

Madagascar: Betsiboka Rice Project, Phases I-V

Ex-post evaluation

OECD sector	311/Agricultural water resources	
BMZ project number	(1) 1981 70367 (Phase I) (2 a) 1981 65 672 (Phase II, investment in fixed assets) (2 b) 1981 70 524 (Phase II, complementary measure) (3 a) 1988 66 524 (Phase III, investment in fixed assets) (3 b) 1988 70 354 (Phase III, complementary measure) (4 a) 1992 66 116 (Phase IV, investment in fixed assets) (4 b) 1992 70 091 (Phase IV, complementary measure) (5 a) 1996 66 116 (Phase V, investment in fixed assets) (5 b) 1998 70 274 (Phase V, complementary measure)	
Project-executing agency	Fikambanana Fampandrosoana ny Lemak'i Betsiboka (FIFABE)	
Consultant	Agrar- und Hydrotechnik GmbH (AHT)	
Year of ex-post evaluation	2004	
	Project appraisal (scheduled)	Ex-post evaluation (actual)
Start of implementation	(1) 2. quarter 1982 (2 a) 1. quarter 1984 (2 b) 1. quarter 1984 (3 a) 1. quarter 1989 (3 b) 1. quarter 1989 (4a) 1. quarter 1992 (4 b) 1. quarter 1992 (5 a) 1. quarter 1997 (5 b) 1. quarter 1997	1. quarter 1983 1. quarter 1984 1. quarter 1984 1. quarter 1989 1. quarter 1989 4. quarter 1993 1. quarter 1992 1. quarter 1997 1. quarter 1997
Period of implementation	(1) 12 months (2 a) 60 months (2 b) 60 months (3 a) 24 months (3 b) 24 months (4a) 36 months (4 b) 36 months	12 months 60 months 60 months 57 months 36 months 38 months 60 months

	(5 a) 30 months (5 b) 30 months	60 months 72 months
Investment costs	(1) EUR 1.6 million (2 a) EUR 11.3 million (2 b) EUR 5.3 million (3 a) EUR 3.5 million (3 b) EUR 2.2 million (4 a) EUR 5.0 million (4 b) EUR 5.4 million (5 a) EUR 4.6 million (5 b) EUR 3.8 million	EUR 1.6 million EUR 11.3 million EUR 5.3 million EUR 6.5 million EUR 3.4 million EUR 4.7 million EUR 6.2 million EUR 5.2 million EUR 5.8 million
Counterpart contribution	(1) EUR 0.0 million (2 a) EUR 1.1 million (2 b) EUR 0.0 million (3 a) EUR 0.1 million (3 b) EUR 0.0 million (4 a) EUR 1.7 million (4 b) EUR 0.0 million (5 a) EUR 0.7 million (5 b) EUR 0.0 million	EUR 0.0 million EUR 1.1 million EUR 0.0 million EUR 0.7 million EUR 0.0 million EUR 1.8 million EUR 0.0 million EUR 1.2 million EUR 0.0 million
Financing, of which Financial Cooperation (FC) funds	(1) EUR 1.6 million FC/grant (2a) EUR 10.3 million FC/grant (2 b) EUR 5.3 million FC/grant (3 a) EUR 3.4 million FC/grant (3 b) EUR 2.2 million FC/grant (4 a) EUR 3.3 million FC/grant (4 b) EUR 5.4 million FC/grant (5 a) EUR 3.9 million FC/grant (5 b) EUR 3.8 million FC/grant	EUR 1.6 million FC/grant EUR 10.3 million FC/grant EUR 5.3 million FC/grant EUR 5.8 million FC/grant EUR 3.4 million FC/grant EUR 2.9 million FC/grant EUR 5.8 million FC/grant EUR 3.9 million FC/grant EUR 5.8 million FC/grant
Other institutions/donors involved	none	none
Performance rating (Phases I-V)	Rating 5	
• Significance/relevance	Rating 5	
• Effectiveness	Rating 4	
• Efficiency	Rating 5	

Brief Description, Overall Objective and Project Purposes with Indicators

The purpose of the project remained essentially unchanged since the first project appraisal in 1981: stabilizing and raising rice production on irrigated farmland situated in the lower valley of the Betsiboka river in northwestern Madagascar. The irrigation land in the project area is divided into 13 sectors altogether located on both sides of the Betsiboka river. Heavy equipment must be transported across the river on a ferry. The irrigation and drainage system (hydraulic system) in the project area stems from the colonial era. It is made up of many subsystems and is incapable of full flood control. During the rainy period, broad stretches of cropland are inundated and large amounts of sediment enter the irrigation and drainage system. This necessitates considerable repair work directly after the rains to clear and level drainage ditches for rapid drainage of floodwater so that rice can be planted in time for the tight cropping schedule. The 13 sectors are watered through gravity irrigation from reservoirs, via drainage weirs at the tributaries of the Betsiboka and by means of pump irrigation.

