

India : Minor Irrigation Programme Rajasthan

Ex-post evaluation

OECD sector	Agricultural water resources / 31140	
BMZ project number	1) 1984 65 809 (investment) 2) 1986 70 150 (accompanying measure)	
Project-executing agency	Department of Irrigation, Government of Rajasthan	
Consultant	1) - 2) ULG Halcrow Consultants (short-term assignments)	
Year of evaluation	2003	
	Project appraisal (planned)	Ex-post evaluation (actual)
Start of implementation	1986	1989
Period of implementation	1986-1989 (3 projects)	1989-1993 (3 projects) 1992-1996 (new projects)
Investment costs (EUR million)	1) 6.29 2) 1.77	1) 11.2 2) 1.10
Counterpart contribution (EUR million)	1) up to 1.91 2) -	1) 4.91 2) -
Financing, of which FC amount (EUR million)	1) 6.29 2) 1.38	1) 6.29 2) 1.10
Other institutions/donors involved	-	-
Performance rating	4	
• Significance/relevance	5	
• Effectiveness	3	
• Efficiency	4	

Brief Description, Overall Objective and Programme Purposes with Indicators

At the project appraisal for the Rajasthan Minor Irrigation Programme it was planned in a first phase to co-finance three irrigation projects with an irrigated area of up to 2,000 ha each from FC funds. The planned measures comprised the construction or rehabilitation of earth-fill dams, irrigation and drainage canals as well as the implementation of erosion protection measures. Along with this, an accompanying measure was to be implemented to ensure, among others, adequate agricultural extension. The objective of the programme was to raise agricultural production in particular in small farms and to increase the incomes of the rural population. The economic rate of return of the individual projects was targeted not to be lower than 10%. The irrigation programme was part of a nationwide programme carried out by the government of Rajasthan and comprising approx. 190 irrigation projects.

Due to the devaluation of the Indian Rupee it was possible to realize 14 individual projects under the programme. The measures comprised the construction and rehabilitation of small dams and irrigation and drainage canals. The individual projects took up operation until 1998 (final follow-up report). In the context of an accompanying measure concluded in March 2001 the project-executing agency was given personnel support for the selection, planning and implementation of irrigation projects and the preparation of studies on impact monitoring.

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

On the basis of selection criteria and the derived feasibility studies productive agricultural areas of up to 2,000 ha (per project) were to be opened up. The operation and maintenance of the dams was to be implemented by the project-executing agency, the Department of Irrigation, Rajasthan. The users of the individual projects were to participate in the seasonal irrigation planning through user committees. Within the canal systems user groups composed of farmers were to decide about the distribution of the water provided. The project measures were to benefit mainly small and medium farmers (up to 6 ha).

However, at the time of the ex-post evaluation most of the projects showed major deficiencies:

- Due to deficits in the planning and quality control major implementation problems occurred, which led to delays in the construction. All projects still require completion or follow-up works and a formal final acceptance did not take place.
- An unexpected effect of the measures are considerable seepage losses from dam reservoirs of roughly 15 % of the dam volume. But owing to a significant enrichment of the groundwater and through the new construction or deepening of groundwater wells there has been a substantial increase in well irrigation. Besides the high seepage losses at the foot of the dam, the lack of water management at the level of main and secondary canals causes high water losses. During the final evaluation it was noted that the reservoirs had been overdimensioned and that the storage volume was too large. Even in years with normal effective rainfalls the corresponding storage volumes will not be reached. Thus, the water availability is about 60% lower than estimated.
- The establishment of water user groups was not pursued systematically. As a result a well-regulated water distribution within the canal systems does not exist.

Key Results of the Impact Analysis and Performance Rating

The above-mentioned deviations from the original design had mostly negative impacts on the operation of the projects.

After inspection of 7 of the 14 projects* the actual area newly opened up (11,650 ha according to the studies drawn up in the course of the programme implementation) was estimated at only about 60% or 7,000 ha. Due to the fact that works have not been concluded specific operating problems have occurred in the following projects: So far, the Piplaj irrigation project (894 ha) has not been ready for operation because the dam works have not been completed. In Kumariya (761 ha) a stretch of 2.7 km of the main canal has so far not been completed. Khanpur (1,082 ha) is operational only on a limited scale due to a dam break at the flood spillway (1996), which was not finally repaired.

Dams and ancillary facilities are in a satisfactory state but due to the fact that maintenance has been reduced safety risks may occur in the medium term. On the other hand the state of the main and secondary canals and the distribution networks was rated as very bad. This is mainly due to the bad budgetary situation of the project-executing agency.

* The locations of the 14 projects are: Thikaria, Madan Sarowar, Khanpur, Dorai, Shiv Sagar, Baneri, Piplaj, Kankrisel-ka-naka, Pitha-ka-mand, Sanwaria Sarowar, Kumariya, Nimbora, Mathania, Karodidhwaj.

The lack of regulation and distribution facilities in the irrigation systems results in an unequal water allocation between people in the higher-lying and in the lower-lying areas. The fact that people in the higher-lying areas also increasingly benefit from the additional well water has led to user conflicts, for which there are no solution structures and which in some cases have already been the subject of legal and political disputes. Problems with regard to the proper and sustainable operation of the facilities are caused by compensation payments to about 10% of the users, which have in some cases been due for many years and been imposed by court order. Due to the construction of the irrigation infrastructure the users concerned had suffered a loss of agricultural surface in the areas required for the reservoirs and canals. These grievances have a substantial potential for social tension and conflict and in one case (Sanwaria Sarowar) the use of the reservoir has not even been possible so far.

