

AMERICAN RED CROSS



Water and Sanitation Needs Assessment

Phase I: Trang Province, Thailand

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INTRODUCTION

The American Red Cross, in partnership with the World Wildlife Fund, is currently transitioning to longer-term recovery programs throughout Thailand's tsunami-affected provinces. The identification of villages, schools, pre-schools and health facilities with water and sanitation needs is fundamental to carrying out the organization's long-term fresh water supply and waste disposal initiatives. These initiatives include the construction of wells, boreholes, water transmission and distribution, rainwater catchment systems, toilet and hand washing facilities, and basic water treatment.

D-TRAC's role has been to provide insight into the varying degrees of need that still exist in affected communities a year and a half after the tsunami ravaged the Thai coastline. After conducting intensive field research in Krabi, Trang and Satun Provinces, D-TRAC has identified communities, schools and health facilities throughout each province that are in need of water and sanitation assistance.

In accordance with the *American Red Cross Tsunami Recovery Program Interim Strategy*, the *IFRC Code of Conduct*, and the *American Red Cross Tsunami Recovery Program Beneficiary Statement*, D-TRAC's Water and Sanitation Needs Assessment for Krabi, Trang and Satun Provinces aims to provide a baseline to assist the American Red Cross in determining the areas of greatest need.

Transition to Phase II: Krabi, Trang and Satun

In the second phase of D-TRAC's Water and Sanitation Needs Assessment, more ground had to be covered with three provinces and a total of thirteen districts to interview. With this in mind, it was imperative that our research was conducted in an even more systematic and strategic manner.

Phase II was broken down into two separate visits to each province. Our first visit to Krabi, Trang and Satun Provinces targeted government offices from the top down, from provincial offices down to tsunami-affected districts and sub-districts. These government office interviews were supplemented with surveys of international and local NGOs in order to provide a better overall assessment of the situation. Village, school and health facility visits were conducted in the second visit to each Province, after data from our first visit was reviewed and analyzed in-house. Taking this approach, we were able to determine which communities met the following criteria:

- Have a tangible need for water or sanitation assistance;
- Have received little or no aid in the past or are considered to be "off the radar" of aid organizations;
- Have minority populations or are considered to be a "vulnerable" community;
- Have health issues related to poor sanitation.

Approximately one village, school and or health facility was chosen per district based on the above criteria. Once each site was chosen, D-TRAC ventured back to the province and conducted an interview to assess the needs of the identified village, school, or health facility.

In some instances it was not possible to strictly follow the above guidelines. For example, we identified a community that was in great need of a new water system but later determined through further research that the sub-district office was already planning on installing new water pipes there within the next two months. In other cases, the government offices did not know or had failed to mention that a number of international aid organizations were already working at villages they identified as in need of water and sanitation assistance. On paper, choosing a village or school sometimes seemed to be an obvious choice, only to learn once we made the visit that World Vision, Care International or a Peace Corps project had already been active at the site.

Trends and Observations

The examples cited in the previous section apply to Krabi province. Aid organizations were very active in Krabi, providing post-tsunami recovery, assistance, and longer-term reconstruction programs. It was truly difficult to find a location where no NGO had previously been active.

Satun and Trang were very different. World Vision is one of very few NGOs that were active in Trang Province. In Satun, we found little evidence of NGO projects.

Although more ground was covered in Phase II, Trang and Satun were less tsunami-affected than Phuket and Ranong. The damage inflicted by the tsunami seemed to be less part of their every day work. Government offices had less information to provide; and we were given a smaller number of support documents compared to Ranong, Phuket, and Krabi.

DOCUMENT STRUCTURE

This section explains the structure of the remaining document, and how to interpret the given information.

Recommendation List

The Recommendation List is a list of all surveys we conducted with government offices and aid organizations. It gives a rationale why we chose to visit specific offices, or why we chose not to. For example, a District Office might recommend that we visit a certain Sub-district office to get more information; or a Sub-district office might suggest we visit the Public Health Office. This information is given in the “Recommended by” column. “Recommended by D-TRAC” means we chose to go to that office of our own accord – for example, this is always true for the Provincial Office, which is our starting point in each province.

The Recommendation List includes the following information:

- Code: **I** for interview in person, **P** for phone call, **E** for email.
- Organization: The office/organization interviewed, and their contact information
- Recommended by: The government office or NGO that recommended we visit this organization
- Recommended Organization: Who did they recommend we visit?
- Were those recommended sites visited in person? Yes/No, and reasons provided.

District Overview

The district overview gives a summary of information found at the district level, and a recommendation for potential project sites for the American Red Cross in that district.

Potential Project Sites

The recommendation for potential project sites is divided into three sections, with priority from “high” to “low”:

- Recommendation of places that we visited and which we have identified as in need of water and sanitation assistance;
- Recommendation of places that we did not visit, but which are in great need of water and sanitation assistance, according to our surveys, and which we would have visited, given more time;
- Recommendation of places that are in need of water and sanitation assistance.

These recommendations are a best effort based on the data we gathered.

Villages Not Visited

This section includes any information gathered from government offices, agencies, or NGOs regarding villages, schools and health facilities. This data is provided in a short notation and grouped by source, from the highest level of government down to the local government, and any aid organizations we interviewed.

Example:

Bak Bah Rah, Moo 2, Bak Nam, La Ngu

District Office

- A tsunami warning system has been placed in this village.

Needs

- Identify areas in which boreholes could pump fresher water.
- Need expert assistance in finding borehole locations and installing water systems.

Sub-District Office

- This village was the most affected by the tsunami in Bak Nam Sub-district.
- This village has a population of slum-dwellers.
- Bak Bah Rah School was recommended as a school in need of assistance due to tsunami.
- This village has issues with standing water.
- In Bak Bah Rah, storm water drains are not kept clear; therefore, flooding sometimes occurs.

Needs

- Identify areas in which boreholes would pump fresher water.
- Need expert assistance in finding borehole locations and installing water systems.

Educational Office

- The Bak Ba Rah School needs the toilets adjusted, a canal built, and a sink.
-

In this example, information for Bak Bah Rah village, in Bak Nam sub-district, La Ngu district is given by the District office, the Sub-district office and the Educational office. The District and Sub-district offices give the same needs for this village.

We believe that for villages that we did not visit in person, this form to present information helps the reader to identify trends / consolidated information, or inconsistencies, in a straightforward manner. Information about villages, schools and health facilities is often inconsistent, depending on the source.

Health Stations Not Visited

This section is similar to "Villages not visited" but gives an overview of health stations, by sub-district.

Villages / Schools Visited

This section includes the villages and schools we visited in a specific district. Because so much information is collected when visiting a site in person, we decided to summarize the information in a few paragraphs.

Each village / school report includes the following information:

- Location (address) – see “Location” below for more details.
- Contact information
- GPS Coordinates (UTM)
- Hyperlink and page number to the corresponding Recommendation List.
- Hyperlink and page number to the cited surveys and secondary sources. These are all located in the appendices, which are organized by province (see table of contents).
- Summary of information gathered from survey reports for the village / school.
- List of water and sanitation issues and needs.
- Wish List – a quick “snapshot” of needs, e.g. requested construction/rehabilitation of facilities, equipment needed, etc
- Photographs of facilities at the featured village or school.
- We also decided to include the same “raw data” that we gave for villages we did not visit. We feel this gives a good overview of how information can be gathered at different government levels, and illustrates that the most authoritative information is gathered “on the ground”.

Supporting Documents

All supporting documents given to us by NGOs and government offices are coded with a reference number. The reference number begins with a letter denominating the province: **K** for Krabi, **T** for Trang, **S** for Satun, followed by a Coding number that identifies which government office level the document comes from, followed by the Document number which identifies the document itself. For district and sub-district offices, we allocate an Office number to uniquely identify that district or sub-district office. The reference code ends with a letter denominating the team, which is either **A** or **B**.

Document number:

1. Provincial
2. District
3. Sub-District
4. DDPM
5. Municipal
6. Health
7. Education
8. NGO
9. Village
10. School
11. Other

Examples:

T1.3B = Trang Provincial Office, third document received by Team B.
S2.2.1A = Satun, a district office, first document received by Team A.

Appendices

The appendices contain the raw interview data from our surveys. The first appendix includes all data gathered at the provincial level. Each subsequent appendix contains surveys from a specific district, e.g. Appendix II in Satun Province includes all surveys from Muang Satun District. Each Appendix is divided into two parts: surveys and supporting documents. The supporting documents section is only present if supporting documents are available for a specific district.

Hyperlinks / References

Underlined text sections in red color are links to other parts of the document. This is used to reference to relevant appendices, surveys, and supporting documents.

Example: Reference to the Satun Provincial Education Office survey.

Locations

Locations will always be listed with the village name first, followed by its corresponding Moo number, and the sub-district and district name. The province name will only be included when comparing or listing locations from different provinces.

Example:

Village	Moo Number	Sub-district	District	Province
Ban Klong Dow	Moo 1	Koh Si Bo Ya	Nua Klong	Krabi

Each individual village or school report will have the following heading:

- o Ex. - Ban Klong Dow, Moo 1, Koh Si Bo Ya, Nua Klong

EXECUTIVE SUMMARY

On the morning of December 26, 2004, a tsunami slammed the coastline of western Thailand causing a path of destruction and devastation. Among the provinces affected by the tsunami is Trang. According to the Provincial Office (DDPM) records, the tsunami caused 5 deaths, 168 injuries, and 1 missing person. Over 200 homes were directly affected by the tsunami waves, with 162 houses damaged and 40 destroyed [T4.2B]. Also, a total of 4 districts, 13 sub-districts and 51 villages were affected by the tsunami [T4.2B].

