

Serving the Unserved

Volume-III

Promotion of Alternative Technologies

Introduction

The three hill districts namely Rangamati, Khagrachhari and Bandarban under the CHT are in the extreme south-east of Bangladesh between latitudes 21° 11' N and 23° 45' N and between longitude 91° 42' E and 91° 42' E. The CHT is divided into four valleys surrounded by the Feni, Karnaphuli, Sangu (Shankho) and Matamuhuri rivers and their tributaries. The area is totally different from the rest of the country both in geo-physical nature and cultural diversity. At the same time, it has induced some disadvantages in alleviating the elements of health crisis and poverty.

The different geo-physical nature of the CHT area has fashioned the areas with different natural sources of water like streams, *Chhara*, *Jhiri*, *Khal*, rivers, etc. From the time immemorial, the indigenous communities in the area took up the uses of the sources in their culture of water. The sources have been contributing to the people of the hilly areas with water to be used in everyday's drinking and domestic affairs. It is the tradition that the indigenous people in the CHT set up their abode on the hilltop or at the valley of hills. They select the place to live getting ensured the availability of water in nearby locations. It means that availability of water is the major prerequisite of developing a locality of the indigenous people in the CHT areas. They are habituated to the practices of using water from the natural sources. But today they have been facing different problems regarding availability of water. Very often they face various difficulties in collecting seemingly clean water in some particular seasons. Moreover availability of safe water has been the core issue in the areas since water-borne diseases very often suffer the people in the areas drastically due to lack of safe water facilities. On the other hand, they are habituated to defecate in open spaces. They have fewer ideas on safe water and sanitation and the causes of water-borne diseases. To draw a solution of the problems, the ideas of introducing alternative water technologies and sanitation equipments have come to the fore.

Government of Bangladesh once achieved a success of providing safe water to 98% people through installation of hand-pumped shallow Tubewells across the country. But the rocky soil texture in the ground and irregular terrain of the CHT areas hindered the process. Considering the drawbacks, some alternative water technologies have been innovated to make a solution to the safe water crisis in the CHT areas. In addition, a step of initiating the sanitation materials into the communities has been intervened to get the CHT areas sanitized. Alongside the government, some WatSan NGOs, in partnership with NGO Forum have been working in the areas to promote the alternative technological options and area-specific sanitation equipments as well as providing software services to the community with a view to addressing the WatSan and hygiene issues in the areas. NGO Forum through its Community-managed Water and Sanitation Programme has stepped in the CHT with a view to developing a sustainable community-managed and community-owned water and sanitation programme. With the implementation of this programme the member of the community groups have been enriched with safe water supply and sanitation facilities through introducing alternative safe water technologies and establishment of Village Sanitation Centre (VSC). With technical assistance from NGO Forum, the 12 partner NGOs have been introducing the alternative safe water technologies and getting the sanitation equipments at the door to the community people through VSCs.

Geo-physical Distinctiveness of CHT

Geology and land forms

The Chittagong Hill Tracts area is geologically of recent origin comprising old Pleistocene sediment deposits. The general land feature comprises of a series of anticline ridge lying parallel to one another and trending in roughly NW-SE direction. They are composed largely of consolidated sand stone's, sandy shale's and shale's of tertiary geological age. These have been subjected to considerable folding, faulting, tilting and dissection. The ridge crests reach heights of 100-3000 feet (300-1000 m) MSL. In the synclines between these main ridges, there are lower of hills below 250 m generally the height ranges between 42 m to 80 m and formed mainly over unconsolidated sandstone of late Tertiary age. Some of these hills are leveled or of rounded summits, but most of them are closely dissected and sharp ridge. Almost everywhere in the CHT, slope is very steep.

Rainfall

The annual rainfall in the CHT areas ranges from 80 inches (2000 mm) in the central north to 150 miles (3750 mm) south-eastern border about 150 inches (3,750 mm) over 80% rainfall occurs between May and September pre-monsoon and monsoon rainfall typically in torrent downpours and flash of flood in the valleys.

Soil

Soil patterns often are complex due to rapid changes in the underlying lithology, differences in relief and the varying extent of soil erosion. The most extensive hill soils are brown, loamy and strongly acid, with rapid permeability and low moisture-holding capacity. Except over hard rocks, they are generally deep. Valleys soils include brown, loamy soils on well-drained terraces, Grey and clays on poor valley-bottom sites. Eleven soil series were identified. One extensive series was divided into deep and shallow phases. Gently, moderately and steeply sloping phases were also identified.

