PROMOTING MATERNAL AND CHILD HEALTH THROUGH WATER, SANITATION AND HYGIENE IN CAMBODIA

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Abstract

Safe drinking water and adequate sanitation and hygiene behaviors are important elements for better human health. Unfortunately, many people suffer or die from waterborne disease because of unsafe drinking water, inadequate sanitation and poor hygiene. Women and children are especially vulnerable groups due to their greater risk of disease. An estimated 2,000 children under age of five die every day from diarrhoea diseases and of these some 1,800 deaths are linked to water, sanitation and hygiene. Women who lack safe water are more prone to illnesses, such as hookworm infestation, which when it occurs during pregnancy, is linked to low birth weight and slow child growth. The World Health Organization (WHO) suggests that 94% of diarrheal disease deaths are preventable through sanitary modification and interventions. Some 3.9 million of those without access to safe drinking water in Cambodia are poor and also live in poor rural area. These rural areas have a majority of people who are poor. One such area is Siem Reap. This paper presents a grant proposal for a project to decrease morbidity and mortality due to water-borne disease through the provision of potable water from protected springs and the construction of latrines and hand wash facilities in communities and schools in Siem Reap, Cambodia.
Abbreviations

CDHS       Cambodia demographic and health survey
HDI        Human Development Index
HWTS       Household water treatment and storage
JMP        Joint Monitoring Program
MCH        Maternal and Child Health
MDG        Millennium Development Goals
O&M        Operation and Maintenance
ORT        Oral Rehydration Therapy
UN         United Nations
UNICEF     United Nations Children’s Fund
WaSH       Water, Sanitation and Hygiene
WHO        World Health Organization
Access to water and sanitation services is considered a right of all people. Advocates for water, sanitation and hygiene link inadequate access to potable water and poor sanitation with poverty because it affects negatively many fundamental aspects of people’s lives. While economic growth has increased in recent years, Cambodia remains one of the poorest countries in the world. People in rural areas of Cambodia still face severe poverty, lack of health care, and low levels of education and economic opportunity, and other resources. The majority of rural villages in Cambodia have no source of clean drinking water and inadequate sanitation. Without access to clean water, Cambodians are forced to rely on gathering dirty water from ponds, or carrying water in plastic containers from rivers far away from their homes.

This project will support Trei-Nhoar communities of Puok district of Siem Reap province in obtaining access to safe drinking water, adequate sanitation, and to practicing key hygiene behavior, especially handwashing with soap at critical times. The project
assumes that an improvement in these services and hygienic behaviors will lead to better maternal and child outcomes and improvements in quality of life. This project has targeted its intervention to ensure benefits to the poorest and most vulnerable people, especially households who have children and pregnant women.

**Background**

Access to water and sanitation is a fundamental human right and essential for health and dignity. In 2013, mortality associated with diarrheal disease was estimated at 760,000 deaths annually, with children under-five as the most vulnerable. The United Nations (UN) adopted the Millennium Declaration in September 2000, which committed UN member states to support needy countries in reaching eight Millennium Development Goals (MDG) by 2015. Target 7C aims to halve, from 2000 levels, the fraction of people without access to safe drinking water and basic sanitation by 2015. In March 2012, WHO announced the world had met the MDG target for clean water based on access to improved water sources and supplies(Figure 1). According to the 2014 report from the Joint Monitoring Program (JMP) on the Progress on Drinking Water and Sanitation, since 1990, over 2 billion people have acquired access to drinking water and almost 2 billion people gained access to improved sanitation.

Figure 1. Trends in global drinking water and sanitation coverage (%), 1990-2012.
However, based on the microbial quality of household water, much of the improved water counted as providing access to “safe” water is microbi tally contaminated and therefore unsafe. Regardless of whether or not the MDG target was met globally, access to safe water and proper hygiene is still a big problem in many countries. It is estimated that 780 million people worldwide still lack access to improved drinking water even more lack access to microbiologically safe water and 2.5 billion people are without adequate sanitation facilities. Some countries such as Cambodia, Ethiopia and Nepal experienced the greatest improvements in access. However, the greatest achievements in access have been made in urban areas, leaving access to drinking water in rural areas lagging behind, especially among the rural poor.

