

**Resource Development International – Cambodia**



**Proposal to Deliver Water and Sanitation Products to Support the  
Tonle Sap Environmental Management Project**

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## Background

In the wet season, the Boeung Tonle Sap (Tonle Sap Lake) is one of the largest freshwater lakes in Asia, swelling to an expansive 12,000 km<sup>2</sup>. During the dry half of the year, the lake shrinks to as small as 2,500 km<sup>2</sup>, draining into the Tonle Sap River, which meanders southeast, eventually merging with the Mekong River.

Boeung Tonle Sap is also an important commercial resource, providing more than half of the fish consumed in Cambodia. In harmony with the specialised ecosystems, the human occupations at the edges of the lake are similarly distinctive – floating villages, towered stilted houses, huge fish traps, and an economy and way of life deeply entwined with the lake, the fish, the wildlife and the cycles of rising and falling waters.

There are five Cambodian Provinces situated around the Boeung Tonle Sap: Kampong Thom, Siem Reap, Battambang, Pursat, and Kampong Chhnang.

## Summary of the Project

The Tonle Sap Environmental Management Project (TSEMP) focuses on developing and supporting Community Fisheries (CFs) in the five provinces around the Boeung Tonle Sap (as well as Banteay Meachay province as a lower priority). Within each province there are a number of Community Fisheries (CFs) working within the local community under a committee structure. CFs are supported by a single Project Implementation Unit (PIU), and UN FAO staff in each Province.

The next stage of the TSEMP project is to support the CFs with activities that improve quality of life.

Resource Development International – Cambodia (RDI) proposes to support this work through the delivery of four water and sanitation projects:

1. Water filter provision, use and maintenance education and supply chain support;
2. School rain water collection and handwashing/sanitation systems;
3. Provision of appropriate latrines; and
4. Soap manufacture and selling techniques training and establishment.

RDI has extensive experience in the consultation, planning, construction, logistics, education, and follow up required for delivering each of these projects as described below.

## General Approach

### *Sequential Delivery*

RDI has extensive experience in delivering projects sustainably within communities and clearly understands the time and resource commitments required to deliver each of the projects it proposes to provide. RDI recognises that without providing sufficient educations, and ongoing supply chain support, the ability of communities to successfully take up appropriate technologies can be severely compromised.

Therefore RDI proposes to initially deliver projects to each province in sequence (rather than in parallel). This will ensure there is a strong capacity to deliver to each community; that lessons learnt from one community can be used to add strength to delivery in subsequent communities; that the RDI scheduling is feasible and that RDI continues to deliver its breadth of projects.

#### ***Use of existing RDI Teams***

RDI has existing teams, primarily of Cambodian staff, that are trained and experienced in delivering each of the projects proposed. These teams will deliver the projects, and may be supplemented by additional staff – who will be given training and therefore skills development – as required.

#### ***Consideration of self investment***

RDI's technologies are developed to ensure affordability for community members. They support the principals of self investment by recipients of the technologies. This principal encourages care to be taken with the technology, maintenance activities to be undertaken as required, and longer use of the technology as it has been valued by the recipient.

Additionally, by making products pay for themselves, a sustainable supply of the technology can be established with local businesses and suppliers to ensure spare parts, replacement technologies and additional items become reliably available in the long term.

RDI believes there are opportunities for establishing self investment principles into the projects and is happy to discuss further, including options for non monetary self investment.

#### ***Selection of Provinces***

RDI will discuss with TSEMP project officers their priorities for selecting an initial province for the implementation. RDI is most active in Kandal, Prey Veng and Takeo and welcomes the opportunity to engage more closely with the provinces of the Boeung Tonle Sap. Key factors in selecting the initial province include:

- the priorities of the TSEMP
- level of need and historical level of support
- capability to take up the technology
- a variety of CFs that represent a breadth of communities and conditions and therefore serve as a good foundation for future implementation

#### ***Selection of CFs***

Once a province has been selected RDI will engage with the Project Implementation Unit of that province to ensure that appropriate CFs are chosen based on the considerations of: greatest need, sufficient capacity – including human capacity and access to required resources and supply chains (high likelihood of success).

Greater than 5 CFs may be selected at this stage to allow for the exclusion of a particular CF if at the scoping stage if it is determined to be inappropriate.