Vegetation and land use

The entire CHT areas have typical vegetation and tropical evergreen and deciduous forest. There are trees like *Sal*, *Teak*, *Chapalish*, *Kari*, *Chambal*, etc. In addition, there are plantation of Pine and other foreign trees in the reserved forest. The indigenous people traditionally practice *Jhum* cultivation by clearing the natural vegetation and burning it during the dry season. These practices destroy the existing natural vegetation pattern in reserved forest. By tradition, village Headman allocate land to *Jhum* cultivation. The *Jhum* cultivators do not have own land. Permanently settled cultivators have allotted land in which they have heritable rights but they cannot transfer the land outside their family without government's approval. When population density was lower, the successive cultivation periods were 12 years or longer. Now, with greater pressure on the land, especially following the creation of Kaptai lake, which submerged most valuable floodplain in the reason, a period may be less than five years. As a result, the soil fertility is increasing and reversible degradation of the environment is taking place.

River system

The main rivers in the CHT are: a) Karnafuli b) Halda c) Ichhamoti d) Sangu e) Matamuhuri f) Kaselong and g) Feni. In addition there are smaller streams and rivulets. They are tributaries to the main rivers. The Feni river originates in the northern part of Khagrachhari district and flows into the Bay of Bengal through the district of Feni. The Karnafuli River with its tributaries is the biggest and most important river. Hydro-electric project was built on this river in 1962. As a result Kaptai Reservoir Lake has been formed during next monsoon. The Halda and Ichhamoti rivers fall into the Karnafuli below the Kaptai Dam. The Karnafuli flows into the Bay of Bengal. The Sangu river originates in the high hills of the Bandarban district and after passing through several valleys it takes a westerly direction and flows into the coastal plain of Chittagong and ultimately debauch into the Bay of Bengal. The Matamuhuri originates in the southern most part of the high hills of Bandarban and after flowing in northerly direction takes westerly turn and fall in the Bay of Bengal near Cox's Bazar. All the hilly rivers are subjected to flash-flood during monsoon. Again during dry season tidal flow penetrates through the river outfall and proceeds up to considerable length of the channel upwards. In addition to the rivers and *Khals* there are a few springs of artesian and non-artesian native and from water discharges from hills to plain called *Chhara*.

Water Sources in CHT

Surface water

The Bay of Bengal lies in the south-west directions from the hill tracts districts. Bandarban district closes to Bay of Bengal. Other two districts remote from the Bay of Bengal. The other two districts are little away of the Bay of Bengal. Monsoon rain is the main source of surface water, which flows through the rivers in the form of excess run-off. During the monsoon the rivers level remains high but during the dry period the level drops low. Being hilly streams the velocity of flow is considerable high. In the Kaptai Lake the difference of high and low level is 113 m. The highest depth near the dam is about 50 m. Habitation settlements grow near to the river, lakes and spring, the reason is easy access to surface water stream, lakes and spring water are used for domestic and potable purposes during the dry periods. The monsoon water remains turbid and full of organic and inorganic material as such their use is restricted. There is no major specific source of surface water pollution. In rainy season rivers receive agro-chemical, domestic wastes and sand-mix and these contaminants pollute river water which is turned useless for domestic purposes. Physical appearance of river water is observed muddy.

A Man for Men's Sake

A road goes to the Panchhari and then to border area Dudukchhra from Khagrachhari town. On the way, a temple named *Shib-mandir* is seen. Crossing the temple a tiny open hut is found by the street. There is a big earthen pot appeared put on a wooden frame in the hut. Two earthen jugs and a mug are put beside the big pot. A sitting place made of bamboo sticks have been put under the hut. The thirsty and tired passersby break their long walking journey to meet up their thirst for water and minimize tiredness sitting there. A gigantic banyan tree is giving its shadow to the hut. There is a comparatively big hut behind the tiny open hut. An 80 year-old man is always seen sitting on a chair under the veranda of the big hut. This is the person who puts water in the hut for the thirsty passersby everyday. His wife and grandsons help him doing it.

The name of old man is Protibanda Chakma. He is a village *Karbari* (traditional village leader in the indigenous communities in the CHT appointed by the Raja). He established the system in 1986 with a view to meeting up the thirst of the passersby. "I set up it here since there is less water sources beside the hilly roads. Where people will get water when they feel thirst? There was no shop on the way in the previous times where the passersby could meet up their thirst. Considering the need, I established the system. Here the thirsty passersby can have water and take rest under the banyan tree. Moreover, this is the religious feeling as well as my duty as *Karbari* to meet up the thirst of people. This is easy. Feeding people sweet or rice requires spending money. But there is no need to spend money in making people met up their thirst of water. I cannot work out now for the people because of my oldness. I assume I would be no more after some years. Until my death I will do the duty. I wish my sons and grandsons will take up it in my absence after death," expresses the old man, a friend and saviour of the fatigued passersby.