The destruction caused by the tsunami left villagers to sustain major losses. The tsunami destroyed 370 boats, 3 cars, 287 rais of land, 493 pieces of fishing equipment, 5 public facilities, and 332 farms [T2.1.1B]. Thus, the tsunami had a major impact upon the livelihoods of many of the people living within the district.

Following the tsunami, the Provincial Office has reported that they provided short-term recovery assistance in the form of basic occupational assistance in agriculture and the fishing industry, mental health recovery assistance, and food for affected people. They also moved residents from the islands to the mainland and provided them with temporary shelter. The Provincial Office also claims responsibility for having repaired damaged houses and rebuilt destroyed ones. They also provided 1,624 students with a 15,000 baht scholarship each. The Provincial Office also states that they held evacuation drills and assigned safety points and mapped evacuation routes. Finally, the Provincial Office built an early warning tower system in 11 areas.

According to Provincial records, numerous organizations have been active in Trang since the tsunami. The Trang Provincial Office provided 5 fishing boats. The Thai Red Cross built a Child Center in Ban Sai Thong, Moo 4, Koh Su Gon, Pa Rian and in Ban Koh Muk, Moo 2, Koh Li Bong, Kan Tang. Had Tip provided carts from Coke Cares for small business start-ups. Chai Pattana Foundation provided equipment for fisherman at Koh Su Gon. World Vision provided equipment (nets for traps) for 750 families on Koh Li Bong, Kan Tang District. Lastly, ITV News provided support for fish farms, floating fish pens, and provided 1 fishing boat.

Based on information gathered from government offices, public facilities, and NGOs, D-TRAC decided to survey villages within the four most affected districts within Trang: Pa Rian, Kan Tang, Had Sam Ran, and Si Kao. Also, under the instruction of ARC, we shifted our focus towards villages and health offices due to the French Red Cross' involvement in the Trang school system. However, we still attained general information about schools from the Provincial Education Office (see Provincial Education Office survey) to provide us with a broader view of the water and sanitation issues existing throughout the province. Please reference documents T7.1B and T3.3.1B for additional information about which schools were directly and indirectly affected by the tsunami.

The records from the Health Office were important to our survey because they were often used to determine which sub-district and/ or village our research team would visit as water and sanitation issues were, at times, very similar. We utilized the T7.2A document, which reports cases of disease by district and sub-district.

After surveying numerous villages within Trang, we noticed certain trends common to the region. In general, Trang experienced tsunami destruction which most affected the occupations of coastal villagers. Although water and sanitation along the coastline was marred by the tsunami, in general, water and sanitation issues in Trang have been an issue for a longer period of time due to the geography of the region. The Trang coastal area can be characterized by its swampy condition; therefore, well water is often brackish and reservoir systems are often times non-

existent in low lying areas. As a result, existing water systems are being exasperated by village populations that are too large for these water systems to handle.

We also observed that communities in Trang, unlike those in Satun, were less likely to use rainwater catchments. Island communities, however, such as Koh Li Bong, which was predominantly Muslim, did use rainwater catchments and were receptive to the idea of using more of these tanks so as to appease their water shortage problem. Mainland villages in Trang were not interested in the idea of rainwater catchments.

Sanitation issues in Trang were not as prevalent as in Satun. The areas which displayed the greatest sanitation issues were island communities who often bury their trash or dump it in the sea. Communities who bury their trash run the risk of contaminating the well water source.

RECOMMENDATION LIST

DTRAC – Disaster Tracking Recovery Assistance Center

T: +66 (0) 76 420 808, **F:** +66 (0) 76 420 810,

W: www.d-trac.org

**P A R I A N
D I S T R I C T**

Water and Sanitation Needs Assessment

DISTRICT OVERVIEW

Possibly the most damaging aspect of the December 2004 tsunami upon the Pa Rian District was its destruction upon the livelihoods of the district's population, many of whom rely on their geographic coastal location as a means to earn a living. According to the District Office, as a result of the tsunami, 1 house was destroyed, 10 houses sustained damages, 3 people were injured, and 1 person is listed as missing. In terms of people's livelihoods, 20 shrimp/ crab farms and 35 floating fish pens were damaged, and 35 boats were completely destroyed.

Since the tsunami, Pa Rian District has not received much aid from the government. This is because the government will not rehabilitate shrimp farms damaged in the tsunami, which made up a majority of the damage. Government aid in Pa Rian is not as great as other districts. The government did help repair damaged boats from the tsunami. Also, the Thai Red Cross donated food provisions in tsunami-affected areas.

Water and sanitation issues in this district were not as directly affected by the tsunami. We choose to visit Tah Kham, Moo 1 in Tah Kham District as it was labeled as an affected tsunami village and "vulnerable" village in need of water and sanitation aid by the Sub-District Office. Also, Tah Kham Sub-District has the highest number of reported health issues than any other sub-district in Pa Rian. According to the Provincial Health Office, in 2005 Tah Kham Sub-District reported 5 cases of Dengue fever and 248 cases of diarrhea, and in 2006, the sub-district reported 115 cases of diarrhea [T7.2A]. And finally, the French Red Cross had already brought aid to Koh Su Goan Sub-District.

The village we visited, like many other villages in the region, is located on a peninsula; therefore water obtained from wells and/ or boreholes tend to be brackish and go waterless in the dry season. As a result, villages are forced to buy their water, as is the case for Tah Kham, Moo 1. Many of the villages in need of water assistance in Pa Rian are in need of bore holes that will produce fresh water.

We noticed in our site visit in this district, as with other site visits in Trang, that people were unreceptive to the idea of water storage tanks because they were not a permanent answer to the water shortage issue. These contraptions could be used to appease the water shortage problem and allow for villagers to have water throughout a longer period of the dry season.

POTENTIAL PROJECT SITES

Recommendation of Villages / Schools / Health Centers visited

The following villages and schools have been visited by D-TRAC and identified by as having water and sanitation needs. They are eligible for assistance under criteria specified in *The American Red Cross Tsunami Recovery Program Beneficiary Statement*.

Villages

- Ban Tah Kham, Moo 1, Tah Kham, Pa Rian

Recommendation of Villages / Schools / Health Centers not visited, but in great need

Information not available.

Recommendation of Villages / Schools / Health Centers not visited

D-TRAC also gathered recommendations and tips on needs present in other schools / villages throughout Pa Rian District. Due to time constraints, the team was unable to visit all recommended sites but has done its best to provide a well rounded view of the recovery situation in Pa Rian District.

Recommended Villages

- Ban Nah, Moo 2, Ban Nah, Pa Rian
- Ban Hin Kok Kwai, Moo 3, Ban Nah, Pa Rian
- Ban Wang Si La, Moo 4, Ban Nah, Pa Rian
- Ban Koh Glang, Moo 6, Ban Nah, Pa Rian
- Ban Laem Yang, Moo 7, Ban Nah, Pa Rian
- Ban Nong Prue, Moo 9, Ban Nah, Pa Rian
- Ban Ton Ch Ngu, Moo 1, Tah Kham, Pa Rian

VILLAGES NOT VISITED

This section lists villages and schools in need of water and sanitation that we did not visit in person. All information has been gathered through our surveys at the provincial, district and sub-district level. All our [surveys in La Ngu District](#) can be found in [Appendix IV](#) Error! Bookmark not defined.. [Surveys at the provincial level](#) can be found in [Appendix I](#) Error! Bookmark not defined..

Tah Kham Sub-District

Sub-District Officed

Sub-district is 80% Muslim

T3.2.1A – need to check! Very different village names and numbers!!

Ban Tah Kham, Moo 1, Tah Kham, Pa Rian

- *Visited this village. Information of Village Information Page.*
-

Ban Ton Cha Ngoo, Moo 1, Tah Kham, Pa Rian

Sub-District Office

- Identified as a village that is in need of water assistance
 - Shares the same “Moo” number with Ban Tah Kham
-

Ban Yong Star, Moo 2, Tah Kham, Pa Rian

Sub-District Office

- 1 house damaged
 - School searching for a source of potable drinking water; students currently buy their drinking water.
 - Storm drains are not kept clear.
 - Statistics from Tah Kham Sub-District (T3.2.1A):
 1. Families: 209
 2. Population: 831
 3. Males: 391, Females: 440
-

Ban Thung Ruang Tong, Moo 4, Tah Kham, Pa Rian

District Office

- School is in need of water assistance, but advised to speak directly to school for more information.

