

Maldives: Water supply and Sanitation Male (Phase II)

Ex-post evaluation

OECD sector	14020 / Water supply and sewage disposal	
BMZ project ID	1.) 1994 65 634 2.) 1994 70 188	
Project-executing agency	Maldives Water and Sanitation Authority (MWSA) <u>As from Nov. 98: Maldives Water and Sewerage Company (MWSC)</u>	
Consultant	Engineering Consultants Ltd., Colombo, GKW Consult, Mannheim	
Year of ex-post evaluation	2005	
	Project appraisal (planned)	Ex-post evaluation (actual)
Start of implementation	4th quarter 1993	4th quarter 1993
Period of implementation	12 months	72 months
Investment costs	1.) EUR 2.88 million 2.) EUR 0.18 million	1.) EUR 2.88 million 2.) EUR 0.18 million
Counterpart contribution	n.a.	n.a.
Financing, of which Financial Cooperation (FC) funds	1.) EUR 2.88 million 2.) EUR 0.18 million	1.) EUR 2.88 million 2.) EUR 0.18 million
Other institutions/donors involved	n.a.	n.a.
Performance rating	2	
• Significance / relevance	2	
• Effectiveness	2	
• Efficiency	1	

Brief Description, Overall Objective and Programme Objectives with Indicators

At the beginning of the 1980s an Financial Cooperation (FC) project ("Phase I") was implemented in Male, the capital of the Maldives, which comprised measures to improve the drinking water supply and the installation of a central sewerage system. Shortly after the commissioning in 1988 corrosion on the concrete parts and substantial damage on the buildings occurred due to unexpected chemical reactions. The project subject to final evaluation here ("Phase II") comprised the implementation of measures to eliminate the damage that had occurred and constructional changes in order to optimize operations (canal ventilation, extension of the discharge pipes into the sea). Also envisaged were staff support measures to support the project-executing agency in the maintenance and operation of the facilities. The overall objective of the project was to reduce health hazards to the population of Male that resulted, among others, from a decentralised subordinate waste water disposal system. The

project objective was the central discharge of the waste water of approximately 110 litres per day and per person. At the same time a sufficient minimum quantity of hygienically-bacteriologically safe water for domestic use of approximately 100 litres/day/person was to be ensured in sufficient quality for the population of the island through the avoidance of any further pollution of the freshwater lens.

Project Design / Major Deviations from the original Project Planning and their main Causes

Phase I of the project comprised measures to ensure the drinking water supply (private and public rainwater collection tanks and related standpipes) and the waste water disposal (construction of a sewage network with connections to all households, construction of a pumping station and ocean discharge pipes) in order to protect the freshwater lens under the capital at least as a resource that provides water for household use. After the commissioning of the seawater desalination plant financed by DANIDA the public water collection tanks were put out of operation after only very few years of operation. The originally planned distribution network for rainwater and the installation of standpipes was implemented only in part. Due to the intense building activities and the extension of buildings the private tanks also disappeared gradually and the share in supply from desalinated seawater increased. Though the large-scale disposal of waste water was achieved it still has to be noted that the system had to cope with a series of technical and operational problems. A further deterioration of the quality of the groundwater could not be prevented.

In consequence, the supplementary project comprised only measures to remedy the problems that had occurred in the area of waste water disposal. These are, among others,:

- improvement of the air ventilation system;
- different rehabilitation measures, for instance the construction of a new concrete layer, the modification of the pumping station;
- extension of two ocean discharge points;

In addition, an accompanying measure had originally been envisaged to support the project-executing agency especially in the maintenance and operation of the sewage network. However, the conception of the project was modified: Upon the request of the Maldives side the planned training of staff in the area of operation and maintenance was implemented by the Danish operator of the seawater desalination plant, while the German advisory component focussed solely on providing advice with regard to the reduction of digester gas and on the establishment of a corresponding operating unit. The operating statistics presented to us by the project-executing agency show that due to the advisory activities it was possible to reduce the gas concentration to an unobjectionable level.

Key Results of the Impact Analysis and Performance Rating

Switching the water supply system to a seawater desalination system and changing the waste water disposal into a central system led to a clear reduction especially in diarrhoeal diseases in Male. Though the statistical data is not reliable in this field because not all cases of sickness are registered (for instance if a doctor is not consulted) the Ministry of Health still estimates that since the facilities have been put into operation the cases of sickness declined by about 50%.

It can be assumed that the improvement in the health situation has a direct positive effect on the situation of women, who are responsible for the care of sick family members, because the time and effort which they have to spend on nursing the sick is expected to have been reduced substantially.

In Male itself the poverty situation is not very pronounced compared with the peripheral atolls, because the capital offers employment opportunities. In this respect, it was not possible to make a direct contribution to reducing poverty.

The original objective of protecting the freshwater lens as the central drinking water reservoir of the island could not be achieved due to the dynamic population growth. As a result the drinking water supply is today ensured exclusively through seawater desalination plants. Still, the freshwater lens continues to be used as a reservoir to provide water for household use.

The waste water disposal system in Male functions without problems today and the discharge of waste water into the ocean is assessed as ecologically safe according to water samples regularly collected.

With its water supply and waste water disposal policy, especially in the capital Male and the islands surrounding the capital, the Maldivian government was able to reach the Millennium Development Goals. As regards the outer atolls it is much more difficult to reach the objectives due to their geographic location. But still, the construction of desalination plants is being supported there as well. On those Islands where this does not make sense economically the drinking water supply is ensured by tank ships, which poses a logistical challenge.

Overall, we assess the impacts of the project as follows:

It was possible with the main project and the supplementary project to connect the entire population of Male to the central sewage disposal system. Due to the 100% discharge of waste water into the ocean it was possible to reduce, almost to nil, the pollution of the freshwater lens caused by domestic waste water. This ensures a minimum quantity of hygienically-bacteriologically safe water for domestic use (100 litres/day/person) for the population. The quantities needed are covered entirely from the freshwater lens. We therefore classify the **effectiveness** of the project as satisfactory (**sub-rating 2**).

According to statements made by the Ministry of Health, water-induced diseases, especially diarrhoeal diseases, have declined significantly. According to the World Health Organisation diseases such as typhus, cholera, etc. have not occurred in the last ten years. Therefore, we assess the **significance / relevance** of the project as satisfactory (**sub-rating: 2**).

As regards the (production) **efficiency** one can state that dynamic production costs for the waste water disposal were adequate. However, the costs for the entire system are very high. But the costs can still be considered as acceptable because there is no alternative in Male to the comparatively expensive water supply through seawater desalination plants. The allocation efficiency is good since in a static calculation the company produces a profit and in a dynamic calculation it almost achieves full coverage of costs. The tariffs are acceptable to the population but they are also high enough to incite people to use water sparingly (sub-rating 1).

In view of the ongoing advanced training measures for the staff of MWSC in the context of measures implemented by the MWSC itself and the operating concept, which was designed with due care and vision, and given the fact that the facilities are continuously and preventively being maintained we do at present not see any risks to the sustainability of the investments.

After considering the individual criteria mentioned above, in summary we judge the developmental effectiveness of the project to be satisfactory (rating 2).

General Conclusions

In the planning and operation of piped sewage disposal systems in tropical countries it should be ensured that special attention is paid to the adequate ventilation of the systems in order to avoid damage caused by chemical concentration and unpleasant odors.

Legend

Developmentally successful: Ratings 1 to 3	
Rating 1	Very high or high degree of developmental effectiveness
Rating 2	Satisfactory 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 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:

- 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, organisational and/or technical support has come to an end.