Ground water

The geology of the area is complex and is characterized by a series of folded tertiary formations. The area is considered unfavorable for extensive ground water development. The aquifer has low transmissible and intensive development, therefore, incur large draw-down. However, wells can be developed successfully on an individual basis.

Safe Water Sources

It is proved that the surface water sources in the CHT are not safe. The indigenous community people think that the well's water is safe since it is apparently clean. But it contains germs. Moreover, the wells dug beside the *Chharas* go under water during rainy season or flash-flood situation. They then drink and use contaminated water of the *Chharas*. On the other hand, the geo-physical condition of the CHT is not friendly to install easy and low-cost technologies. There are some state-of-the-art technologies those are suggested for the areas. But those are highly expensive and unaffordable for the poor indigenous community people. The operation and maintenance are also complicated. Without proper training on O&M and gaining people's acceptability, the technologies cannot exist and finally get left inoperative.

Among the safe water sources, Ring-well is the popular alternative in the CHT areas. But it costs high. It goes beyond the capacity of the poor people. Some rich people in the community have installed it. Government also has provided it to some communities. But the low quality installation and improper orientation and training on O&M have made it inoperative and unused. On the other hand, the poor indigenous community people have less access to the sources established by the rich people of their community. Government's supports which are entitled to the poor people are mostly mocked and manipulated by the rich and powerful people of the community.

Sanitation Status

The indigenous people of the CHT who have been yet remaining far away of education facilities and awareness on sanitation do not have the idea about the system of defecating in a particular place or in a latrine that should be protected by a water-seal and some hygiene measures should be followed after using it. They usually defecate in open spaces beside the hills or in jungle. They usually have the practices of using leafs for cleanliness after defecation. Other than the traditional practices, some people who have been acquainted to the system of using latrine in

different ways have installed pit latrine and use it. But this is very minimal in number in the CHT areas.

Addressing WatSan Issues

The indigenous community people of the CHT have never been witnessed raising demand for safe water and sanitation facilities. It is because they have fewer ideas on safe water and sanitation, the necessity of those and their rights to safe water and sanitation facilities. Like other areas, government tried to provide safe water options in some areas in CHT through hand-pumped shallow Tubewells but adverse rocky ground hindered the process. Later they tried Ring-well in a few localities but improper installation and lack of orientation have made the technology unused. On the other hand, the NGOs those got allowed to anchor their programmes in the CHT after signing the Peace Accord, did not pay due emphasis on addressing WatSan issues in the CHT.

Addressing the Adversity through Alternative Options

Adverse geo-physical condition i.e. the rocky soil texture and irregular terrain is the reality in the CHT areas. And it tends to hinder the process of supplying safe water through low-cost technologies in the areas. Should the state and the development actors conserve the reality and get refrained from providing safe water facilities to the people in the CHT? Since the people of the CHT areas deserve the right to safe water security as the citizen of the state, NGO Forum as the apex non-government service-delivery agency feels the accountability to address the adversity in alternative mode. Although the alternative technologies are not low-cost, the local partner NGOs with technical assistance from NGO Forum have promoted different alternative technologies at community level with a view to establishing the right of the CHT people to safe water.

Ring-well

The partner NGOs have introduced Ring-well in the CHT areas at community level after testing its feasibility, acceptability and capacity of covering people under its services. Ring-well is a system of lifting ground water by hand-pumped device. A 60-80 feet-well is dug in the ground penetrating the rocky ground. The rocky ground is not accessible for the drilling pipes and that is why the Tubewell is not feasible in the hilly areas. However, concrete rings are set and shaped into the hole using cement and sand to protect it from external contaminants. The vacuum space around the well is filled in with sands. A pipe is set into the well. The top of the well is covered with a concrete set-up and a hand-pumped device is set over the pipe. This is alike the hand-pumped Tubewell and easy to operate. That is why it is easily acceptable to the users.

The local partner NGOs have promoted 63 Ring-wells at the communities in the CHT, where they have found it feasible and community people have made their demand for this technology. A number of 20 households can access to a Ring-well for safe water required for their everyday's drinking and other domestic uses.

Rain-water Harvesting System (RWHS)

It has been estimated that the average rainfall in the CHT is sufficient for making Rain-water Harvesting System useful in the communities. The community people inform that they sometimes catch rain-water in rainy season with banana leaves and pieces of clothes when they

find it difficult to face the irregular hilly slippery paths in the rainy season to collect water from *Chhara*, *Khal* and other sources. Considering the habituation of drinking rain-water by the target communities in the CHT, the average rainfall and the pressure on surface and ground water, the RWHS has been promoted in some communities. Two types of RWHSs have been introduced. One is household-based and another is community-based.