Some of the projects may need to utilise different CFs, for example the water filters may be appropriate for all CFs in a province, however latrines and rainwater collection will require solid ground for installation which may not be possible in all CFs due to the flooding of the lake.

# 1. Ceramic water filter provision, education and supply chain support

## Project Requirements

The TSEMP project brief specified the provision of:

- 20 water filters per Community Fishery which equates to
- 100 filters per province, and
- 500 filters for the 5 Tonle Sap provinces.

Filters are likely to be delivered at the household level.

## Description of RDI's Ceramic Water Filters

RDI's Ceramic Water Filters are locally constructed from clay, laterite, and rice husks. Ceramic water filters work through: the physical 'straining' of dirt and bacteria out of the water as it passes through small pores in a ceramic substrate of the filter element, and the chemical action of silver paint, impregnated into the clay, that acts as a biocide to kill microbes. Laterite has recently been added to RDI's filters to provide some viral and arsenic binding qualities.

## Implementation of the project

RDI proposes to deliver this project using the following activities:

### *a. Scoping and Consultation Visit*

An RDI team (approximately 3 staff) will visit CFs, or CF options to **scope and consult** on:

- The type and quality of source water(s) used in the CF, both during the wet and the dry season, to ensure water filters are appropriate (water contaminated with arsenic or other chemicals cannot be successfully treated with ceramic water filters); and
- Mechanisms for filter distribution in the short and long term
  - eg through school/teacher, business, district market ensuring suitable capacity as ongoing trainers educators
  - accessibility for ongoing supplies to be delivered and managed
- Consider the appropriate self investment strategy for example – a strategy that encourages initial uptake by offering 40 filters at half price (US \$5 each), or 30 filters at \$7 each. The message would be made clear that only the set number would be available at that price, and that future filters would be \$10 each.

This will also form an initial opportunity to discuss and educate key community members on the value of the filters.

### *b. Manufacture filters*

- RDI will manufacture the required number of its filters, including an initial supply of spare parts and replacements

### *c. Education and distribution of filters*

RDI will revisit the selected CFs and:

- Provide community education on the purpose of the filters, how they work and how they are used – through its established education programme – including through use of multi media – video vans or cases, pictures, and demonstrations.

- Provide targeted education of distributors to ensure they have a clear understanding of the technology and its risks, can answer questions, and are clear on the distribution strategy in the short and long term.

#### **d. Follow up education and intervention**

RDI will revisit CFs within 12 months to ensure correct usage of filters and to discuss and manage any concerns that have arisen in the community.

## **2. School rainwater collection and handwashing/sanitation systems**

### **Project Requirements**

The TSEMP project brief specified the provision of rainwater collection systems; and hygiene and sanitation education for:

- 1 school per CF which equates to;
- 5 schools per province; and
- 25 schools for the 5 Tonle Sap Provinces

### **Description of RDI's Cylinder Tank System**

A 30,000 litre rainwater tank can harvest enough water to get a typical large Cambodian school through the dry season. The process for establishing a water tank system involves:

- Gutters added to the roofs of nearby buildings (where needed, a metal roof is offered);
- PVC pipe run from the gutter to the cylinder tank;
- During the rainy season, the tank fills up;
- Water is diverted to hand washing stations, into various outdoor filters for drinking water, toilets, or miscellaneous water spigots;
- (Depending on the location, a series of clay filters or the ultra-violet light filtration system may be employed to further purify the drinking water.)
- Clean water is used!

The tanks store huge volumes of low-risk drinking water giving entire schools access to what would be otherwise wasted high quality water. The enclosed design makes it hard for mosquito larvae and solids to contaminate the tank; and light cannot get in which prevents algae growth and reduces food supply for dangerous pathogens.

### **Implementation of the project**

RDI proposes to deliver this project using the following activities:

#### **a. Scoping and Consultation Visit**

An RDI team (approximately 3 staff) will visit CFs, or CF options to **scope and consult** on:

- The appropriateness of possible schools for implementation of rainwater collection and handwashing/sanitation systems including:
  - sufficient area of roof collection, the average rainfall of the area, the room for tanks (which will constrain size of tanks), water consumption at the school
  - the capacity and commitment of school staff to maintain the system and reinforce handwashing/sanitation education;
  - the need of the school (compared with others)
  - the accessibility of the school for delivering materials
- Scope the materials that will be required including guttering, cleaning materials for short and long term.

