

A CASE STUDY OF 24 X7 WATER SUPPLY FACILITY OF HARAOROU VILLAGE, IMPHAL EAST, MANIPUR

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ABSTRACT

Manipur including the capital city of Imphal is facing water crisis. The government is able to provide only 70 million litres per day (MLD) against the required 101.9 MLD. Quite contrary to the situation, a village in Imphal East district of Manipur namely Haraorou village avails of uninterrupted supply of potable water through the plant located in the village. The source of the water supply plant is groundwater. Besides, reforestation of the hill range, the villager water and sanitation committee in consultation with the PHED developed an artificial recharge structure to make the source sustainable. By virtue of it, villagers have potable water through the public hydrant as well as domestic connections at a reasonable cost of ₹ 40 per household for public hydrant and ₹ 150 for domestic connection. Water tax remains unchanged so far. The water supply plant is now a model for rural water supply scheme in Manipur. This paper examines the model cited herein and also tries to understand why it could not be replicated in other villages.

Keywords : Water Governance, Manipur, Success Story, Drinking Water

Introduction

Water crisis is a situation when the availability of good water is less than the demand. This crisis is not just the disturbance in the demand and supply curve but is also about mismanagement of water resources. The United Nations acknowledges that 2.6 billion people are

without adequate water for sanitation and in view of world-wide water crisis, the UN General Assembly has proclaimed the years 2005- 2015 as the International Decade for Action on "Water for Life". The issues are coupled, since, without water for sewage disposal, cross-contamination of drinking water by untreated sewage is the chief

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adverse outcome of inadequate safe water supply. Consequently, disease and significant deaths arise from people using contaminated water supplies which are particularly pronounced for children in underdeveloped countries (Department of Civil Engineering, 2015).

The State of Manipur particularly the capital district of Imphal West and adjoining Imphal East district has been facing water crisis since the last decade and more so in the last five to six years. As per census 2011, about 25 per cent of the households in Manipur use tap water from treated source as their main source of drinking water; and the remaining households use water from other untreated sources like tap, well, handpump, tube well, borehole, spring, river, canal, tank, pond, lake and others. Only for thirteen per cent of the rural households, as against 51 per cent of the urban households, the main source of drinking water was treated tap water. Most of the households' sources of drinking water are ad hoc and temporary arrangement. These waters are untreated and uncertain about its safety for drinking (Reimeingam 2015). Public Health Engineering Minister Irengbam Hemochandra Singh in year 2014 admitted that Imphal city is facing an acute shortage of water (Thokchom 2014). Times of India (2014) reported that the crisis is so extreme that people have started using disposable plates and banana leaves, just to save water used for washing utensils.

Reimeingam Marchang (2015) observed that water scarcity in the State is a matter of choice and chance. For instance, Manipur is blessed with 15 (fifteen) major rivers/ streams under the four

major river basins such as (i) The Barak river Basin to the West, (ii) The Manipur River Basin in Central Manipur, (iii) The Yu River Basin in the East and (iv) a portion of the Llyai River Basin in the North. Besides, the National Wetland Atlas 2010 developed by the Space application Centre has identified 167 wetlands (>2.25 ha) and 541 wetlands (< 2.25 ha) covering 63.616 of the total geographical areas under different types of wetland. Besides, the State falls under the high intensity of rainfall areas (ENVIS No date). As per the record of the Department of Earth Sciences, Manipur University, the State has not recoded any situation of drought or severe drought during the period of 1926 to 2009 (The Sangai Express 2014).

Water crisis in Manipur could be because of many factors such as increase in water demand, deforestations, lack of proper management of water bodies particularly the wetlands and community ponds, urbanisation and rapidly expanding population in Imphal, leakage in pipes, illegal connections and irregular power supply (The Sangai Express 2014). But one of the major factors is lack of proper management of water bodies and also the government water treatment plants.