The household-based RWHS has been introduced for a particular household that lives on an isolated hilltop. It can contain 3200-3500 litres at a time and can be likely to meet up the necessities of water for 6 months. The community-based RWHS has been introduced in the communities where a group of families live and can easily communicate with each other. A community-based RWHS can contain 35000-50000 litres water and a number of 20 families can depend on it for drinking water for 6 months. A number of 65 RWHSs have been promoted for the target communities in the CHT.

Promoting the Water Technologies

The alternative technologies i.e. the Ring-well and RWHS have been introduced in the target communities in the CHT following a series of procedures to find these accepted and sustained. Before introducing the alternative water technologies, the communities have been oriented to safe water, its importance and the ways of ensuring it. Organizing meeting with male, female, children, using IEC/BCC materials, showing promotional films, utilizing the influences of the community allies, the target people have been mobilized towards using safe water in drinking, cooking, washing dishes, preparing foods, etc. The promotional activities have helped the communities pondering the importance of safe water as well as the way of securing it. It has led them to raising the demand for alternative water technologies.

Shaping Village Development Group (VDG)

In order to create the feeling of addressing safe water crisis collectively, introduce community management, empower the community people in decision-making and to get the technologies and other outputs of the programme sustained, the Village Development Groups (VDGs) have been formed in the communities ensuring the participation of the poor and women and the involvement of the allies i.e. the influential people of the concerned communities. The VDGs have contributed a lot in creating awareness on safe water in the communities and demanding for the right and appropriate technologies.

Selecting caretaker and training on O&M

In order to ensure proper operation and maintenance of the alternative technologies with a view to getting these sustainable and supportive with expected services, dedicated volunteers have been searched out and made caretaker of the alternative technologies after installation. The concerned communities have selected the caretakers within their communities and ascribed them the duties and responsibilities. The caretakers- one male and one female for each device have been made well-oriented to the O&M of the technologies. The training has helped the users and caretakers making a sense that they are able to keep the technologies useful for a long term.

Feeling the Duty of His Own

“I could have worked in a construction firm. Then I had to work for constructing high-rise buildings for the rich people. But it is my great pleasure that I have attained a great chance to

work for the people of my community. I have been witnessing the distress of hilly people in collecting drinkable water since my early boyhood. Still they have been facing the same distress.” Tanoy Dewan, a Field Engineer expresses it. After completing Diploma in Civil Engineering, he started working in a construction firm in Chittagong. Getting an offer of working in WatSan promotion, he welcomed the chance.

Tanoy helps the community driving the demand for safe water options, selecting the suitable technologies and site for installation. He works for making the community involvement in the process, ensuring the quality, supervising the installation process, testing the quality of water, providing training on O&M, monitoring the uses and so on. He visits all alone regularly at all working communities in the entire CHT. He makes sure of sustaining the services of the technologies. He makes answers that the users face in operating and maintaining the technologies.

“Sometimes the people outside of our working villages seek for supports. I cannot make good answer before them. I suggest the people to install a technology who have the capacity. If somebody gets convinced, I provide my technical support without making charge. I help the poor people to learn the way of purifying water from *Chhara*, well, *Khal*, etc. If I could do something for them...,” repents Tanoy.

He has the strong aspiration to continue his assistance in reducing the water stress of the indigenous people in the CHT. “If possible I will continue my endeavour to make the people in the CHT free from the safe water crisis and water-borne diseases through promoting the alternative technologies. I feel sad when I see someone drink unsafe water collecting from *Chhara* or *Khal*. I get pleased when I look the smiling face of the people who get pleased getting the safe water source at their community,” says the pleased Engineer.

Acceptability of the Alternative Options

The target communities have accepted the technologies and adopted the usage of these in collecting water for drinking and other domestic uses. Mita Chakma (38), a user of community-based RWHS in Nalchhara of Bhaibonchhara Union, Khagrachhari informs that she now collects water from the RWHS and all her family members drink it. Nana Chakma (42), a housewife of Ganchban village in Bhaibonchhara Union, Khagrachhari informs that they drink now water from RWHS. Her family has shared 10% cost of installing a household-based RWHS at her homestead. “We have no problem in drinking rain-water. It tastes well,” her school-going son Shuvo Chakma (10) says. Jonaki Chakma (35), a user of Ring-well in Nalchhara of Bhaibonchhara Union, Khagrachhari expresses that the Ring-well gives them safe water and saves their times. Mong Prue Marma (36), a beneficiary of Ring-well in Thowaingyapara of Kuhalong Union, Bandarban expresses, “We have been using Ring-well water to keep ourselves free from diseases.” Pakhi Tanchangya (41), a user of Ring-well in Bogapara of Ghagra Union under Kawkhali Upazila, Rangamati says, “Ring-well is giving me germ-free water. In the previous times, I needed much time to collect water from *Chhara*. The Ring-well is now saving my times.” Hena Chakma (35), a user of Ring-well in Chowdhurypara of Ghagra Union under Kawkhali Upazila, Rangamati informs that the women had to go by slippery hilly paths in rainy season to collect water from *Chhara*. Moreover, in the rainy season the *Chhara* water gets muddy. “Now we are free from the dangers. Ring-well gives us the relief,” she expresses. Chitra Prue Marma (27), a beneficiary of Ring-well in Purba Monaipara of Betunia Union under Kawkhali Upazila, Rangamati says, “We use Ring-well water in drinking, cooking and even in bathing. Now we need not to go far away of our home to collect water.” Aung Shwe Prue Marma

