 mln made the AES Haripur power plant one of the lowest-cost projects of this kind in the world (USD 0.5m/MW). The initial financing plan was as follows:

- USD 73.7 mln AES Corporation equity;
- USD 37 mln AES Corporation senior sponsor facility;
- USD 60.9 mln commercial banks tranche led by the Australia and New Zealand

Banking Group Limited (ANZ) supported by a Partial Risk Guarantee provided by the International Development Association (IDA/World Bank), and
- USD 4.8 mln pre-completion revenues.

In 2002, FMO obtained a mandate for the substitution of the USD 37 mln senior sponsor facility, a subordinated loan from AES's parent company. The total package included:

- USD 12 mln FMO-A loan;
- USD 10 mln FMO-LDC subordinated loan;
- USD 15 mln FMO-B loan on a best effort basis.

Eventually, FMO succeeded in financing USD 27 mln consisting of a syndicated loan comprising an underwritten tranche of USD 22 mln (USD 12 mln FMO-A loan and USD 10 mln FMO-LDC subordinated loan) as well as a B-tranche (parallel loan) of USD 5 mln with Swedfund. ANZ financed the remainder of the senior sponsor facility as a parallel loan. FMO's disbursement took place in July 2003, approximately one year later than expected due to a change in AES Haripur's ownership.

3 Compliance to LDC Fund criteria

The project qualified for LDC Fund funding as, at the time of the investment, it was expected that the project would contribute to the economic development of Bangladesh (e.g. positive effects on local businesses, employment opportunities, balance of payments), be financially sustainable, support and promote high corporate standards (e.g. professional management, application of stringent corporate governance principles, adherence to anti-corruption regulations, application of international accounting practices), make use of appropriate technological platforms (e.g. use of indigenous natural gas, combined cycle gas turbine technology and use of mostly industrial land), and meet international environmental and social standards applicable to similar investments. The project's compliance with additionality and catalytic requirements is dealt with below.

4 Additionality and catalytic impact

As stated in the 2007 FMO internal evaluation of the AES Haripur investment, 'additionality [of the LDC Fund loan] lays in the fact that it refinanced an existing shareholder loan which commercial banks did not want to take over'. Local financial institutions and foreign investors, including international development banks, were unwilling to supply long-term finance to infrastructure projects. Internationally, commercial banks and investors were reluctant to carry long-term Bangladesh country risk. Furthermore, the risk perception for the energy sector had increased in the wake of the ENRON crisis in December 2001 and a fall back of the global energy market. As a result, the combination of country and sector risks made investing in AES Haripur unattractive to potential investors.

An investment climate assessment carried out in Bangladesh, based on data from a 2002 survey of manufacturing firms and from publicly available sources, concluded that finance was a major problem. If available at all, it was mostly short-term (World Bank 2003). Under these circumstances, it is highly likely that in absence of the LDC Fund (and FMO) the senior sponsor facility would not have been substituted. Nevertheless, it must be note that the LDC Fund loan was only additional is the sense that commercial banks refused to take over the existing shareholder loans. The LDC Infrastructure Fund did not finance any new activities; it only refinanced an existing activity.

The 2007 FMO internal evaluation of the AES Haripur investment acknowledged that the 'LDC Fund loan did not fully comply with the programme criteria of having a catalytic role. The LDC loan was only relevant for the FMO-A loan and the Swedfund USD 5 mln'. The fact that other loans, totalling USD 98 mln, were already outstanding confirms that the catalytic role of the project was marginal.

5 Development impact

The key output of the investment project is the construction and operation of a 360 MW Plant. Construction costs were among the lowest in the world (USD 0.5m/MW) and AES Haripur is an efficient and well-managed electricity generation facility. It contributes 10% of the country's power supply and is of crucial importance to the city of Dhaka, the main economic centre of Bangladesh. It provides approximately 5 to 10 million people in Dhaka with highly reliable and low-cost power. The cost of power generation is one of the lowest of all Independent Power Producing plants in the world. Over the period between 2001 and 2008, average availability of the power plant was 94.5%, average net capacity 81.0% and total outage hours 4184 (2616 scheduled and 1568 forced) against a total of 6852 permissible outage hours.

As AES Haripur is a gas-fired power plant, Bangladesh is able to use its indigenous natural resource (gas) to produce highly-demanded electricity. The use of gas also translates into savings in the country's foreign currency reserves, because the other fuel used to produce power is oil, which must be imported and paid in USD. However, the precise amount of foreign currency savings is unknown.

A World Bank project appraisal study of the AES Haripur power plant argued that the project would replace most of the aging gas/steam and liquid-fuel thermal power plants. The net impact of the project would thus be a reduction of total greenhouse gas emissions from the Bangladesh power sector (World Bank 2000). Specifically, the study estimated that:

- based on a 87.5% load factor and 46% conversion efficiency, the power plant would emit approximately 326,727 tons of carbon per year, which is equivalent to 1,172,000 tons of C02 per year;

- this means that, if the Haripur plant were to replace all of these plants, annual emissions would be reduced with 1,568,000 tons per year of C02. And if the old plants were to continue to produce power at half capacity, then there would still be a net reduction of 784,000 tons of C02 per year.

6 Conclusions

AES Haripur is an efficient and well-managed electricity generation facility that contributes 10% of the country's power supply and provides approximately 5 to 10 million people in Dhaka with reliable and low-cost power. The cost of power generation is among the lowest of all Independent Power Producing plants in the world. Based on limited and non-conclusive literature available, it can be argued that by increasing the supply of electricity, the impact on a number of social and economic indices will most likely be positive. Nevertheless, this result cannot be attributed to the LDC fund loan. The loan was used to refinance an existing sponsor facility; the loan did not contribute to additional energy production capacity in Bangladesh.

6 Bengaz and Sotogaz

Key data

Project name:	West African Gas Pipeline, Benin and Togo.
Applicant:	Bengaz and Sotogaz.
Sector:	Energy.
LDC Fund contribution:	Loans of USD 21.9 mln (Bengaz) and 22.3 million (Sotogaz) (2005).

1 Description of the project

The West African Gas Pipeline Project (WAGP) was set up in 1995 to deliver gas from Nigeria to Benin, Togo and Ghana via a 680-km onshore and offshore pipeline. The pipeline was to improve the competitiveness of the energy sectors in these four countries by promoting the use of cheaper and environmentally cleaner gas from Nigeria for power generation and other industrial and commercial purposes as well as to diversify energy supply sources.[63] The construction started in 2005 and the project is envisaged to be operational by the end of 2009, although uncompressed gas purchased by WAPCo in Ghana is already flowing through the pipeline. This gas will be used for electricity generation after the construction of gas-to-power units has been completed and existing power units have been converted. At the start of the project, it was expected that the Ghanaian Volta River Authority (VRA) would account for 92% of the total demand and Communauté Electrique du Benin (CEB) for 8%.[64]

2 Size and funding of the project

The project was developed by Chevron/Texaco and Shell. A special purpose company was set up for the project: the West African Pipeline Company (WAPCo). This company, registered in Bermuda, owns the pipeline and is responsible for its construction and operation. The company is a partnership between Chevron Nigeria Limited (CNL, 36.7%), the Nigerian National Petroleum Corporation (NNPC, 25%), the Shell Petroleum Development Company of Nigeria Limited (SPDC, 18%), the Volta River Authority (VRA, 16.3%), the Société Beninoise de Gaz S.A. (Bengaz, 2%) and the Société Togolaise de Gaz S.A. (Sotogaz, 2%).

Total project costs were estimated at USD 560 mln. Funding took the form of equity (30%) and shareholder loans (70%).[65] The World Bank International Development Association (IDA) provided a USD 50 mln IDA Partial Risk Guarantee to the Government of Ghana in support of its termination payment obligations to WAPCo. In addition, the

63 Project Appraisal Document, on a Proposed IDA Political Risk Guarantee in the Amount of USD 50 Million for Ghana and a Proposed MIGA Guarantee in the Amount of USD 75 Million for Sponsors Equity to the West African Gas Pipeline Company Limited for the West African Gas Pipeline Project, November 2, 2004, p. 10.

64 World Bank Appraisal Document, November 2, 2004, p. 13.

65 Finance proposal Sotogaz and Bengaz, 23 June 2005.

Multilateral Investment Guarantee Agency (MIGA) provided USD 75 mln political risk insurance to the West African Pipeline Company (WAPCo).

Both Bengaz and Sotogaz were established to promote and invest in the use of gas in their respective countries and were given exclusivity by their governments for this purpose. The two companies each had an option to purchase 2% in the equity of WAPCo by the end of 2004. The then existing shareholders extended this option until the end of June 2005. If Sotogaz and Bengaz had not exercised the option then, it would have expired under the terms of the WAPCo shareholder agreement. Bengaz and Sotogaz are private companies. Bengaz was established at the request of the Government of Benin and incorporated in September 2004 with a fully paid-up share capital of CFA 300 mln (EUR 460,000). The original company failed to finance the purchase of the 2% at financial close in December 2004, after which the Ministry of Energy of Benin requested a local law firm to invite local businesses to subscribe to a new company formed for this purpose. Sotogaz' shareholders represent local industries, investors and potential users of the gas. Sotogaz is managed by the Chevron West African Gas Ltd, which has a direct shareholding of 15% in the company. The Communauté Electrique du Benin (CEB), the government-owned electricity distributor in Benin and Togo, is a shareholder of both Sotogaz and Bengaz. In 2005, FMO provided a 14-year loan of USD 17.3 mln to Bengaz and a USD 17.7 mln loan to Sotogaz (including interest during construction) to enable both companies to exercise the 2% option. The loans have an interest rate of 5.25% above Euribor (Euro Interbank Offered Rate). In 2007, it became clear that the project would exceed the USD 135 mln budget. As a result, Bengaz and Sotogaz were each forced to invest another USD 2.9 mln (including interest) in order to maintain their participation of 2% and prevent dilution of their, and accordingly FMO's, position. FMO eventually financed the USD 4.8 mln.

3 Compliance to LDC Fund criteria

It is likely that the WAGP project contributes to sustainable economic, ecological and social development. Nevertheless, the question remains whether the participation of Bengaz and Sotogaz has contributed to these objectives. The LDC Infrastructure Fund does not participate (directly) but only provided the loans that enabled Bengaz and Sotogaz to participate in a project that would have been carried out anyway: 'Both Bengaz and Sotogaz have an option to purchase 2% each in the equity of WAPCo until June 30th, 2005. The 4% in total has been prefinanced/warehoused by the current shareholders [...] Pursuant to the Shareholders Agreement, each of Société Beninoise de Gaz SA, incorporated in Benin, and Société Togolaise de Gaz SA, incorporated in Togo, have been granted an option to purchase a interest (by way of shares and loan notes) in WAPCo.'[66] It was suggested that without direct participation of these two companies in WAPCo, it would have been more complicated to operate the pipeline in the territorial waters of Benin and Togo. Nevertheless, CEB had signed gas purchase agreements with WAPCo and Bengaz and Sotogaz planned to sign an agreement with

66 Financing proposals of 25 June 2005, pp. 1 and 59.

the selling gas company in their role as gas distributor in the two countries. The participation of Bengaz and Sotogaz in WAPCo may make it easier for them to secure their role as gas distributor (a role given to them by their respective governments) in Benin and Togo, but it is not a precondition.

