

## WATER AND SANITATION FOR HEALTH SERVICES IN NORTH EAST INDIA

SECON

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### KEY MESSAGES

- A lack of safe drinking water and adequate sanitation at health facilities undermines the quality of health services, compromises infection control, and reduces demand for services, discouraging women and girls in particular from seeking care.
- In Nagaland, an assessment found generally poor water supply and sanitation facilities, with some exceptions where communities and health staff have improved water and sanitation systems.
- Based on the requirements of different types of facilities, technical recommendations for water and sanitation system investments were developed, appropriate to the Nagaland context.
- The role of communities in ensuring day-to-day maintenance and hygiene of water supply and sanitation facilities will be crucial to sustainable improvements.

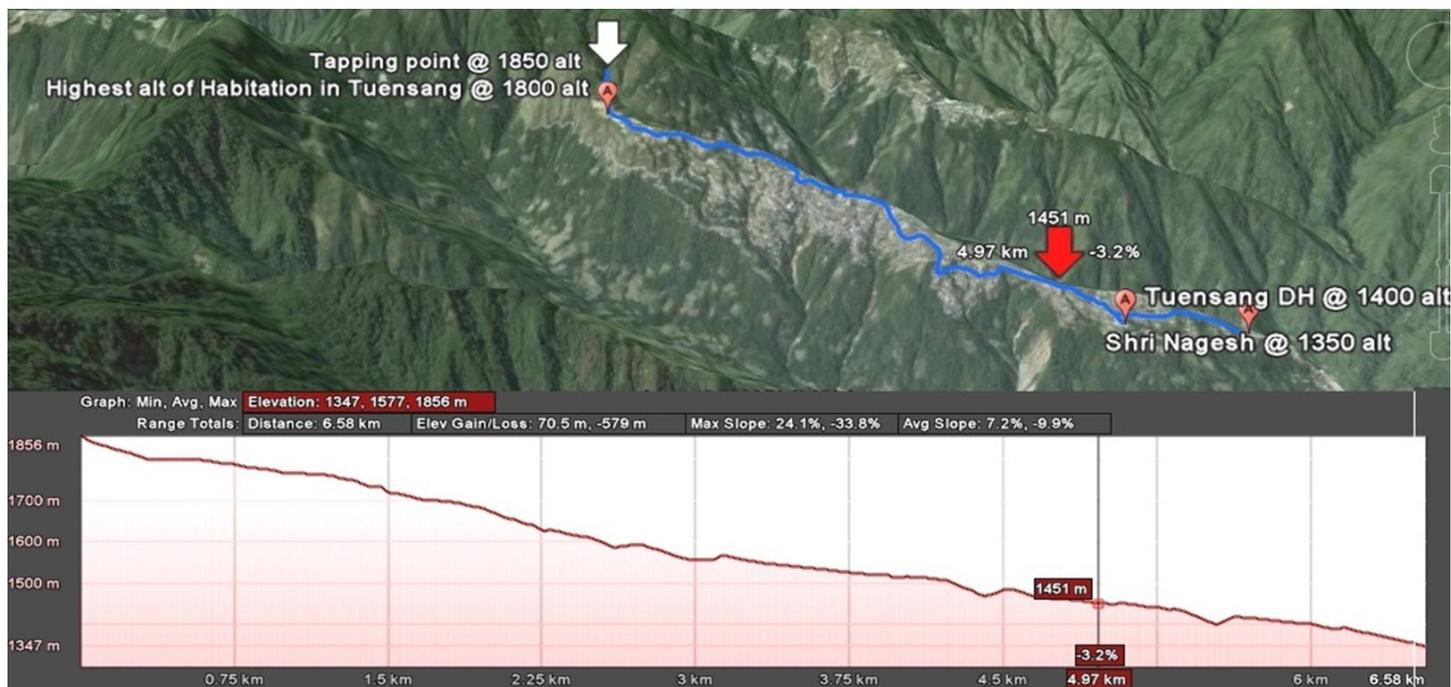
### Introduction

A lack of safe drinking water and adequate sanitation at local health facilities undermines health services in many countries. Drawing on data covering 66,101 facilities in 54 low- and middle-income countries, a recent study found that that 38 percent of health facilities do not have an adequate water source, 19 percent do not have adequate sanitation, and 35 percent do not have water and soap for handwashing. This compromises the ability of health staff to ensure infection prevention and control, so that infections can spread in the very place where patients seek care. Lack of adequate water and sanitation in health facilities may discourage women and girls in particular from seeking care. Better water supply, sanitation and hygiene can contribute to better quality

and use of health services, and higher health staff morale. Functional and well-maintained water and sanitation facilities can also have demonstration effects for communities where these services need improvement. (WHO and UNICEF, 2015)