(75), a village *Karbari* of Tambuchipara in Gaindhya Union under Rajasthali Upazila, Rangamati informs that all people of his community drink and use Ring-well water. They have forgotten to use water of *Chhara* or wells.

Tanoy Dewan, Field Engineer of the Programme informs that all the alternative technologies installed under his supervision are working well. The beneficiaries are satisfied. They have no objection against it. At the very beginning some users objected saying insects can grow up in the reservoir of RWHS. “We have made them understood that the water would be well-protected in the reservoir. It has all the measures to leave water in it safe. If it is washed and maintained properly, no problem will be arisen. They then have understood and become convinced to use the technology,” he says.

Operation & Maintenance of the Options

Sumon Chakma (45), a beneficiary of a household-based RWHS in Ganchban of Bhaibonchhara Union, Khagrachhari informs, “We do not face any problem in operating the system.” Sonatan Chakma (37) is a caretaker of a community-based RWHS in Nalchhara of Bhaibonchhara Union, Khagrachhari. He has been given training on O&M of the technology. Before catching rain-water, he in cooperation with other users washes the inside of the tank, catchments and gutter. They wait 10 minutes when it starts raining. Then he opens the channel and let rain-water be into the tank. “It is easy to wash the tank, catch water and to operate it. A hand-pumped device is used to lift water. The washer is sometimes getting loose. I have the tools and training on how to repair. I can easily take care of it,” says Sonatan.

Purno Ranjan Chakma (52), a caretaker of a Ring-well in Nalchhara (Jouthapara) of Bhaibonchhara Union, Khagrachhari says that the users can easily pump the device to get water. Mong Way Marma (18), a caretaker of a Ring-well in Tambuchipara of Gaindhya Union under Rajasthali Upazila, Rangamati says that he can easily repair it if some disturbances are created. Ananda Tanchangya (45), a caretaker of a Ring-well in Bogapara of Ghagra union under Kawkhali Upazila, Rangamati says, “I have the training on O&M. I can repair it. I did not face major problem in it. Sometimes the washer of the pump gets disturbed. Every user maintains the principles of its operation. They have no objection on its services. All are satisfied.” Mong Prue Marma (36), a beneficiary of Ring-well in Thowaingyapara of Kuhlalong Union, Bandarban informs, “All the users spontaneously give subscription if needed in repairing the technology. A caretaker among the users always takes care of it. We also help him.”

Tanoy Dewan, Field Engineer of the Programme says that the users have raised complaints at the very beginning on O&M of the technologies. Then the users have been oriented to the operating systems. Two caretakers have been given training in O&M. “I have oriented them about the entire system remaining the parts open to them. I have provided them a manual also. They have now no complaint,” he says.

A Careful Caretaker

“We sat together to select the person who would have the mind-set to offer him/herself for taking care of new source of safe water. We found out a person. We all proposed and finally selected his homestead for installing the new technology and him as caretaker”, says Nirod Baron Chakma, a village *Karbari* of Nalchhara in Bhaibonchhara Union, Khagrachhari. The person whom they selected is Sonatan Chakma (37), a *Jhum* farmer of the same village.

As caretaker Sonatan has been taking care of a community-based Rain-water Harvesting System

(RWHS). With technical supports from NGO Forum, local NGO Parbattya Bouddha Mission (PBM) has helped them installing the system. Sonatan's community has contributed to the technology with 10% sharing of the total cost as well as their tremendous labour. His and other 19 neighbouring families in his *Para* collect water from the system.

Sonatan with help of his wife and other users cleans the inside of the reservoir, catchments and gutter of the technology before preserving water. When rain starts, they wait for ten minutes to let the catchments and gutter be cleansed and thereafter they let the raindrops be poured into the reservoir. The reservoir can contain 35,000 litre water at a time. They fill it in rainy season. After installation of the system in May 2005, they have been getting safe water for drinking and cooking purposes. Sometimes the users tend to bathe with water of the system because of their sense of using clean water also for bathing. But Sonatan does not allow it. "We need to have sufficient safe water for drinking. Safe water for drinking should get first priority. We should not compromise here. That is why I do not allow them doing that," says Sonatan.