The project was carried out in 5 phases from 1983 to 2002. A review and updating of planning in Phase I (1983) was followed in Phase II (1984-88) by the main measures of a basic overhaul of the hydraulic system and the provision of a new rice mill. In the course of Phase III (1989-91), 2 irrigation sectors (about 3,400 ha) were fully rehabilitated, the rice mill privatized, different measures to improve infrastructure and farm production carried out and work begun on setting up water user associations (*Associations d'Usagers de Réseaux*; AUR). Phases IV (1992-96) and V (1997-2002) were concerned with consolidating the project results by expanding and qualifying AURs, founding umbrella organizations of AURs, conducting measures to step up agricultural production and continuing assistance to water management operations. In all phases, the project executing agency, Fikambanana Fampandrosoana ny Lemak'i Betsiboka (FIFABE), was given intensive support by consultants financed as part of the complementary measures.

The overall objective of the programme throughout all phases was to raise farming income from rice production. An indicator for this was only defined for Phases IV and V. The indicator for Phase IV required family income to rise from FMG 0.5 million (some EUR 250) in 1991 by 20% in real terms to FMG 0.6 million in 1994 and for Phase V from FMG 1.3 million (about EUR 300) in 1995 in real terms by 15% to FMG 1.45 million in 1999.

The project purpose in Phase I (preparatory project) consisted in drawing up detailed plans for the main project (Phase II). The main project purpose of Phase II was to maintain adequate paddy yields on rice-growing land. As project appraisal indicator for Phase II (1984), an average output of 2.5 to 3 t/ha was set based on information from the executing agency FIFABE. Also based on information from the executing agency, the indicator for cropland amounted to about 17,000 ha. In 1991, it emerged that the original cropland area at project appraisal was probably only around 11,250 ha. In 1995, studies conducted in the meantime cast doubt on the appropriateness of the original yield target of 2.5 t/ha, which was then reduced to 1.7 t/ha. We consider this comparatively late reduction to be unfortunate and base the assessment of the project purpose achievement on the original yield target.

The major project objective in Phase III (1988) was securing sustainable adequate rice yields in Sectors 4 and 9, whose primary and secondary irrigation and drainage systems had been completely rehabilitated in this phase. The indicator was the increase in paddy yields from 2.5 to 3 t/ha 4-5 years after the completion of rehabilitation. Added to this was assistance in founding AURs as legally registered user associations and their qualification to run parts of the irrigation and drainage system on their own.

In response to increased sedimentation in the irrigation area due also to spreading deforestation, the main project aim in Phase IV was to prevent falls in output and raise rice production by a small margin. The indicator was a rice yield for 1994 amounting to 2.9 t/ha in the fully rehabilitated Sectors 4 and 9 comprising cropland of 5,000 ha and 2.2 t/ha on the 9,600 ha in the remaining 11 sectors. Another major objective was to further expand and strengthen

user associations. The project purpose of Phase V was to prevent declines in rice production on project land. The indicator was an average paddy rice yield of 3.0 t/ha. In 1998, the project purpose was changed for Phase V to ensuring the sustainable operation of the irrigation and drainage facilities, primarily through strengthening the AURs and setting up an umbrella organization for them. The indicator was adequate financial and personnel contributions by government, FIFABE and the user associations in accordance with the agreed budget allocations.

Project Design/Major Deviations from Original Project Planning and Their Main Causes

A combination of various measures, to (a) rehabilitate the irrigation and drainage system, (b) improve rice processing by FIFABE, (c) improve seed production established at FIFABE, (d) improve the workshop section at FIFABE and (e) improve FIFABE's technical, economic and management performance (complementary measures), aimed at halting the decline in rice production in the project area. A major assumption at project appraisal (1981) was that FIFABE would earn sufficient income from its commercial activities to be able to finance regular maintenance work on the irrigation and drainage system through cross-subsidies. Sectoral reforms in the mid-eighties abolishing the purchase and marketing monopoly for rice revived competition through new private buyers and processors, which the project executing agency FIFABE could not cope with. This and inadequate allocation of government funds resulted in a substantial deterioration in its finances as of the mid-eighties. The main measures of Phase III were thus a response to changed framework conditions (e.g. the privatization of the rice mill operations). Founding legally registered user associations (*Associations d'Usagers des Réseaux, AUR*) bearing increasing (partial) responsibility for the running and upkeep of the hydraulic system also helped reduce costs for FIFABE. In the consolidation Phases IV and V, assistance to FIFABE was continued in equipping and operating its remaining facilities and in rehabilitating and running the irrigation and drainage infrastructure, but full-scale rehabilitation measures were no longer conducted in the sectors, only selective ones requiring systematic contributions from users (so-called concerted rehabilitation). The focus, however, was on increased assistance to the AURs and setting up a AUR umbrella organization. The aim here was to lay the institutional groundwork for a sustainable operation of the hydraulic system largely by the users themselves, particularly after FIFABE was disbanded at the end of 2001.

