Madagascar: Water supply Mahajanga

Ex post-evaluation report

OECD sector	Water supply and sanitation – large systems/14020	
BMZ project number	1992 65 794	
Project executing agency	JIRAMA/Mahajanga municipal authority	
Consultant	Project team: CES Consulting Engineers Salzgitter GmbH – BCEOM - INFRAMAD	
Year of ex-post evaluation	**2006**	
	Project appraisal (planned)	**Ex-post evaluation (actual)**
Start of implementation	January 1994	October 1995
Period of implementation	60 months	96 months
Investment costs in millions (FC project)	10.99	14.68
Counterpart contribution in millions	0.77	3.83
Finance, of which FC funds, in millions	10.22	10.85
Other institutions/donors involved	GTZ	GTZ
Performance rating	3	
Significance/Relevance	2	
Effectiveness	3	
Efficiency	4	

Brief Description, Overall Objective and Project Objectives with Indicators

The project carried out in cooperation with GTZ was aimed at providing an adequate and secure supply of hygienically safe drinking water to the urban population of Mahajanga up to at least 2001. The project appraisal had ascertained considerable deficits in the physical condition of the water supply systems, high water losses, frequent downtimes and unhealthy tap surroundings. Another intention was to mitigate the danger of flooding in the Metzinger Valley (Vallon Metzinger), which regularly occurred during heavy rainfall and posed large health hazards for the valley inhabitants. The project comprised the rehabilitation and the small-scale extension of the existing water supply system, the drainage of central parts of the urban area, the rehabilitation of the tidal valves at the Metzinger dyke, the introduction of an operating plan for kiosks providing water against payment (KIAO) as well as awareness campaigns and finance for equipment, vehicles and building materials under the TC project to improve sanitation in Mahajanga. To

protect the aquifer from salination a drilling campaign was also carried out for new production and monitoring wells in Well Field II.

The overall objective of the project was the reduction of health hazards for the urban population of Mahajanga as a result of the unsatisfactory supply of drinking water and flooding. No overall objective indicator was defined.

The project objectives were (i) the adequate and secure supply of hygienically safe drinking water up to at least 2001 and (ii) flood containment in the Metzinger Valley area.

To measure objectives achievement, indicators were defined on the reduction of unaccounted for water, the increase in the drinking water coverage index for the urban population, the availability of water at the mains and the water kiosks, on water quality and the extent of flooding in the Metzinger Valley area.

Project Design/Major Deviations from Original Planning and Main Causes

Except for slight changes in the specification of inputs, the project was designed in line with the findings and recommendations in the project appraisal. It comprised the following measures:

- rehabilitation and small-scale extension of the existing water supply system (well installations, grids, overhead reservoirs, pumping station, kiosks, household connections),

- rehabilitation of the tidal valves at the Metzinger dyke, incl. bolstering the road embankment,

- drainage of central parts of the urban area (construction of about 35 km of drainage canals),

- introduction of an operating system for water kiosks, incl. awareness campaigns,

- finance for equipment, vehicles and building materials under the GTZ-assisted project to improve sanitation in Mahajanga. As part of the GTZ-assisted project an urban waste depot, drying beds for household sewage treatment sludge and 10 public toilets were installed at central locations in the town.

The construction measures for the water supply component were finally accepted in June 2001. The kiosk component carried out by GTZ had also been completed before the time of ex-post evaluation. According to the executing agency (JIRAMA) there are presently 251 kiosks installed. Of these, 50 were built under this project in newly developed town districts and 139 (planned: 124) were renovated under the GTZ-assisted project (financed by KfW). In addition, 11 public washing places (some at the same sites as the kiosks) were overhauled. The new operating plan for water against payment was implemented throughout.

The drilling campaign carried out to protect the aquifer (salination risk) comprised five new production wells and 10 piezometers (monitoring wells) in Well Field II. The drillings were successfully completed at the end of November 2004. Of the new wells only one has been attached to a supply line as the connection of the other wells is currently impossible for hydraulic reasons (limited capacity of supply line). Groundwater salination does not pose a large risk at present, since JIRAMA adheres to the recommendations on maximum conveyance-mass.

The construction works for the canal in the Metzinger Valley carried out under the GTZ-assisted project were completed at the end of 2000 and the canal has been in operation since.

