Water and sanitation in camps on the Andaman Islands

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When the Asian *tsunami* struck the Andaman Islands, nearly 7000 people were relocated in six camps. In spite of the large number of bathing and sanitation facilities built, water and sanitation conditions remained unsatisfactory in four of the camps. The facilities had been constructed without consulting their users.

Relief operations for displaced persons and refugees is one of the landmarks of humanitarian action. In the last 10 years, agencies have been increasingly concerned about being seen as accountable for their assistance in camps. The recognition of 'Sphere standards' by major organizations and donors is a clear demonstration of this concern.[1] These standards include a number of technical specifications and ratios for coverage and they provide advice and guidelines on how to apply them.

The way in which standards are actually applied is as essential to quality as the ratios, which often attract most of the attention. The case of water and sanitation assistance to the Asian *tsunami* victims of Little Andaman Island is an interesting illustration of how high standards don't always translate into optimal results. Ambitious standards lose their value when applied with little or no community consultation and an apparent absence of reflection on the usage of the facilities.

This article is based on a visit to Little Andaman made by one of the authors in October 2005.

Disaster and response

Little Andaman is the most southern island of the Andaman Island archipelago, a group of islands in the Bay of Bengal, part of the Andaman and Nicobar Union Territory of India (capital: Port Blair, see Figure 1). The island's population, before the *tsunami*, was 17,528 people (2001 census), the majority of whom lived in the Hutbay area, situated on the eastern coast of the island.

The December 2004 *tsunami* considerably affected the archipelago. In April 2005, more than 1,400 were confirmed dead and 3,000 were still missing. In Little Andaman, 58 persons died and 16 went missing. About two-thirds of the population lost or abandoned their homes.[2]

In the first days after the disaster, the authorities relocated 6,848 people to six 'temporary shelter' camps settled in the surroundings of Hutbay and evacuated 4,537 people to Port Blair.[2] The Andaman Public Works Department (APWD) organized the construction of the camps, including their water and sanitation facilities. It defined its own standard designs in terms of quantities, size and characteristics of shelters, water systems, toilets etc. National and international NGOs also took part in the construction process, but their role was limited to providing manpower for the construction of shelters.

Shelters were built with corrugated steel sheets. Their size is about 20 m^2 for an average family of five. A total of 1962 shelters were built in camps ranging from 50 to 600 units.

Water supply

Water is an abundant resource in the Andaman Islands. The domestic supply usually comes from dams built in the

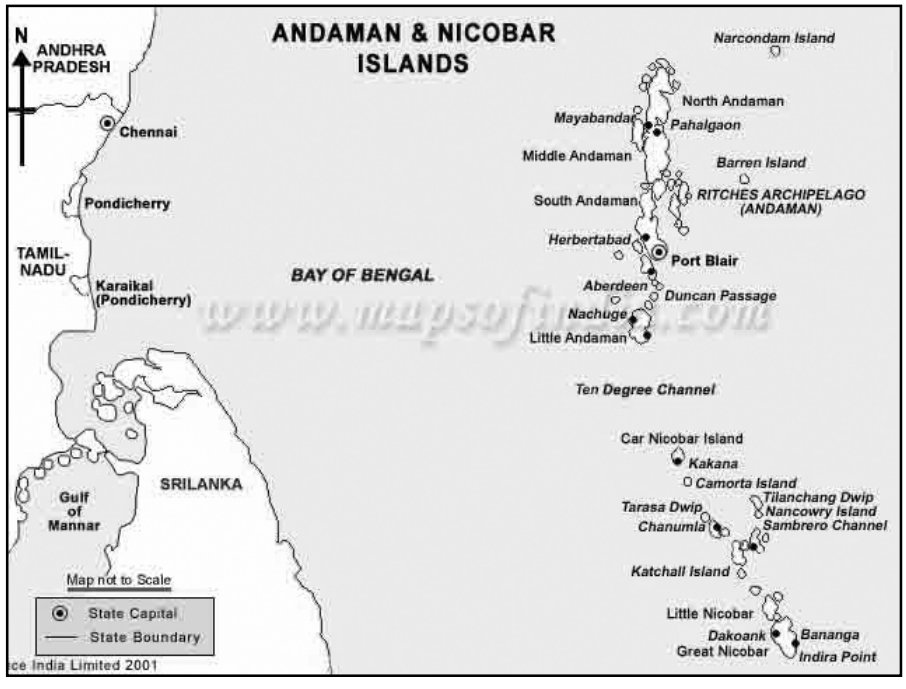
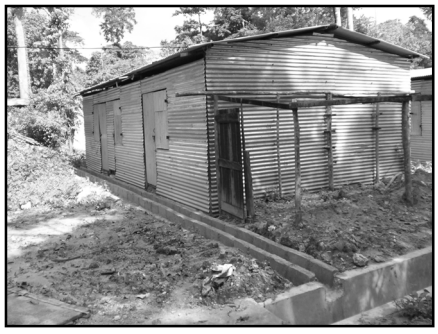