The WHO estimates 6.3 percent of all deaths are caused by limited access to: 

Source: Complied by CRS from UNICEF and WHO, Progress on Sanitation and Drinking Water. 2014 Updates, pp 6
• Safe drinking water;
• Improved sanitation facilities and hygiene practices;
• Water management practices that reduce the transmission of water-borne disease

Water advocates link inadequate access to potable water and sanitation with poverty because it affects negatively many aspects of people’s lives. These include:

Health—Many infectious diseases, including diarrhea and several neglected tropical diseases are contracted through ingestion of or contact with microbially contaminated water and soil and cause millions of deaths and illnesses annually.  

Education—Women and children are often tasked with collecting water, which is a daily chore that consumes and energy. While collecting water, women are unable to do other productive activities and children miss school. Girls who are in menses may drop out of school because of lack of access to sanitation facilities at school. Access to clean water at or near home can minimize the amount of time children spend collecting water and allow more time for education. At the same time, availability of sanitation facilities at schools can help with school completion rates among girls.

Children—Children with poor nutritional status and overall health, as well as those exposed to poor environmental conditions, are more susceptible to severe diarrhea and dehydration than healthy children. Children are also at greater risk than adults of life-threatening dehydration since water constitutes a greater proportion of children’s body weight. Young children use more water over the course of a day given their higher metabolic rates, and their kidneys are less able to conserve water compared to older children and adults.
Child mortality and WaSH

An estimated 2,000 children under age of five die every day from diarrhea diseases and of these some 1,800 deaths are linked to water, sanitation and hygiene. 11 Globally, the two leading causes of death of children (1 month – 5 years old) are pneumonia and diarrhea. Both are addressed by improving the use of safe water and adequate sanitation, as well as good hygiene practices. 12

It is estimated that 50 percent of global malnutrition is due to waterborne disease such as diarrhea and intestinal worms, and 25 percent of stunting can be attributed to five or more episodes of diarrhea before two years of age. 13 Of the 555 million preschool children in developing countries, 32 percent are stunted and 20 percent are underweight. This leads to long-term cognitive deficits, poorer performance in school, fewer years of completed schooling, and lower adult economic productivity. 14

Maternal Health and WaSH

Countries with high maternal mortality are those where the burden of infectious disease remains high, and health education and primary healthcare are difficult to access. Improving access to WaSH, and providing expectant mothers with basic services and accurate hygiene information are vital to reduce maternal mortality rates and for ending preventable child deaths. 15

Collecting and carrying water while pregnant can cause difficulties in pregnancy and other reproductive health consequences, such as uterine prolapse. 16 Women who lack safe water are more prone to WaSH-related illnesses, such as hookworm infestation, which, when occurring during pregnancy, is linked to low birth weight and slow child growth, 17 as well as hepatitis. 18 In developing countries, an estimated 10-15 percent of
maternal deaths are due to infections that can be directly linked to unhygienic conditions during labor and birth, at home or in facilities, and to poor hygiene practices in the six weeks after childbirth.  

**Why Cambodia?**

With just under 15 million people, Cambodia is a small country in Southeast Asia. It shares borders with Vietnam, Thailand and Laos (Figure 2). With just under 15 million people, Cambodia is a small country in Southeast Asia. It shares borders with Vietnam, Thailand and Laos (Figure 2).  

Figure 2. Cambodia Map

![Cambodia Map](source: www.shaozhionthenet.com)

While economic growth has increased in recent years, Cambodia remains one of the poorest countries in the world. Rural areas of Cambodia still face severe poverty, lack of health care, and low levels of education, economic opportunity, and resources. In
2013, Cambodia ranked 138th out of 199 countries assessed in the HDI, a measure of well-being composed of education, income and health. In under-five mortality (deaths of children under five mortality per 1,000 live births) Cambodia ranked 138th out of 199 countries assessed in the HDI. 21

Current diarrhea and WaSH situation in Cambodia

Cambodia stands out for its achievements in increasing access to improved drinking water sources and sanitation in urban areas. Urban improved drinking water sources increased by 62 percentage points, from 32 percent in 1990 to 94 percent in 2012, and the gap between wealth quintiles was reduced. Gains in rural sanitation are also impressive. It increased 25 percentage points, from 0 percent in 1990 to 25 percent, but with the wealthy benefiting more than the poor. 5

Unsafe drinking water inadequate sanitation and poor hygiene are linked to diarrheal disease. Dehydration caused by severe diarrhea is a major cause of morbidity and mortality among young children, although the condition can be treated easily with oral rehydration therapy (ORT). 22 According to the Cambodia Demographic and Health Survey (CDHS), in 2010, 15 percent of all children under age five had diarrhea, and 2 percent had diarrhea with blood in the two weeks preceding the survey. Three in five children with diarrhea were taken to a health provider. Fifty-three percent of children with diarrhea were treated with some kind of oral rehydration therapy (Figure 2).22