In Nagaland, a state in the North East of India, officials know water and sanitation services at local government health facilities are poor and must be improved. The state government requested the World Bank to provide support on assessing needs and developing technical strategies and a plan of action to improve the situation. The World Bank's Health, Nutrition and Population Global Practice worked together with its Water Global Practice with the aim of developing a plan that encompasses locally-appropriate, sustainable and environmentally-friendly strategies and technologies for water and sanitation services in health facilities

Figure 1. Water catchment area (springshed) for spring supplying water to Tuensang District Hospital



## Methodology

The assessment team visited six District Hospitals, five Community Health Centres, 11 Primary Health Centres, and 11 Sub-Centres across the state. Information was collected on:

- The health facility's water supply and sanitation system;
- The water supply and sanitation situation in the larger community;
- Information on patient and health worker requirements for water supply and sanitation (including for patients, family members, and health staff, as well as the requirements of medical interventions, laundry, cooking and cleaning);
- The health staff's observations about conditions at each facility; and
- The health facility's structural layout, including details of water and sanitation systems.

The analysis of water demand and the identification of existing – and possible future – water sources were based on government data, maps, and other available secondary information. Additional data for the assessment and strategic planning were collected from state authorities.

## Findings

Despite the fact that Nagaland receives considerable rainfall during the monsoon season, the hilly terrain and location of villages near the tops of ridges limits water availability. In particular, water supplies are constrained due to limited watersheds, springsheds, and catchment areas, where the natural landscape collects water. (Figure 1) According to the state government, 22 percent of villages do not have regular water supply, while in a further 71 percent the available supply is deemed inadequate (between 0 and 55 litres per capita per day). This situation is mirrored by the health system, as 93 percent of Sub-Centers have water supply less than 60 litres per capita per day, including 35 percent that have less than 10 litres.

While the water and sanitation systems at many health facilities are inadequate and hampered by lack of maintenance, some facilities are taking steps to improve the situation. The assessment found:

- Health facilities lack adequate and regular water supplies that vary by season. However, some facilities have installed systems to harvest rooftop water.
- Available water is often unfit for human consumption, but efforts have been made in some places to improve water quality. For example, the Public Health Engineering Department (PHED) in the village of Meriema has automated water treatment by installing a solar-powered water treatment unit in the village.

- Community and health facility water systems are affected by soil erosion, landslides, leaky pipes, and insufficient funding for operation and maintenance.
- Existing bore wells produce insufficient supplies and the water quality is problematic.
- Local farming strains water supplies in many areas. However, in the village of Chare, where the Longpang Primary Health Center is located, farmers have been trained to grow bananas and citrus. A small proportion of their income funds the center's operations.
- In many cases, bathroom wash basins lack running water while toilets are inadequate and suffer from insufficient maintenance. Some facilities do have running water, however, including the Primary Health Center in the village of Kuthur, which has a continuous supply from the community network, allowing for running water for wash basins and toilets.
- Cleanliness and hygiene suffer from lack of regular water supply and poor maintenance of washbasins and toilets. In some cases, patients resort to open defecation.
- In many locations, septic tanks and soak pits are improperly designed or incomplete, although in other places these sanitation systems are functional.
- The water and sanitation situation affects health facilities' operations. For example, at the Dr. Motsuo District Hospital in the village of Wokha, the lack of water had a direct impact on the delivery of services, especially in the operating room and laboratory.

## Recommendations

Recommendations for water supply and sanitation systems for different types of health facilities were based on the assessment. Estimates for water supply requirements informed the recommendations. (Table 1)