Methodology

As compared to the water crisis in the State particularly Imphal East and Imphal West, the Haraorou village in Imphal East is enjoying 24 x 7 water facility through the water supply plant. The paper examines this successful model and also tries to understand why it could not be replicated in other villages. The study follows Qualitative

Research technique and an exploratory research design. Key informant or stakeholders (particularly members of Village Water and Sanitation Committee (VWSC), concerned PHED official, Staff of the water supply plant) selected through purposive sampling method were interviewed to collect information. The interview was conducted through the Interview guide. Primary data were supplemented by the secondary data which were collected from the published materials and unpublished materials of village VWSC as well as the concerned officials of the PHED.

Haraorou Village, Imphal East, Manipur

The Haraorou village falls under the administration of Sawombung block, Imphal East district, Manipur. The village has a total geographical area of 230.9 hectares. It is approximately located at a distance of 14 from

the State capital. It comes under Haraorou Tangkham Gram Panchayat. As per Census 2011, the village has a total population of 1207 (male population: 597 and female population: 610) with 268 households. The literacy rate of the village is 89 per cent while it is 76.94 per cent in Manipur. The male literacy stands at 95.45 per cent while female literacy rate is 82.86 per cent.

The livelihood activities of the villagers are mostly agriculture and allied activities. The number of people engaged in the government sector are very less. As per Census 2011, 98.61 per cent of workers describe their work as main work (employment or earning more than six months) while 1.39 per cent were involved in marginal activity (providing livelihood for less than 6 months). So, out of total population, 722 were engaged in main work, 282 were cultivators (owner or co-owner) while 293 were agricultural labourers.



Figure 1: Sign Board Along the Imphal Saikhul Road.



Figure 2: Ariel View of the Hill (Kalen Chingjin) Where the Water Supply Plant is Located.

History of Water Crisis in Haraorou Village

Water crisis, particularly drinking water, was one of the major issues that the villagers of Haraorou are facing for the last three decades till the successful completion of the water supply plant at Kalen Chingjin. The only source of drinking water was the handpump at neighbouring Chingkhuh village, which is located at a distance of one to two kilometres from the centre of the village. It was supplemented by the community ponds and the nearby rivers. The water crisis was extreme particularly during non-rainy seasons, to such an extent that the villagers reused the available water for different purposes. It was a waste of time and energy for most villagers as hours are spent daily on collecting water. However, the interventions of the government to address the situation were very limited. After repeated appeal and request to address the issues of water particularly drinking water, the minor Irrigation Department, Government of Manipur developed a community pond in the village. It helps the villagers to a great extent, but the problem of drinking water continues as it could not be used for drinking water. So the only source for drinking water remains the handpump of the neighbouring Chingkhuh village. Unfortunately, private water traders thrive in and around the village.

The dependency on the handpump of Chingkhuh village and private water traders for potable water was minimised only with the installation of a handpump at the foothill of the Kalen Chingjin, where the present water supply plant is located. The temple of *Ibothou Tolongkhomba*, is also located at the same hill,

which makes the place more scared. The handpump was drilled some fifteen years back in the village as part of the survey all over Imphal valley by the government, but the installation of the handpump was done only in 2010. This indicates that the source of water particularly drinking water was available in the village but not available to the villagers because of lack of government intervention as well as limited negotiating capacity of the villagers. The handpump installed was the only handpump of the village. So, the handpump was the centre of attraction of the villagers and also of the nearby villagers, who frequented the handpump to supplement their source of water. This situation continued till October 2013 when the water supply plant at the same hill was inaugurated and started distributing water to the villagers through domestic connection and public hydrant at strategic locations of the village.

Haraorou Village Water Supply Plant

The Haraorou Village Water Supply Plant located at Kalen Chingjin was developed by the Public Health and Engineering Department (PHED), Government of Manipur under the Accelerated Rural Water Supply Programme (ARWSP), now renamed as National Rural Drinking Water Programme (NRDWP). This programme has been under implementation since 1972-73. In 1986, the National Drinking Water Mission (later named as the Rajiv Gandhi National Drinking Water Mission in 1991) was launched and, further in 1999, the Department of Drinking Water Supply was created, to provide a renewed focus with a mission approach to implement programmes for rural drinking water supply (Ministry of Drinking Water and Sanitation).