Figure 2: Prevalence of diarrhea and diarrhea treatment, Cambodia 2000-2010
Some 3.9 million of those without access to safe drinking water in Cambodia are poor and live in rural areas. Without safe water and adequate sanitation and hygiene, children (41% of the population) are especially vulnerable to water-borne disease.²³

**Program overview**

This project will be a more focused and strategic effort to improve WaSH for underserved rural populations, especially mothers and children, based on the mobilization of available options to achieve this goal by the implementing of new or improved WaSH programs and initiatives that are carried out by particular stakeholders and donors such as UNICEF.

Trei-Nhoar commune is one of the poorest communities in Puok district of Siem Reap Province. This project will be implemented in the Trei-Nhoar communities of Puok district of Siem Reap province to obtain access to safe drinking water, adequate sanitation, and to practice key hygiene behavior. The total population of the community
is 11,071 people and there are 1,844 households in all ten villages of the community. In a recent site visit to the project area, the project team surveyed 50 households and observed the 20.44 percent of them do not have safe drinking water sources and 19.22 percent of them do not have adequate sanitations.

There are five primary schools, one secondary school, and one high school. Sixty percent of primary schools do not have access to clean water and 0 percent of secondary and high schools do not have access to clean water.

**Goal:**

The goal of the project is to decrease morbidity and mortality due to water-borne disease through the provision of potable water from protected springs and the construction of latrines and hand wash facilities reinforced by community–based water and sanitation education to 11,071 people in Siem Reap.

**Objectives:**

1. Increase access to potable water and improved sanitation: 11,071 people (1,884 households) reporting access to potable water and improved sanitation by May 2016.

2. Improve sanitation and hygiene conditions in ten villages through the construction and subsequent adoption of latrines: Each village has one accessible and protected spring, one piped water supply system and fifty latrines. Priority will be accorded to those families who have children or pregnant women.

3. Improve toilets and hand wash facilities in primary schools, secondary and high schools: Each school will have 6 hand wash facilities and 6 toilets by May 2016.
4. Promote behavioral changes with respect to proper hygiene associated with the identification of safe handling of water and appropriate domestic water storage by training ten community volunteers and seven teachers, who will in turn train community members and students: 95% of community members and students obtain hygiene education by May, 2016.

**Project Beneficiaries**

The beneficiaries of this initiative are the following:

- Primary, secondary and high school student who will benefit from improved sanitation services at school and at home leading to reduced diarrhea (~100 pupils x 7 schools = 700 pupils beneficiaries).
- Families (particularly mothers and care givers) who benefit from improved water (~1,884 households).
- Families (particularly mothers and care givers) who benefit from improved sanitation facilities (~500 families)
- Families (particularly mothers and care givers) who benefit from improved household facilities (handwashing stations) for handwashing with soap at critical times.
- Ten villages will receive hygiene education through community volunteers and print materials.
- Primary, secondary and high school students will receive hygiene education through schoolteachers and print materials.

**Program Activities**
Objective 1: Increase access to potable water and improved sanitation for 11,071 people (1,884 households).

Output:

Improved water access/supply points made up of ten protected artesian springs and ten piped water supply systems. These water access/supply points are expected to serve 1,884 households or 11,071 beneficiaries.

Activities:

1) Mobilization of community volunteers for the provision of labor: The community will provide manual labor, stones and sand for construction. The project input will be limited to the purchase of cement, payment of experienced masons and transportation.

2) Construction of water access points-spring “boxes” and piped water supply systems: Ten spring boxes will be constructed with concrete and fitted with a one-meter pipe to serve as a faucet. A heavy and secure cover that can be removed to allow for periodic cleaning of the spring box will be constructed. Also, additional storage capacity for the water produced will be constructed besides the spring box. About eight meters upslope from the spring, a canal will be constructed to divert surface rainwater that could possibly contaminate the spring box. Masons will also construct a concrete laundry slab for washing clothes about 20 meters below the site to avoid contamination.