The loans exceed the LDC Infrastructure Fund's maximum financing limit of 49%. This was deemed acceptable, because FMO's contribution to the total project would be no more than 4%. However, following that argument, these loans should be taken together and their combined total investment (approximately 15%) considerably exceeds the maximum of 10% of the total fund size. The LDC Fund Manager nevertheless approved the exceeding of the maximum limit.

4 Additionality and catalytic impact

The assessment of the additionality of funding takes into account that the LDC Infrastructure Fund did not (directly) contribute to the WAGP project, but only enabled Bengaz and Sotogaz to exercise their option to buy 2% of the WAPCo shares. Funding of the project was already secured. The project was only additional in the sense that no other bank was prepared to loan money to Bengaz and Sotogaz to buy these shares. According to the financing proposal, the LDC Infrastructure Fund was the 'lender of last resort' for Benin and Togo. Co-financing, with DEG in case of Sotogaz and with the African Development Bank in case of Bengaz failed due to the size of transaction and policy reasons (financing equity), respectively, even with a subordinated position for the LDC Fund. On the other hand, the project provided FMO with an opportunity to increase its imbursements. The total sum invested in the project (in 2005) was more than 40% of the total FMO budget and comprised 60% of the disbursements in 2005.[67]

The LDC Infrastructure Fund loans did not have a catalytic impact. The Fund financed 100% of the participation of Bengaz and Sotogaz in WAPCo, while funding of the other 96% of WAPCo was already secured. FMO expects the project to have a catalytic impact in the long run, as the increased availability of gas in Benin and Togo will eventually generate spin-off investments. Bengaz, for instance, is developing a 100 MW power plant in Benin but in Togo a different company is developing a new plant. Moreover, there is no proof that these activities are an effect of the participation of Bengaz and Sotogaz in the project.

5 Development impact

The main arguments for investing in the project were:

Environment: by facilitating a fuel switch, the project helps reduce greenhouse gas emissions both by substituting oil by gas and by using associated gas that would

67 Financial proposals Bengaz and Sotogaz, 25 June 2005 and Annual Report 2005.

otherwise be flared.[68] Whereas the former argument is valid, it appears that the latter was a selling point. In 2008 an Inspection Panel of the World Bank observed that the documents on gas flaring that were produced in the context of this project were actually imprecise and overestimated the benefits. It appears that FMO was misled. The argument of effective use of associated gas gradually lost weight. It has even been suggested that the project will only utilize non-associated gas.[69]

Energy supply: among the main benefits for Benin and Togo are the sharp reduction in energy costs, diversification of energy sources, lower dependence on the import of energy from Ghana and Côte d'Ivoire and improved reliability and stability of energy provisions. The importance of an improvement of the energy situation in Benin and Togo cannot be overstated. The demand for electricity doubled from 510 GWh in 1993 to 1054 GWh in 2003.[70] The main domestic supply came from a hydropower plant in Togo (with a capacity of 65 MW). Thermal plants in Cotonou and Lomé (25 MW each) are not in operation due to the high costs involved. These two plants are relatively expensive and produce relatively high CO2 emissions. Particularly Benin does not have the capacity to meet the increasing demand. Both countries almost completely (for 80%) depend on Ghana and Côte d'Ivoire for their electricity, while these countries are themselves struggling to maintain supply. Most of the electricity consumed in these two countries is produced by Ghana's Akosombo hydroelectric dam and transported through a single interconnection. Ghana faces major power supply problems and increasing occurrence of outages. Côte d'Ivoire also faces problems with its supply of natural gas.[71] As a result, supplies were cut from 140 MW to 80 MW in March 2006. A drop in water levels in southern Togo created an additional deficit. In November 2006, the energy crisis forced the CEB to start daily four to six-hour electricity cuts, with outages of up to 14 hours.

Based on the WAPCo report, the World Bank calculated savings for CEB ranging from USD 96 mln in the low demand scenario to USD 108 mln in the high demand scenario (present value).[72] Lower energy costs also imply savings on foreign exchange and therefore an improvement of the balance of payments. However, calculations are based on a comparison with the relatively expensive and inefficient plants in Cotonou and Lomé. Moreover, the World Bank had assumed that Bengaz and Sotogaz would be public entities and that all benefits would therefore accrue to the two countries.

Most of the gas from the pipeline will be used for the generation of electricity. The rapid growth of demand for electricity in the two countries confirms that additional

68 Associated gas is a side product of oil production. In Nigeria it is flared to a large extent and this makes the country one of the highest contributors to CO2 pollution.
69 Environmental Action in a public hearing for the World Bank
70 World Bank Project Appraisal, November 2, 2004, p. 51.
71 Inter Press Services English News Wire, December 15, 2006.
72 World Bank Project Appraisal, November 2, 2004, p. 102.

plants and energy supply are urgently needed. Electricity demand doubled between 1993 and 2003 and it has been predicted that the total demand will grow significantly faster between now and 2018.[73] These two countries almost completely (for 80%) depend on Ghana and Côte d'Ivoire for their electricity, while these countries are themselves struggling to maintain supply. Load shedding (the deliberate temporary restriction of power supply in regions or towns for a number of hours per day) and outages are common.

It is very difficult, however (and beyond the scope of this evaluation) to give estimates of the project's economic effects. These effects will primarily depend on the gas distribution network in the two countries and on investments in thermal power stations. The role of Bengaz and Sotogaz is instrumental in this regard. Bengaz received a EUR 3 mln grant for the development of a 100 MW power plant near Cotonou. In Togo, ContourGlobal realises a 100 MW power plant that runs on gas from WAPCo through Sotogaz.

Direct employment effects are rather limited. Most of the jobs involved are only temporary. According to Environmental Action, the project has not contributed to the growth of local businesses, apart from these temporary jobs, because of the high technology character of the project. Local companies are incapable of operating within this specialized area. The anticipated tax revenues for the governments of Benin and Togo (approximately USD 5 to 10 mln per year) were not substantiated. This is due to the fact that WAPCo operates as an offshore company with major fiscal, environmental and social exemptions that are allowed under the WAGP treaty (Karikpo, 2008).

On the negative side, the production has had negative effects on the livelihood and environment of communities located in the production area and on the fragile ecosystem in the Niger delta. In 2008, a World Bank Inspection Panel concluded that the implementation of the project in Nigeria had serious shortcomings. Populations that were forced to resettle (involuntarily) were not properly supported and no efforts were made to provide adequate compensation in order to avoid them from becoming impoverished.

73 Environmental Impact Assessment Benin 2004, pp. 3-10.

6 Summary and conclusions

During the 1990s, the governments of Nigeria, Ghana, Benin and Togo, as well as the oil companies Chevron/Texaco, Shell and the Nigerian National Petroleum Corporation developed a proposal for the construction of an on and offshore pipeline running from the Niger Delta in Nigeria to Benin, Togo and Ghana. The project would enhance regional economic cooperation, create extra employment and income, especially in Nigeria, improve the reliability of energy supply in Ghana, Benin and Togo, contribute to energy diversification in these countries and, above all, provide access to relatively clean and much cheaper energy. Moreover, the project would contribute to the reduction of gas flaring in Nigeria.

In order to carry out the project, Ghana, Nigeria, Chevron and Shell created the West African Pipeline Company (WAPCo). Newly established companies Société Beninoise de Gaz S.A. and Société Togolaise de Gaz S.A. were each given the opportunity to buy 2% of the shares. When these companies were unable to raise the funds needed to buy these shares and other DFIs were unwilling to step in, the LDC Infrastructure Fund provided 100% loans to these companies to buy the shares (USD 20.2 mln to Bengaz and USD 20.6 mln to Sotogaz). The construction was finalised in 2008.

FMO considers these loans as an important contribution to WAGP. However, the LDC Infrastructure Fund does not participate (directly) in the project but only provided loans that enabled Bengaz and Sotogaz to participate in a project that would have been carried out anyway. These loans did not have a catalytic impact. The funding was only additional in the sense that no other bank was prepared to finance the participation of Bengaz and Sotogaz in WAPCo. Nevertheless, the project will certainly have positive development impacts in Benin and Togo. The energy situation in these countries (and especially Benin) is alarming and the pipeline offers the two countries access to much cheaper and relatively clean energy.

7 MSI/Celtel

Key data

Project name:	MSI/CelTel74, Tanzania.
Applicant:	MSI/CelTel.
Sector:	Telecommunications.
LDC Fund contribution:	2003: USD 15 mln in equity capital.

1 Description of the investment

MSI/Celtel is a telecom company that supplies mobile telephone services in Africa. The company was launched in 1998 with the establishment of its holding company based in the Netherlands. Already in the early phase of development MSI/CelTel obtained licenses from thirteen African governments to invest, build and operate mobile telecommunication. MSI/Celtel followed a deliberate acquisition policy of obtaining licences in a very early stage of development of the African mobile phone industry and for countries in which its major competitors were not yet active. As a result, licenses were cheap and MSI/Celtel obtained a competitive edge in its countries of operation. Within a number of years the company had installed and operated mobile phone networks in twelve countries. In most of these countries MSI/Celtel was fully operational (Commercial Operating Date) around the turn of the century. MSI/Celtel developed into a major player in the mobile phone industry on the African continent: its operations extended to a larger number of African countries than any other operator. MSI/Celtel attained market leadership in six of these countries.

At the holding level, MSI-CI/Celtel International first started to generate increasingly positive EBITDA[75] in 2001; positive net profits followed in 2003. Among the MSI/Celtel subsidiaries the one in DRC is the largest with nearly 30% of the total of MSI/Celtel subscriptions. Sudan and Tanzania come in second place, each with approximately 15% of all subscriptions. Both DRC and Sudan are largest in terms of generated cash flows, together accounting for nearly 60% of the total cash flow. The estimated market shares of most subsidiaries are substantial; in a number of cases they are extremely high (Congo, DRC, Sierra Leone and Sudan).

In April 2005 the company was acquired by, and became a subsidiary of, the Mobile Telecommunications Company (MTC), a Kuwaiti operator, for USD 3.4 billion. MTC Group changed its name to ZAIN (Arabic for 'beautiful, good and wonderful') and unified its different brands in 22 countries. Hence, the FMO-LDC participation in MSI/Celtel was sold in April 2005 and as a result FMO earned a return of USD 34.4 mln. Total investments of MSI/Celtel in Africa currently (2008) amount to more than USD 750 mln.

74 MSI/Celtel was taken over in 2005 and ceased to exist as an independent company. This made is difficult to obtain data and information.

75 Earnings Before Income Tax, Depreciation and Amortization.

2 Size and funding of the investment

In 2003 the FMO-LDC Fund participated in MSI/Celtel with a USD 15 mln strategic investment in common shares for a price of USD 17 per share, acquiring a 2% stake in MSI/Celtel and generating an estimated return on equity of 23%. The investment was intended to provide risk capital at a time when this was badly needed and basically unavailable or only at a very high price. It was impossible to verify exactly the planned size of the 2003 investment and the financing plan for the 2003 equity-raising round. However, it is likely that MSI/Celtel expected to tap much more equity funding from the market than it eventually did. It turned out to be laborious and difficult to obtain equity funding for its investment operation during this period.

MSI/Celtel urgently needed finance in order to expand and upgrade its networks to be able to support the strong growth of mobile phone services and maintain a competitive edge in the national markets. At the time, activities aiming at a rapid expansion of capacity and networks in a highly competitive environment were characterized as 'cash burning'. Due diligence for the FMO-LDC participation was performed jointly with EIB, which, more or less simultaneously, planned a USD 40 mln equity investment by the end of 2003 (see below).