Sub-District Office

- 1 house damaged
- 4 boats damaged

- School searching for a source of potable drinking water; students currently buy their drinking water.
 - Preschool searching for a source of potable drinking water; preschool currently buys its drinking water.
 - Storm drains are not kept clear.
 - Statistics from Tah Kham Sub-District (T3.2.1A):
 1. Families: 236
 2. Population: 837
 3. Males: 411, Females: 426
-

Ban Sam Yak, Moo 5, Tah Kham, Pa Rian

Sub-District Office

- School searching for a source of potable drinking water; students currently buy their drinking water.
 - Statistics from Tah Kham Sub-District (T3.2.1A):
 1. Families: 321
 2. Population: 1,208
 3. Males: 584, Females: 624
-

Ban Toan Han, Moo 6, Tah Kham, Pa Rian

Sub-District Office

- School searching for a source of potable drinking water; students currently buy their drinking water.
 - Preschool searching for a source of potable drinking water; preschool currently buys its drinking water.
 - Identified as a village that is considered “vulnerable” because it currently does not have a reliable source of water.
 - Statistics from Tah Kham Sub-District (T3.2.1A):
 1. Families: 242
 2. Population: 1,098
 3. Males: 544, Females: 554
-

Ban Dok, Moo 7, Tah Kham, Pa Rian

Sub-District Office

- Storm drains are not kept clear.
-

Ban Loom Taem, Moo 8, Tah Kham, Pa Rian

Sub-District Office

- 20% of the sub-district's Buddhist community lives in this village and Ban Tah Kham, Moo 1

- Identified as a village that is considered “vulnerable” because it currently does not have a reliable source of water.

Ban Kuan Lam Pet, Moo 9, Tah Kham, Pa Rian**Sub-District Office**

- Statistics from Tah Kham Sub-District (T3.2.1A):
 1. Families: 165
 2. Population: 718
 3. Males: 364, Females: 354

Ban Seam Mai, Moo 1, Koh Su Goan, Pa Rian**District Office**

- 3 people injured

Ban Nah Sub-District

Ban Laem Yang, Moo 7, Ban Nah, Pa Rian

District Office

- Need a borehole drilled and a water system constructed
-

Ban Nah, Moo 2, Ban Nah, Pa Rian

District Office

- Need a borehole drilled and a water system constructed
-

Ban Wang Si La, Moo 4, Ban Nah, Pa Rian

District Office

- Need a borehole drilled and a water system constructed
-

Ban Koh Glang, Moo 6, Ban Nah, Pa Rian

District Office

- Need a borehole drilled and a water system constructed
-

Ban Nong Prue, Moo 9, Ban Nah, Pa Rian

District Office

- Need a borehole drilled and a water system constructed
-

Ban Hin Kok Kwai, Moo 3, Ban Nah, Pa Rian

District Office

- Need a borehole drilled and a water system constructed

Koh Su Goan Sub-District

Provincial Office

- Muslim community considered “vulnerable” because they experience water shortages in the dry season; need water systems installed.
- Chai Pattana Foundation provided equipment for fishermen in the sub-district.

Provincial Education Office

- Needs a water system constructed because their current water source is brackish.

Provincial Health Office

- Koh Su Goan doesn't have enough water in the dry season.

District Office

- Preschools have need, but unsure of what and advised to speak directly to preschools for more information.
-

Ban Laem, Moo 2, Koh Su Goan, Pa Rian

Provincial Education Office

- Ban Laem School was directly affected by the tsunami and needs a water system to be constructed.

District Office

- School is in need of water assistance, but advised to speak directly to school for more information.
-

Ban Had Sai Thong, Moo 4, Koh Su Goan, Pa Rian

Provincial Office

- Thai Red Cross built a Child Center in the village.

Provincial Education Office

- Ban Had Sai Thong School was directly affected by the tsunami and needs a water system to be constructed.
- School is 80-90% Muslim.

VILLAGES / SCHOOLS VISITED

Tah Kham, Moo 1, Tah Kham, Pa Rian

GPS Coordinates:
47N 0576780
UTM 0793290

Recommended by:
See Recommendation List

Supporting Documents:
T2.2.1A, T3.2.1A, T7.2A

Overview

Based on the information provided by the Tah Kham Sub-District Office, Village 1 is listed as one of the “affected” villages in the sub-district. The tsunami is mainly responsible for damaging the livelihoods of many of Tah Kham, Moo1’s, inhabitants. According to the Sub-District Office, 2 people died in the Tah Kham Sub-District; however, there were no deaths in Moo 1. The main industry disrupted by the tsunami in Tah Kham was shrimp farming. The tsunami caused the water flowing into Tah Kham, via the canal, to rise to an excessive level, thus washing the shrimp out of the ponds. 9 Rai worth of shrimp farms were destroyed in the village, which was a huge investment lost by many villagers. Currently, the shrimp farms are functioning, but at a much lower capacity. The villagers cannot afford to raise a large amount of shrimp and are therefore trying a more natural density approach. Other fishing equipment, shrimp traps, and boats were damaged.

The village of Tah Kham, Moo 1 is geographically located on a peninsula and is therefore surrounded by water. The village has a population of 259 people [T3.2.1A]. Compared to the other villages in the sub-district, Tah Kham is smaller. Children from this village attend schools in nearby villages.

Since the tsunami, Tah Kham has received some aid from the government. The Thai government did help to repair the boats damaged in the tsunami. According to the Sub-District Office, the district provided 20,000 Baht to each person who lost fishing pens. The District will not agree, however, to give aid to shrimp farmers because they do not see the direct link between the tsunami and the shrimp farm damage. Also, within the sub-district, there are several long-term tsunami relief and redevelopment projects going on. The first, which deals with occupational development, is a project in which the sub-district office coordinates activities with the CHARM Foundation and networks with each village. Another project deals specifically with fishery redevelopment. The third project consists of information nights where the sub-district office will plan updated projects each year and informs villages about the prevention of and protection against diseases in the area.

Information regarding Tah Kham from the Sub-District Office is accurate, but rather vague. The sub-district labeled Tah Kham, Moo 1, as a “vulnerable” village in terms of its water and sanitation issues because the village does not have a reliable drinking source.

The main source of water in this village is bought by villagers and stored in 1000L tanks at people’s homes. The water is used for drinking, washing, etc. It costs 150 Baht for 1000 liters. This amount of water is typically used by a family of 10-12 people. This same quantity of water, if consumed by 10-12 people, will last approximately 2-3 days. At one point, a borehole was created as a means of getting water; however, the village is a peninsula so the hole quickly became brackish. During the dry season the water from the borehole actually turns red, and in

the wet season it is salty. During the dry season, if conditions are very bad, the SAO will give out water.

Again, in mentioning the geography of the area, the town is situated on a peninsula; therefore, wells do not work. The borehole is approximately 80 meters and still brackish. It is 12 years old and has been drilled twice to make deeper. It was first 40 meters and then made deeper to go 80 meters.

In terms of sanitation, wastewater is controlled through the use of septic tanks. The government empties out these tanks from people's homes. Also garbage is collected as every family has a government issued garbage bin. Finally, there is no official recycling program, yet individuals will collect and sell certain things on their own, such as plastic.

Water and Sanitation Needs

Water is the most important issue in this village as wells are ineffectual as a means to obtain water. In our village interview with the SAO and his assistant, they claim that the only solution is to hook into the water system of Tah Kham Dok. Tah Kham, Moo 1, has the plans all created. They are somewhat complicated because the town is elevated. The SAO has gone to the provincial governor for approval of the water plans; however, the governor has not agreed to financially back the project due to the distance the water system would need to cover, the high cost of the project, and the fact that the village is not heavily populated. According to the SAO and his assistant, this project would cost 7 Million Baht.

This project would clearly cost a considerable amount of money for a small population; however, unlike any other village we saw, they had plans drawn up and have taken action themselves to appease this on-going crisis. Perhaps this village could cover a percentage of the costs needed to fund the project, while the Red Cross could fund the remainder. When D-TRAC mentioned the idea of more rainwater storage tanks, the SAO and his assistant were very unreceptive and said that it is not a long-time solution to the problem.

The SAO was unable to provide D-TRAC with a copy of the municipal city water plans on such short notice; however, the SAO can obtain such copies if needed.

Village Wish List

- Hook into municipal water system of Tah Kham Dok
- Water storage tanks

Raw Data

Ban Tah Kham, Moo 1, Tah Kham, Pa Rian

Sub-District Office

- 20% of the sub-district's Buddhist community lives in this village and Ban Loom Taem, Moo 8
 - Identified as a village that is considered "vulnerable" because it currently does not have a reliable source of water.
-

Village Survey

- **Tsunami**
 - Island indirectly affected by the tsunami.
 - 2 people in Tah Kham Sub-District died.
 - 9 Rai worth of shrimp farms were destroyed
- **Background**
 - population of 259 people [T3.2.1A]
 - Geographically located on a peninsula.
- **Aid**
 - District provided 20,000 Baht to each person who lost fishing pens.
 - District will not agree, however, to give aid to shrimp farmers because they do not see the direct link between the tsunami and the shrimp farm damage.
 - 3 Projects currently being sponsored by Sub-District
 - Occupational development
 - Fishery Redevelopment
 - Information Nights
- **Water Sources**
 - Water bought by villagers and stored in 1000L tanks at people's homes.
 - Water is used for drinking, washing, etc.
 - Costs 150 Baht for 1000 liters.
 - Amount of water is typically used by a family of 10-12 people.
 - If consumed by 10-12 people, water will last approximately 2-3 days.
 - 12-year-old bore hole that is unused
 - During the dry season the water from the borehole turns red, and in the wet season it is salty.
 - It was first 40 meters and then made deeper to go 80 meters.
 - During the dry season, if conditions are very bad, the DAO will give out water.
- **Waste Treatment**
 - Septic tanks, which government empties.
 - Garbage is collected as every family has a government issued garbage bin.
- **Needs**
 - Hook into municipal water system of Tah Kham Dok
 - Water storage tanks

KAN TANG DISTRICT

Water and Sanitation Needs Assessment

DISTRICT OVERVIEW

As Kan Tang District is comprised of many island communities, the region endured the direct impact of the December 2004 tsunami. The tsunami claimed the lives of 4 people in the district. The district also withstood boat and fish pen damages. According to the District Office, 411 boats and 127 fish pens were damaged, while 9 boats were completely destroyed. Other statistics from the District Office state that there were 32 houses damaged, 126 houses destroyed, 21 injuries, and 1 missing person.