The aim and objective of NRDWP is to provide every rural person with adequate safe water for drinking, cooking and other basic domestic needs on a sustainable basis, with a minimum water quality standard, which should be conveniently accessible at all times and in all situations (Press Information Bureau 2013).

The development of the water supply plant was the long cherished dream of the villagers but it was not any easy process. The movement for a water supply plant was initiated three decades back by the villagers as the water crisis was affecting the development of the village and the villagers. The productive works were mostly compromised as their main concern was to collect water for daily needs; else they have to buy water from the private water traders. The water supply plant was sanctioned during the time of the Hon'ble Speaker Lokeshwar, the sitting MLA representing the village and also happens to be the Speaker of Manipur Legislative Assembly. The present site for the water supply plant was selected in consultation with the experts and official of PHED. The site was chosen as it is located in the required elevation and the groundwater level was satisfactory as the water supply plant is a groundwater fed water supply plant. It is also adjacent to the sacred forest of *Ibothou Tolongkhomba*, where cutting down of trees are forbidden and always remains under forest cover. Besides, there was also an approach road to the temple, which can be used by the official of the PHED and the villagers to transport the construction materials easily.

Community Participation

The villagers were so happy with the sanctioned water supply plant that they commit

to volunteer (read as community participation) in developing the water supply plant. As committed, most of the developmental works of the water supply plant and its components such as the lying of pipes, fitting of public hydrants and domestic connection, etc., were done by the villagers but with a strict supervision from the official and experts of PHED. The community participation was systematically done under the supervision of the Village Development Committee (VDC) and in close coordination with the concerned official of PHED. The coordination was to effectively utilise the volunteers according to their skills and to avoid any confusion with the PHED official. THE VDC was formed in the year 1978 with the overall objectives of developing the village. The simple logic for community participation was because of the fact that the water supply plant has the capacity to resolve the water crisis which the villagers are facing for the last three decades and at the same it will minimise the hardship for the present and future generations. In addition, they can also invest their time and energy to other developmental activities for themselves and also for the village.

The water supply plant was inaugurated on October 26, 2013 by the Hon'ble Minister, PHED Shri I. Hemochandra in the presence of Shri Th. Lokeshore Singh, MLA representing the village and also the Speaker of the Manipur Legislative Assembly. A Memorandum of Understanding (MoU) was signed with the PHED and Village Water and Sanitation Committee (VWSC) of the Haraorou village. The MoU was compulsory as per the guideline of National Rural Drinking Water Programme. As per the guidelines, once any rural

water supply scheme is completed and commissioned, the operation and maintenance of the scheme is to be handed over to the VWSC. The VWSC should comprise about 6-12 members including (i) Members of the Gram Panchayat; (ii) 50% Women; (iii) Representatives of all habitation; (iv) Representatives of SCs, STs and poorer section of the village. The VWSC acts as a standing committee of the GP. The president of the VWSC can be sarpanch/president of the GP or an elected member as decided by the Gram Sabha. The responsibilities of VWSC are: (i) Operation and maintenance of Water Supply Scheme; (ii) Monitoring of Water Quality; (iii) Collection of water cess and (iv) Interaction with PHED as and when required.

The Haraorou Village Water and Sanitation Committee comprises twelve members with the Zilla Parishad as the President of the Committee. The Committee is the symbol of community

partnership with the Government particularly the PHED. Partnerships, by their very nature, represent a sustained commitment to move forward together to reach a common objective. This partnership can also be seen from the perspectives of public-public partnership. This partnership model is one of the most commonly found in America and Europe. This collaboration may occur between public authorities of the same type and level or it may occur between different types or levels of public authorities. However, this narrow use of the concept of public-public partnership has been widened to include partnerships between public authorities (government) and any part or member of the general public. For example, a recent definition of public-public partnerships in South Africa includes "government–community partnerships, government–NGO partnerships, as well as government–government partnerships (Singhal 2016)".