This will also form an initial opportunity to discuss and educate key community members on the value of clean drinking water and sanitation.

#### ***b. Purchase and preparation of materials***

RDI will purchase required materials including:

- Cement, sand, plastic fittings, first flush system, guttering

#### ***c. Construction and education visit***

An RDI team of 6 construction and educators will visit each school and:

- Transport materials to the site prepare support structures
- Prepare guttering
- Construct the water tanks
- Test the system

RDI will seek to gain support of the school community and may use some local laborers.

RDI will also undertake education on handwashing/sanitation

- Provide school education on the value of handwashing and sanitation – through its established education programme – including through use of multi-media – video vans or cases, pictures, demonstrations.
- Targeted education of school teachers will also ensure they have a clear understanding of the technology, the risks, can answer questions, are clear on the distribution strategy in the short and long term.
- Links will be drawn to the soap making project.

#### ***d. Follow up education and intervention***

RDI will revisit schools within 12 months to ensure correct usage of the rainwater collection system and to discuss and manage any concerns that have arisen in the community.

### **3. Provision of appropriate latrines**

#### **Project Requirements**

The TSEMP project brief specified the provision of:

- 10 latrines per Community Fishery which equates to
- 50 latrines per province, and
- 250 filters for the 5 Tonle Sap provinces.

It is proposed to implement latrines at the household level.

#### **Description of RDI's Organic Latrines**

RDI has an extensive history installing organic latrines. These latrines consist of two cylindrical holes. One hole is the active side, the other remains unused for a time. A rectangular concrete base is placed over the active hole. In order to keep costs down, the base has no walls but is fitted with four PVC pipes from which modesty screens can be hung. A lid to reduce ambient odor and insect attraction is also provided. A family can use this active side - being careful to sprinkle ash into the hole after each use - until it is filled (about 18 months.) At that time, the base is moved over the other hole which now becomes active. A round concrete lid is placed over the exposed hole and the contents are allowed to compost into usable fertilizer. When the second hole becomes filled, the process is reversed.

## Implementation of the project

RDI proposes to deliver this project using the following activities:

### *a. Scoping and Consultation Visit*

An RDI team will visit CFs and **scope and consult** on:

- The suitability of the organic latrine for the selected CFs (or CF options) – including the need for the latrines to be installed in dry ground above the highest point to which the groundwater may rise.
- Discuss the latrines with community groups and consider how to select where the latrines would be installed, and the willingness of community for uptake.
- Consider the distribution strategy including the option for monetary or other forms of self investment by technology recipient
- Consider capacity of recipients to maintain and manage the latrines.

### *b. Purchase and preparation of materials*

RDI will purchase required materials including:

- Cement, sand, plastic fittings, piping

### *c. Construction and education visit*

An RDI team of 6 construction workers and educators will visit each CF and:

- Meet with and educate community groups on the role of the latrines for individual and community health
- Install the latrines at selected sites with community involvement – this will ensure they are aware of how the latrines are constructed and therefore have greater appreciation for maintenance requirements
- Provide recipients of the latrines with additional targeted education to ensure they are aware of management and maintenance requirements.
- Initiate discussions with community members who may seek additional latrines in the future

### *d. Follow up education and intervention visit*

RDI will revisit CFs within 12 months to ensure correct usage and maintenance of the latrines collection system and to discuss and manage any concerns that have arisen in the community.

RDI may also be able to undertake additional installations at this time.

## 4. Soap manufacture and selling techniques training and establishment.

### Project Requirements

The TSEMP project brief specified the provision of training to:

- 1 women's group/community group per CF which equates to
- 5 groups per province and
- 25 groups in the 5 Tonle Sap Provinces.

It is proposed to provide the initial materials for manufacture under the project, and to support the groups in accessing raw materials for future batches through existing supply chains.