Key Results of the Impact Analysis and Performance Rating

The results obtained by the measures implemented can be summarized and assessed as follows:

- As to the yield targets set in Phases I-V, at 2.9 t/ha, we note first of all that average rice yield in 2002 was about 70% higher than at the beginning of the project (1983: 1.6 t/ha). So the original target yield was largely achieved, but several distinctions need to be made: (a) The original target yield should have been reached after completion of Phase II, that is, in 1990. Average yield at that time amounted to only 2.4 t/ha, however. (b) In the two fully rehabilitated Sectors 4 and 9, the rice yield target per ha for Sector 4 was only met between 1994 and 1997 and in Sector 9 only in 1994 and 1996. Yield here has now declined to 2.4 and 1.3 t/ha respectively. (c) For lack of adequate maintenance of the irrigation and drainage system, rice yields in future can be expected to fall by a large margin under the conditions in the project area so that the yield targets cannot be sustained.
- Due to the annual floods, cultivated land area also alters every year. Altogether, though, it increased from about 11,200 ha at project start to some 15,000 ha at the beginning of the nineties and then declined again markedly to around 12,000 ha in 2000, approximately the original size. A major reason for shrinking cropland since the mid-nineties has been the successive close down of pump irrigation due to uneconomical rice growing on altogether 2,500 ha. For the near future, cropland can be expected to

decrease substantially for lack of upkeep measures on the irrigation and drainage system. So ultimately the reduced land area target cannot rate as sustainable either.

- The rice mill shut down in 1996 was never run efficiently.
- The investments (including technical equipment, workshop, ferry, seed production) and the complementary measures to strengthen the project executing agency FIFABE were not successful. Since disbandment of FIFABE (at the end of 2001) the remaining equipment has not been used.
- Most of the financed pumping stations are no longer in use.
- After the disbandment of FIFABE, major maintenance work for the sustainable operation of the hydraulic system has not been carried out.
- Of 45 village savings banks, the survival of the 32 still remaining is threatened by increasing loan losses.
- The *Contrat Plan* between government and users has failed. The agreed financial contributions have not been made by either the government or the users. The requisite maintenance work is not being conducted on the primary system.
- At the time of the ex-post evaluation, 82 AURs were in existence with a total of almost 10,000 members, regional associations of user associations and a user group umbrella organization had been founded as registered corporations. Since the disbandment of FIFABE, the AURs in fact operate the whole irrigation and drainage network. However, they only have the technical capabilities to perform relatively simple repair work by hand on comparatively small canals and drains in the secondary system. To finance the requisite more complex and technically more sophisticated repair work on the primary system, the AURs would only have had to make comparatively small financial contributions under the agreed contract with the government, the so-called *Contrat Plan*. Till now, neither the AURs nor the UAUR have managed to actually collect payment of the agreed water rates from the users. The user groups and their umbrella organization are in a very difficult financial position and are in fact unable to perform their tasks in adequate measure.

In all areas, the results achieved fall far short of those originally planned and are largely unsustainable.

The risks posed by the sectoral framework and the shortcomings of FIFABE as the executing agency were detected early on but their adverse implications were ultimately underestimated. In view of the extensive complementary measures, the ability to influence these risks was overestimated. Not enough account was taken of the FIFABE management's self-interest (safeguarding its position of power) in obstructing a consistent implementation of the schemes drawn up by the consultant, which envisaged a concentration on a few core tasks. Ultimately too, the Madagascan government provided too little support to central components of the project design (increasing outsourcing of maintenance work to private entrepreneurs, introduction of cost-effective water rates, sufficient and timely provision of funds).

The achievement of the overall and project objectives can be summarized as follows:

The overall objective of the programme throughout all phases was to raise farming income from rice production. The calculations made by the ex-post evaluation show that this higher income was not achieved in the end. At the end of 2002, the income of the rice growers was well below (-20%) what they earned when Phases IV and V were assessed. The intended rise in real income was therefore not achieved.