Table 1: Members of the Haraorou Village Water and Sanitation Committee

| S. No. | Position | Remark | Gender |
|--------|------------------|---|--------|
| 1 | Chairperson | Zilla Parishad | Female |
| 2 | Vice-Chairperson | Representative from Village Development Committee | Male |
| 3 | Member | ASHA Worker | Female |
| 4 | Member | ASHA Worker | Female |
| 5 | Member | Anganwadi Worker | Female |
| 6 | Member | Anganwadi Worker | Female |
| 7 | Member | Representative from Nupi Semgat Sagatpa Lup (Women Association) | Female |
| 8 | Member | Representative from Youth Modern Club | Male |
| 9 | Member | Representative from Youth Modern Club | Male |
| 10 | Member | Representative from Village Development Committee | Male |

Note: The same committee was later upgraded to the Haraorou Tangkham Gram Panchayat, by replacing only the Zilla Parishad with the Pradhan of the Gram Panchayat. There are stories of the upgradation but in this paper, it is not covered as opinion of the different villages of the Gram Panchayat was not taken and also it is beyond the scope of the paper.

Status of Water Supply

The handpump which was the only source of drinking water and also the centre of attraction of the villagers now stands alone with no villagers coming to take water. It was also a symbol that the water supply plant commissioned in the village is successfully providing water to the villagers at a reasonable cost. The water supply plant has a capacity of one lakh litres, which more or less are consumed everyday by the villagers. The source of the water supply plant is the groundwater. So, the water supply plant needs to pump the groundwater daily. The daily requirement of water is pumped in three phases, as morning, afternoon and evening for five hours. The gap in pumping water is to allow the groundwater to recharge to the storage area. The committee members observed that the catching of groundwater is approximately 80 feet during lean season and approximately 35 feet during rainy season. It is because of the fact that the village is located in low lying areas and thus the status of groundwater level is satisfactory. The committee members observed that, it is the gift of nature to the villagers as they have been facing water crisis for the last three decades. So, there is no storage of groundwater so far and most importantly, the committee strictly monitors that only the required water is pumped. They are concerned that over-exploitation of the groundwater will only create problem for the villagers.

In the initial days after the commissioning of the water supply plant, only five households were having domestic connection with a monthly tax of ₹ 150, while the rest were using public

hydrant which charged a monthly tax of ₹ 40 per household. But now, the domestic connection has increased to 100 households (out of 268 households) and the remaining households are using 26 public hydrants. Now, one public hydrant caters only to ten households but there are some which has 11-12 households. In order to effectively manage the water supply plant, two staff are recruited by the Committee with a honorarium of ₹ 6000 each (one caretaker and another lineman). They are responsible for day-to-day functioning of the water supply plant. The caretaker and the lineman in consultation with the experts from the PHED, treat the water through the kits provided by the PHED. The honorarium and the maintenance of the water supply components are drawn from the income generated through the collection of water tax from the beneficiaries. The honorarium is constant (₹ 12000 per month) but the maintenance differs every month depending upon the type of maintenance. So the expenditure fluctuates every month.

24 x 7 Water Supply Facility: A Case of Innovation

The water supply plant provided potable water for three hours in the morning till January 2014. The idea of providing 24 x 7 water supply was conceptualised and proposed by Shri L Swamikanta Singh, Director, Community and Capacity Development Unit, PHED, during an awareness campaign on drinking water at the village. He convinced the committee members that if the villagers feel that they can get potable water anytime, then it will reduce the storing behaviour of the villagers, which in turn reduces

even the consumption of water. The idea proposed was discussed by the committee members and it was decided to see the feasibility on an experimental basis. It was experimented for few days and later extended for another few weeks. The experiment was found to be satisfactory after the committee examined the consumption pattern for the three hour facility and 24 x 7 facility. So, the facility of 24 x 7 was introduced. However, the initial three months was reported to be the most hectic days for the members of committee as there were always cases of overuse of water. So, the committee decided for a continuous awareness campaign, community workshops and drive against overuse of water. The campaigns bear results as conserving water is now an integral part of the village life world. Now, the villagers store water only for their daily needs. So far there is no report of misuse of water as the villagers themselves monitor misuse of water in any part of the village. The committee feels that the high rate of literacy and the history of water crisis experienced by the village for the last three decades contributed to making the villagers understand the importance of conserving water.