3) Construction of piped water supply systems. This will be a distribution pipe with risers and faucets at strategic points for water access. The community will be mobilized to provide labor for the construction of ten piped water supply systems.
4) Water testing and disinfection: On completion, water from both systems (piped water supply systems and protected springs) will be subjected to water quality tests with compartment bag test kit to check *E.coli* levels are acceptable according to WHO guidelines and national standards. Communities volunteers will provide do the testing every month. If the water shows the presence of *E.coli* bacteria, the water supply systems will be disinfected by chlorination to eliminate bacteria. A sanitary inspection will be done to identify sources of fecal contamination and other vulnerabilities so that corrective actions can be implemented to reduce or eliminate fecal contamination. Communities volunteers will perform and maintain this activity. Also, operation and maintenance costs will be included the project budget.

**Objective 2:** Improvement in sanitation and hygiene conditions in ten villages through installation and subsequent adoption of latrines: sanitation platform latrines (Pit latrine with slab) that use a concrete slab;

**Output:**
In each of the ten villages, fifty pit latrines will be constructed. Every fifty households will be provided two hand washing facilities (one is at a latrine and another one is at a food preparation area) to help benefit greatly from a handwashing critically with soap after using the toilet or before preparing food. Priority will be accorded to those families who have children or pregnant women.

**Activities**
1) Masons and commune members will be trained to construct latrines.
2) Distribute latrine- digging tools.
3) Construct pit latrines: The ventilated improved twin pit (VIP) latrine will be providing because it has proved successful in overcoming problems with flies and odors. The pit will have a ventilation pipe, which will be at least 100mm in diameter and extend from the pit to about 0.5m above the roof. The top will be fitted with a fine-mesh stainless steel or aluminum fly-screen. Pit latrines will be located for convenient access by sludge removal vehicles where required. Latrines will be placed downwind of the house and the doorway of the VIP latrine will face the wind. The slab will be constructed with concrete and will be constructed with concrete and will be used in combination with steel reinforcement. Sludge safe for manual extraction will be removed after one year.

4) Two handwashing facilities (such as happy taps) will be provided per household.

Objective 3: Improvement in sanitation and hygiene conditions in primary schools, secondary and high schools in ten villages.

Output:

Each school will have six latrines (three for boys and three for girls) and six hand wash facilities.

Activities:

1) Masons and community volunteers will be trained to construct hand wash facilities and latrines.

2) Distribute the materials and instructions to construct hand wash facilities and latrines.

3) Construct latrines and hand wash facilities in schools targeting 700 children in ten villages. The ventilated improved twin pit (VIP) latrine will be providing because
it has proved successful in overcoming problems with flies and odors fecal sludge management. The pit will have a ventilation pipe, which will be at least 100mm in diameter and extend from the pit to about 0.5m above the roof. The top should be fitted with a fine-mesh stainless steel or aluminum fly-screen. Pit latrines will be located for convenient access by sludge removal vehicles when required. Latrines vaults filled with fecal sludge and subjected to storage while the other vault is being used actively will be emptied when the pit in use is filled. Sludge safe for manual removal will be removed after one year. Latrines will be placed downwind of the school and the doorway of the VIP latrine will face the wind. The slab will be constructed with concrete and will be used in combination with steel reinforcement. Sludge safe for manual extraction will be removed after one year.

Objective 4: Foster behavioral change through community and school health education
Training will focus on correct hand washing, excreta disposal, wastewater disposal, treatment and protection and safe management of water, personal and household hygiene and food handling.

Output:
1) Ten community volunteers and seven teachers will be recruited to spread the message, education and training on safe domestic water management and use.
2) Ten villages will receive hygiene and sanitation behavioral changes messages and education and training through community volunteers and print materials.
3) Seven schools will receive hygiene behavioral changes through the education and training activities of teachers and the use of print materials.
Activities:

1) Community volunteers will be trained on knowledge and skills for hygiene and sanitation education. Specific behaviors related to WaSH will be addressed at the individual, households and community levels using tools that enable specific behavior change communication and engagement and interaction with beneficiaries rather than the “prescriptive one-way messages”.

2) Hygiene and sanitation education will be given twice a month at community social occasions and through house to house visits. Community members will visit next to people’s homes to focus on messages and activities to safely managing water and waste and keep a safe clean environment around their households. Schools will exercise the hygienic behavior and utilization of sanitation facilities effectively. Training will be given for schoolteachers jointly with community volunteers. The training will mainly focuses on teaching the practice of hygiene and health to students both at school and at home to build and utilize sanitation facilities like latrines and solid waste disposal and to keep the cleanliness of school compounds.