**Table 1. Water demand estimates**

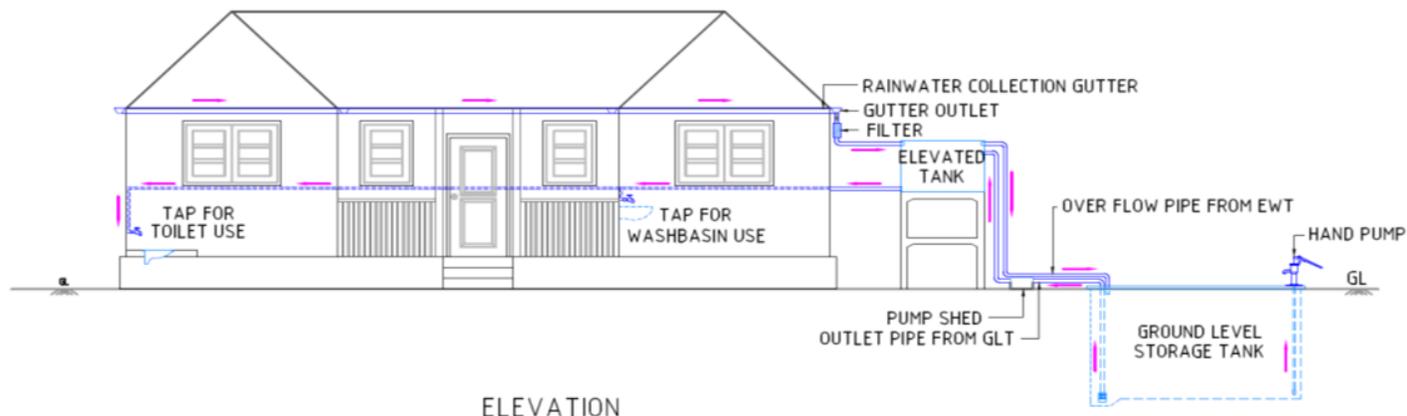
Health staff	20 litres/person/day
Outpatient	5 litres/person/day
Inpatient	40-60 litres/person/day
Caretaker/family member	15 litres/person/day
Operating theatre or maternity unit	100 litres/intervention
Floor washing	0.5 litres/m <sup>2</sup> /day
Sub-Centre residential quarters	70 litres/person/day

Based on patient and staff numbers and service mix, total water demand by facility type was estimated and technical systems recommended. (Table 2) An example of a roof water system is illustrated in Figure 2. To ensure water quality, treatment options were recommended: filtering and disinfection of roof water; de-silting and sand filtering of surface water; and disinfection and other treatment based on existing quality of groundwater. Storage tank capacity and piping requirements were also estimated.

**Table 2. Water supply recommendations**

Health facility type	Water requirement (litres/day)	Water supply system
Smaller Sub-Centre	125	Roof water harvesting (along with a surface source in low-rainfall areas)
Larger Sub-Centre	500	
Primary Health Centre	1,500	Roof water harvesting along with a groundwater or surface source
Community Health Centre	10,000	
District Hospital (100 beds)	34,000	
District Hospital (200 beds)	90,000	

**Figure 2. Roof water harvesting system**



Production of wastewater from various sources (toilets, washbasins, floor washing, laundry) was also estimated for different types of facilities and treatment systems recommended. (Table 3) For Community Health Centres and District Hospitals, Decentralized Wastewater Treatment Systems (DEWATS) were recommended.

**Table 2. Wastewater treatment recommendations**

Health facility type	Wastewater (litres/day)	Treatment system
Smaller Sub-Centre	100	Septic tank and soak pit
Larger Sub-Centre	400	
Primary Health Centre	1,200	Improved septic tank (with up-flow anaerobic filter)
Community Health Centre	8,000	Decentralized Wastewater Treatment System (DEWATS)
District Hospital (100 beds)	27,200	
District Hospital (200 beds)	72,000	

Production of wastewater from various sources (toilets, washbasins, floor washing, laundry) was also estimated for different types of facilities and treatment systems recommended. (Table 3) For Community Health Centres and District Hospitals, Decentralized Wastewater Treatment Systems (DEWATS) were recommended. (Figure 3) This treatment process is designed to be low maintenance and appropriate to low-income country settings.

The recommended strategy emphasizes the importance of sustainable operations and maintenance by communities, building on Nagaland’s “communitisation” policy which has decentralized responsibility for water supply, health care and other services to local committees. The roles of local health committees as well as health facility staff are of primordial importance for day-to-day maintenance, cleaning and hygiene of water and sanitation facilities. Engagement of the community also provides the opportunity for improving knowledge and behaviors in households.

An investment plan and budget were developed, including the necessary capacity-building and support to communities, for implementation by the World Bank-

supported Nagaland Health Project.

## Conclusion

This technical strategy, grounded in an assessment of the current situation with regard to water and sanitation in health facilities in Nagaland, provides an example that will be useful for other similar situations. It provides the basis for investments that hold the potential to make a large contribution to improving the quality of health services and their attractiveness to the population.

## Reference

World Health Organization (WHO) and UNICEF (2015) *Water, sanitation and hygiene in health care facilities: Status in low- and middle-income countries and way forward*, Geneva.

*This HNP Knowledge Note highlights the key findings from the following World Bank-commissioned report:*

SECON Private Limited (2014) “Nagaland – Technical Requirements for Water and Sanitation to Improve Health Services: Analysis and Recommendations,” Bangalore.

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