MSI/CelTel had already established a relationship with FMO prior to the FMO-LDC participation of 2003. In 2000 a total of USD 7.5 mln senior loan was supplied for investments in Congo and Malawi. In 2001 an FMO-A subordinate loan of USD 10 mln was supplied for the extension of networks in Tanzania and Nigeria.

3 Compliance to LDC Fund criteria

Financing meets the LDC Fund criteria. MSI is active in 14 countries, 12 of which are on the DAC list. The investment is made in a Dutch holding, which subsequently raised the share capital of one of its subsidiaries. The finance and investment plan indicated that the funds would be used for expansion of existing networks in DRC, Uganda, Burkina Faso and Tanzania. The OECD untied ODA notifications made by the Netherlands in the period between 2003 and 2004 confirm that the funds were allocated to Tanzania and Uganda.

4 Additionality and catalytic impact

The FMO-LDC equity participation in MSI/Celtel in 2003 was both additional and catalytic. The equity participation was additional to the market since – particularly from 2001 to 2003 – it was extremely difficult to obtain equity funds due to depressed world equity markets for telecom companies and risk-averse investor behaviour. In the years 2001 and 2002 several efforts were undertaken by MSI/Celtel to raise equity funds. In 2002, these efforts included a mandate MSI/Celtel gave to Rothschild to raise new equity and a fund-raising boutique in the Middle East. A boutique directed at high net-worth individuals was organized in subsequent years. All these efforts were in vain and eventually called off.

Nevertheless, in 2003 the key performance indicators of MSI/Celtel were reasonably good (revenues, EBITDA and net profit) and projected developments for the company were even better. There were no clear indications that the company would fail to realise the projected developments. Additionally, internal FMO documents qualified MSI/Celtel as a well-established holding company with well-managed and expanding subsidiaries and a solid equity and lending base consisting of large private equity investors and international banks.

The catalytic impact of the FMO-LDC funding in 2003 is supported by the USD 40 mln investment by Capital Investment, which was made in December 2003, shortly after the FMO equity participation.

5 Development impact

Within a few years after 1998, when the MSI/Celtel holding was established in the Netherlands, the company had installed and operated mobile phone networks in 12 countries. In most of these countries MSI/Celtel was fully operational (Commercial Operating Date) around the turn of the century. This assessment of outcome and impact focuses on developments in the Tanzanian telecommunication market. Penetration rates in this market show a tremendous growth: between 2000 and 2007 annual average growth rates were around 57%. This figure also confirms the dominance of mobile phones in Tanzanian telecommunication: landlines have virtually disappeared. Market shares of MSI/Celtel (subscriptions) range from approximately 15% in 2002 to 30% in 2007. This growth suggests that MSI/Celtel has been responsible for a large part of the increase in penetration rates. Telecommunication tariffs in the Tanzanian telecommunication market have decreased substantially and similarly to other operators, reflecting both competition between operators and economies of scale. In the period between 2001 and 2007 tariffs decreased with an average rate of 9.5% to 13.5%, depending on the type of phone call (calls to own network, to a network of another operator or to the fixed network). Tariffs of fixed line local calls are low but increasing. Besides tariffs, average revenue per unit (ARPU) has also declined. At the end of the 1998-2007 period ARPU stabilized to a value of slightly above USD 20. Like declining tariffs, declining ARPUs reflect both competition between operators and economies of scale.

The question arises how investments in mobile phone industry in Africa support the economic process, per capita GDP and poverty reduction. Easy distribution of and easy access to information form the main channel of transmission. Mobile phone services, generally lead to a reduction in transaction costs in a wide range of economic processes.

The availability of information has a profound impact on economic efficiency, on transparency of markets, on investment decisions, on the spread of new technologies, on innovation, etc. Various studies in the literature make it clear that the introduction of mobile phones in Africa has had a major positive impact on numerous aspects of economic life and has increased welfare. Estimated overall economic impact of the mobile industry relative to GDP varies from 1.3% to 5.3% for a range of African countries (see GSM Association, 2008).

6 Conclusions

The 2003 FMO-LDC equity participation in MSI/Celtel has been both additional and catalytic. The equity participation was additional to the market because in 2002 and 2003 it was nearly impossible for MSI/Celtel to obtain equity funds due to depressed world equity markets for telecom and risk-averse investor behaviour. The catalytic impact of the FMO-LDC funding in 2003 is supported by additional funding shortly after the FMO equity participation.

MSI has contributed significantly to the development of the mobile phone industry in Africa. According to the literature, this industry has a significant economic impact on the continent. Cell phones contribute to a reduction of transaction costs and productivity gains. Several studies point to the positive social effects of the increased communication facilities.

8 Telekom Malaysia International (Bangladesh) Limited

Key data

Project name:	Telekom Malaysia International (Bangladesh) Limited.
Applicant:	Telekom Malaysia International (TMI) and A.K. Khan Group.
Sector:	Telecommunications.
LDC Fund contribution:	2005: subordinated loan equivalent to EUR 18 mln.

1 Description of the investment

The project consists of financing Telekom Malaysia International (Bangladesh) Limited (TMIB), one of the largest mobile phone companies in Bangladesh, operating under the brand name AkTel. At the time of the FMO-LDC investment in 2005, TMIB was a joint venture established by TeleKom Malaysia International (TMI) (70%) and A.K. Khan Group (30%). In 2003, TMIB counted with some 400,000 subscribers, representing a market share of 22%. One year later, by the end of 2004, TMIB's market share had increased to 29% with 1.1 million subscribers. Competition in the mobile market has increased since 2005 due to the entry of two new operators, Banglalink and Teletalk.

In 2004, TMIB decided to invest in the expansion and upgrading of its existing network technology in order to exploit its momentum, support sustained growth and strengthen its market position in response to expected new providers. It wanted to expand its network coverage and capacity (CAPEX) as well as upgrade its billing system. In mid-2004, TMIB signed a series of agreements in order to expand its network by constructing 700 additional base stations (2004/05). In May 2006, TMIB signed a USD 180 mln contract with Chinese equipment manufacturer Huawei Technologies to expand its GSM network. Huawei was to supply a wide range of GSM products as well as provide consulting services. In March 2007, TMIB tested its new network technology and in September 2007, it awarded Ericsson a contract to further upgrade and expand its network. Ericsson was to install over 1,000 base stations and mobile equipment that together enabled TMIB to minimise network costs.

2 Size and funding of the investment

The total envisaged investment amounted to USD 330 mln for the period 2004 to 2007 (table 8.1). The initial investment plan is presented in table 8.2, indicating that TMIB was to provide USD 55 mln in equity capital and that the remainder would come from debt financing. The initial plan was to (partly) use the LDC Fund to re-finance an existing Australian facility by the Export Finance and Insurance Corporation (EFIC). This facility comprised subordinated loans. EFIC hindered the structuring of a new finance plan by strictly applying its covenants regarding new lenders and sharing of securities. The fact that EFIC was not willing to renegotiate these covenants indicated that it preferred to pull out. By late 2005, the FMO contribution was approved and TMIB repaid the EFIC facility.

Table 8.1 Investment Plan 2004-2007		
	Amount (USD mln)	Share
Telecom Network	279	85%
Billing System	37	11%
Other CAPEX	14	4%
Total	330	100%

Source: Financial Proposal.

Since the disbursement of FMO contributions took place later than envisaged, the investment period was extended to 2009. In 2006, FMO disbursed EUR 18 mln to TMIB. Due to this late availability of external funding, TMIB was forced to pre-finance its CAPEX investments with resources from its cash flow.

Table 8.2 Initial Funding of Investment Plan 2004-2007		
	Amount (USD mln)	Share
TMIB	55	17%
DEG	15	5%
FMO-A	15	5%
FMO-MOL	15	5%
Standard Chartered Bank (SCB)	50	15%
Supplier's Credit	180	55%
Total	330	100%

Source: FMO. Financial Proposal, 2005.

According to the Change Request of 20 December 2005, the total financing package had increased to USD 372 mln, exceeding the original financing plan by USD 42 mln. The increase was mainly due to higher CAPEX requirements in 2006. FMO financing comprised a subordinated 10-year loan from the LDC Infrastructure Fund, of the initial Taka equivalent of USD 15 mln, which was later raised to an equivalent of EUR 18 mln. In addition, a 7-year senior FMO-A loan (USD 15 mln) was also provided.

3 Compliance to LDC Fund criteria

By late 2005, telecommunications was added to the list of eligible sectors for LDC Infrastructure Fund financing. Hence, the loan to TMIB was provided in the context of the new opportunities formulated at that time. The subordinated loan was an individual transaction with a value of less than 10% of the LDC Fund and had a tenor of less than the maximum of 20 years, which were among the main LDC Fund criteria. The investment also matched all other FMO-LDC Infrastructure Fund criteria.[76]

Since the FMO package comprised a contribution from the LDC Fund as well as an FMO-A loan, the question was raised whether it would have been better if FMO had only used FMO-A funds. From an investor's perspective, it can be argued that it was the same activity and that therefore the same risk profile applies. In addition, the Finance Proposal argued that investment in mobile telecommunication was less risky than most other investments. In addition to the country risk for Bangladesh, there also was a regulatory risk related to the fact that the Bangladesh Telecommunication Regulatory Commission was a relatively new supervisory body that had not yet established clear regulations. Off-take risk in terms of default by subscribers was considered limited, as prepaid subscriptions made up approximately 95% of all subscriptions. The real risk, which was too high to be taken with FMO-A resources was the currency risk: TMIB's revenues are all in local currency (Bangladeshi Takas) whereas its financing obligations and debt servicing are expressed in US dollars. A subordinated loan expressed in local currency was highly valuable to TMIB as it avoided conversion costs and exchange rate risks.

4 Additionality and catalytic impact

When TMIB decided to expand, it contacted Standard Chartered Bank (SCB) and Citibank to make finance arrangements. Citibank assumed this task and approached a number of parties, including FMO. The Finance Proposal (2005) stated that '[i]n general, it is difficult to obtain financing from commercial banks in Bangladesh in the amounts and tenors needed for TMIB's expansion, making parties such as FMO and DEG necessary'. Had FMO not joined in, TMIB would have gone to other investors and might have obtained financing, but at a higher cost. Since FMO showed interest, alternative finance opportunities were not explored in detail.

There are, however, also reasons why the use of LDC Funds can be qualified as additional. First, it is unlikely that alternative finance would have been made available at the long tenors required by the financing plan. It may have been possible for local banks to participate, but with a shorter tenor and most likely not for the amount required. Second, since only a consortium of banks would have been able to issue a loan of the amount needed, this would have required more time. It would also have taken a long time to obtain approval by the Bangladesh Bank. In sum, it is the local

76 See: Criteria MOL fonds, Annex 1, Hernieuwde beschikking MOL-fonds WW 190301, February 14, 2002, and Wijziging subsidiebeschikking MOL Infrastructuurfonds – WW 190302 / 3278, February 24, 2006.

currency feature that makes this subordinated loan to a tailor-made product that implies high risks for the LDC Fund and major benefits for the client.