Figure 1. The location of the Andaman Islands



A typical shelter for a family of five

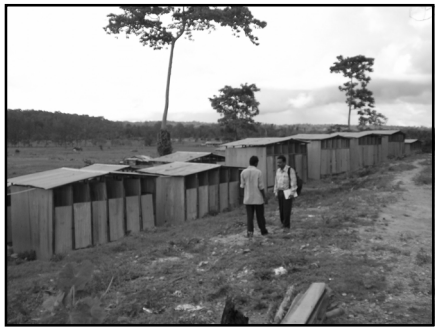
hills, from where water is distributed after basic treatment. In Hutbay, a pipeline system supplies Hutbay Bazaar, the main town, and some of the island villages. Five of the six camps were supplied with piped water, one continuously and the four others every second day.

Trucks were also used for water distribution. They visited the camps daily or several times a week and filled up all sorts of plastic storage tanks. People would also bring their pots and buckets to be filled directly from the trucks.

Finally, in two of the camps, wells have been dug by NGOs. They are located inside or at the edge of the camps. Their diameter is large (1.5 to 2 m) and they are often covered with roofs or grids. They are relatively shallow and their water is used only for bathing or washing.

Toilets and bath facilities

The APWD standard for toilets and bath facilities was one toilet and one bath cubicle per family. As a result, 1,962 toilets and the same number of bath cubicles were built in the six camps. In one of them (Harminder Bay), toilets and bathrooms were, on request from the recipient community, built in front of their houses. Everywhere else, they were built in blocks of six cubicles made of corrugated steel sheets. One to six sites were selected at the periphery of the camps for this purpose. In each of them, the number of cubicles varied from 50 to 100 toilets and bathrooms.



The toilet blocks were built away from the shelters

Toilet blocks were connected to septic tanks (usually one or two per site), wastewater being collected in above-ground PVC pipes and directed to the tanks, sometimes over relatively long distances.

Major problems and possible solutions

A number of shortcomings in the design of the water and sanitation facilities is obvious when visiting the camps and talking to their residents.

When designing sanitary facilities, the authorities had two main concerns:

- to ensure that the facilities were used and kept clean by providing a private toilet and a bathroom per family and
- to build sanitary blocks away from living areas in order to limit disease transmission.

Unfortunately, these concerns had contradictory effects because people didn't like having to walk to large sanitary blocks where they found little privacy and in most cases no water and no light. Moreover, access paths were, in some cases, flooded or slippery. As a result, few of these blocks are in use. A large proportion of adults found it more acceptable to walk the same distance, but to the forest. Children were often seen defecating in corners of the camps. A majority of camp residents had no toilets in their original homes and were used to open defecation on the beach. In their new home, there was no beach where they could go (except for fishermen) but using toilets in these conditions was not an option attractive enough to make them modify their habits.

The bathing cubicles provided were replaced by improvised bathrooms built in front of many of the shelters. These bathrooms sometimes created an accumulation of stagnant water.

Paradoxically, health concerns, which led to building toilets and bathrooms away from living areas, contributed to open defecation practices and increased the amount of stagnant water within the camp.

The large septic tanks built to serve the sanitary blocks were largely underused. This, in a way, avoided the problems with their design. Serving a large number of cubicles through long pipe schemes would probably have led to clogging if they were actually in use.

These toilets had been abandoned

There are, however, two camps in which water and sanitation facilities are satisfactory. In the first, 'Harminder Bay', people insisted that toilets and bathroom cubicles were built next to their homes. In the second, 'Netaji Nagar camp A', a relatively small camp of 114 families, piped water was available 24 hours a day and there was good access to the cubicles. In both places, facilities were in use and kept clean.

This shows that when water is available and toilets or bathrooms are convenient and easy to access people use and maintain them. Improving access paths to toilets and bathrooms, implementing drainage works and ensuring that water is available on the spot would therefore contribute to increasing the number of facilities in use and maintained. It is a strategy that the NGO World Vision, who took over camp management in Little Andaman from October 2005, should follow. The organization intends to help to raise awareness about environmental health through hygiene promotion and will carry out the necessary improvement works. Another, even more fundamental improvement would be to implement a participatory approach of camp management, whereby committees with representation from the residents are created.

