Case studies of sustainable sanitation projects

Rural Water Supply in Rajasthan – Sanitation component
Asia / India / State of Rajasthan

1 Objective

The overall project aimed to reduce the risks of water-induced diseases. The project covered water supply, health education and sanitation. The main focus of this document is health education and sanitation.

2 Context

BMZ ID: 1995 65 420
Planning started in 1994; implementation from 1995 – 2007, latest report 02/2008

	Project area	India
Target group / population	1.05 million	1,148 million (2008)*
Under 5 mortality rate (per 1,000)	67 (Rajasthan 2004) ***	32 (2008) *
Population below poverty line	n.a.	25%*
Population growth p.a.	2.2% (Rajasthan 2005) ****	1.6% (2008) *
GDP per capita at official exchange rate	EUR 400 (Rajasthan 2004)**	EUR 575 (2004)** EUR 711 (2007)*
Local per capita household income	EUR 63 (2005)	
N°of on-site systems realised	28,266	n.a.
N°of sewer connections realised	0	n.a.
% improved sanitation in the project area	9% (before project) 55% (2008)	n.a.
% sewage treated	0%	n.a.

* CIA The World Fact Book, July 2008; 973 USD per capita (base 1,130 million) in 2007
** Ministry of Statistics and Programme Implementation, 2004
http://en.wikipedia.org/wiki/States_of_India_by_size_of_economy
*** http://sje.rajasthan.gov.in
****http://www.investrajasthan.com/kommon/bin/sr.php?kall=showfile&code=020070020

The project area is a rural area located in the State of Rajasthan (North-West of India). Little rainfall (400 mm per year) and high temperature variation (0.5° - 48° C) characterise this semi-desert region. Drought and excessive use of ground water for irrigation raised the salt content of the ground water. Population density in this rural area is high (165 inh./km²) in relation to scarce water resources, but lower than Indian average (386 inh./km²).

Prior to the project, drinking water supply was insufficient and fluor content constituted an additional health hazard. Sanitation conditions were very poor. Only 9% of households had access to basic sanitation. More than 80% of the rural population used open fields for defecation. For women this situation was especially discriminatory, since they are subject to strict social conventions. Thus they were forced to find sheltered places or to go out at night time. Knowledge of the linkage between hygiene and health was limited, especially among poor people.

3 Project approach

Investment/Technology:

The project financed a water supply system providing villages with water from the Indira Ghandi canal. The sanitation component supported investment in private and public facilities. For private latrines, several different models were suggested. In a participatory and demand-driven approach, women have been systematically included in the decision process, in particular regarding the location of the sanitation facilities within the compound. People mainly opted for a pour-flush toilet combined with a bathroom. They generally preferred a deep pit for the toilet, which requires no emptying over long time. The grey water from the bathroom infiltrates the sandy soil through a separate soak pit. All construction materials and know-how are locally available. Altogether the project supported the

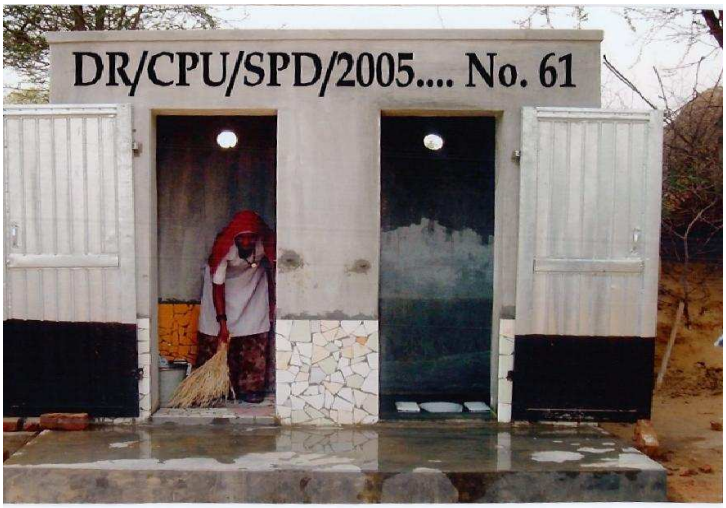
construction of 28,266 private sanitation units to serve about 180,000 people as well as 95 school sanitation facilities. The sanitation coverage in the project area increased from 9% to 55% in 2007. A part of the increased coverage is the result of investments without project support (mainly better-off households).

School sanitation facility

Institutional concept / support activities:

The Public Health Engineering Department (PHED) of Rajasthan is responsible for water supply and sanitation. Before the start of the project, PHED had no particular focus on wastewater management and hygiene. Local authorities also did not consider this an important issue. Only some NGOs promoted sanitation and hygiene campaigns.