The initial plan was that the LDC Fund would be used to take out the Australian EFIC subordinated loan, which counted with covenants that hindered the entry of new financial stakeholders. The FMO Investment Committee (2005) showed some concern about the fact that the LDC facility substituted a commercial facility. However, at the moment the LDC Fund contribution was approved, TMIB had already repaid the EFIC loan. In sum, the contribution made by the LDC Fund was additional in the sense that it concerned a loan in local currency. LDC Fund contributions had no catalytic impact.

5 Development impact

Two specific outputs of the investment are the installation of 1,700 additional base stations and expansion of the GSM network. TMIB also launched new services such as the country's first full Bangla-language SMS service in January 2006. This service is named 'Aktel Mayer Bhasha' and enables users to write, transmit and receive SMS in Bangla text.

TMIB's average revenue per user (ARPU) is less than that of its main competitor Grameen Phone. ARPU dropped from 342 Takas per year at the time of FMO investment (2006) to 221 Takas per year in 2008.

Competition in the mobile phone market has intensified with the entry of two new operators, Banglalink and Teletalk, in 2005. Foreign providers (including Telenor and Telekom Malaysia International) heavily invested in their respective mobile businesses. The overall effect has been that the base of mobile subscribers was widened as mobile telephony in general was made more affordable.[77] By late 2008 Bangladesh counted 44 million mobile subscribers.

An indirect effect of the strong growth of the mobile phone industry was the deregulation of the country's telecom sector. This deregulation enabled further expansion and made mobile phones accessible to almost all strata of society.
The use of mobile phones also implied an additional source of revenue to government, since prepaid cards are subject to value added tax and income tax to telecommunication companies was increased to 40% of their profits.

Waverman and Ovum indicated that increased mobile penetration leads to increased economic growth. A 0.1 percentage point increase in the penetration rate of mobile phones raises the GDP growth rate by 0.6%. In Bangladesh, the penetration rate

77 Findings from a recent comparative study of price and affordability in eight South Asian countries (Mobile Benchmarks South Asia, March 2008) indicate that Bangladesh has the lowest average monthly cost for mobile telephony at all levels of use (low, medium and high) for both prepaid and post-paid tariff plans. It is followed closely by Pakistan, India and Sri Lanka.

increased from 13% to 22% in 2007, while TMIB retained its market share of 18%. Hence, 18% of this 9 percentage point increase, i.e. a 1.6 percentage point increase, of this penetration rate can be attributed to TMIB. This implies that in 2007 TMIB's expansion activities increased the GDP growth rate by 10% and, accordingly, raised GDP by approximately 0.5 percentage points.

6 Conclusions

The utilisation of LDC Fund resources was additional, but had no catalytic impact. The planned expansion and upgrading of existing network technology were, at least partly, realised. The investments contributed to the expansion of mobile phone use and increased competition in the market. Competition led to price effects that, in turn, further promoted the use of mobile phones.

9 Kenmare Development and Exploitation of Titanium Dioxide

Key data

Project name:	Kenmare Development and Exploitation of Titanium Dioxide, Mozambique.
Applicant:	Kenmare Moma Mining (Mauritius) Limited (KMML) and Kenmare Moma Processing (Mauritius) Limited.
Sector:	Mining. Activity: heavy sand mining (ilmenite, rutile, zircon).
LDC Fund contribution:	2004: equity participation of USD 10 mln and a subordina ted loan of EUR 7.1 mln. 2006: USD 2.5 mln stand-by facility. In addition, FMO-A provided a loan of USD 19.5 mln.

1 Description of the investment

Kenmare Resources Plc (Kenmare) is an Irish company quoted on the Official Lists of the Dublin and London Stock Exchanges. The Titanium Minerals project concerns the development and exploitation of a greenfield titaniumdioxide mine close to the coastal town Moma in the Nampula Province in Mozambique. The Moma titanium minerals mine is Kenmare's main asset. It is registered under two subsidiary African-based companies: the Kenmare Moma Mining (Mauritius) Limited (KMML) and the Kenmare Moma Processing (Mauritius) Limited (KMPL). Both companies are registered in Mauritius.

2 Size and funding of the investment

In 2004, it was estimated that the total investments required would amount to EUR 396.5 mln. Over the years, this amount did not increase substantially, due to the fact that the main component of the investment was an Engineering Procurement and Construction agreement for USD 218.4 mln with a project joint-venture between Australian contractor Multiplex and South African mining engineer Bateman ('MBJV'). By August 2008, the total size of the investment had increased to USD 422 mln, including contingencies.

In 2004, Kenmare managed to raise equity financing for GBP 53 mln and a debt finance package totalling USD 199 mln (senior debt) and EUR 64.9 mln (subordinated debt) signed with a lender group comprising the European Investment Bank (EIB), the African Development Bank (AfDB), FMO, KfW, Emerging Africa Infrastructure Fund Limited (EAIF) and ABSA (a South African commercial bank). Political risk insurance was provided by MIGA (a member of the World Bank Group) for the KfW (MIGA) tranche. Hermes provided political and commercial insurance coverage to KfW (Hermes tranche), whereas the Export Credit Insurance Corporation of South Africa (ECIC), the South African export credit agency, covered the ABSA facility.

Considering the constraints on Kenmare's financial capacity, lenders required an additional equity capital injection of USD 79 mln to guarantee their investment.[78] Kenmare managed to collect additional equity capital by a placing and a supplementary placing, but it was not enough. In fact, it needed another USD 11.7 mln. With the backstop expiry date coming up, the Chairman of Kenmare decided to add private property worth USD 1.7 mln and the equity brokers of Kenmare Cannacord and Levy entered into an underwriting agreement for USD 10 mln. The USD 218.4 mln EPC contract could then be signed after which the installation and construction of the mine could begin. However, since equity investment does not pertain to the regular services by Cannacord and Levy, Kenmare had to find the USD 10 mln missing at short notice. Due to a dive in the mining index at the time, it was impossible to find an additional institutional equity partner.[79] One participating DFI, the Emerging Africa Infrastructure Fund Limited (EAIF) was willing to increase its loan. But since EAIF is not allowed to take equity participation, Kenmare approached FMO with the request to swap part of the LDC sub-debt for equity. EAIF approved a takeover of USD 10 mln sub-debt in exchange for FMO equity participation for the same amount.

In May and November 2004 negotiations between Kenmare and FMO produced a package of four finance arrangements:

1) a 12-year FMO-A loan of USD 19.5 mln;
2) a 15-year subordinated LDC loan of USD 11 mln;
3) a LDC participation of GBP 5.5 mln, and
4) a USD 1.5 mln standby facility from the LDC Fund. In 2006 an additional USD 2.5 mln was made available as standby facility.

The USD 19.5 mln senior loan (FMO-A) (opposed to ABSA and KfW) assumes full political and commercial risk. The tenors of the other senior loans to the project are 11 years for the KfW/Hermes tranche which is tied to the ABSA/ECIC tranche and 14 year for the untied AfDB, KfW and EIB tranches. The USD 11 mln subordinated loan (LDC) was issued in connection with the construction of the transmission line and related hardware to connect the project with the national grid. The USD 1.5 mln Subordinated Standby Facility (EAIF/EIB/FMO) facility was established to maintain the Cash Contingency (CRA) at a minimum level when, in 2005, it became apparent that the project would be confronted with a USD 10 mln overrun for the ilmenite roaster (part of the processing plant). By December 31, 2007, EUR 8,698,023 of the subordinated loan had been disbursed, as well as EUR 1,131,860 of the EUR 1,270,000 stand-by facility.

By late 2008, FMO owned approximately 6.2% of the shares in Moma. All FMO equity participation in Moma was funded from the LDC Fund. Another part was a warrant, but

78 In fact, this was also the result of over-collaterisation requirements.
79 Since Kenmare shares were already owned by over 6,000 shareholders, Kenmare wanted to avoid an extra large number of small 'adventure' shareholders.

all shares obtained through this warrant were eventually sold (with substantial profit). Equity participation for EUR 7,893,610 up to December 31, 2007 was approved; EUR 9,905,102 was actually paid (differences due to exchange rates and capitalized interest). On December 31, 2007, the value of the participation was EUR 13,761,304.

3 Compliance to LDC Fund criteria

In the overall FMO strategy, mining is among the focal sectors, as are energy and telecommunication. Within the mining component, FMO only supports junior companies in Africa. In its financing proposal, FMO justified its allocation of the LDC Infrastructure Fund by referring to three 'eligible' sectors involved in the mining project: energy distribution (the LDC subordinated loan was specifically destined to a 170-km electricity transmission line), immobile infrastructure (road and jetty construction in particular) and social infrastructure (through the Kenmare Moma Development Association).

Kenmare is a junior miner (a company lacking own resources and without mining activities in operation) starting a greenfield activity. For junior companies it is difficult to gain access to either large amounts of equity funds or loans from commercial banks. This is the kind of enterprise that is eligible for LDC funding. However, it is difficult to match mining activities with the main objective of the LDC Fund. According to FMO Financing Proposal 2004, the use of LDC Funds was justified because they were invested in an infrastructure project (electricity line) that was considered too risky for FMO-A finance alone. However, this 'earmarking' to the electricity line was rather artificial, since it was an integral component of the mining construction plan that cannot be singled out (fungibility).

4 Additionality and catalytic impact

Kenmare approached an array of commercial banks and DFIs, aiming at a sound balance between equity and debt finance. In addition to FMO, both the European Investment Bank and the East African Investment Bank were willing to provide subordinated loans. Concerning the equity component, FMO described its financial contribution as 'the final piece in the Moma financing plan and crucial for the development of the project'. Kenmare's financial engineering strategy was an award-winning financial construction in which commercial banks and development banks alike joined in with secured loans. FMO formed part of that package in which subordinated loans (LDC Fund) provided security to both the commercial bank ABSA and the African Development Bank (as well as the FMO-A loans).

In addition to equity capital, a variety of DFIs and commercial banks were found willing to provide loans. Part of those loans counted with ECA security, while the risk of another part was mitigated by subordinated loans (including FMO loans provided with LDC Fund resources). FMO funding (both FMO-A and LDC Fund) formed part of a complex financial package that won two financing awards.

During the second half of 2004, when the mining index had taken a dive and Kenmare was approaching the back-stop expiry date, the financial brokers took a risk by underwriting. At that point, FMO was the 'last resort' equity provider. FMO's equity participation from the LDC Fund was fully additional.

The LDC contribution to the loan component consisted of subordinated debt. The fact that Kenmare attempted to interest commercial banks, but failed to commit them (except for the South African ABSA) indicates that the LDC Fund was additional to the commercial banks. However, other DFIs were able to provide subordinated debts as well, as was shown by EAIF's willingness to take over USD 10 mln of FMO's sub-debt. In sum, the LDC Fund component in the lending was additional to the commercial providers, but additionality cannot be fully confirmed if DFIs are also taken into consideration.

The catalytic impact of the LDC Fund component in equity provision (at that moment) is proven by the swap with EAIF. It is highly likely that the debt financing component had a catalytic impact. The LDC Fund subordinated loan provided comfort to the African Development Bank, to ABSA (to a certain extent) and the FMO-A loan. There was an 'external' catalytic impact as well: FMO provided an additional grant to the Kenmare Development Association.