Following the tsunami, the Provincial and District government acted on behalf of its inhabitants to improve the poor conditions of affected villages. The Provincial Office provided approximately 139 houses to affected areas. Also, the Koh Li Bong Sub-District has established a recovery program involving occupational training by which each village will receive funding by the sub-district to be put towards making a variety of products that will be sold to tourists. World Vision also came to the District following the tsunami. The organization distributed drinking water to every village in Koh Li Bong and Koh Muk, and they built wells throughout the villages located on the Koh Li Bong Island. And finally, Chai Pattana Foundation assisted in drilling boreholes at Ban Koh Muk, Moo 2, Koh Li Bong, Kan Tang.

In our field research, we chose to visit the island of Koh Li Bong, which sustained some of the worst tsunami damage and therefore has some of the most severe water issues. The water condition based on the Sub-District Office has been brackish and scarce. In addition, the French Red Cross had already visited the other island that is apart of this sub-district, which also suffered heavy damage as a result of the tsunami (Village 2).

Overall, we noticed specific trends in the area relating to water and sanitation. Like other island communities, Koh Li Bong has the challenge of obtaining water in a more isolated situation. This particular island does have a freshwater source; however, the overall system which cleans and feeds the water out to the villages is in need of rehabilitation. The gravity fed water system, water purifier, and piping system are all in need of repairs. As a result, this water system is not efficient and is not able to fully provide the village's population with the maximum amount of water possible. Also, like other island communities, Koh Li Bong has issues with sanitation as villagers dump their septic tanks in isolated areas on the island. This presents the possibility of cross-contamination between well water and waste. Essentially, the district has to ensure that its island communities are receiving the proper funding despite the more distant and isolated locations of these villages.

It should be noted that although this district is 69% Buddhist and 31% Muslim, Koh Li Bong District is almost entirely Muslim. Unlike other sub-districts we viewed in Trang, homes in Koh Li Bong used rainwater storage tanks and villagers requested more tanks as a means of controlling the water scarcity problem.

POTENTIAL PROJECT SITES

Recommendation of Villages / Schools / Health Centers visited

The following villages and schools have been visited by D-TRAC and identified by as having water and sanitation needs. They are eligible for assistance under criteria specified in *The American Red Cross Tsunami Recovery Program Beneficiary Statement*.

Villages

- **Ban Khok Saton, Moo 1, Koh Li Bong, Kan Tang**
- **Ban Ba Du Bu Dah, Moo 4, Koh Li Bong, Kan Tang**
- **Ban Lang Khao, Moo 5, Koh Li Bong, Kan Tang**
- **Ban Sao Gaew, Moo 7, Koh Li Bong, Kan Tang**

Recommendation of Villages / Schools / Health Centers not visited, but in great need

Recommendation of Villages / Schools / Health Centers not visited

D-TRAC also gathered recommendations and tips on needs present in other schools / villages throughout Had Kan Tang District. Due to time constraints, the team was unable to visit all recommended sites but has done its best to provide a well rounded view of the recovery situation in Kan Tang District.

Recommended Villages

- Ban Koh Muk, Moo 2, Koh Li Bong, Kan Tang
- Ban Had Sai Kao, Moo 1, Nah Glua, Kan Tang
- Ban Mod Dah Noi, Moo 3, Koh Li Bong, Kan Tang (mainland)

VILLAGES NOT VISITED

This section lists villages and schools in need of water and sanitation that we did not visit in person. All information has been gathered through our surveys at the provincial, district and sub-district level. All our [surveys in Tah Pae District](#) can be found in [Appendix III](#) Error! Bookmark not defined.. [Surveys at the provincial level](#) can be found in [Appendix I](#) Error! Bookmark not defined..

Koh Li Bong Sub-District

Ban Kok Saton, Moo 1, Koh Li Bong, Kan Tang

- *Visited this village. Information available on Village Survey Page.*

Ban Koh Muk, Moo 2, Koh Li Bong, Kan Tang

Provincial Office

- Village needs assistance with its water systems.
- Village island community is 80% Muslim.
- Muslim community considered “vulnerable” because they experience water shortages in the dry season; need water systems installed.
- Thai Red Cross built a Child Center in the village.

Provincial Health Office

- The Health Department received funding from the Governor’s Office to build two toilets in the village.
- Village doesn’t have enough water in the dry season.
- The Governor’s Office improved and repaired water storage tanks (99 cubic meters) at the Health Center.
- The Health Center uses rainwater catchment cisterns and a borehole to get its water. The water supplied from the borehole is not enough, and additional water storage facilities are needed in order to save rainwater in the dry season.

District Office

- 2 people died in tsunami
- 1 house was provided by the Association Development Institute of Trang.
- Village is predominantly Muslim.
- The island isn’t being supplied with enough water due to shipping difficulties. The villagers resort to buying their own drinking water. They have boreholes but the water pumped from them is brackish. The district office claims that the brackish water has become worse after the tsunami due to underground changes.
- Ban Koh Muk School and Kindergarten both have the same water needs as the village.
- Ban Koh Muk Health Station has the same water needs as the village and schools.

Needs

- Identify areas in which boreholes would pump fresher water.
- Need expert assistance in finding borehole locations and installing water systems.

Sub-District Office

- 3 people died in the village.
- Village has a Buddhist community.

- 32 new homes were built.
- Same problems and needs mentioned by District Office.
- Want to install a reverse osmosis system.
- Village health station has same needs as village.

Aid

- Chai Pattana assisted in drilling boreholes in this village, however the residents are complaining about discolored, murky water.
- Chai Pattana bypasses the sub-district office and works directly with the village, so the office is unsure if the borehole project is complete.
- The village experiences standing water problems; storm drains aren't clear and the land is low-lying. The waterways don't have the capacity to drain water all the way to the sea due to blockages from synthetic garbage such as plastics, bags, and foam.

T3.1.1A

- **Population**
Male: 860
Female: 823
Total: 1,683
-

Ban Mod Tanoi, Moo 3, Koh Li Bong, Kan Tang

District

- Village is predominantly Muslim.
- The village is far away from any water source; villagers currently use rain water catchment cisterns and buy their drinking water.
- Ban Mod Tanoi School and Kindergarten both have the same water needs as the village.
- Ban Mod Tanoi has the same water needs as the village and schools.

Needs

- Identify areas in which a borehole would pump fresher water.
- Need expert assistance in finding borehole locations and installing water systems.

Sub-District Office

- 1 person died in the village.
- **Health station:**
 - Needs to identify areas in which a borehole would pump fresher water.
 - Need expert assistance in finding a borehole location and installing water systems.
 - Wants to install a reverse osmosis system.
- The village experiences standing water problems; storm drains aren't clear and the land is low-lying. The waterways don't have the capacity to drain water all the way to the sea due to blockages from synthetic garbage such as plastics, bags, and foam.

T3.1.1A

- **Population**
Male: 518
Female: 480
Total: 998
-

Ban Ba Du Bu Deh, Moo 4, Koh Li Bong, Kan Tang

- *Visited this village. Information available on Village Survey Page.*

Ban Lang Khao, Moo 5, Koh Li Bong, Kan Tang

- *Visited this village. Information available on Village Survey Page.*

Ban Jao Mai, Moo 6, Koh Li Bong, Kan Tang**District Office**

- 1 person died in tsunami

Needs

- Ban Jao Mai School and Kindergarten both need assistance in identifying areas in which boreholes would pump fresher water and installing water systems.

Sub-District Office

- Ban Jao Mai School and Preschool are both currently using boreholes that pump brackish water. Needs are same as those listed by District Office.
- Want to install a reverse osmosis system.
- Village is predominantly Buddhist.
- The village experiences standing water problems; storm drains aren't clear and the land is low-lying. The waterways don't have the capacity to drain water all the way to the sea due to blockages from synthetic garbage such as plastics, bags, and foam.

Aid

- World Vision drilled borehole in the village.
- World Vision is in the process of donating an incinerator to minimize the impact of garbage on the environment. This project is still ongoing and completion is currently dependent upon World Vision's timeframe.

T3.1.1A

- **Population**
Male: 299
Female: 295
Total: 594

Ban Sao Gaew, Moo 7, Koh Li Bong, Kan Tang

- *Visited this village. Information available on Village Survey Page.*

Bang Sak Sub-District

Ban Khuan Dung Gu, Moo 3, Bang Sak, Kan Tang

District Office

- Needs include identifying areas in which boreholes would pump fresher water with expert assistance and installing water systems.
- 1 house was provided by the Association Development Institute of Trang.

Nah Glua Sub-District

Ban Had Sai Kao, Moo 1, Nah Glua, Kan Tang

District Office

- The island isn't being supplied with enough water due to shipping difficulties. The villagers resort to buying their own drinking water. They have boreholes but the water pumped from them is brackish. The district office claims that the brackish water has become worse after the tsunami due to underground changes.

Needs

- Identify areas in which boreholes would pump fresher water.
- Need expert assistance in finding borehole locations and installing water systems.