Sonatan himself repairs the technology. PBM has trained him on operation, maintenance and caretaking of the system. It also has given him the necessary instruments and manual for repairing the system. A hand-pumped device is used to lift water from the reservoir. "Two months ago the washer of the device got ineffective. I bought it with my own money and set it. I am always ready to make the contribution for mending it if it requires minimum. If it needs to make big expenditure, I call upon contribution of other users. They spontaneously make it," expresses Sonatan, a careful caretaker.

Replicability of the Technologies

The community people in the CHT are now mobilized to use safe water from the alternative sources. They expect to have the opportunity to collect water from the alternative sources. But the poor communities do not have the capacity to replicate the technologies. They can share a minimum of the costs of the technologies. But it goes beyond their capacity to forebear the total cost of a technology like Ring-well or RWHS. Maksud Ahmed (55), a mason of RWHS, has been working in the CHT areas. He informs, "The people in the CHT have huge demand for the technology. They pursue me to convey it to NGO Forum." Amitav Tripura, President of the Ganchban School Managing Committee, Bhaibonchhara, Khagrachhari argues that the community people are well-convinced now to use safe water. But the cost of installing the alternative technologies goes out of their imagination. But they are eager to replicate it. External support is a must for the replication of the technologies. Bhubanjeet Karbari (55), a community leader in Chowdhurypara of Ghagra Union under Kawkhali Upazila, Rangamati argues that installation of Ring-well is expensive. The people who have the capacity already have installed it. But it is not possible for the poor people in the CHT.

Tanoy Dewan, Field Engineer of the Programme has observed that the people in the CHT do not have the capacity to install the alternative technologies by their own effort. But it can be possible if an entire community can take initiative collectively. Sometimes people out of the programme areas express their aspiration of getting the technologies. They want to share the cost. But it is not possible to persuade them to install the technologies by their own accord.

Making the Target Communities Sanitized

The partner NGOs have targeted to see the target communities having the orientation to the facts and importance of sanitation and installing the sanitary latrines at every homestead. The target

community people in the CHT have been first oriented to the facts and importance of sanitation with a view to inflaming them with the ideas that would lead them towards creating the sanitation facilities and maintaining the sanitary measures. Meeting with male and female separately and altogether, utilizing the influences of the community influential people through making them allies, organizing film-show, using IEC/BCC materials, etc have been followed to give the sense to the people that sanitary latrine and its hygienic uses are needed to keep their health good.

Establishment of VSC

In order to make the community people acquainted to the sanitation facilities and to set the materials at their vicinity, every partner NGO has established Village Sanitation Centre (VSC) at their working areas. The necessary equipments i.e. rings, slabs of making sanitary latrines are available at the VSCs. The equipments are made poor-friendly so that the poor community people can have ability to purchase within their incomes.

The sanitation equipments are made in the VSCs engaging the trained-up masons. NGO Forum has trained up the masons on making the low-cost equipments of the sanitary latrines. Besides the duties of making the equipments, the masons also sell these to the community people.

Mahir Makes it for Men

Mahir Uddin (40) had come to Rangamati from Kurigram 10 years ago to work as a Mess-boy in an Army Camp. Passing there for a year, he came to contact with a Mason and decided to work with him in constructing building, roads, culverts, etc. He was engaged in it for 7 years. In 2004, he was offered to work in a VSC run by a local NGO Progressive. He accepted it. In a question of why he accepted the offer, Mahir replies, “It is secured. I can work here everyday. I can construct 10 rings and 5 slabs a day. The people of the community are aware now. They buy the rings and slab to install sanitary latrine. So the VSC can sell huge and can pay me regularly.”

Mahir also sells the sanitary latrine sets to the community people. He can sell 20-25 sets in average a month. Mahir informs that except the rainy season, the sale is satisfactory. He has received training on how to construct the equipments of sanitary latrine. He has been also oriented on how to install a sanitary latrine and where the latrines should be installed. Based on the training, he instructs the customers to get the latrines installed properly. He also instructs not to break the water-seal of the slab. He explains if question is made.

Mahir finds it out that the community people are getting aware of sanitation. “So the VSC will be running successfully. I have got a chance to stay at a room adjacent to the VSC free of charge. I have no water problem. I am getting regular remunerations. I can send a good amount of money to my family in Kurigram every month. Considering these, I am satisfied,” says the Mason with a joyful face.

Benefit of the Technologies

The alternative technologies and VSCs have impacted a lot in the communities of the CHT.