3) Conduct hygiene education such as correct hand washing, excreta disposal, wastewater disposal, treatment and protection of water, personal and household hygiene and food handling activities in the targeting ten community by volunteers. Also, print materials will be used for promoting hygiene education. School curriculum aimed at preventing diarrhea disease by installing drinking water and handwashing stations and latrines in schools, teaching students about hygiene and instructing them to share these messages with their families will be done as these
approaches have increased hygiene knowledge among students and changed practices of parents.

**Sustainability**

Maintenance of installed water and sanitation facilities is a critical consideration. In a recent site visit to the project area, the project team observed several non-functioning water pumps and stations provided by other donors (Figure 3).²⁴

![Figure 3: Non-functioning water pumps and water access stations at primary school](image)

To establish maintenance practices, financial plans should include calculations for future repair costs and include monitoring costs.²⁴ To contribute to the sustainability of the project a number of approaches will be adopted during and after the project’s implementation to ensure the targeted communities benefit from the outcomes and impacts of the projects for years to come:

1. Cost Sharing (Local community): To improve ownership in the community $5,409 has been donated to the project by the Cambodia government.
2. Community Participation and Staff Management: This project will promote the active participation of primary stakeholders before, during and after the implementation. Specially one national health coordinator and one project coordinator will be hired. Their roles are to ensure the active participation and engagement of the target population for significant knowledge sharing, skill transformation, trainings, orientation and counseling specifically to the community volunteers and teachers.

3. Operation and Maintenance (O&M): To support the O&M of water and sanitation infrastructure constructed after the completion of the project, the community volunteers will receive training on a number of O&M approaches. To establish maintenance practices, future repair costs will be included in the project budget. An appropriate number of community volunteers for the scheme will be identified, trained and given necessary materials to manage the water systems, i.e. identify problems, and make small repairs, and clean tanks and intakes.

4. Community volunteers will be hired to be responsible and accountable for managing the water and sanitation system.

Project Budget

<table>
<thead>
<tr>
<th>Description</th>
<th>Cost per unit</th>
<th>Quantity</th>
<th>Unit</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 National Health Coordinator</td>
<td>USD 700</td>
<td>12</td>
<td>Month</td>
<td>$8,400</td>
</tr>
<tr>
<td>1 Project Coordinator</td>
<td>USD 500</td>
<td>12</td>
<td>Month</td>
<td>$6,000</td>
</tr>
<tr>
<td>10 Masons</td>
<td>USD 250</td>
<td>4</td>
<td>Month</td>
<td>$10,000</td>
</tr>
<tr>
<td>10 Assistant masons</td>
<td>USD 100</td>
<td>4</td>
<td>Month</td>
<td>$4,000</td>
</tr>
<tr>
<td>1 Driver</td>
<td>USD 200</td>
<td>12</td>
<td>Month</td>
<td>$2,400</td>
</tr>
<tr>
<td>Description</td>
<td>Cost per unit</td>
<td>Quantity</td>
<td>Unit</td>
<td>Total</td>
</tr>
<tr>
<td>-----------------------------------------------------------------------------</td>
<td>---------------</td>
<td>----------</td>
<td>------</td>
<td>---------</td>
</tr>
<tr>
<td>10 Community volunteers &amp; 7 Teachers</td>
<td>USD 100</td>
<td>12</td>
<td>Month</td>
<td>$20,400</td>
</tr>
<tr>
<td>Motor vehicle</td>
<td>USD</td>
<td>1</td>
<td>Year</td>
<td>$600</td>
</tr>
<tr>
<td>Fuel</td>
<td>USD 50</td>
<td>12</td>
<td>Month</td>
<td>$600</td>
</tr>
<tr>
<td>Training</td>
<td>USD 50</td>
<td>12</td>
<td>Month</td>
<td>$600</td>
</tr>
<tr>
<td>Training on basic knowledge on WaSH for school teachers and community volunteers (cover only refreshment)</td>
<td>USD 50</td>
<td>12</td>
<td>Month</td>
<td>$600</td>
</tr>
</tbody>
</table>

**2. Fringe Benefits**

<table>
<thead>
<tr>
<th>Description</th>
<th>Cost per unit</th>
<th>Quantity</th>
<th>Unit</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Project Coordinator and Driver</td>
<td>15% of base salary for employer portion</td>
<td>1</td>
<td>Year</td>
<td>$1,350</td>
</tr>
</tbody>
</table>