5 Development impact

The mine contains reserves of heavy minerals, including titanium minerals ilmenite and rutile, as well as zirconium silicate and zircon. Ilmenite is used for titanium extraction and pigment; rutile for pigment; zircon for the ceramics industry. The mine's clients are not from Mozambique, but mainly from the United States, Eastern Europe, and Japan. The Moma mine is one of the largest exploitable titanium feedstock and zircon deposits in the world. Production started in April 2007 and the first export of ilmenite took place in December 2007. It was initially envisaged that the plant would be handed over to Kenmare by January 2007 but it was postponed to late 2008 due to setbacks during the process. By late 2008, the mining installations were almost completed: a number of technical problems were still to be solved (roaster installation), the jetty was constructed and was operative for exports of products and import of fuel, the airstrip was exclusively used by Kenmare and the electricity line was put into operation. A number of roads leading to the mine were constructed, the reallocation of villages was completed for the first three years of exploitation and the Kenmare Development Association (KMAD) was established and had completed its first 3-year plan.

The main outcomes are:

1) Direct and indirect employment
During the construction stage, the number of people employed amounted to 1,000, 300 of whom were recruited locally. All personnel of subcontractors included, the workforce consisted of approximately 1,500 people during 12 months of construction. Kenmare's own staff employed for the mining activities gradually increased and consisted of 443 persons by October 2008 (105 of whom were expatriates). In addition, permanent subcontractors employed approximately 30-40 people at any moment. According to the Implementation Agreement with the Government of Mozambique, the number of expatriate staff would be reduced to 15% of total staff by 2009.

2) Payment of taxes
The mine and jetty area form an Industrial Tax Free Zone, in which products can be imported and exported free of border taxes. Kenmare pays withholding taxes on salaries paid in Mozambique (expatriate staff is paid offshore). Royalties are paid based on the quantity of heavy mineral concentrate (HMC) extracted. Taxes paid amounted to USD 1.1 mln in 2008. Export revenues are estimated at USD 97 mln annually (estimate 2007) but only a minimum amount of foreign exchange enters Mozambique, since escrow forex accounts are held on Mauritius and Ireland.

3) Improved local infrastructure
Kenmare implemented the reallocation of a village (140 families) and improved secondary roads leading to the mining area. The jetty was built for large ships and cannot be used by small vessels or local fishermen. The area is forbidden to outsiders. The airstrip is operational but only used by Kenmare and not open to third parties. The 170-km transmission line is in place and supplies electricity to the mine and Moma town. Late 2008, the Mozambican Electricity company constructed distribution lines to villages. A cell phone system was brought to the mine camp area and it also serves the nearby local villages.

4) Productive and social programmes by Kenmare Development Association (KMAD)
The KMAD counts with approximately USD 350,000 per annum and supports a) economic development projects with a focus on supply to the Moma mine (agricultural produce, poultry, credit facilities); b) socio-cultural development projects (education, HIV/AIDS awareness programme, sports development); and c) infrastructure development (educational facilities, water pumps).

At the moment of approval in 2004, FMO envisaged the project to generate development impacts in terms of macroeconomic aspects (balance of payments and tax payments), employment generation and infrastructure. Regarding the *macroeconomic aspects*, and particularly tax payments, export revenues were estimated at USD 97 mln annually over the lifetime of the project (estimate 2007). However, since payments for exports are made offshore, the net effect on the balance of payments (of Mozambique) is equal to the amount of financial resources required to meet local obligations. This amount is very small. *Tax and royalties* payments were estimated at USD

30 mln over the lifetime of the mine. At full production, payments in taxes and royalties were expected to reach USD 1.5 - 2.0 mln per year, or 2% of export earnings. Compared to the weighted average tariff rate of 8.3% in 2006, or the average corporate income tax of 12.6% in Mozambique, the modest 2% tax payment can only be considered 'better than nothing'.[80] Temporary employment generation was substantial, but the permanent employment of local staff (approximately 300-350 people) is low compared to the level of investment (over USD 1 mln per job created). Regarding the infrastructure component, the Moma township was connected to the electricity grid, obtaining a 24-hour supply that is more stable than the diesel-generated electricity supply. Nearby villages still need to be connected. Roads were constructed and rehabilitated but few roads serve local communities since they do not connect villages with either markets or townships, but all lead to the mine, which is prohibited area to outsiders. The jetty and the airport strip are only accessible to Kenmare. KMAD promoted access to social infrastructure: several primary schools and health centres were constructed. Particular attention was paid to the malaria problem, while special HIV/AIDS campaigns were organised. Activities in the social sectors were all small scale, since they are merely manifestations of Kenmare's 'corporate social responsibility'. Kenmare has shown willingness to purchase nationally and locally, but only few products can be bought locally: some food products, sand bags and some stationary ware and lubricants (the latter two both imported products). Benefits to the local area are limited: poultry products (broilers and eggs) are produced by six families, agricultural produce by 120 households and special sandbags for the laboratory are produced by six families.

In sum, a number of the impacts envisaged in 2004 have not materialised, since the newly constructed infrastructure facilities are either inaccessible or useless to the local population.

80 Source: www.heritage.org and www.imf.org.

6 Conclusions

FMO supports mining in Africa. The project, however, does not directly match with the LDC Infrastructure Fund criteria. The LDC Fund finance was both additional (both equity and lending) and had a catalytic impact. The mining activities take place in a remote area in the middle of a subsistence economy based on fisheries and agriculture. The Moma mine is an 'enclave' industry: sponsors, financiers, constructors, suppliers and buyers of produce are all located outside Mozambique. Notwithstanding the explict policy of Kenmare to procure nationally and locally, the amounts involved in local procurements, taxes and salary payments (and hence the foreign exchange component) are small compared to the value of exports.

A number of development benefits are achieved in terms of access to local infrastructure (GSM, electricity, social infrastructure) but the local population barely benefits from the road infrastructure, jetty and airstrip.

10 Grown Energy Zambezi

Key data

Project name:	Grown Energy Zambezi, Mozambique.
Applicant:	Grown Energy (Pty) Ltd.
Sector:	Environmental infrastructure, bio-energy.
LDC Fund contribution:	Grant 1: July 2006: USD 525,000. Grant 2: February 2007: USD 201,000. Extension: USD 30,000. Total contracted: EUR 232,625. 2008 Proposal: USD 3.2 mln convertible grant and a EUR 100,000 grant to cover part of the legal costs.

1 Description of the investment

In 2005 Rademan Janse van Rensburg (RvR, an agricultural entrepreneur) supported by Fieldstone Africa (Pty) Ltd[81] (both South African) established Grown Energy (Pty) Ltd ('GE') for the development and operation of a 100 million litre bio-ethanol plant based on a feedstock (mainly sweet sorghum) and food crop plantation in the Zambezi Valley in Mozambique. The project is known as Grown Energy Zambezi (GEZ). After having explored a site at Mopeia that was considered unsuitable, GEZ found the Sena-Chemba site, a 30,000 hectare concession within the Sofala Province (March 2007). By late 2008, the required land licences had not yet been obtained and only minor land clearance had been carried out and a small number of nurseries had been installed. Development activities at the new site are expected to reach the full feasibility stage by mid-2009.

2 Size and funding of the investment

The total costs of the project are estimated at USD 213 mln, to be funded 60/40 by debt and equity (April 2008). However, as late as the end of 2008 only a small number of pre-investment activities and minor development activities had been carried out.

FMO's grant from the LDC Infrastructure Fund was allocated in July 2006 and planned to cover the costs of feasibility studies and an environmental impact assessment. GEZ gradually attracted a number of 'stable' stakeholders and an array of temporary 'interested parties'. RvR, supported by Fieldstone Africa (Pty) Ltd were the initial sponsors of GEZ. By 2006, they had secured commitments from ACTIS, a private equity investor in emerging markets and VenFin, a South African investment holding company, as well as a number of smaller partners: PETROMOC, the Resource Energy Group (REG) and TsB Sugar (Booker Tate). Insufficient funds were available to complete

81 Fieldstone Africa pertains to Fieldstone Private Capital Group Limited, a financial advisory and investment company registered in London.

the feasibility stage. Since ACTIS was unable to finance the development stage, it searched for additional partners. It was ACTIS that approached both FMO and Mocoh, a British potential buyer of the ethanol, before it withdrew at an early stage. The feasibility study of the Mopeia site showed that it was unsuitable. Based on this conclusion REG, TsB Sugar and VenFin decided to end the agreement.

Given the portability of the project concept, the remaining backers (RvR and Fieldstone) decided to shift to an alternative site at Chemba, further up the Zambezi River valley. Given the prospects of the project in terms of employment generation, FMO indicated that it would continue to support the initiative, while German DEG was committed for the funding of the environmental impact study. FMO also indicated that a majority investor needed to be found. Potential investors, such as Tata Chemicals, BP, Cargill, NCP Alcohol, Greenery, Sekpa and Tongaats Hulets were approached to participate in the undertaking. Tata Chemicals Ltd (TCL) from India showed interest. After a Memorandum of Understanding (MoU) was drawn up in February 2008, a Project Development Agreement was signed between TCL, RvR, Fieldstone and FMO in August 2008. TCL's share was 65% and FMO's share was 35% instead of the required 20%. The reason is that FMO wanted to keep its stake at 20% and Tata's intention was to hold on to a participation of 51%. Since RvR and Fieldstone each join with 5% 'free equity', a 30% 'gap' remains. This gap was split between TCL and FMO until an additional shareholder is found. In addition, Tata Chemical made a USD 750,000 'buy-in' to contribute to the development costs. By late 2007, FMO had paid a total amount of EUR 229,661.

3 Compliance to LDC Fund criteria

The FMO financing proposal 2006 stated that '[t]his bio-fuels renewable energy project would be a first of its kind for the LDC Fund and is a welcome addition to the current LDC Fund portfolio'. The project is eligible for either equity or loan funding by the LDC Fund, due to its high envisaged development impact (particularly in terms of employment creation) as well as its envisaged environmental impact (though this positive impact would only be registered in the countries where the ethanol is used, not in Mozambique). The LDC Infrastructure Fund criteria establish that grants are to be used for 'the development and/or feasibility stage of infrastructure projects which in principle qualify for financing from the Fund'. This criterion applies to the Grown Energy project. The two grants are also compatible to the other LDC Fund criteria for grants (maximum of EUR 5 mln and not more than 50% of the total transaction).

4 Additionality and catalytic impact

The Financial Proposal (2006) stated: 'We deem additionality as essential; without substantial funding from FMO, the project may not materialize' and 'FMO's continued interest contributes to the viability of the overall financing plan. [...] Our role is definitely catalytic and essential.' And 'Combining a grant in the early stage, with most likely an equity contribution and potentially a (subordinated) loan in a later stage leads to a substantial catalytic effect'.

According to Fieldstone 'the appetite from FMO to support the project from feasibility study through to start-up was critical. […] Given the greenfield nature of the project, the underlying agriculture and commodity risk, it is doubtful that the equity providers would have been willing to provide further funding'.

FMO's continuity as financier played a fundamental role in bridging the period between Mopeia and the new start at the Chemba site. FMO's condition was that at least one strong commercial partner had to participate. FMO indicated that it was willing to use the LDC Infrastructure Fund to offer a subordinated loan during the construction stage in order to make the project more attractive to other investors. Tata Chemicals (India) joined in as a major shareholder and on top of this made a USD 750,000 'buy-in' to contribute to the development costs.

FMO's contribution was both additional and had catalytic impact during the first (Mopeia) as well as the second stage (Chemba). The participation of Tata Chemicals can be directly attributed to FMO's insistence.