Altogether, the project was appropriately designed to remedy the problems identified at project appraisal. Cooperation with GTZ proved to be worthwhile, the measures complemented each other well. In hindsight,

however, it would have been better to introduce the pay kiosks scheme everywhere at the beginning, instead of confining it only to the new kiosks. The resulting lack of acceptance on the part of the users was allayed by additional GTZ efforts to raise awareness to pay for water.

With a view to sustainable water availability it would have made more sense to include the additional wells financed afterwards in the project earlier on and integrate them into a general hydraulic scheme.

Key Results of Impact Analysis and Performance Rating

At present, the production installations operate practically 24 hours a day, which seriously handicaps well maintenance. One of the two main supply pipes has also reached its capacity limit, but raising supply via a second pipe, also connecting the four new wells, is presently unfeasible for hydraulic reasons. As the chlorine dosage units are faulty, chlorination is performed manually.

Due to the danger of salination, the pump capacity of all 11 production wells totalling 775 m³/h cannot be exceeded at present. This is why annual output has still been able to meet average but not peak demand.

Five years after commissioning, the installations are still in a satisfactory condition (except for the dosage units) and are generally properly operated. The system has a reported meter rate of 100% (ratio of household connections fitted with meters) and theoretically an adequate number of large water meters have been installed for proper management of the individual supply zones, incl. loss measurement and loss reduction. According to the operator, technical losses are low at 5%. The biggest problem are the high administrative losses, which are presumably due to faulty and irregular meter reading at the household connections, insufficient know-how about how household water meters function and illegal sales of drinking water.

So far, the operator has kept to the norms on maximum capacities recommended by the consulting engineer. At present, however, the physical chemical water analyses are not conducted frequently enough to ensure the requisite regular supervision of water quality. The results of water quality testing are not passed on promptly because the water samples need to be transported over a long distance to the project executing agency in the capital, and the same applies for the bacteriological water quality analyses. Response to risk is therefore not fast enough. To improve water quality supervision, a small local laboratory should be set up.

Of particularly favourable note are the total of 251 kiosks, which function well and are widely accepted by the target group. Water consumption is now paid regularly and at every standpost. Moreover, the kiosk scheme has also contributed to a considerable reduction in water wastage (due to water taps not having been been turned off fully). The kiosks and the washing places are properly run, the purchase price for the water is accepted by the users. Reportedly there is currently still a need for another 20 kiosks, primarily in the new residential areas in the northeast of the town. There are still some shallow wells which are mainly used for utility water (washing, cleaning), particularly in the rainy season. In the densely populated urban areas, however, these wells are not used any longer.

In part, there has been a tangible improvement in disposal facilities. Flooding has been substantially contained in the critical Metzinger Valley district. Nevertheless, due to cuts in budget allocation from central government to the municipalities, only a minimum of urban services (e.g. refuse collection and removal in the town centre) are rendered, despite the evident good intentions of the municipal authority to maintain the drainage infrastructure. The rudimentary sewage disposal system in the town centre, which was already heavily dilapidated at project appraisal, is not maintained at all by the municipal authority. The household treatment pits are not emptied either so the constructed drying beds are not used. The rather poorly regulated waste depot will soon be reorganized in the GTZ-assisted project so that refuse can be

properly deposited again. A positive aspect worth mentioning is a local NGO (supported by a French church institution) that produces compost at the dump and markets it successfully.

Overall, the main deficits are in the maintenance and servicing of project-financed installations, which is primarily attributable to current financial constraints on the operator and the municipal authority. This impairs the sustainability of the project, which has, however, already been in operation for about five years. How far things will improve in water supply in the foreseeable future depends on the successful completion of the rehabilitation measures at the project executing agency JIRAMA. The financial problems of the Madagascan municipalities can, however, only be remedied as part of large-scale decentralization.

From the target-group standpoint (about 188,000 inhabitants in 2006), the project (still) provides a reliable supply of water at affordable prices and is in brisk demand. In combination with a reduction of flooding in the Metzinger Valley, this has also improved the health status of the target group.

The target group of the project are particularly low-income parts of the population in the peripheral, underdeveloped residential areas and the flood-affected inhabitants of the Metzinger Valley. No quantitative poverty data on the target group is available, but from observations it can be classified as poor to very poor throughout, so the project has had a very substantial bearing on poverty.