## Description of RDI's Treatment Soap Project

Lice and scabies are an ever present health problem amongst rural Cambodians. Until recently, however, treatment soap was expensive and hard to find. RDI has developed its own recipe for treating both lice and scabies in one bar of soap. RDI has found suppliers for the ingredients that can allow the soap to be sold much, much cheaper than previously available and in large enough quantities to be readily available to the public. Through constant testing and trial and error, RDI has succeeded in developing a much needed product.

By teaching this soap making technique to rural villagers, this project can be self-sufficient financially, and actually create income for those who do not have a marketable trade skill.

## Implementation of the project

RDI proposes to deliver this project using the following activities:

### *a. Scoping and Consultation Visit*

The RDI team will visit CFs **scope and consult** on:

- appropriate groups of 1-5 women for training in each CF
- consider employment needs, business planning, respect in the community (existing and to improve), opportunities for sales
- ensure appropriate accommodation and facilities are available for the manufacturing process
- hold initial meeting with identified group, gain commitment to the project and hold discussion on purpose and output,
- finalise selection of the appropriate group
- scope out appropriate supply chain options for the community group for the medium to longer term.

### *b. Purchase and preparation of materials*

RDI will purchase required materials including:

- Components of the soap, containers, moulds.

### *c. Establishment and education visit*

An RDI team will visit the selected groups and:

- Assist them to set up of factory,
- Provide training to the group on purpose and value of the soap, directions for its use, its manufacture and selling techniques.

### *e. Follow up education and intervention visit*

RDI will revisit CFs within 12 months to ensure correct manufacture and successful sales and distributions of the soaps and to discuss and manage any concerns that have arisen in the group.

### About RDI

RDI-Cambodia is a US registered, private, non-profit organization working internationally.

We are dedicated to serving the people of Cambodia in dynamic ways. RDI has combined technology, education, and heart in order to help the people of Cambodia. Each project stands independently, but the entire range of projects form a unique and strong outreach program that works best as a sum of all its parts.

RDI Delivers a breadth of projects including:

1. Water
  - a. Water purification – construction and distribution of water filters (25,000 distributed in 2006)
  - b. Arsenic testing and mapping to provide information for research and water management
  - c. Rainwater harvesting – through construction of water tanks
  - d. Pumps
  - e. Latrines – construction, education
  - f. Water quality surveys including the development of a simple and clear Drinking Water Quality Index
  - g. Water testing in its own laboratories
2. Hygiene Education
  - a. Clean water, nutrition, dental and germs
  - b. Use of puppets, production of videos and targeted karaoke presentations,
  - c. Use of mobile video trucks and suitcases
  - d. Strong educational team
3. Health
  - a. Education
  - b. Home Visits
  - c. Traditional medicine.

## Attachment

Proposed Budget per Province as Requested.

LOCATION	WATER FILTERS	RWH TANKS	LATRINES	SOAP
Kampong Thom	100	5	50	5
Siem Reap	100	5	50	5
Battambang	100	5	50	5
Pursat	100	5	50	5
Kampong Chhnang	100	5	50	5

COSTS:

Water Filters: (20 delivered to each CF location)	
100 units @ \$8 per unit	= \$800
Transportation	= \$100
Educational teams 5 villages	= \$1,000
<b>TOTAL COST PER PROVINCE</b>	<b>= \$1,900</b>

RWH Tanks:

Materials per tank	= \$ 3,300
Housing and meals	= \$ 400
Fuel	= \$ 300
Labor	= \$ 195
Educational team	= \$ 1,500
<b>TOTAL COST PER TANK PER PROVINCE</b>	<b>= \$5,695 x 5 locations = \$28,475</b>

Latrines: 10 families per community	
Latrine Materials	= \$ 35
Labor	= \$ 10
Material shipping	= \$ 10
Educational materials	= \$ 5
Educational team	= \$ 500
<b>TOTAL COST PER LATRINE PER PROVINCE</b>	<b>= \$60 x 50 units+ \$500 = \$ 3,500</b>

Soap Making Class (1 class per Province)	
1 session per province	= \$ 350
Materials for each group	\$ 150 per group x 5 CFs = \$ 750
<b>Total</b>	<b>= \$ 1,100</b>

Scoping teams	= \$ 450
Project Coordinator	= \$1,000
Administration Cost	= \$2,000

**Average cost per Province for 5 construction sites and 1 teaching site**

**\$38,425**