Despite the technical restrictions but also due to the improved well irrigation the agricultural areas in the project villages were extended by about 18% and the proportion of irrigated areas rose from 30% to about 50%. However, since a part of the total area is outside of the project area it is not possible to give a detailed account for the programme. The mean land-use intensity since the start of operation of the individual projects is about 120% on average. Upon project appraisal a total land-use intensity of 140% had been expected. The lower intensity achieved is attributed to the bad operating condition and the lower availability of storage water. The most important crop plants during the rainy season are corn, peanuts, various leguminosae, cotton and forage plants. Wheat, mustard, chick peas and lentils are the most important crop plants cultivated during the dry season. In particular the cultivation of wheat and mustard is subject to strong fluctuations depending on the availability of water. Overall, no significant changes in the rotation of crops have occurred. The development of animal production as an important economic factor in the programme area is marked by an intensification of the milk production (substitution of traditional dairy cows by domestic buffalos) and the related switch to forage production and stable feeding. The development is influenced positively by the larger availability of irrigation water for forage production.

Revenue from irrigation tariffs has recently been influenced mainly by the persistent drought in Rajasthan. The mean collection efficiency for the project was 57% (2000) and 37% (2001), respectively. However, tariff revenues cover only about 25% of the actual running costs. But the total amount of revenue has no direct influence on the budget allocations of the project-executing agency because such fees flow into the general budget of the union state. Recently the project-executing agency received only 8% of the budgetary funds required for operation and maintenance out of the union state budget.

At the level of the executing-agency the establishment of a Monitoring&Evaluation Unit (MEU) was started in 1993 on the basis of a concept worked out with the help of external experts. The objective was to enable the executing agency to implement programme-related monitoring tasks. After the financing under the accompanying measure had been concluded the MEU was dissolved in March 2001. A sustained structural effect could not be achieved. The tasks of the MEU will not be continued at the level of the executing agency. However, from 2003/04 a section in charge of quality monitoring (construction) has taken up work in the context of the new water sector programme.

A definition of the social and economic composition of the target group was not made at the time of the project appraisal because of the low level of preparation. According to the selection criteria for individual projects the programme measures were to be concentrated on small farmers and/or underprivileged sections of the population. The target group comprised 6,240 families (approx. 37,000 persons). 49 % are small farmers and 34 % are medium farmers, which together, however, account for only about 50% of the effective area to be opened up. Half of the area is owned by larger farmers (more than 6 ha) accounting for 17%. The project is directly poverty oriented. Gender aspects were not taken into account or not examined during the planning and implementation. Due to the existing traditional structures it has to be assumed that the work load of women has increased as a result of the intensification and extension of agricultural production.

The measures envisaged during the project appraisal for erosion protection in the catchment area of the reservoirs were not finally designed and were of no importance for the implementation of the project. Environmental effects of the project were recorded only to a very limited extent. Positive environmental effects result from the higher than expected enrichment of the ground water from seepage losses. At the ex-post evaluation need for action was detected with regard to the increased unregulated extraction of groundwater for well irrigation and the resulting danger of soil salinisation, which has risen in the last 3-4 years due to low precipitations.

On the basis of the three criteria of effectiveness, relevance/significance and efficiency the developmental effectiveness of the programme is rated as follows:

- Overall the project's effectiveness is still satisfactory (rating 3). The programme objective of "increasing the agricultural production and the incomes of sections of the rural population" has been achieved at the operational level despite deficits in the condition and operation of facilities (increase in incomes calculated for model operation: 230% to 330%). The agricultural production could be increased significantly as a result of the project. In the medium-term the existence of the facilities is jeopardized, which will have micro-economic effects, however, the basis for agricultural production, which was created due to the improved availability of groundwater (the sustainability is clearly limited) will enable such operating results to be achieved in the course of planned useful life, although to a decreasing extent.
- The significance of the programme can be described as follows: The originally planned concept for surface irrigation could not be realized but thanks to the unintended enrichment of the groundwater the agricultural production in the projects could be supported. The overall objective – measured by the macroeconomic rate of return of the projects of 10% - could not be achieved. The average macroeconomic rate of return is, at best, 2.3%. There are still considerable problems with regard to the target groups. As regards the ecological impacts, one has to mention the over-exploitation of the groundwater and the soil salinisation, which occurred in some instances. The institutional and structural impacts aimed at (user participation, monitoring and evaluation unit) could not, or not sustainably, be reached. Even if the relevance of the programme is given, we judge the significance/relevance of the project to be clearly insufficient (rating 5).
- The efficiency of the programme is rated as slightly insufficient (rating 4). Owing to considerable delays in the implementation and deficiencies in the technical realization, quality control and the required reinvestment substantial additional costs and significant loss of use have occurred or are still to be expected. In comparison with the assumptions made at the time of the project appraisal, however, the specific development costs are low. Due to a water availability, which is too low given the sizing of the systems, high water losses and the lack of an irrigation management a complete irrigation of the only partly developed areas was not possible. The revenues from water tariffs are by far not cost-covering and the actual budget of the project-executing agency does not allow the proper maintenance of the facilities. The extensive use of personnel and experts in the context of the accompanying measure has obviously not led to an optimization and qualitative improvement in the implementation and the operation of the irrigation facilities.

Taking into account these criteria we rate the developmental effectiveness of the programme overall as slightly insufficient (rating 4).

General Conclusions applicable to other Projects

The main reason for the insufficient achievement of goals was the lack of a realistic implementation planning targeted also at reaching interim results. Such implementation problems might be reduced at least in part if a coordinated approach were pursued in the implementation of the individual projects ("benchmarks") which is based on the existing institutional (personnel, technical, organisational and budgetary) capacities. In this approach equal attention has to be paid to aspects of early participation and conflict management and to technical aspects.

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.