Kan Tang Dai Sub-District

Ban Koh Kiam, Moo 4, Kan Tang Dai, Kan Tang

Provincial Office

- Village livelihoods were affected.
- Currently experiencing water shortages and have problems with their drinking water because they have to always buy it on the mainland.

VILLAGES / SCHOOLS VISITED

Khok Sah Thon, Moo 1, Koh Li Bong Sub-District, Kan Tang, Trang.

GPS Coordinates:
47N 0543582
UTM 0808762

Recommended by:
See Recommendation List

Supporting Documents:
T2.4.1A, T3.1.1, T7.2A

Overview

The December 2004 tsunami directly affected the island community of Koh Li Bong. According to information provided by the sub-district office, 5 people died in the tsunami and approximately 800 families in the sub-district were affected. The tsunami is also responsible for destroying businesses and homes that were located on the beaches of villages within Koh Li Bong Sub-District.

The 2004 tsunami disrupted the livelihoods of many of Koh Li Bong's inhabitants. Based on the sub-district's statistics, 400 floating fish pens and 400 boats were damaged. The tsunami also affected the island's water situation as many wells now produce brackish water.

The sub-district of Koh Li Bong is comprised of eight villages, four of which are located on the island; Villages 1, 4, 5, and 7. There are a total of 3,026 people living on the island [T3.1.1A]. The island is 99% Muslim.

Since the tsunami, the island has received aid from World Vision. Based on our interview with the assistant village headman in Moo 1, we learned that World Vision has built 7 wells in that specific village; yet, the organization has built many more throughout the entire island. These wells have been helpful in the villager's ability to obtain larger quantities of water throughout the rainy season. Also, according to the Sub-District Office, their office has established a recovery program involving occupational training so that each village will receive funding by the sub-district to be put towards making a variety of products that will be sold to tourists. No such program was evident on the island villages of Koh Li Bong.

The information regarding the island villages of Koh Li Bong from the District and Sub-District Offices, although broad, essentially both conclude that there is not enough drinking water for the villagers and that existing bore holes produce brackish water. While there is not enough water for the island villagers to drink, the offices fail to discuss the reservoir and existing piping system that are capable of feeding water to the majority of the island if they received repairs. The sub-district office mentions a reverse osmosis system for the island which is unnecessary if the broken water system in existence is rehabilitated.

Island villages on Koh Li Bong obtain water from either a reservoir located in Village 4, which is distributed via a piping system; water storage tanks; or wells. The water from the reservoir feeds all the villages on the island except for Village 5, which only has wells or rainwater storage tanks. Water flows down from the top of the island via a canal to the reservoir. The reservoir has a water purifier and water storage tower, which are also located in Village 4; however, both of these systems are broken; therefore, water is fed directly to the villages by means of the pipes. The villagers do not complain of brackish water because the soil is a clay substance which prevents the salt from seeping through to the water. The pipes carrying this water are in need of repairs as they have holes that leak water after years of erosion. According to one villager, the pipes are

not made from PVC, but from a cheaper material. Finally, the SAO distributed 1000L rainwater catchments to the villagers; however, in villages such as Village 1, which is built over the river, these tanks are too heavy and unstable to use.

One thing in particular which should be noted about this island is a small project, which was started by World Vision. As mentioned previously, World Vision built wells on the island, yet they also built one particular well that is hooked to a water purification system. This water is bottled and sold in the hopes that a small business will commence. The money that is made from the water that is sold should be invested back into the water system to take care of repairs. The village headman is in charge of this project; we were unable to meet with him. Although the idea behind this project is good, the situation is rather strange due to the dire need of water at this point in time. Based on the outward appearance of the village headman's house compared to all the other homes on the island, it is possible that the village headman is getting some of the profit made from selling water instead of that money being put back into the upkeep of the well.

In terms of waste management, toilet waste goes into septic tanks which are dumped into the land, but they are careful to keep this away from the wells. The villagers are not worried about cross-contamination issues. The villagers also do not bury any of their trash. They burn the trash where there are no houses. Village 1, however, dumps their trash in the ocean. The people on the island have trash cans, branded with the World Visions mark, however there is no system in place to come and collect the garbage. Clearly, although the villagers say they are careful to dump toilet waste far from the wells, cross-contamination is possible.

Water and Sanitation Needs

In order for the water and sanitation condition of the island villages to improve repairs need to be made on the existing water system in place. These repairs include rehabilitating the water purifier and water tower in Village 4 and replacing the piping system that carries the water throughout the island villages. Also, there are two large water storage tanks near village 1 that have not been used since the new water tower in Village 4 was created. If both tanks are repaired, they could provide the island with a significant amount of extra water. In addition, brand new water tanks could be given; however, especially in Village 1 where houses are built on stilts, the water storage tanks will need a solid base for support. The tanks could also be distributed to share between homes, as many homes are so close together. A gutter system should also be put up to collect the rainwater.

Also, sanitation measures should be taken as there is the possibility that toilet waste is contaminating well water. Perhaps first, the water should be tested to see if in fact cross-contamination is occurring.

Village Wish List

- Repair gravity fed water tower and water purifier in Village 4
- Repair piping system carrying reservoir water throughout the island
- Repair two large water storage tanks in Village 1
- Distribute water tanks to be shared between houses (tanks should come with support stand and gutter system which will maximize water quantity).
- Test well water for waste contamination.

Photographs of Facilities

Raw Data

Koh Li Bong Sub-District

Ban Khok Sah Thon, Moo 1, Koh Li Bong, Kan Tang

Provincial Health Office

- The Health Department received funding from the Governor's Office to build two toilets in the village.

District Office

- The island isn't being supplied with enough water due to shipping difficulties. The villagers resort to buying their own drinking water. They have boreholes but the water pumped from them is brackish. The district office claims that the brackish water has become worse after the tsunami due to underground changes.

Needs

- Identify areas in which boreholes would pump fresher water.
- Need expert assistance in finding borehole locations and installing water systems.

Sub-District

- Same problems and needs mentioned by District Office.
- Want to install a reverse osmosis system.
- School and preschool have same water needs as the village.

T3.1.1A

- **Population**
Male: 398
Female: 362
Total: 760
-

Ban Ba Du Bu Deh, Moo 4, Koh Li Bong, Kan Tang

District Office

- The island isn't being supplied with enough water due to shipping difficulties. The villagers resort to buying their own drinking water. They have boreholes but the water pumped from them is brackish. The district office claims that the brackish water has become worse after the tsunami due to underground changes.
- Ban Ba Du Bu Deh School has the same water needs as the village.
- Ban Koh Li Bong Preschool located in Ban Ba Du Bu Deh has the same water needs as the village.

Needs

- Identify areas in which boreholes would pump fresher water.
- Need expert assistance in finding borehole locations and installing water systems.

Sub-District Office

- Same problems and needs mentioned by District Office.
- Want to install a reverse osmosis system.

- School and preschool have same water needs as the village.
- Health Station has same water needs.

Aid

- World Vision drilled borehole in the village.
- World Vision is in the process of donating an incinerator to minimize the impact of garbage on the environment. This project is still ongoing and completion is currently dependent upon World Vision's timeframe.

T3.1.1A

- **Population**
Male: 393
Female: 369
Total: 762
-

Ban Lang Khao, Moo 5, Koh Li Bong, Kan Tang

District Office

- 1 person died in tsunami
- The island isn't being supplied with enough water due to shipping difficulties. The villagers resort to buying their own drinking water. They have boreholes but the water pumped from them is brackish. The district office claims that the brackish water has become worse after the tsunami due to underground changes.
- Ban Lang Khao School has the same water needs as the village.

Needs

- Identify areas in which boreholes would pump fresher water.
- Need expert assistance in finding borehole locations and installing water systems.

Sub-District Office

- 1 person died in the village.
- 4 new homes were built.
- Same problems and needs mentioned by District Office.
- Want to install a reverse osmosis system.
- School and preschool have same water needs as the village.

T3.1.1A

- **Population**
Male: 289
Female: 276
Total: 565
-

Ban Sao Gaew, Moo 7, Koh Li Bong, Kan Tang

Provincial Health Office

- The Health Department received funding from the Governor's Office to build two toilets in the village.

District Office

- The island isn't being supplied with enough water due to shipping difficulties. The villagers resort to buying their own drinking water. They have boreholes but the water

- pumped from them is brackish. The district office claims that the brackish water has become worse after the tsunami due to underground changes.
- Ban Sao Gaew School has the same water needs as the village.

Needs

- Identify areas in which boreholes would pump fresher water.
- Need expert assistance in finding borehole locations and installing water systems.

Sub-District Office

- Same problems and needs mentioned by District Office.
- Want to install a reverse osmosis system.

Aid

- World Vision drilled borehole in the village.
- World Vision is in the process of donating an incinerator to minimize the impact of garbage on the environment. This project is still ongoing and completion is currently dependent upon World Vision's timeframe.

T3.1.1A

- **Population**
Male: 456
Female: 483
Total: 939
-

Village Survey

- **Tsunami**
 - Directly affected the island community of Koh Li Bong.
 - 5 died in Sub-District; approximately 800 families affected.
 - Destroyed businesses and homes.
 - 400 floating fish pens and 400 boats damaged.
- **Background**
 - Villages 1, 4, 5, and 7 are located on Koh Li Bong Island.
 - Island population is 3,026 [T3.1.1A]
 - 99% Muslim.
- **Aid**
 - World Vision has built wells throughout the island
 - 7 wells in Village 1; entire number unknown
 - One well built specially with water purifier which produces water people must buy. This well is run by the village headman. It is unclear whether this system is free from corruption.
 - Sub-District Office established a recovery program involving occupational training so that each village will receive funding by the sub-district to be put towards making a variety of products that will be sold to tourists
 - No such program was evident on the island villages of Koh Li Bong.
- **Water Sources**
 - Reservoir System
 - Located in Village 4.
 - Water is distributed to all villages on the island with the exception of Village 5.
 - Pipes are leaking.
 - Reservoir also connected to gravity fed water tank and water purifier; however, both are broken.
 - Wells.