The sustainable yield targets defined as the project purposes for Phases I-V have not been reached (see above). As to the changed definition of project purpose for Phase V, the following points need to be made: (a) FIFABE has been disbanded without a qualified successor organization to replace it; (b) the *Contrat Plan* is defunct; (c) the AURs are not able to collect enough user contributions; (d) the AURs are incapable of performing the requisite, technically more advanced maintenance work on the hydraulic system. Altogether then, the project purpose for Phase V was not achieved.

Conceived as a preparatory phase, the developmental success of Phase I depends ultimately on whether the development objectives of the main measure and the other programme phases have been achieved. As for the most part the project objectives of Phases II-V were not attained, cropland size has already diminished by 2,500 ha due to the termination of pump irrigation and sustainable operation of the irrigation and drainage systems essential for rice growing in the project region is seriously threatened, we gauge the effectiveness of the programme altogether as insufficient (Rating 4), despite the actual rise in rice output, which we view as unsustainable for the reasons cited.

The overall project objective was to secure income for the rice farmers. Under the programme their income has evidently not ultimately increased. Income dropped from about EUR 460 before the programme (1981) to some EUR 395 (at the end of 2002). The overall objective has thus not been achieved. The causes of this are lower rice prices in Madagascar and less than expected increases in yield. The present level of income cannot be expected to be sustained. Due to the lack of maintenance of the irrigation and drainage systems, the rice yield in future is likely to diminish by a considerable margin in the project area with the attendant adverse consequences for the income of the rice growers. The significance and relevance of the programme is thus clearly insufficient (Rating 5).

Even under optimistic assumptions, the programme's overall economic impact has been negative. We therefore rate the efficiency of the programme as clearly insufficient (Rating 5).

Weighing up the above key criteria for developmental performance, we gauge the project overall to be **clearly insufficient in terms of developmental effectiveness** (Rating 5).

General Conclusions Applicable to All Projects

Projects to improve yield through large-scale agricultural irrigation should only be carried out under the following conditions:

- There is a clear demarcation of responsibilities between the public and private sector for the operation and upkeep of the respective irrigation and drainage facilities.
- The users participate actively in planning, implementing and financing the project from the outset.
- The users can be expected to be able to pay cost-effective water rates.
- Government provides sufficient and timely funds for its public duties in maintaining irrigation perimeters.

When major sectoral parameters change during project implementation (e.g. abolition of purchase monopolies), the measures envisaged at project appraisal should be reappraised to assess whether they are still warranted and worth continuing under changed conditions.

When parastatal executing agencies suffer from discernible institutional weaknesses, binding, measurable and scheduled targets should be agreed for higher efficiency (e.g. degree of cost recovery, cost reduction, profitability). Attempts should not be made to compensate for lack of ownership on the part of the executing agency by stepping up advisory services. If it emerges

that the executing agency is not interested in implementing planned or prepared reform strategies for its own reasons, the project should not be started or it should be terminated.

Particularly under difficult sectoral conditions and where the willingness of government to reform is gauged to be low, FC should collaborate closely with all international donors engaged in the sector to exert joint pressure on the government to implement the requisite reforms in the sector and amongst the executing institutions.

Legend

Developmentally successful: Ratings 1 to 3	
Rating 1	Very high or high degree of developmental effectiveness
Rating 2	Satisfactory degree of developmental effectiveness
Rating 3	Overall sufficient degree of developmental effectiveness
Developmental failures: Ratings 4 to 6	
Rating 4	Overall slightly insufficient degree of developmental effectiveness
Rating 5	Clearly insufficient degree of developmental effectiveness
Rating 6	The project is a total failure

Criteria for the Evaluation of Project Success

The evaluation of a project’s “developmental effectiveness” and its classification during the final evaluation into one of the various levels of success described below in more detail concentrate on the following fundamental questions:

- Are the **project objectives** reached to a sufficient degree (aspect of project **effectiveness**)?
- Does the project generate **sufficient significant developmental effects** (project **relevance** and **significance** measured by the achievement of the overall development-policy objective defined beforehand and its effects in political, institutional, socio-economic and socio-cultural as well as ecological terms)?
- Are the **funds/expenses** that were and are being employed/incurred to reach the objectives **appropriate** and how can the project’s microeconomic and macroeconomic impact be measured (aspect of **efficiency** of the project conception)?
- To the extent that undesired (**side**) **effects** occur, are these tolerable?

We do not treat **sustainability**, a key aspect to consider for project evaluation, as a separate category of evaluation but instead as a cross-cutting element of all four fundamental questions on project success. A project is sustainable if the project-executing agency and/or the target group are able to continue to use the project facilities that have been built for a period of time that is, overall, adequate in economic terms or to carry on with the project activities on their own and generate positive results after the financial, organizational and/or technical support has come to an end.