Owing to groundwater protection through reduced water losses and the prevention of salination, the environmental impact is beneficial even though the project has not made any contribution to improving sewage disposal.

The argument at project appraisal was that the higher number and density of kiosks would relieve women's workload in fetching water in particular (shorter distances and waiting times) and ease strains due to poor health. The project was thus assessed as affording considerable scope for contributing to gender equality. We share this assessment at present. Women also collaborate very actively in the Associations de Quartier (AdQ) and frequently rent the kiosks.

In the project, the AdQs also functioned as contact partners for the kiosks and the drainage measures and were involved from the outset in the planning (e.g. locations) and also in the awareness measures for introducing the operating system for water against payment. The AdQs are also responsible for organising operations and maintenance of the tertiary pipe system and a large part of the kiosks. They are also in charge of assigning the population to community work and levying special rates in the case of larger repairs. The project was thus also aligned with participatory development/good governance.

Altogether, we assess the programme as follows:

For the most part, the project objectives were met. Unsatisfactory aspects, however, include inadequate unaccounted for water reduction and deficits in servicing the water supply systems. Moreover, only average, not peak, demand can be met. There are therefore current and medium-term risks for the sustainability of drinking water supply and the long-term project impacts. Considering the upcoming reorganization of the project executing agency JIRAMA, these risks ought to be limited, however. Due to the sustainability risks we assess the **effectiveness** of the project overall as **sufficient** (**Subrating 3**).

Measured by the specific investment costs, the objectives were attained with a reasonable input of funds. Production efficiency can therefore be attested to the project. The criterion of allocative efficiency has not been satisfied, however, due to the very small margin for dynamic operating cost recovery of only 108%, if we account for the very low collection efficiency of only 60%. Only 31% of the full dynamic costs are met, also accounting for collection efficiency. For the regional office of the executing institution there is little

incentive to improve cost-efficiency due to the lack of budgetary autonomy. Altogether, we judge the **efficiency** of the project on weighted average as **insufficient** (**Subrating 4**).

The health status of the population has improved considerably due to the project. Cholera incidence in particular has only been very sporadic since the abatement of the 1998/99 epidemic. The drainage measures in the Metzinger Valley in particular have contributed to this, which has made a tangible improvement to the quality of life for the poorer population. The shift from shallow wells to kiosks for drinking water supply has reduced potential health hazards in the urban areas. Shallow wells are still used in the new residential areas in northeast Mahajanga, reportedly only for utility water, but the rise in the incidence of diarrhoea in the rainy season suggests that they are also used as a source of drinking water. The overall objective was met in full as far as serious cholera infections are concerned, but the project was unable to contribute significantly to reducing cases of diarrhoea. It also had a broad impact on the city of Mahajanga and it was relevant in sanitation terms, especially as the beneficial impacts were obtained with a relatively small amount of funds. The project was therefore relevant. The pay kiosk scheme is a sectoral innovation nationwide. The project has therefore also had positive capacity impacts and is highly significant for this reason. We assess the **relevance and significance** of the project as **satisfactory** (**Subrating 2**).

Weighing up the above subcriteria, we assess the **developmental efficacy** of the project as sufficient overall (**Rating 3**).

General Conclusions

Crucial to the success of the pay water kiosk scheme was that it could tie in with existing organizational structures (groups of town districts) with high social cohesion and that the awareness measures were carried out over a long enough time. The TC component was of great importance here.

Assessment criteria

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

Performance evaluation criteria

The evaluation of the "developmental effectiveness" of a project and its classification during the ex-post evaluation into one of the various levels of success described in more detail below concentrate on the following fundamental questions:

- **Have the** project objectives **been achieved to a sufficient degree (project** effectiveness**)?**
- **Does the programme generate sufficient significant** developmental effects **(project** relevance **and** significance **measured in terms of the achievement of the overall developmental 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 appropriate **with a view to achieving the objectives and how can the programme's microeconomic and macroeconomic impact be measured (**efficiency **of the programme design)?**

- **To the extent that undesired** (side) effects **occur, can these be tolerated?**

We do not treat **sustainability**, a key aspect to consider when a project is evaluated, as a separate evaluation category, but rather as an element common to all four fundamental questions on project success. A programme is sustainable if the programme executing agency and/or the target group are able to continue to use the programme 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.