

Asian Institute of Technology

Field Observations on Water and Sanitation at Tsunami-affected villages, Kampan Sub-district, Ranong Province

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1 Summary

Through the United States Agency for International Development (USAID), the Government of United States has provided a post-tsunami relief grant to Thailand which is jointly undertaken by the University of Rhode Island, the University of Hawaii and the Asian Institute of Technology. This report describes the 1st field observations on water supply and sanitation at Tsunami-affected villages in Ranong provinces during 13 – 15 June 2005 with the emphases on water and sanitation issues.

Based on field observations and interviews with villagers and officers, it has been observed that water supply is a crucial problem for their livelihood in the newly-built housing estates. Many of shallow wells were severely affected by the intrusion of seawater from Tsunami disasters. Furthermore, it was apparent that inappropriate waste management system would be a potential problem due to the inadequate collection services and inappropriate disposal facilities.

To improve the water supply coverage, it is suggested that the rainwater harvesting be implemented as water supply source with the consideration of the highest precipitation rate in this area. Detailed design on this rainwater harvesting and supply systems should be carefully designed and evaluated.

Instead of provision of collection vehicles, the source separation and recycle of solid wastes in each village should be encouraged by using public participatory approaches. Introduction of “Garbage Bank” concept should be conducted through training sessions or demonstration programs.

1.1 Introduction

The United States Government has provided a tsunami relief grant to Thailand with the ultimate aim at the rehabilitation of sustainable livelihood communities at the Tsunami-affected villages in Ranong province. The focal villages include village No. 1, 2, 3, 4 and 7 in Tambon Kampuan, most of which are coastal areas of Ranong provinces. As part of the sustainable livelihood, the water supply and sanitation issues are deemed crucial factors for villagers in the newly-built housing estates. It was, therefore, set the preliminary field survey during 13 – 15 June 2005 with the emphases on water and sanitation aspects.

This report describes the existing water supply and sanitation systems and identifying the possible resolution for those Tsunami-affected villages which should be further undertaken by the Post-Tsunami Sustainable Livelihoods program.

1.2 Mission goal

The overall aim of this field observation is to provide the preliminary findings for further detailed investigations and technical assistances on the water supply and sanitation issues.

2 Preliminary findings

2.1 Water supply systems

After catastrophic incident in December 2004, several villages in Ranong province were seriously demolished including the water supply systems, most of them were contaminated by saline water in the shallow wells. According to the discussions with villagers and TAO officers, those villages have faced the shortage of water supply especially in dry season where either surface or groundwater sources are diminished. This incidence is contradictory to the fact that Ranong province has the highest rainfall in Thailand at the rate of about 2,000 mm/year.

The newly-built housing estates in Ranong province for Tsunami-affected householders were mostly completed, but apparently lacking of water sources for their livelihoods. Based on the discussion with TAO officers, it was informed that there are 2 main sources for water supply in these villages: surface water from a small dam at Kampuan creek (Figure 1) and shallow well (Figure 2). However, at village no. 1 there is a small reservoir at waterfall nearby (Figure 3), but seems not adequate for the whole village.

For the newly-built houses, pipes and plumbing systems were adequately installed in individual household, except village no. 2 where groundwater is used as a water supply source, as shown in Figure 5. In addition to groundwater supply system, a 1.5-m³ plastic tank was provided for each household for rainwater collection (see Figure 2). However, probably because local people do not familiar to the uses of rainwater, it was noticed that they would prefer to get the tap water either from either groundwater or surface water sources. Similarly, this behavior is also apparent at Village no. 4 where a 2-m³ concrete jar has been given for each household, but rarely used for rainwater collection (see Figure 6).



Figure 1. A small concrete dam at Kampuan creek



Figure 2. Typical shallow well in a village



Figure 3. A small reservoir at Village 1 waterfall



Figure 4. Groundwater supply system at Village no. 1



Figure 5. A 1.5 m³ plastic tank for rainwater collection



Figure 6. A 2-m³ concrete jar at Village no. 4

With the fact that the highest precipitation rate occurs in Ranong province, the rainwater harvesting from roof and underground collection tanks should be an alternative for water supply system where either shallow wells were contami-

nated or relatively long distance for tap water network. Feasibility study and detailed investigations on the rainwater harvesting systems should be further conducted in consultation with Tambon officers and local householders. Some potential options are listed as follows:

- A clustered rainwater harvesting system that enables 4 – 5 households sharing underground water tank
- Installation of a reservoir in a village for rainwater collection, wherever land available, with a simple water treatment system
- For drinking water, a solar disinfection (SODIS) process by exposing the transparent plastic bottles into sunlight

2.2 Sanitation systems

The filed surveys revealed that the solid waste collection and disposal systems in these villages are inadequate to serve the whole communities. There is only one small-scale truck (Figure 7) for solid waste collection in 7 villages and disposing the collected waste at the open dumping site (Figure 8). Because of the limited collection service, there are wastes remaining in the communities, threatening to public hygiene as well as contamination into land and water resources. At the open-dumping site, where appropriate lining and regular soil coverage do not prevail, the leachate from solid wastes piles can cause serious environmental problems such as contamination of toxic compounds in the farmland nearby the dumping site.

Possible mitigation measures to solve the solid waste management problem are listed as follows:

- Sort separation at household level – introduction of “Garbage Bank” concept
- Waste reuse and recycling
- Composting of organic wastes
- Improving the dumping site to be sanitary landfill

In addition to the solid waste management, it is expected that collection and disposal of septage, an emptying sludge from septic tank or cesspool, be another sanitation concerns. Either in the existing newly-built or existing housing estates, toilet wastewater is connecting to a cement-ring cesspool (Figure 9) or septic tank (Figure 10), which typically require sludge emptying every 1 or 2 years. Inappropriate disposal of this sludge, containing high contaminants and pathogens, could cause severe disease transmissions/outbreaks in the communities. It is suggested that the appropriate sludge collection and disposal system be introduced in these communities which should help relief health burden for the public.



Figure 7. A 6-m³ truck for solid waste collection in Tambon Kampuan



Figure 8. An open-dumping site in Tambon Kampuan, adjacent to rice fields



Figure 9. Toilet system at Village No. 4



Figure 10. Toilet system at Village No. 7