5 Development impact

The project is still in its initial stage. Late 2008, the necessary studies had not been conducted, nor had the Mozambican government issued all required land-licences. At site, a number of agricultural trials had been launched making use of a rudimentary irrigation system. A camp site was under construction. Approximately 30 persons were employed, 27 of whom were manual labourers clearing the plot.

The major developmental argument of the project was its expected employment effect. According to the 2007 investment plan, the project was expected to generate 2,000 jobs during phase 1, an unknown number of temporary jobs during the construction stage of the ethanol plant, 2,000 additional jobs in phase 2 and 3,000 jobs in out-grower schemes. The 2006 and 2007 FMO Financing Proposals assessed the financial-economic impact as 'strong' and envisaged 'positive effects on balance of payment and reduced spending of foreign currency. The project will pave the way for similar projects when successful.'

Apart from minor start-up activities, no tangible outputs had been achieved at the moment of evaluation. There is a risk that the project may not materialise at all. By late 2008, the required land license had not been issued and the required components of the feasibility study had not been completed. There are risks of a different nature as well, such as the isolation of the province and the related transport difficulties that could negatively affect the internal rate of return, the fact that sales of excess electricity to the grid would not be profitable at the moment and fact that the international market for ethanol is volatile and currently (late 2008) not competitive to other fuels. Export of ethanol will increase national export earnings and hence improve the trade balance. However, imports of fossil fuels will not, or hardly, be reduced since national demand for ethanol is expected to remain modest for another decade due to the

absence of blending facilities in Mozambique. In addition, the vehicle fleet is not adapted to blended fuels.

6 Conclusions

The Growing Energy project complies with the LDC Infrastructure criteria for funding, although the 'infrastructure' argument put forward in the Grant Proposal is not convincing. The electricity generated by the project would cost at least twice as much as the electricity delivered by the state electricity company (USD 0.024 KWh). The project meets at least three LDC Fund criteria: resources are used to support a greenfield activity by a junior company in a country with a relatively high country risk for an activity that is expected to generate an environmentally friendly product. Commercial funding for this project is unlikely and the prospects for social and employment opportunities are high.

The CO2 reduction arguments used in favour of this project should be treated with caution. The production of ethanol out of sorghum and sugarcane causes CO2 emission, while the annual burning of sorghum fields will also pollute the air. The benefits of bio-fuel will be reaped in the consumer countries (Europe) and not in Mozambique itself. FMO provided two grants for pre-investments and signed a project development agreement in 2008. The FMO grant was additional in both the first and second stage. FMO's continuous commitment throughout the project's life, including the transfer from the first to the second project site, has had a catalytic impact shown by FMO's insistence to get a large commercial player (Tata Chemicals) on board.

The project is still in its incipient stage. A number of feasibility studies still need to be carried out and it is uncertain whether all necessary licences will be issued within a reasonable period of time. The profitability of ethanol production is closely related to international prices for fossil fuel. The late 2008 price levels did not make the prospects very bright, but the market is highly volatile and the automobile industry is actively developing engines that use non-fossil fuels.[82]

Once the plant is fully operational, it will create approximately 7,000 permanent jobs, either as directly employed labourers (some 4,000) or in out-grower systems. This level of employment brings in cash into the local economy and is likely to have a substantial developmental impact.

82 However, the focus seems to be on electric cars rather than alternative combustion engines.

11 World Wide Recycling Bio (WWR Bio)

Key data

Project name:	World Wide Recycling Bio (WWR Bio), Bangladesh.
Applicant:	World Wide Recycling Bangladesh Holding (WBH).
Sector:	Environmental Infrastructure.
FMO contribution:	2007: EUR 0.5 mln in equity and subordinated loans of EUR 5.4 mln.

1 Description of the investment

The objective of the project is to construct and operate large-scale organic waste composting facilities near Dhaka, Bangladesh. There is a large potential demand for compost, (partly) replacing chemical fertilizers, as domestic production of chemical fertilizers is insufficient to cover the demand for fertilizer in Bangladesh.

The construction takes place in three phases. Once completed, the total capacity will be 700 tonnes of organic waste per day. The project has been registered (for 15 years) as a Clean Development Mechanism (CDM) project and can earn Certified Emission Rights (CERs). The first phase of the construction started in June 2008 and was completed on 25 November 2008. The expected date of full operation was January 1, 2009. The main stakeholders in the activity are:

- World Wide Recycling Bio, a project company established by the Bangladeshi NGO Waste Concern and the Dutch company World Wide Recycling (WWR);
- World Wide Recycling Bangladesh Holding (WBH) established in the Netherlands. The only activity of WBH is to buy CERs from WWR Bio at a relatively low fixed price and sell them (at a higher price) on the market. WBH's other source of revenue is the dividend paid by WWR Bio;
- FMO, Triodos Bank and Dutch Bangla Bank Ltd (DBBL).

2 Size and funding of the investment

Total funding for the three phases of the project amounts to EUR 12 mln. The funding from the LDC Fund consists of: 1) an equity stake in WBH, 2) a subordinated loan to WBH and 3) a Taka equivalent of EUR 3.9 mln subordinated loan to WWR Bio.

The equity agreement between FMO and WWR for the first phase was signed and disbursed in November 2007. The loan agreement was signed in January 2008 after which the loan was disbursed to WBH, which in turn transferred it to Bangladesh in the form of equity. By late 2008, approval of the Taka loan was pending.

3 Compliance to LCD Fund criteria

The project is fully compatible to one of the main criteria of the LDC Infrastructure Fund, viz. that of providing a positive contribution to ecological development. It is also expected to promote poverty reduction by generating employment opportunities. Its contribution to sustainable economic development is likely to be positive, since the project generates sufficient revenue (through the sales of CERs and compost) to cover its costs (negative gate fee, operational cost) and saves foreign exchange (which would be required for the import of chemical fertilizers). At the same time, it is an investment with a relatively high risk profile. The risks envisaged at the time of the LDC funding approval were the country risk and the risk related to the fact that it was a new type of project. Actually, it was the first large-scale organic waste recycling project in the world that had CDM approval and was based on new technology.

4 Additionality and catalytic impact

FMO's financing with resources from the LDC Fund was additional. The participation from the Fund and the loans also catalysed funding from other sources. WWR/WCC could have carried out the first phase of the project with financing from Triodos, but without LDC Fund it would have been difficult to finance the second and third phases. The LDC Fund subordinated loan provided comfort to the DBBL senior loan. Without this contribution, DBBL would probably not have participated.

5 Development impact

The major *inputs* of the project are its funding and the availability of technical expertise. By late 2008, funding for the first part was not fully disbursed, yet. For the first phase of the project, land was leased; it will be purchased for the other two composting facilities. The major *outputs* of the project are the construction of the composting facilities and the (on-the-job) training of staff. Among the *outcomes* is the production of enriched compost. Other outcomes are the generation of employment and revenues from the sale of compost and CERs. A major *impact* of the project is the reduction of greenhouse gas emissions.

The construction of the first plant, with a capacity of 130 tonnes per day, has been completed. It was officially opened on November 25, 2008. Staff was trained to operate the plant.

By late 2008, one of the constraints was that the Taka loans (from FMO, Triodos and DBBL) had not yet been approved and disbursed. By late 2008, the project was not (fully) operational yet and it was therefore not possible to properly assess the outcomes. The employment generated during the construction and trial phases of the large-scale composting facility was limited. The expected outcomes of the project include employment during operation, production of soil-improving compost, reduced dependency of Bangladesh on imported chemical fertilizers, inflow of foreign currency by the sales of Certified Emission Reductions (CERs) and public sector cost savings in terms of waste transportation and landfills.

The project's expected impact includes the substantial reduction of pollution from waste and the reduction of greenhouse gas emissions. With a capacity of 700 tonnes per day, greenhouse gas reductions could reach 250 thousand tonnes of CO_2 equivalents per year. The project is also expected to promote poverty reduction through employment generation.

6 Conclusions

The project was fully eligible according to the criteria for LDC Fund financing. Funding was both additional and catalysing. The first phase of construction is completed and staff has been trained. By late 2008, the only realized outcome was employment generation. Since the project is still in its initial stage, it is too early to assess its impacts.

Annexe 8 References

Advisory Council on International Affairs / Adviesraad Internationale Vraagstukken (AIV) (2006). *Private Sector Development and Poverty Reduction*. No. 50, October.

Ahammad, H. and K.W. Clements (1999). *What does minerals growth mean to Western Australia?* Resources Policy 25.

Ali, Alia Abdel Gadir and Ibrahim A. Elbadawi, 2008, Explaining Sudan's economic growth performance, in: Ndulu, Benno, Stephen A, O'Connell, Robert H. Bates, Paul Collier and Chukwuma C. Soludo (eds.), *The political economy of economic growth in Africa*, 1960-2000, Cambridge: Cambridge University Press.

Aroca, P. (2001). *Impacts and development in local economies based on mining: The case of the Chilean II region*. Resources Policy 27.

Aryee, B.N.A. (2001). Ghana's mining sector: its contribution to the national economy. Resources Policy 27.

Aryeetey, E. (2003). *Recent Developments in African Financial Markets: Agenda for Further Research*. Journal of African Economies, 12, AERC supplement 2, pp. 111-152.

Aryeetey, E., H. Hettige, M.K. Nissanke and W. Steel (1997). *Financial Market Fragmentation and Reforms in Ghana, Malawi, Nigeria, and Tanzania*. World Bank Economic Review, 11, 2, pp. 195-218.

Aschauer, D.A. (1989a). *Is public expenditure productive?* Journal of Monetary Economics, 23, pp. 177-200.

Aschauer, D.A. (1989b). *Does public capital crowd out private capital?* Journal of Monetary Economics, 24, pp. 171-188.

Asiedu, Elizabeth, 2006, Foreign direct investment in Africa, The role of natural resources, market size, government policy, institutions and political instability, *The World Economy*, Vol. 29, No. 1, pp. 63-77.

Ayogu, M. (2007). *Infrastructure and Economic Development in Africa: A Review.* Journal of African Economies, 16, AERC supplement 1, pp. 75-126.

Ayyagari, M., A. Demirgüç-Kunt and V. Maksimovic (2008). *How Important Are Financing Constraints? The Role of Finance in the Business Environment*. The World Bank Economic Review, Vol. 22, No. 3, pp. 483-516.

Beck, T., A. Demirgüç-Kunt and M. Soledad Martinez Peria (2008), *Banking Services for Everyone? Barriers to Bank Access and Use around the World.* The World Bank Economic Review, Vol. 22, No. 3, pp. 397-430.

Bedi, A.S., and G. Song (2005). *The Impact of Telecommunications on rural Enterprises: The Case of Laos.* In Máximo Torero and Joachim von Braun (eds.), Information and Communication Technology for Development and Poverty Reduction. Baltimore: Johns Hopkins University Press. Chapter 5, pp. 1971-206.

Bhavani, A., R.W. Chiu, S. Janakiram and P. Silarsky (2008). *The Role of Mobile Phones in Sustainable Rural Poverty Reduction.* Washington D.C.: World Bank, ICT Policy Division, GICT.

Bloom, David E., David Canning and Jaypee Sevilla (2004). The effect of health on economic growth: a production function approach, *World Development*, 32 1, pp. 1-13.

Bosch, Christine, Kirsten Hommann, Gloria Rubio, Claudia Sadoff, and Lee Travers, Water and Sanitation, chapter 23 of the PRSP sourcebook, Washington, World Bank.