Recent feedback from the NGO suggests that works on drainage and water access are ongoing. One of their main projects is the installation of rainwater harvesting systems wherever possible. The creation of camp management committees is also ongoing.

Lessons learned

Andaman authorities have shown their concern about the well-being of the

An improvised washing area

affected population by setting high standards and investing considerable resources per capita. One toilet and bath cubicle per family is well above international standards such as those set out in 'Sphere' (which recommends 1 toilet for 20 people). Yet, in Little Andaman, high standards did not produce satisfactory results. This happened because another important standard, one that is not expressed in numbers, was forgotten: the standard that defines the involvement of the beneficiaries. 'Sphere Hygiene promotion standard 1' states: 'All facilities and resources provided reflect the vulnerabilities, needs and preferences of the affected population. Users are involved in the management and maintenance of hygiene facilities where appropriate.'

Unfortunately, these are notions that are not familiar to many engineers, in particular when they lack the experience of working in emergency situations. Authorities should be aware of this situation and try to ensure that a team with a larger spectrum of competence and experience is consulted when designing water supply and sanitation for refugee camps, since these are issues far too important to be left to engineers alone.

Notes

1. Sphere (2004) *Humanitarian Charter and Minimum Standards in Disaster Response*, The Sphere project, Geneva. http://www.sphereproject.org/handbook/hdbkpdf/hdbk_full.pdf
2. *Earthquake and Tsunami Relief Operations, Andaman and Nicobar Islands, Port Blair* (2005) http://www.and.nic.in/tsunami/

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Sustainable rural water supply

- **Rural Water Supply Network (RWSN)**
  The RWSN aims to facilitate the provision of safe water and sanitation to the poor through the promotion of sustainable technologies that are affordable to the needs of users. It functions as a global knowledge network, acting as a depository of knowledge and providing support to sector partners. The website provides access to the RWSN discussion forum and newsletter.
  http://www.rwsn.ch/

- **Guidelines for sustainable handpump projects in Africa**
  This research looks at the improved benefits from communal handpumps in Africa through an increased application of factors affecting sustainability in new projects. The project website includes all outputs from the research.
  http://wedc.lboro.ac.uk/projects/new_projects3.php?id=47

- **Towards Sustainable Water-Supply Solutions in Rural Sierra Leone**
  Oxfam research in 2006 investigates the contention that if communities have insufficient capacity to maintain their water points, then officially prescribed systems will not be sustainable; it then considers potential options for extending access to safe water. This report also uses research by WaterAid to compare the situation in Sierra Leone with that in Mozambique. It is shown that handpumps supply the safest drinking water and are the water-lifting device that most people prefer.
  http://www.oxfam.org.uk/what_we_do/issues/health/research_water_sleone.htm

- **Taking Sustainable Rural Water Supply Services to Scale: a Discussion Paper**
  This paper reviews some of the issues associated with scaling up an effective RWS initiative, identifying four broad categories of constraints: resources, knowledge, resistance and untested implementation conditions.
  http://www.wsp.org/publications/scaling_up_press_20_03_03.pdf

- **Making rural water supply sustainable: Recommendations from a global study**
  This WSP study clarifies what is meant by 'demand-responsiveness' in theory and in practice, and measures the impact of this on the sustainability of rural water systems.
  http://www.wsp.org/publications/global_ruralstudy.pdf

- **A multi-sectoral approach to sustainable rural water supply: the role of the rope handpump in Nicaragua**
  A description of the success of the low-cost rope handpump for boreholes and hand-dug wells, developed, marketed, and subsequently mass-produced in Nicaragua by local, small, privately owned workshops since the early 1990s. By 1995 the technology became an integral part of rural water programmes implemented by NGOs and government agencies, contributing to an increase in rural water supply coverage.
  http://www.wca-infonet.org/servlet/BinaryDownloaderServlet?filename=1060849787088_WDWP81.pdf&refID=98332

- **Toward Equitable and Sustainable Rural Water Supplies: A Contingent Valuation Study in Brazil**
  This article describes a study of willingness to pay for water in Brazil, showing that surveys of actual and hypothetical water-use practices can provide policy-relevant information on this, which varies according to household socio-economic characteristics and the characteristics of the existing and new supplies of water.
  http://wber.oxfordjournals.org/cgi/content/abstract/4/2/115

Compiled by Julie Fisher, Water, Engineering and Development Centre, UK for WELL. WELL is a resource centre network providing access to information and support in water, sanitation and environmental health for the Department for International Development (DFID) of the British Government.