- Water storage tanks.
- **Waste Treatment**
 - Septic tanks, which are emptied away from the wells.
 - Garbage is burned, but Village 1 empties their trash into the sea.
- **Needs**
 - Repair gravity fed water tower and water purifier in Village 4
 - Repair piping system carrying reservoir water throughout the island
 - Repair two large water storage tanks in Village 1
 - Distribute water tanks to be shared between houses (tanks should come with support stand and gutter system which will maximize water quantity).
 - Test well water for waste contamination.

HAD SAM RAN DISTRICT

Water and Sanitation Needs Assessment

DISTRICT OVERVIEW

Had Sam Ran District suffered mostly industrial losses as a result of the December 2004 tsunami. According to statistics from the District Office, 17 families were affected by the tsunami, 22 people sustained injuries, 7 floating fish pens were damaged, 130 boats were damaged, 6 vegetable farms and 1 chicken farm were damaged, and 169 nets were impaired. Also, the tsunami was detrimental in that it exacerbated the already dwindling water supplies of villages within this district.

Subsequent to the tsunami, the Provincial and District government acted on behalf of its inhabitants to improve the poor condition of affected villages. The District Office provided first aid bags and basic supporting funds to villages [T2.3.2A]. Funds were also given out to students, elderly, small businesses, and injured people following the tsunami. Refer to document T2.3.2A in order to view exact funding amounts and how they were allocated by different government offices. Also, according to the District Office, the Thai Red Cross provided first aid kits to every affected family. In addition, it is reported that the Department of Irrigation (Trang Province) is currently working to research and collect information regarding water and sanitation needs throughout the district in order to assess if water and sanitation projects are needed.

In our field research we initially chose to visit Had Sam Ran Sub-District due to its health record. In 2005, the sub-district documented 130 cases of diarrhea and it reported 56 cases in 2006 [T7.2A]. These numbers were the greatest among all the sub-districts. In terms of water and sanitation for Had Sam Ran District, we chose to do a more general overview by visiting the SAO for information because the conditions in the sub-district are very similar. Based on this interview, we were able to get a more detailed description of the most vulnerable villages within the district in terms of their water issues, and the SAO's assistant was able to take us on a more detailed tour of the problem-some villages.

Overall, we noticed specific trends in the area relating to water and sanitation. Water is a far greater issue than sanitation as the sub-district has a garbage collection system in place, which deposits garbage at a landfill site. Water in Had Sam Ran District is scarce and often brackish, especially during the dry season due to the districts proximity to the ocean. The gravity fed water systems in place throughout Had Sam Ran Sub-District, much like the water situations in other sub-districts, are overwhelmed by the amount of people using them on a daily basis. As a result, villagers must buy bottled water or risk the occasional periods of drought when the water system is without water to send out via the piping system.

Interestingly, unlike districts in Satun Province, villagers do not use water storage tanks often. When we suggested using water storage tanks at the different villages in Had Sam Ran Sub-District, the suggestion was often dismissed as an unreasonable and short term answer to this large problem. We are uncertain if there is a cultural association made with having water storage tanks that people from Had Sam Ran and other districts in Trang do not wish to utilize these potentially helpful contraptions.

POTENTIAL PROJECT SITES

Recommendation of Villages / Schools / Health Centers visited

The following villages and schools have been visited by D-TRAC and identified by as having water and sanitation needs. They are eligible for assistance under criteria specified in *The American Red Cross Tsunami Recovery Program Beneficiary Statement*.

Villages

- Ban Bak Bron Tah Dok, Moo 1, Had Sam Ran, Had Sam Ran
- Ban Laem Baw, Moo 5, Had Sam Ran, Had Sam Ran
- Ban Nah Rah Po, Moo 11, Had Sam Ran, Had Sam, Ran
- Ban Khok Kien, Moo 12, Had Sam Ran, Had Sam, Ran

Recommendation of Villages / Schools / Health Centers not visited, but in great need

Not applicable.

Recommendation of Villages / Schools / Health Centers not visited

D-TRAC also gathered recommendations and tips on needs present in other schools / villages throughout Had Sam Ran District. Due to time constraints, the team was unable to visit all recommended sites but has done its best to provide a well rounded view of the recovery situation in Had Sam Ran District.

Recommended Villages

- Ban Nah Cuhm Het, Moo 2, Dah Sae, Had Sam Ran
- Ban Na Khuan, Moo 5, Dah Sae, Had Sam Ran
- Ban Kok Ok, Moo 6, Dah Sae, Had Sam Ran
- Ban Bak Prok, Moo 2, Had Sam Ran, Had Sam Ran
- Ban Bok Hak, Moo 4, Had Sam Ran, Had Sam Ran
- Ban Tah Dob, Moo 7, Had Sam Ran, Had Sam Ran
- Ban Khuan Lon, Moo 9, Had Sam Ran, Had Sam Ran

VILLAGES NOT VISITED

This section lists villages and schools in need of water and sanitation that we did not visit in person. All information has been gathered through our surveys at the provincial, district and sub-district level. All our [surveys in Tah Pae District](#) can be found in [Appendix III](#) Error! Bookmark not defined.. [Surveys at the provincial level](#) can be found in [Appendix I](#) Error! Bookmark not defined..

Dah Sae Sub-District

District Office

- 7 people reported the loss of floating fish pens / baskets
- Sub-District office is one of the two tsunami evacuation sites for the sub-district
- 90% Muslim, 10% Buddhist
- 86 people reported the loss of boats and engines
- 159 people reported the loss of nets

Sub-District Office

- 95% Muslim, 5% Buddhist (*differs from District Office stats*)

Ban Nah Talay, Moo 1, Dah Sae, Had Sam Ran

District Office

- Ban Nah Talay School is one of the two tsunami evacuation sites for the sub-district

Sub-District Office

- “Tsunami Training Project” on-going in this village.
- Bah Nah Talay School has 12 toilets separated by sex; school has sinks but no soap.
- School uses water from its borehole (40-50m deep) but it pumps poor quality water. The sub-district needs technical knowledge and equipment to find a location that would pump clean, potable water.
- Ban Nah Talay Preschool has the same water needs as the village.

Ban Nah Chum Hed, Moo 2, Dah Sae, Had Sam Ran

District Office

- Ban Dah Sae School has approximately 10 toilets; unknown if it has sinks.

Sub-District Office

- “Tsunami Training Project” on-going in this village.
- Village uses water from its borehole (40-50m deep) but it pumps poor quality water. The sub-district needs technical knowledge and equipment to find a location that would pump clean, potable water.
- Ban Koh Rak School (located in this village) has the same water needs as the village.
- Ban Koh Rak School has 8 toilets separated by sex; school has sinks but no soap.

Ban Thung Plaew, Moo 3, Dah Sae, Had Sam Ran

Sub-District Office

- “Tsunami Training Project” on-going in this village.

Ban Dah Sae, Moo 4, Dah Sae, Had Sam Ran**District Office**

- Ban Dah Sae School has approximately 10 toilets; unknown if it has sinks.

Sub-District Office

- "Tsunami Training Project" on-going in this village.
 - Ban Dah Sae Preschool uses water from its borehole (40-50m deep) but it pumps poor quality water. The sub-district needs technical knowledge and equipment to find a location that would pump clean, potable water.
 - Ban Dah Sae School has 10 toilets separated by sex; school has sinks but no soap.
-

Ban Nah Khuan, Moo 5, Dah Sae, Had Sam Ran**Sub-District Office**

- Village uses water from its borehole (40-50m deep) but it pumps poor quality water. The sub-district needs technical knowledge and equipment to find a location that would pump clean, potable water.
-

Ban Kok Ok, Moo 6, Dah Sae, Had Sam Ran**Sub-District Office**

- Ban Kok Ok Preschool uses water from a borehole (40-50m deep) but it pumps poor quality water. The sub-district needs technical knowledge and equipment to find a location that would pump clean, potable water.
- Ban Kok Ok Health Station is experiencing the same water needs as the village's preschool (listed above).
- Village is predominantly Buddhist (5% of sub-district population is Buddhist)

- *Visited this Sub-District. Look for information on Village Survey Information Page.*

Dah Sae Sub-District

Ban Nah Chum Hed, Moo 2, Dah Sae, Had Sam Ran

District Office

- Village faces water shortages in the dry season
- Lacks a sufficient number of boreholes

Needs include either of the following options:

- Additional boreholes need to be drilled
 - Construction of a water system
-

Ban Dah Sae, Moo 4, Dah Sae, Had Sam Ran

District Office

- Village faces water shortages in the dry season
- Lacks a sufficient number of boreholes
- Ban Dah Sae School has approx. 10 toilets; unknown if it has sinks

Needs include either of the following options:

- Additional boreholes need to be drilled
 - Construction of a water system
-

Bah Wee Sub-District

District Office

- 60% Muslim, 40% Buddhist

VILLAGES / SCHOOLS VISITED

Had Sam Ran Sub-District, Had Sam Ran, Trang

GPS Coordinates:
47 N 0563664
UTM 0800230

Recommended by:
See Recommendation List

Supporting Documents:
T2.3.1A, T2.3.2A, T7.2A

Overview

The tsunami had an indirect affect on Had Sam Ran District in that the livelihoods of the district's inhabitants were negatively influenced. According to the Had Sam Ran District Office, Had Sam Ran Sub-District was the second most affected sub-district. Within the Had Sam Ran Sub-District, 44 people reported boat losses and 10 people reported loss of nets as a result of the tsunami.