Calderon, César and Luis Servén, 2004, *The effects of infrastructure development on growth and income distribution*, World Bank, Washington DC, Policy Research Working Paper 3400.

Canning, D. and E. Bennathan (2000). *The Social Rate of Return on Infrastructure Investment*. Policy Research Working Paper, 2390, World Bank.

Caprio, G. (Jr) and A.Demirgüç-Kunt (1998). *The Role of Long-Term Finance: Theory and Evidence.* The World Bank Research Observer, 13, 2 (August), pp. 171-89.

Christeaansen, L., L. Demery and S. Paternostro (2003). *Macro and Micro Perspectives of Growth and Poverty in Africa*. World Bank Economic Review, 17, pp. 317-347.

Claessens, S. (2006). *Access to Financial Services: A Review of the Issues and Public Policy Objectives.* The World Bank Research Observer, 21, no. 2 (Fall), pp. 207-240.

Clements, K.W. and P.L. Johnson (2000). *The Minerals Industry and employment in Western Australia: assessing its impacts in federal electorates*. Resources Policy 26.

Cohen, Daniel and Marcelo Soto, 2004. *Why are poor countries poor?*, Econometric Society, 2004, Latin American Meetings 75.

Dailami, M. and D. Leipziger (1998). *Infrastructure Project Finance and Capital Flows: A New Perspective.* World Development, 26, 7, pp. 1283-1298.

Darche, B. (2000). *Local Capital Markets and Private Infrastructure Development: Global Best Practice Review.* Report for the Public Infrastructure Advisory Facility and the World Bank.

Davis, G.A. and J.E. Titon (2001). *Should Developing Countries Renounce Mining? A Perspective on the Debate.* pp. 9-19.

De Silva, H., and A. Zainudeen (2007). *Teleuse on a Shoestring: Poverty reduction through telecom access at the Bottom of the Pyramid.* Paper prepared for Centre for Poverty Analysis Annual Symposium on Poverty Research in Sri Lanka December 6 -7, 2007, Colombo.

Deloitte and Touche (2008). *Economic Impact of Mobile Communications in Serbia, Ukraine, Malaysia, Thailand, Bangladesh and Pakistan.* A Report prepared for Telenor ASA. Deloitte and Touche.

Edge for Consultancy & Research (2007). *Social mapping and baseline survey of North Omdurman, Khartoum State*, Khartoum.

Edge for Consultancy & Research (2008). *Update Social mapping and baseline survey of North Omdurman, Khartoum State*, Khartoum.

Erpf, Karl and Ana Lucia Obiols (2008). *Mission Report on the Evaluation of the PlayPumps installed in Mozambique*.

Esfahani, H.S. and M.T. Ramirez (2003). *Institutions, infrastructure, and economic growth*. Journal of Development Economics, 70, pp. 443-477.

Etemad, H. and K.S. Salmasi (2002). *Location-Specific Advantages in Mining Investments in Developing Countries: Empowering and Inhibiting Factors.* McGill University.
FMO (n.d.). *LDC Infrastructure Fund Criteria* (LDC Fund or Fund).

FMO (2008). *Development Impact Assessment at FMO.* Internal memo.

Galdo, Virgilio and Bertha Briceño, 2005, An impact evaluation of a potable water and sewerage expansion in Quito: Is water enough? Washington.

Galiani, Sebastian, Gertler, Paul J. and Ernesto Schargrodsky (2005). *Water for Life: The Impact of the Privatization of Water Services on Child Mortality*. Journal of Political Economy, Vol. 113, pp. 83-120, February 2005.

Gramlich, E.M. (1994). *Infrastructure investment, a review essay.* Journal of Economic Literature, 32, 3, pp. 1176-1196.

Grootaert, C. (2002). *Socioeconomic Impact Assessment of Rural Roads: Methodology and Questionnaires.* World Bank.

Hudson, H. E., A. P. Hardy and E. B. Parker (1982). *Impact of Telephone and Satellite Earth Station Installations on GDP- A Model for Rural Areas of LDCs.* Telecommunication Policy, December.

Hulten, C. (1996). *Infrastructure Capital and Economic Growth: How Well You Use It May Be More Important Than How Much You Have.* NBER Working Paper no. 5847.

Humphreys, D. (2000). *Mining as a Sustainable Economic Activity.* Paper presented for presentation to an informal seminar on the mining and metals industry at the OECD, Paris. February 9, 2000.

IEG, 2005, IEG Impact Evaluations: Bangladesh Maternal and Child Health, Washington, World Bank.

IEG (2006). *Annual Review of Development Effectiveness 2006. Getting Results.* Washington D.C.: Independent Evaluation Group, World Bank.

IEG (2008). *What Works in Water supply and Sanitation? Lessons from Impact Evaluations. A Summary of Findings.* Washington D.C.: Independent Evaluation Group, World Bank.

Jenkins, C. (1998). *Determinants of Private Investment in Zimbabwe.* Journal of African Economies.

Jin, S and K. Deininger (2009). *Key Constraints for Rural Non-Farm Activity in Tanzania: Combining Investment Climate and Household Surveys.* Journal of African Economies, 18, pp. 319-361.

Karikpo, Mike (2008). Negotiating resource sovereignty, fuelling conflicts: the case of West African Gas Pipeline Project, Port Harcourt, ERA.

Kasatuka, C. and R.C.A. Minnitt (2006). *Investment and non-commercial risks in developing countries.* The Journal of Southern African Institute of Mining and Metallurgy, volume 106.

Levy, S. (2007). *Public Investment to Reverse Dutch Disease: The Case of Chad.* Journal of African Economies, 16, 3, pp. 439-484.

Liebenthal, A., R. Michelitsch and E. Tarazona (2005). *Extractive Industries and Sustainable Development; An Evaluation of World Bank Experience.* World Bank Operations Evaluation Department. pp. xi-xii + 58.

Lokshin, M. and R. Yemtsov (2005). *Evaluating the Impact of Infrastructure Rehabilitation Projects on Household Welfare in Rural Georgia.* The World Bank Economic Review 19(2), pp. 311-333.

Ministry of Foreign Affairs of the Netherlands (2002a). Sector wide approach for water and sanitation development.

Ministry of Foreign Affairs (2002b). *Herziene beschikking m.b.t. het project 'FMO Infrastructuur Fonds Minst Ontwikkelde Landen'.* Kenmerk DDE-0182-rd/02.

Ministry of Foreign Affairs (2006). *Wijziging subsidiebeschikking MOL Infrastructuurfonds – WW 190302/3278.* Kenmerk DDE-0224/2006.

Ministry of Foreign Affairs, Development Cooperation (2007a). *Our Common Concern, Investing in Development in a Changing World.* Policy Note Dutch Development Cooperation.

Ministry of Foreign Affairs, Development Cooperation (2007b). *Private Sector Development, Infrastructure.* DDE Working Paper.

Mlambo, K. and T. W. Oshikoya (2001). *Macroeconomic Factors and Investment in Africa.* Journal of African Economies, 10, AERC supplement 2, pp. 12-47.

Munnell, A.H. (1992). *Infrastructure investment and economic growth.* Journal of Economic Perspectives, 6, 4, pp. 189-198.

Mwilima, N. (2003). *Foreign Direct Investment in Africa.* African Labour Research Network (ALRB). September 2003.

Ndikumana, L. (2000). *Financial Determinants of Domestic Investment in Sub-Saharan Africa: Evidence from Panel Data.* World Development Vol. 28, No. 2, pp. 381-400.

Ndulu, Benno J., Infrastructure (2006). *Regional Integration and Growth in Sub-Saharan Africa: Dealing with the Disadvantages of Geography and Sovereign Fragmentation.* Journal of African Economies, Vol. 15, Issue 2, pp. 212-244.

Ndulu, Benno, Stephen A. O'Connell, Robert H. Bates, Paul Collier and Chukwuma C. Soludo (eds.) (2008). *The political economy of economic growth in Africa*, 1960-2000, Cambridge: Cambridge University Press.

Newman, John & Menno Pradhan & Laura B. Rawlings & Geert Ridder & Ramiro Coa & Jose Luis Evia (2002). *An Impact Evaluation of Education, Health, and Water Supply Investments by the Bolivian Social Investment Fund*, World Bank Economic Review, Oxford University Press, vol. 16(2), pp.241-274, August.

Nissanke, M.K. (2001). *Financing enterprise development in sub-Saharan Africa.* Cambridge Journal of Economics, 25, pp. 343-367.

OECD (2006). *Promoting Pro-Poor Growth: Private Sector Development.*

OECD-DAC (n.d.). *DAC Evaluation Quality Standards.* DAC Evaluation Network, Paris: OECD-DAC.

Overå, R. (2006). *Networks, Distance, and Trust: Telecommunications Development and Changing Trading Practices in Ghana.* World Development, Vol. 34, No. 7, pp. 1301-1315.

Ovum (2006). *The Economic and Social Benefits of Mobile Services in Bangladesh – a case study for the GSM Association.* Prepared by B. Lane, S. Sweet, D. Lewin, J. Sephton and I. Petini.

Patricof, A.J. and J. Sunderland (2005). *Venture Capital for Development.* Report prepared for the Brookings Blum Roundtable: The Private Sector in the Fight against Global Poverty.

Phillips, L.C. et al. (2001). *Tanzania's Precious Minerals Boom: Issues in Mining and Marketing.* African Economic Policy Discussion Paper, Number 68, March 2001.

PREM (2006). *A guide to water and sanitation sector impact evaluation*, Washington, World Bank.

Röller, L. and L. Waverman (2001). *Telecommunications Infrastructure and Economic Development: a simultaneous approach.* The American Economic Review, vol. 91 No. 4 (September 2001), pp. 909-923.

SEOR (2006). *ORET/MILIEV Evaluation 1999-2004, Final Report.* Assignment from Ministry of Foreign Affairs, DDE, November 2006.

SEOR (2008). *Monitoring and Evaluation of Private Sector Development Programmes, A Handbook for the Application of a Results Model.* Report to the Ministry of Foreign Affairs.

Song, G. and A.S. Bedi (2005). *The Benefits of Rural Telecommunications: The Case of Laos.* In Máximo Torero and Joachim von Braun (eds.), Information and Communication Technology for Development and Poverty Reduction. Baltimore: Johns Hopkins University Press. Chapter 5, pp. 251-267.

Souter, D., C. Garforth, R. Jain, O. Mascarenhas, K. McKemey and N. Scott (2005). *The Economic Impact of Telecommunications on Rural Livelihoods and Poverty Reduction: A Study of Rural Communities in India (Gujarat), Mozambique and Tanzania.* Report of DFID KaR Project 8347.

Stevens, P. (2003). *Resource Impact – Curse or Blessing? A literature survey.*

Stilwell, L.C., R.C.A. Minnitt, T.D. Monson and G. Kuhn (2000). *An input-output analysis of the impact of mining on the South African economy.* Resources Policy 26.

Thorborg, Hedwig, Sasha Vlaski, Bas Hulstein and Paul Bergsma (2007-2008), *Quarterly Reports Omdurman Water Supply and Optimisation Project*, Royal Haskoning, Rotterdam.

Torero, M., S. Chowdhury and A.S. Bedi (2005). *Telecommunications Infrastructure and Economic Growth: A Cross-Country Analysis.* In Máximo Torero and Joachim von Braun, (eds.), Information and Communication Technology for Development and Poverty Reduction. Baltimore: Johns Hopkins University Press. Chapter 2, pp. 21-63.