**3. Supplies & Materials**

<table>
<thead>
<tr>
<th>Description</th>
<th>Cost per unit</th>
<th>Quantity</th>
<th>Unit</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>*This company will be selected after bidding with other companies to consider budget, monitoring and follow up inspections. Funds will be provided only when it meets on output and achievement of deliverables.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Handwashing Facilities (Happy Taps)</td>
<td></td>
<td>100</td>
<td>Year</td>
<td>$2,500</td>
</tr>
<tr>
<td>Compartment bag tests purchase in USA</td>
<td>Water quality testing</td>
<td>20</td>
<td>Kit/Year</td>
<td>$1,500</td>
</tr>
</tbody>
</table>

**4. Services**

<table>
<thead>
<tr>
<th>Description</th>
<th>Cost per unit</th>
<th>Quantity</th>
<th>Unit</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Educational Materials for having an interactive for school children</td>
<td>Flyers and posters, papers and colored pens</td>
<td>1</td>
<td>Year</td>
<td>$450</td>
</tr>
</tbody>
</table>

**5. Other Costs**

<table>
<thead>
<tr>
<th>Description</th>
<th>Cost per unit</th>
<th>Quantity</th>
<th>Unit</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rental Fees for one office</td>
<td>USD 150</td>
<td>12</td>
<td>Month</td>
<td>$1,800</td>
</tr>
<tr>
<td><strong>6. Technical Support and Monitoring</strong></td>
<td>Operation, Management</td>
<td>12</td>
<td>Year</td>
<td>$6,000</td>
</tr>
<tr>
<td>Activity</td>
<td>Months</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>-----------------------------------------------------------------------------------------------------------------------------------------</td>
<td>------------</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1. Starting initial work such as visiting communities and getting their support</td>
<td>May June</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2. Subcontract the private company for construction materials</td>
<td>July</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3. Recruit coordinator, masons, community volunteers and teachers</td>
<td>August</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4. Procure digging tools and construction materials</td>
<td>September</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5. Plan the construction of springs, appropriate technology latrines and hand washing stations.</td>
<td>October</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6. Train 20 local masons on spring, latrine and hand washing construction and maintenance.</td>
<td>November</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7. Supervise and carry out the construction of springs, appropriate technology latrines and hand washing stations.</td>
<td>December</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>8. Recruit and train 10 community volunteers and school staff to mobilize and train the community and the school on water and sanitation hygiene and spring protection and</td>
<td>January</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
9. Following the establishment of springs, latrines and hand washing stations educate beneficiaries on personal hygiene, safe handling of water, and appropriate storage of water at home through 10 community volunteers.

10. Following the establishment of educate students on personal hygiene.

11. Project Evaluation

12. Prepare and submit project report

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**Monitoring and Evaluation**

A program monitoring and evaluation system will set up that will provide the records for the data for monitoring the implementation of this project. An objective simple checklist will be used to collect the data by project coordinator.
<table>
<thead>
<tr>
<th>Program Area</th>
<th>Indicator</th>
<th>Source</th>
<th>Frequency</th>
</tr>
</thead>
<tbody>
<tr>
<td>Improved water use in villages</td>
<td>Number of protected springs built</td>
<td>Program records</td>
<td>Monthly</td>
</tr>
<tr>
<td></td>
<td>Number of piped water supply system built</td>
<td>Program records</td>
<td>Monthly</td>
</tr>
<tr>
<td>Improved sanitation use in village</td>
<td>Number of improved toilets built</td>
<td>Program records</td>
<td>Monthly</td>
</tr>
<tr>
<td>Improved toilets and hand wash facilities in primary and secondary schools</td>
<td>Number of improved hand wash facilities built</td>
<td>Program records</td>
<td>Monthly</td>
</tr>
<tr>
<td></td>
<td>Number of improved toilet built</td>
<td>Program records</td>
<td>Monthly</td>
</tr>
<tr>
<td>Household hygiene promotion (Sanitation, hand washing, cooking hygiene)</td>
<td>Knowledge of community members of hygiene behaviors</td>
<td>*Survey</td>
<td>Beginning and the end of project</td>
</tr>
<tr>
<td>School hygiene promotion (Sanitation, hand washing)</td>
<td>Knowledge of students of correct hand washing behaviors (wash their hands before eating and after defecation)</td>
<td>*Survey</td>
<td>Beginning and the end of project</td>
</tr>
</tbody>
</table>
Reference


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