In spite of the understanding of the villagers, the committee also developed a system to conserve water and to collect water tax for the domestic connection and also for the public hydrants. It is to make sure that there is a system of double security so that if one fails, the other will come to rescue. For domestic connection, a regulator and a meter box are installed in a lock system before the pipe connection goes to each household. The key of the lock system is managed

by the committee. In case the household overuses the water and/or fails to pay the monthly tax for two months consecutively, the water is stopped through the regulator and locked by the committee. They have developed a system so that the defaulters are not allowed to take water in the public hydrant as well. But so far, the percentage of defaulters is marginal, which indicates their commitment to the partnership with the committee. In case of public hydrant, there is also a lock system, in case any member of the particular public hydrant fails to pay the monthly bill for two consecutive months, the public hydrant is closed to all of them. So, member of every public hydrant developed a system to pay the required tax on time as it affects all members of the household. As of now, there are few cases of defaulters but it turns out to be the case of negligence rather than the question of income. So it was sorted out easily but with a strict warning from the committee as well as the other members of the particular public hydrant.

Why this is a Model Water Supply Plant

There is no difference with this water supply plant with any other water supply plant sanctioned and developed by the PHED through the NDWSP. However, this plant is considered successful and is visited by many organisations and community leaders with the objectives to replicate the model. The official of PHED also suggested the VHSCs of other villages to visit and study the model of Harourou water supply village plant. The visitors are from different walks of life such as members of different VWSC, academic institutions, Government officials, non-government organisations and even elected

members and the number is increasing. The public hydrant model of the villages has been appreciated by the Hon'ble PHED Minister who suggested to the official of PHED to replicate the model throughout Manipur. The most recent visitors are the Parliamentary Standing Committee on Rural Development, which comprises 20 Members of Parliament and five officers.

The potable drinking water available to the villagers through the domestic connections and public hydrants has far excelled the national norms. For instance, as per the norms for providing

potable drinking water in rural areas under the ARWSP (1972) guidelines (Ministry of Drinking Water & Sanitation 2013), basic minimum need was 40 lpcd, but from the Twelfth Five Year Plan, the vision for rural domestic water supply is to cover all rural households with safe piped drinking water supply @ 70 lpcd. Considering the fact that the norm of 40 lpcd has been continuing for the last four decades and there is a large population that has to be provided with higher service levels, as an interim measure the norm is 55 litres per capita per day (lpcd) for humans to meet the following requirements.

Table 2: Requirement of Potable Drinking Water to the Rural Population

| S. No. | Purpose | Quantity (lpcd) |
|--------|-----------------------------------|-----------------|
| 1 | Drinking | 3 |
| 2 | Cooking | 5 |
| 3 | Bathing | 15 |
| 4 | Washing utensils and house | 10 |
| 5 | Ablution/toilets | 10 |
| 6 | Washing of clothes and other uses | 12 |
| | Total | 55 |

Source: Ministry of Drinking Water & Sanitation (2013).

As stated, the water supply plant at Haraorou village provides 82 litres per capita per day. And at the same time the rate of water tax is also considerably reasonable as compared with the government supply in Imphal and its adjoining areas. For instance, for water connection, PHED charges an amount of ₹ 150 per domestic connection, but it provides water alternate days or on a gap of two to three days. Besides, it supplies water for one to three hours only, while it is 24 x 7 for the same amount in Haraorou village.