Had Sam Ran Sub-District is comprised of twelve villages [T2.3.1A]. Geographically, Had Sam Ran Sub-District is located on the western coast of Thailand and can be characterized as swamp like area. The sub-district is 43% Muslim and 57% Buddhist.

Since the tsunami, the sub-district has received aid from the District, yet no NGOs have come with aid. According to the District Office, 2 evacuation locations have been created in the Had Sam Ran Sub-District; Wat Nong Saman Temple, Moo 3 and Had Sam Ran Sub-District Community Center. See the District Overview for a list of governmental support given to all of the sub-districts, including Had Sam Ran, after the tsunami.

The information regarding Had Sam Ran Sub-District from the District Office is vague but consistent with what we saw during our site visit of the sub-district. Essentially, the district office reports water shortages and a lack of bore holes in the villages from Had Sam Ran. The main difference in our data versus that of the District Office is that they report Villages 1, 2, 3, 4, 5, 7, and 9 as in most in need of water. In our interview with the SAO office; however, they reported Villages 1, 5, 11, and 12 as most in need of water assistance.

Unlike other village surveys we conducted for this project, for Had Sam Ran, we decided to a general sub-district overview because many of the villages within the sub-district suffer from the same water and sanitation problems. D-TRAC met with the SAO of Had Sam Ran District who explained the water and sanitation dilemmas of each sub-district. We then proceeded to visit each of these villages to observe the water situation and issues present.

The Had Sam Ran Sub-District utilizes a gravity fed water system as its main source of water. During the dry season there is a scarcity of water. Agriculture is usually ignored at this time so that the villagers will have enough water for drinking and other personal uses. If, during the dry season, water scarcity becomes a major problem, the SAO will go to a neighboring district 20 kilos away for water. Currently, the SAO's vehicle used to carry the water is broken.

In general the area is one that is surrounded by salt water; therefore, many of the sub-district's water supplies are tainted and considered brackish. As mentioned before, Villages 1, 5, 11, and 12 have the most urgent water issues at this time.

Village 1 is located adjacent to the ocean and therefore cannot obtain well water; therefore, this village is forced to get its water supply from village 2. Village 2 has 2 water towers. One of these water towers runs under a river via piping to village 1. There is overuse of this water tower. It is meant for about 80 people, yet 400-500 people use the water tower daily.

Village 5 suffers from an inadequate amount of water. The water tower in this village is meant for approximately 100 people, yet it is serving 400-500 people at this point in time. The pipes are in place to carry the water to homes, but the water is simply not reaching many of these homes. Also, due to the proximity of the ocean, the water tends to be brackish. Many people are forced to buy their drinking water in this village. We did see a public well in this village, which is used to get water manually. This water was very brackish.

Village 11 had a water system before the tsunami hit. Now, however, the water has a black and inky color. The SAO is still trying to understand what is causing this discoloration. The water from Village 11 is still being consumed by villagers; however, this costs the SAO a significant amount of money to keep clean. The water also has a brackish quality, which is not ideal for bathing. There is also the problem of an inadequate amount of water provided by the water tower, which is especially true during the dry season.

Finally, Village 12's well is 120 meters deep but not working at the moment. There is too much salt in the well. The SAO is attempting to figure out where they should move the well.

In terms of waste management, it is controlled in two manners. Some homes use septic tanks, which are collected and emptied by the SAO. The other wastewater system is a type of double tank, which excretes solids to one side and liquid to the other. Chemicals then break down the solids. Garbage is also under control. The SAO picks up garbage and it is then buried in a landfill. Some of the staff will then pick out recycles to sell.

Water and Sanitation Needs

In order to improve the water and sanitation conditions in this area, certain immediate and non-expensive actions can be taken which would improve the water conditions for villagers in this sub-district. First, the SAO truck used to collect water from a neighboring district during the dry season should be fixed for emergency reasons. Also, rainwater storage tanks should be issued in this sub-district. Unlike Satun Province, water storage tanks were not as common in Trang, and most villagers do not think of water storage tanks as a long term answer to their water shortage problems. Still, if more tanks are issued, people will have a greater quantity of water to last them further into the dry season.

More boreholes should also be drilled in this sub-district; however, they would need to be pre-planned in areas of the sub-district where fresh water is available.

It should also be noted that there is a natural spring in the sub-district, which has drinkable water, yet many villagers do not trust this water source and therefore do not use this water. If the sub-district would hold information meetings about this water source, perhaps more villagers would be trusting of the water from the natural springs.

The SAO and his assistant suggested a more long term solution, which would be to bring in water from the neighboring district, yet this would cost about 50 million Baht and is therefore difficult to fund.

Village Wish List

- SAO truck used to collect water from a neighboring district during the dry season should be repaired.
- Rainwater storage tanks issued.
- More bore holes drilled in areas where fresh water source available.
- Hold information meetings about this natural spring water source so that villagers are not hesitant to use this water source.
- Pipe in water from neighboring district.

Photographs of Facilities

Raw Data

Had Sam Ran Sub-District

Had Sam Ran Sub-District, Had Sam Ran District

District Office

- 44 people reported the loss of boats and engines
- 10 people reported the loss of nets
- Had Sam Ran Sub-District Community Center is one of the two tsunami evacuation sites for Had Sam Ran Sub-District
- 43% Muslim, 57% Buddhist

Ban Bak Bron Tah Dok, Moo 1, Had Sam Ran, Had Sam Ran

District Office

- Village faces water shortages in the dry season
- Lacks a sufficient number of boreholes

Needs include either of the following options:

- Additional boreholes need to be drilled
- Construction of a water system

Ban Bak Bron Tah Ok, Moo 2, Had Sam Ran, Had Sam Ran

District Office

- Village faces water shortages in the dry season
- Lacks a sufficient number of boreholes

Needs include either of the following options:

- Additional boreholes need to be drilled
- Construction of a water system

Ban Nong Saman, Moo 3, Had Sam Ran, Had Sam Ran**District Office**

- Wat Nong Saman is one of the two tsunami evacuation sites for Had Sam Ran Sub-District

Ban Bok Hak, Moo 4, Had Sam Ran, Had Sam Ran**District Office**

- Village faces water shortages in the dry season
- Lacks a sufficient number of boreholes

Needs include either of the following options:

- Additional boreholes need to be drilled
- Construction of a water system

Ban Laem Bor, Moo 5, Had Sam Ran, Had Sam Ran**Provincial Education Office**

- Ban Laem Bor is predominantly Muslim.

Ban Tah Dob, Moo 7, Had Sam Ran, Had Sam Ran**District Office**

- Village faces water shortages in the dry season
- Lacks a sufficient number of boreholes

Needs include either of the following options:

- Additional boreholes need to be drilled
- Construction of a water system

Ban Khuan Lon, Moo 9, Had Sam Ran, Had Sam Ran**District Office**

- Village faces water shortages in the dry season
- Lacks a sufficient number of boreholes

Needs include either of the following options:

- Additional boreholes need to be drilled
- Construction of a water system

Village Survey

- **Tsunami**
 - Indirect affect on Had Sam Ran District.
 - Livelihoods of the district's inhabitants were negatively influenced .
 - Second most affected sub-district.
 - 44 people reported boat losses.
 - 10 people reported loss of nets.
- **Background**
 - 12 Villages within Had Sam Ran Sub-District [T2.3.1A].
 - Geographically, swampy area.
 - 43% Muslim; 57% Buddhist.
- **Aid**
 - No aid from NGOs.
 - Two evacuation locations created in sub-district.
 - Wat Nong Saman Temple, Moo 3
 - Had Sam Ran Sub-District Community Center
 - See the District Overview for a list of governmental support given to all of the sub-districts, including Had Sam Ran.
- **Water Sources**
 - Gravity fed water systems, which are troublesome in 4 villages
 - Village 1 obtains water from a water tower in Village 2 because Village 1 in too close to ocean water to maintain a well.
 - Water tower meant for 80 people, yet used by 400-500 people.
 - Village 5 water tower meant for 100 people, yet used by 400-500.
 - Pipes are in place to carry the water to homes, but water is not reaching many homes.
 - Water tends to be brackish.
 - Many forced to buy their drinking water.
 - Village 11 produces water with black/ inky color
 - Expensive to maintain.
 - Goes dry in dry season
 - Tends to be brackish.
 - Village 12 has 120 meter well but not functioning at the moment.
 - Brackish water.
 - SAO attempting to figure out where to move well.
 - Manual wells.
 - Natural Springs.
 - Bottled Water.
 - SAO brings water in from neighboring district in dry season.
- **Waste Treatment**
 - Septic tanks, which are emptied by SAO.
 - Double tank contraption, which excretes solids to one side and liquid to the other. Chemicals then break down the solids.
 - Garbage collected by SAO and buried in landfill.
 - SAO staff picks out recycles to sell.
- **Needs**
 - SAO truck used to collect water from a neighboring district during the dry season should be repaired.
 - Rainwater storage tanks issued.
 - More bore holes drilled in areas where fresh water source available.
 - Hold information meetings about this natural spring water source so that villagers are not hesitant to use this water source.
 - Pipe in water from neighboring district.