The project therefore initiated the creation of a Community Participation Unit (CPU) staffed permanently from a consortium of five NGOs. The "Indian Institute for Health Management Research" is the lead NGO. The CPU supported user participation in planning and implementation of the entire project. A Water and Health Committee (WHC) was established in each of the 360 villages - it is responsible for maintenance and fee collection for the water supply system.



Standard sanitation unit with latrine and bathroom

The CPU organised a campaigns on hygiene and health addressing women groups, self-help groups and school children in particular. Special efforts were undertaken to empower women and strengthen their social status by stressing their responsibility for water in the families. This contributed to raising demand for the basic sanitation facilities supported by the project. The applications for sanitation facilities were filed in the name of women. The local WHCs were responsible for the selection of beneficiaries, giving priority to poor families and families with handicapped members or households headed by women. The CPU procured building materials, advised local user groups

and trained local masons in technical and health aspects of sanitation. The CPU certified the masons who entered into an agreement with CPU to construct sanitation units for the project. The villagers could then employ these trained masons. Thus know-how remains in the project region.

India has adopted a "total sanitation" approach and the Indian President is rewarding each village that achieves 100% sanitation coverage. This is a strong motivating factor and villages strive to obtain this reward. By the end of 2007 twenty-three project villages out of 360 had achieved 100% sanitation coverage, and 70 to 80 more villages will probably achieve it in 2008.

Operation and maintenance concept

The individual households are responsible for cleaning and maintaining their toilets and bathrooms. With six to seven users, the deep pits generally require emptying only after 10 to 15 years. Due to the dry climate and the very limited amount of water used for flushing, the deep pits will contain a solid product which can be used as fertiliser on nearby fields. The users can do the emptying themselves; but service providers for the job are also available.

4 Costs and financing

	Project (sanitation component)	per capita
Infrastructure investment	EUR 4,857,658	EUR 26
Hygiene awareness, staff, consultant	EUR 613.735	EUR 3
Subsidy (for beneficiaries)	EUR 2,751,842	EUR 15
Loan	n.a.	n.a.
Investment contribution from beneficiaries	EUR 2,719,551	EUR 15
Investment contrib. as % of regional GDP (2005)		3,7%
Investment contrib. as % of HH income (2005)		23%
LRMC* per capita and year (2007 prices)	n.a.	EUR 1.87
LRMC as % of regional per capita GDP (2005)	n.a.	0.5%

* LRMC = long run marginal cost; useful lifetime 25 years; discount rate 5%

The overall cost of the sanitation component (including school sanitation) was EUR 5.4 million, financed 50% by beneficiaries and 50% by the German grant. Average investment costs for a toilet with bathroom serving on average 6 to 7 persons was EUR 135 (in 2007 prices). Eighty percent of the costs are construction materials, the rest is labour costs. The overhead costs for awareness campaign and project implementation were around EUR 21 per sanitation unit. The own labour for regular cleaning of the facilities has not been valued.

The resulting long-run marginal costs (LRMC) are EUR 1.87 per capita and year. On an annual basis, the costs are low compared with the per capita GDP generated in Rajasthan (0.5%). Beneficiaries received a 50% subsidy on average through the project. However, their contribution to the investment was still quite a burden for the poorest households. A household income survey of the project in 2005 classified 58% of households in the lowest income bracket and indicated an average annual per capita household income of around EUR 63. Compared with this income, the contribution to the investment is around 23% of the annual income. Only part of the contribution can be provided in kind (labour, stones), another part has to be provided in cash.

5 Experiences / lessons learnt / critical aspects

The PHED considers that the institutional approach with a CPU including NGO experience was crucial for the success of the sanitation component.

A project survey exploring the motivation of people to improve their sanitation facilities, led to very interesting findings. Neither the protection of natural resources nor the aspect of health or hygiene was the most important. The main factors were “convenience” (74%) and “dignity, self-respect” (8%). A high percentage of beneficiaries were not motivated by the toilet but by the prospect of having an own bathroom. Despite this fact, a survey showed that several years after investment, 90% of toilets and 95% of bathrooms were well maintained and in use.

Even though the water supply is not yet entirely cost-covering and operation problems still occur, the time required for fetching water has been reduced considerably and there is now more water available for personal hygiene. Thus the linkage of sanitation to better water supply has been important.

Another lesson learned from this project applies to the time schedule. Large-scale behavioural changes take time. The initial time schedule of 5.5 years was stretched to an implementation time of 12 years. Sanitation coverage in past years has speeded up, showing that there has been a real change in attitude towards sanitation.

While different technical options were suggested, people generally opted for deep pits for the toilets. The risk for the ground water from the soak pits is limited as the ground water is very deep and not used for drinking purposes because of the poor quality. Technical solutions ensuring better ground water protection will probably be successful only if they are as convenient and economical as the present design.