Creating access to safe water and sanitation

The installed alternative technologies have created easy access to safe water for the poor indigenous people of the CHT. Nirod Baran Chakma (55), a user of RWHS in Nalchhara of

Bhaibonchhara Union, Khagrachhari expresses, “We had been deprived of getting safe water and sanitation facilities for many decades. We have learned that we have the right to safe water. The RWHS has created our easy access to safe water.” Sumon Chakma (45), a beneficiary of RWHS in Ganchban of Bhaibonchhara Union, Khagrachhari says, “We need water for our existence and sanitary latrine for our sound health. It is our right. We have now easy access to safe water.” Purno Ranjan Chakma (52), a beneficiary of Ring-well in Nalchhara (Jouthapara) of Bhaibonchhara Union, Khagrachhari expresses, “Water is our right. The installation of the Ring-well has helped us attaining the right.” Pakhi Tanchangya (41), a user of Ring-well in Bogapara of Ghagra Union under Kawkhali Upazila, Rangamati informs, “A Ring-well has created access of 20 families of our community to safe water. It has helped them a lot to meet up the water demand for drinking, cooking and other domestic uses.”

Mong Prue Marma (36), a villager of Thowaingyapara in Kuhalong Union, Bandarban informs that his community people and he himself have collected low-cost rings and slab from a VSC. The cost of the sanitary equipments does not go beyond their capacity. The establishment of VSC has created the room for the poor indigenous people to access to sanitation facilities. Sui Cha Aung Marma (50), a village *Karbari* in Purba Monaipara of Betbunia Union under Kawkhali Upazila, Rangamati says, “After getting the mobilization on sanitation, some people of the community have bought rings and slabs for making sanitary latrine at their homestead. But who have not minimum ability to make their cost in this regard, they have sought helps of others. Union Parishad and UNICEF have supported them with rings and slabs. Thus they have created the sanitation facilities.”

Remaining Stable with Rain-water

Sumon Chakma (45) started living at Ganchban village of Bhaibonchhara Union in Khagrachhari district in 1998 after the CHT Peace Accord, 1997 leaving the bitter days of refugee life in India. He, with his family went there in 1983 from Parachhara village in Khagrachhari district. He got married there. His two sons also were born in India. They got back to Ganchban and set up an abode buying a piece of land.

Before setting up the abode in Ganchban, Sumon thought about the source of water for drinking, cooking, washing and bathing. There was a *Chhara* blowing over the village. Like other users her wife Nana Chakma (38) started fetching water from the well dug beside the *Chhara*. She had to face everyday the agony of passing a long distance for fetching water. With some other neighbouring families of his *Para*, Sumon contacted to the UP-member. The member paid heed to them and installed a Ring-well. But it got lost after a few months. “We started encountering the previous distress. My wife again started collecting water from *Chhara* for drinking and other uses,” says Sumon.

They started to face various difficulties. Diarrhoea, skin diseases affected his two sons. Sumon and Nana faced dysentery, jaundice and other water-borne diseases. A local NGO HRDO visited their *Para* in 2004 and started raising awareness among their community. “They oriented us about the necessity of safe water for drinking and cooking. At a stage they offered us if we could manage some money they would give us a Rain-water Harvesting System (RWHS) at my homestead,” informs Sumon. Sumon welcomed it and agreed to contribute with 10% of the total cost. HRDO installed a RWHS at his home that can contain 3200 litre water.

“In spite of my poverty, I shared the cost. It has created the feeling that the system is mine and I should take care of it,” expresses Sumon. HRDO has trained him and his wife on O&M of the System. They clean inside of the reservoir with bleaching powder, brush before taking water into

it. They wait for 10 minutes when rain starts to let the catchments and gutter be cleansed. “We can use rain-water for a long time whole in a year. The System has decreased my agony of fetching water from *Chhara* crossing a long arduous path. Since I need not to wait for water in a cue now I can save my time and use it in other works. My sons are now free from diarrhoea and skin diseases,” expresses Nana Chakma, wife of Sumon with a jovial look.

Reducing stress of women

The alternative technologies have reduced the safe water stress of the community people in the CHT. The women can now get safe water at their nearby places where they can easily access and get necessary water without spending lot of time and energy. Sui Cha Ching Marma (18), a user of Ring-well in Thowaingyapara of Kuhalong Union, Bandarban says, “We used to drink *Jhiri* water in the previous times. We have now a Ring-well. We can now drink safe water.” Nana Chakma (42), a user of RWHS in Ganchban of Bhaibonchhara Union, Khagrachhari expresses, “We needed to spend a lot of time in the previous periods in collecting water. I could not cook in time. I have safe water facilities at my yard now. I have no stress now.” Pakhi Tanchangya (41), a user of Ring-well in Bogapara of Ghagra Union under Kawkhali Upazila, Rangamati says, “I can avail safe water at my nearby place. Spending lot of times in collecting water has gone away.”