S I K A O **D I S T R I C T**

Water and Sanitation Needs Assessment

DISTRICT OVERVIEW

Located on the western coastline within the Trang Province, Si Kao District sustained heavy damages as a result of the December 2004 tsunami. Statistics from the tsunami report that 5 people died in the event, 112 people were injured, 1,483 people were affected, and 1 person is missing. In terms of physical damage, 370 boats, 3 cars, 194 houses, 287 rais of land, and 493 crab/ fish traps were destroyed [T2.1.1B].

Following the tsunami, the Provincial and District government acted on behalf of its inhabitants to improve the poor condition of affected villages. The Provincial Office provided each affected family with 2,000 Baht. The district has planned evacuation routes and warning systems in tsunami-affected sub-districts. Loud speakers have been set up on Laem Macam School, Moo 5, Khao Mai Kaew and Had Bak Meng, Moo 4, Mai Fad. Also, according to Khao Keaw Sub-District, a budget of 8 million Baht was approved to build a small drinking water factory that will provide water for villages 3, 4, 5, and 7. Also, the Thai Red Cross provided occupational equipment. In terms of NGOS, World Vision donated basic provisions, Chai Pattana donated 5 fiberglass boats, and Aom Sin bank donated money to build Koh Glang School.

Due to time constraints D-TRAC was unable to visit Si Kao District. Based on information provided by the District Office Si Kao and the Sub-District Office of Khao Mai, there are still a significant amount of villages in this district that are in need of water and sanitation aid. According to the District Office, villages in Si Kao District are without Municipal water and therefore suffer from water shortages. Brackish water is also a problem. These villages, as well as others, also have sanitation issues as many villagers deposit waste water and trash directly into the sea. Also, if D-TRAC had more time to survey this district, we recommend Mai Fad Sub-District due to the higher number of health issues. In 2005, Mai Fad Sub-District documented 421 cases of diarrhea, 39 cases of malaria, and 26 cases of Dengue fever. In 2006, the sub-district reported 256 cases of diarrhea [T7.2A]. Also, the French Red Cross has brought aid to Khao Mai Sub-District.

POTENTIAL PROJECT SITES

Recommendation of Villages / Schools / Health Centers visited

The following villages and schools have been visited by D-TRAC and identified by as having water and sanitation needs. They are eligible for assistance under criteria specified in *The American Red Cross Tsunami Recovery Program Beneficiary Statement*.

Recommendation of Villages / Schools / Health Centers not visited, but in great need

Recommendation of Villages / Schools / Health Centers not visited

D-TRAC gathered recommendations and tips on needs present in other schools / villages throughout Si Kao District. The team was unable to visit all recommended sites but has done its best to provide a well rounded view of the recovery situation in Si Kao District.

Recommended Villages

- Ban Laem Sai, Moo 3, Khao Mai Kaew, Si Kao
- Ban Bang Kang Kao, Moo 4, Khao Mai Kaew, Si Kao
- Ban Laem Macam, Moo 5, Khao Mai Kaew, Si Kao
- Ban Thung Thong, Moo 7, Khao Mai Kaew, Si Kao
- Ban Mai Fad, Moo 3, Mai Fad, Si Kao
- Ban Bak Meng, Moo 4, Mai Fad, Si Kao
- Ban Chang Lang, Moo 5, Mai Fad, Si Kao
- Ban Na La, Moo 7, Mai Fad, Si Kao
- Ban Pru Jude, Moo 2, Baw Hin, Si Kao
- Ban Toh Pan, Moo 8, Baw Hin, Si Kao

VILLAGES NOT VISITED

This section lists villages and schools in need of water and sanitation that we did not visit in person. All information has been gathered through our surveys at the provincial, district and sub-district level. All our [surveys in Thung Wah District](#) can be found in [Appendix V](#) Error! Bookmark not defined.. [Surveys at the provincial level](#) can be found in [Appendix I](#) Error! Bookmark not defined..

Khao Mai Kaew Sub-District

Ban Laem Sai, Moo 3, Khao Mai Kaew, Si Kao

District Office

- Village experiences water shortages; cannot get water from the municipal system because the village sits close to the ocean.
- Village homes are built over the ocean, as well as the bathrooms. Waste falls directly into the sea.
- Recommended by district office: In dry season this village experience water shortages and the water it *does* use is brackish.
- Ban Laem Sai School experiences water shortages and needs additional toilets to be constructed.

Sub-District Office

- Villagers lost boats and fishing equipment.
- 3 houses damaged.
- The sub-district will be funding the construction of a small drinking water factory that will supply water to the village.
- The village has a problem with litter. Garbage and waste water drains untreated into the sea, and the sub-district doesn't have an incinerator.
- Sub-District office constructed wells in this village but they're unusable because the water is brackish.
- Ban Laem Sai School experiences water shortages despite having water storage facilities. Bathrooms are damaged and old.
- Standing water is present in the village.

Ban Bang Kang Kao, Moo 4, Khao Mai Kaew, Si Kao

District Office

- Village experiences water shortages; cannot get water from the municipal system because the village sits close to the ocean.
- Village homes are built over the ocean, as well as the bathrooms. Waste falls directly into the sea.

Sub-District Office

- Villagers lost boats and fishing equipment.
- Sub-District installed a radio system and loud speaker in the village post-tsunami.

- The sub-district will be funding the construction of a small drinking water factory that will supply water to the village.
- Ban Bang Kang Kao School experiences water shortages despite having water storage facilities. Bathrooms are damaged and old.

Ban Laem Macam, Moo 5, Khao Mai Kaew, Si Kao

District Office

- Village experiences water shortages; cannot get water from the municipal system because the village sits close to the ocean.
- Village homes are built over the ocean, as well as the bathrooms. Waste falls directly into the sea.
- Recommended by district office: In dry season this village experience water shortages and the water it *does* use is brackish.
- Ban Laem Macam School experiences water shortages and needs additional toilets to be constructed.

Sub-District Office

- Villagers lost boats and fishing equipment.
- Sub-District installed a radio system and loud speaker in the village post-tsunami.
- The sub-district will be funding the construction of a small drinking water factory that will supply water to the village.
- The village has a problem with litter. Garbage and waste water drains untreated into the sea, and the sub-district doesn't have an incinerator.
- Village has two wells that are 3m wide by 4m deep.
- Sub-District office constructed wells in this village but they're unusable because the water is brackish.
- Ban Laem Macam School received water and sanitation assistance from the French Red Cross.

Ban Thung Ki Lek, Moo 6, Khao Mai Kaew, Si Kao

Sub-District Office

- Villagers lost boats and fishing equipment.

Ban Thung Thong, Moo 7, Khao Mai Kaew, Si Kao

District Office

- Village experiences water shortages; cannot get water from the municipal system because the village sits close to the ocean.
- Village homes are built over the ocean, as well as the bathrooms. Waste falls directly into the sea.
- Recommended by district office: In dry season this village experience water shortages and the water it *does* use is brackish.
- Ban Thung Thong School experiences water shortages and needs additional toilets to be constructed.

Sub-District Office

- Villagers lost boats and fishing equipment.
- Sub-District installed a radio system and loud speaker in the village post-tsunami.
- The sub-district will be funding the construction of a small drinking water factory that will supply water to the village.
- The village has a problem with litter. Garbage and waste water drains untreated into the sea, and the sub-district doesn't have an incinerator.
- Villagers use Thung Thong reservoir but the water isn't clean because residents wash their cars and clothes in it.
- Sub-District office constructed wells in this village but they're unusable because the water is brackish.

Mai Fad Sub-District

Ban Mai Fad, Moo 3, Mai Fad, Si Kao**District Office**

- Village experiences water shortages; cannot get water from the municipal system because the village sits close to the ocean.
 - Village homes are built over the ocean, as well as the bathrooms. Waste falls directly into the sea.
-

Ban Bak Meng, Moo 4, Mai Fad, Si Kao**District Office**

- Village experiences water shortages; cannot get water from the municipal system because the village sits close to the ocean.
 - Village homes are built over the ocean, as well as the bathrooms. Waste falls directly into the sea.
-

Ban Chang Lang, Moo 5, Mai Fad, Si Kao**District Office**

- Village experiences water shortages; cannot get water from the municipal system because the village sits close to the ocean.
 - Village homes are built over the ocean, as well as the bathrooms. Waste falls directly into the sea.
-

Ban Nah La, Moo 7, Mai Fad, Si Kao**District Office**

- Village experiences water shortages; cannot get water from the municipal system because the village sits close to the ocean.
- Village homes are built over the ocean, as well as the bathrooms. Waste falls directly into the sea.

Baw Hin Sub-District

Ban Pru Jude, Moo 2, Baw Hin, Si Kao

District Office

- Village experiences water shortages; cannot get water from the municipal system because the village sits close to the ocean.
 - Village homes are built over the ocean, as well as the bathrooms. Waste falls directly into the sea.
-

Ban Toh Pan, Moo 8, Baw Hin, Si Kao

District Office

- Village experiences water shortages; cannot get water from the municipal system because the village sits close to the ocean.
- Village homes are built over the ocean, as well as the bathrooms. Waste falls directly into the sea.