Van de Walle, D. and D. Cratty (2002). *Impact Evaluation of a Rural Road Rehabilitation Project*. World Bank. January 2002.

Waverman, L., M. Meschi, M. Fuss (2005). *The Impact of Telecoms on Economic Growth in Developing Countries.* The Vodafone Policy Paper Series, No. 2, March 2005.

Weber-Fahr, M. (2002). *Treasure or trouble? Mining in Developing Countries.* The World Bank Groups Mining Department, pp. 14.

Willoughby, C. (2004). *How Important is Infrastructure for Achieving Pro-Poor Growth?* Report to OECD, DAC Network on Poverty Reduction, financed by DFID.

World Bank (2006). *Impact Evaluation: The Experience of the Independent Evaluation Group of the World Bank.*

WHO (2008). *Safer water, better health*, Geneva, WHO, 2008.

Evaluation studies published by the Policy and Operations Evaluation Department (IOB) 2004-2009

Evaluation-studies published before 2004 can be found on the IOB-website: www.minbuza.nl/iob

297 2004 **Over solidariteit en professionalisering**
Evaluatie van Gemeentelijke Internationale Samenwerking (1997-2001)
isbn 90-5328-341-2

298 2004 **Onderzoek naar de kwaliteit van in 2002 afgeronde decentrale evaluaties**
Eindrapport
isbn 90-5328-344-7

299 2005 **Een uitgebreid Europabeleid**
Evaluatie van het Nederlands beleid inzake de toetreding van Midden-Europese landen tot de Europese *Unie 1997-2003*
isbn 90-5328-347-1

300 2005 **Aid for Trade?**
An Evaluation of Trade-Related Technical Assistance
isbn 90-5328-349-8

301 2006 **Van Projecthulp naar Sectorsteun**
Evaluatie van de sectorale benadering 1998-2005
isbn 90-5328-351-x

301 2006 **From Project Aid towards Sector Support**
An evaluation of the sector-wide approach in Dutch bilateral aid 1998–2005
isbn 90-5146-000-7

302 2006 **Evaluatie van het Nederlandse mensenrechtenbeleid in de externe betrekkingen**
isbn 90-5328-350-1

303 2006 **Dutch Humanitarian Assistance An Evaluation**
isbn 90-5328-352-8

304 2007 **Evaluatie van de vernieuwing van het Nederlandse onderzoeksbeleid** 1992-2005
isbn 978-90-5328-353-0

304 2007 **Evaluation of the Netherlands' Research Policy 1992-2005**
(Summary)
isbn 978-90-5328-353-0

305 2007 **Impact Evaluation: Water Supply and Sanitation Programmes Shinyanga Region, Tanzania 1990-2006**
isbn 978-90-5328-354-7

306 2007 **Chatting and Playing Chess with Policymakers**
Influencing policy via the Dutch Co-Financing Programme
isbn 978-90-5328-355-4

307 2008 **Beleidsdoorlichting seksuele en reproductieve gezondheid en rechten en hiv/aids 2004-2006**
isbn 978-90-5328-358-5

308 2008 **Het Nederlandse Afrikabeleid 1998-2006**
Evaluatie van de bilaterale samenwerking
isbn 978-90-5328-359-5

308 2008 **Het Nederlandse Afrikabeleid 1998-2006**
Evaluatie van de bilaterale samenwerking (Samenvatting)
isbn 978-90-5328-359-5

309 2008 **Het Vakbondsmede-financieringsprogramma**
Een evaluatie van steun gericht op versterking van vakbonden en vakbonds- en arbeidsrechten
isbn 978-90-5328-357-8

309 2008 **The Netherlands Trade Union Co-Financing Programme**
An evaluation of support for trade unions and trade union and labour rights (Summary)
isbn 978-90-5328-357-8

309 2008 **El Programa de Cofinanciamiento Sindical**
Una evaluación del apoyo orientado al fortalecimiento de sindicatos y de derechos sindicales y laborales (Resumen)
isbn 978-90-5328-357-8

310 2008 **Clean and sustainable?**
An evaluation of the contribution of the Clean Development Mechanism to sustainable development in host countries
isbn 978-90-5328-356-1

311 2008 **Impact Evaluation: Primary Education in Uganda**
isbn 978-90-5328-361-5

312 2008 **Impact Evaluation: Primary Education in Zambia**
isbn 978-90-5328-360-8

313 2008 **Xplore-programma**
isbn 978-90-5328-362-2

314 2008 **Primus inter pares**
Een evaluatie van het Nederlands EU-voorzitterschap 2004
isbn 978-90-5328-364-6

315 2008 **Impact Evaluation: Support to Rural Water Supply and Sanitation in Dhamar and Hodeidah Governorates, Republic of Yemen**
isbn 978-90-5328-364-6

316 2008 **Be our guests**
Beleidsdoorlichting Nederland als gastland van internationale organisaties en Samenvatting
isbn 978-90-5328-370-7

316 2008 **Be our guests**
Policy review on hosting international organisations in the Netherlands and Summary
isbn 978-90-5328-371-4

316 2008 **Be our guests**
Examen de la politique meneé par les Pays-Bas en tant qu'État hôte des organisations internationales (Sommaire)
isbn 978-90-5328-372-1

317 2008 **Sectorsteun in milieu en water**
isbn 978-90-5328-369-1

318 2008 **Samenwerking met Clingendael**
Evaluatie van de subsidieovereenkomst tussen de ministeries van Buitenlandse Zaken en Defensie en Instituut Clingendael
isbn 978-90-5328-365-7

319 2008 **Meer dan een dak**
Evaluatie van het Nederlands beleid voor stedelijke armoedebestrijding
isbn 978-90-5328-365-3

320 2008 **Het tropisch regenwoud in het OS-beleid 1999-2005**
isbn 978-90-5328-374-8

321 2009 **Maatgesneden Monotoring 'Het verhaal achter de cijfers'**
Beperkte beleidsdoorlichting Medefinancieringsstelsel 2007-2010
isbn 978-90-5328-374-5

322 2009 **Draagvlakonderzoek Evalueerbaarheid en resultaten**
isbn 978-90-5328-375-2

323 2009 **Preparing the ground for a safer world**
Evaluation of the Dutch efforts to control landmines and explosive remnants of war 1996-2006
isbn 978-90-5328-377-6

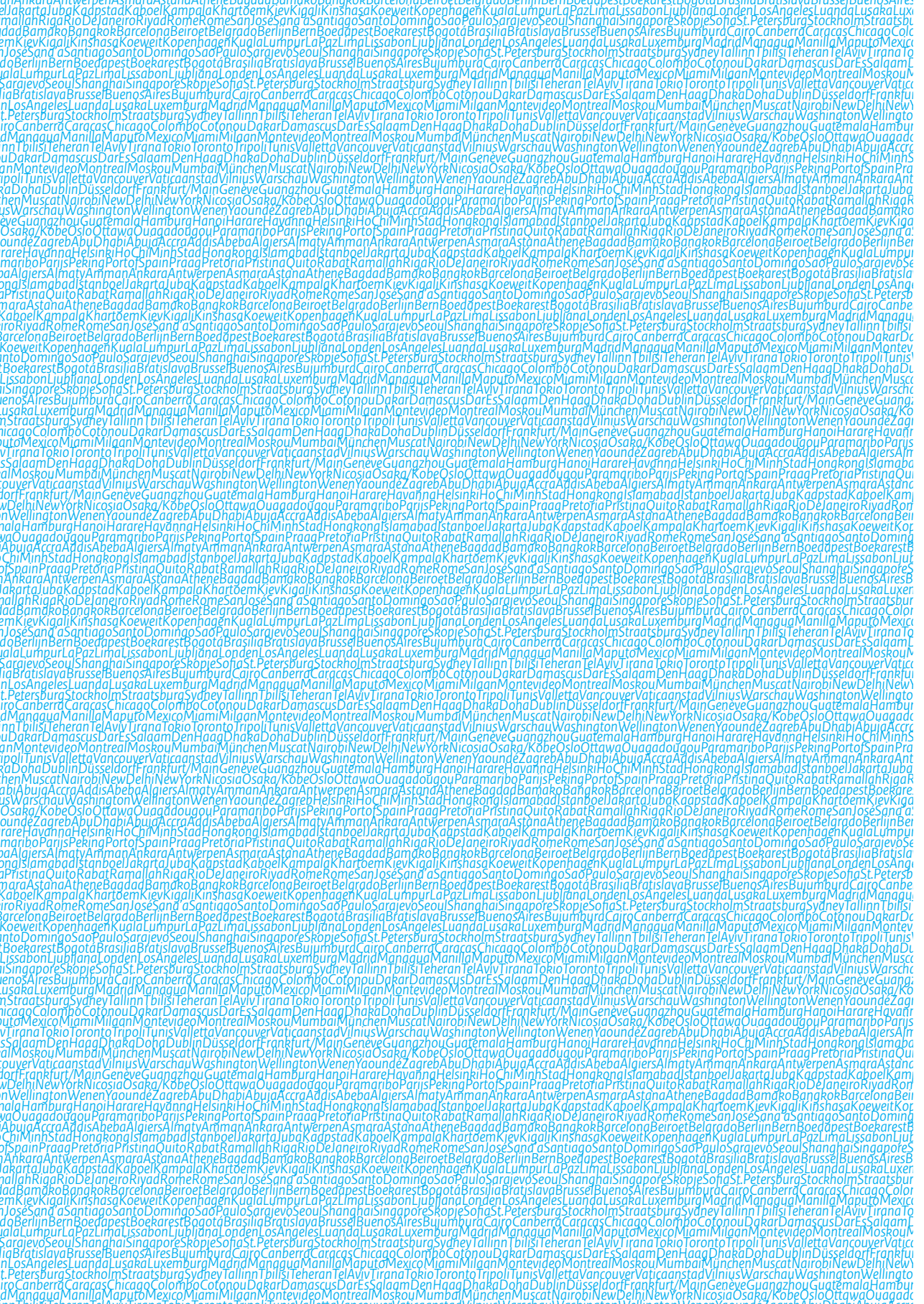
324 2009 **Investing in infrastructure**
Evaluation of the LDC Infrastructure Fund
isbn 978-90-5328-378-3

Published by:

Ministry of Foreign Affairs of the Netherlands
P.O.Box 20061 | 2500 EB The Hague | The Netherlands
www.minbuza.nl/iob

Photo cover: Omdurman Water Optimisation Project (Sudan)
Correction of English: Thijs Vleugel, Ticycle vertalingen
Lay out: Eindeloos, The Hague
Printing: OBT, The Hague
ISBN: isbn 978-90-5328-378-3

Ordercode OSDR/6642/E



The economic and social infrastructure of many least developed countries is severely inadequate or even non-existent. One reason for this is the difficulty in obtaining long-term capital for investment in infrastructure. That is why the Dutch Minister for Development Cooperation established the Least Developed Countries (LDC) Infrastructure Fund in 2002. The Fund, which is managed by the Netherlands Development Finance Company (FMO), aims to stimulate private investment in infrastructure in LDCs. This report presents the results of an evaluation of the Fund's first five years.

Published by:

Ministry of Foreign Affairs of the Netherlands
P.O.Box 20061 | 2500 EB The Hague | The Netherlands
www.minbuza.nl