Ring-well Relieves Her Hardship

Pakhi Tanchangya, aged 41, a housewife of Bogapara village in Ghagra Union under Kawkhali Upazila in Rangamati also works outside for their bread especially through *Jhum* cultivation. In the previous times, she used to collect water from wells dug beside the *Chharas*. She had to work in the field regularly. After getting back from the fields, she used to go to the *Chharas* to take bathe and collect water for drinking and other domestic uses. Other women of her community also gathered there to meet the same purpose. They dug a well beside the *Chhara* where water-drops gathered. Like other women, Pakhi waited there and collected water spending more than one hour. It was her routine work. “I could not cook in time due to the time I had to spend in fetching water,” she says. In rainy season or during flash-flood the wells go under the water. Then Pakhi had to collect *Chhara* water finding no other alternative.

Pakhi and her families drink the water what she fetched. “I had to spend time, energy in crossing the irregular and sometimes slippery hilly paths but could not collect fresh water. Very often my children suffered from diarrhoea, dysentery and many other diseases. My husband and I also got affected. Then we could not go to our fields to work,” recalls Pakhi. She further says, “A local NGO Progressive helped us learning that the water from *Chhara* or well is not safe and we should drink and use safe water to prevent diarrhoea, dysentery, etc. It came to our imagination why we suffered from many diseases very often. We wanted to know how to get safe water. Progressive installed a Ring-well at our community where we collectively shared the cost. We are getting now safe water.”

Pakhi needs not to wait hour after hour now in collecting water for drinking and other domestic uses. She can easily collect water which is safe. “I can now cook in time. Diarrhoea, dysentery and other diseases have decreased. The diseases are not hampering our regular works,” expresses Pakhi with a smiling approach.

Improving health and poverty situation

Sonatan Chakma (47), a beneficiary of RWHS in Nalchhara of Bhaibonchhara Union, Khagrachhari informs, “We very often suffered from water-borne diseases in the previous days. We are not facing now. People needed to spend money for treatment. Sometimes we had to spend it from the money earned for our bread. The RWHS and sanitation facilities have decreased the ominous health risk and unanimous expenses for treatment.” Sui Cha Aung Marma (50) of Purba Monaipara village in Betbunia Union under Kawkhali Upazila, Rangamati informs that water-borne diseases have decreased in his community since they are drinking safe water from Ring-well and using sanitary latrines. Now they need not to spend much money for treatment. Pulushe Marma (28), a teacher of Thowaingyapara Govt. Primary School, Kuhalong, Bandarban informs, “The students from Thowaingyapara village did not come to school regularly. I asked them why. They replied that they very often suffered from diarrhoea, dysentery and other diseases. I learn that BNKS has been working there. I have been marking for a year that the students of the village are coming to school regularly. Now the water-borne diseases do not attack them as such they suffered in the previous times.” Pakhi Tanchangya (41), a user of Ring-well and sanitary latrine says, “I could not do enough works in the previous periods since diarrhoea and dysentery attacked me very often. The diseases weakened me a lot. I now use Ring-well water and sanitary latrine. I face less disease now. My improved health now helps me working more keeping my mind sound.”

Empowering community people

The process of introducing the alternative technologies has traveled a way where the poor disadvantaged and powerless people have been lined on the way to create the rooms for them where they can take part in the decision-making process. They first have been empowered with knowledge on safe water, sanitation, hygiene, rights and so on. The formation of VDGs has made a spacious room for them to participate in decision-making and implementation process utilizing their knowledge, experiences and unused potentials. A scope of raising their demand and priorities also has empowered them a lot at their community. The VDGs is comprised with the membership of 50% women of the community who also have the scope to cherish the taste of empowerment. Hena Chakma (35), a VDG-member in Chowdhurypara of Ghagra Union under Kawkhali Upazila, Rangamati says, “We all have collectively selected the alternative technology, place of installation and the caretaker. All members including the women have participated there. And the decision that we have taken have been implemented.”

Strengthening community togetherness

Most of the indigenous communities in the CHT used to choose their place of living where they would have the facilities of *Jhum* cultivation and availability of water. Many of them lead nomadic life. They leave a place once when they find it unlikely to provide them the supports of doing *Jhum* cultivation and availability of water. The installation of the alternative technologies considering the needs and priority of the community people has created a nexus of the nomadic indigenous people to live in a particular place for long term or permanently since the availability of safe water for their everyday's uses has been established at their community. Moreover, the community-based and community-managed alternative technologies and the VDG have created a scope of community togetherness. A great number of families have been collecting water from a common source. They sit in a meeting every month where they discuss over the problems and prospects of the community regarding safe water, sanitation and hygiene and many other issues.

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