There are a number of factors for the success of this model such as (i) 24 x 7 availability of water with 82 litres per capita per day; (ii) Community participation; (iii) Natural resources; (iv) Sustainability practice and (v) Close coordination with the PHED officials for regular inputs and (vi) Close coordination with the elected representatives representing the village such as Pradhan, Zilla Parishad and MLA. These factors are all inter-related and supplement each other.

The 24 x 7 water supply facility with 82 litres per capita per day was provided to the villagers but in order to supply the required water (one lakh litre), the water supply plant has to get the required groundwater on daily basis. The significant level of groundwater in the village as the village is located in a low lying area help us pump the required water. It is a gift of nature. The villagers make sure that the groundwater is recharged through its natural process and thus the reforestation and the artificial recharge

technique is adopted. This helps us sustain the water source for water supply plant. Further, payment of tax regularly and by avoiding misuse of water help us run and maintain the water supply plant successfully so far. Moreover, the regular inputs from the concerned PHED official and the support from the elected members help us strengthen and expand the water supply plant. The construction of new reservoir and the intervention of MANIREDA to run the water plant on solar energy can be illustrated as an example.



Figure 3: Ariel View of the Artificial Recharges Technique.



Figure 4: Ground Situation of the Artificial Recharges Technique.

Sustainable Practice

In order to get the groundwater recharged, the committee through the help of the VDC strictly commit themselves to sustainable practice such as (i) They have planted more than 2500 trees, particularly Burmese teaks along the foot hill of the water supply plant and also along the hill range. The trees were mostly collected by the VDC and VWSC from the government nurseries, particularly from the forest department. Some of the trees were donated by

the villagers. The plantation of the trees was done by the villagers as part of their contribution to strengthen the source of the water supply plant. This also helps the villagers to reaffirm their commitment to conserve water; (ii) They have converted the hill range into a community reserve forest where no villagers are allowed to cut any forest products particularly trees. This hill range was once used as a rotational (every three to four years) timber collection zone for the village. But, considering the need to strengthen

groundwater, the villagers unanimously decided to conserve the hill range as their reserve. They stated that they are conserving the forest since the inception of the water supply plant and fortunately, there is no reported case of violating the community decision; (iii) A indicated earlier, the hill also maintains its own sacred forest because of the temple of *Ibothou Tolongkhomba*. This also helps the hill range to keep it more sacred and greener. They stated that the inspiration to conserve the hill range comes from the sacred forest of the temple. Earlier, it was only this forest that was covered with trees as the other hill ranges are cut down every three to four years, but now the whole hill range is completely green with enough trees. It also strengthens the biodiversity of the region as well as to mitigate the issue of climate change; (iv) They have developed an Artificial Recharge Technique.

Artificial Recharge Technique: The committee with the help of PHED developed an Artificial Recharge Technique to recharge the groundwater. The artificial recharge to groundwater aims at augmentation of groundwater reservoir by modifying the natural movement of surface water utilising suitable civil construction techniques (Central Ground Water Board 2000). As part of the process, three canals were developed with a length of 50 to 100 meters by keeping a distance of 50 meters each. Each canal has the capacity to hold enough water and the overflows are stored by the following canals. The villagers stated that the canal holds water even in the dry season. The author visited the site during January which is a lean season in Manipur but the canal was filled with water.

(v) Lastly, a community pond along the groundwater recharge structure is developed to conserve the overflow of water from the recharge structure. The community pond which has the dimension of 100 x 50 meters was storing water at its limit.

This integrated approach of community participation, innovation, and sustainable practice are the core of the successful model of Haraorou water supply plant. However, in spite of the appreciation, it could not be successfully replicated even in the neighbouring village. In order to better replicate the model, there is a need to incorporate a strategy for sustainable practice in the MoU, signed with the PHED and VWSC, in addition to the existing guidelines such as (i) Operation and maintenance of Water Supply Scheme; (ii) Monitoring of Water Quality; (iii) Collection of water cess and (iv) Interaction with PHED as and when required.

Issues and Challenges

The water supply plant is no doubt a successful model. But there are also issues and challenges that need to be addressed at the earliest. The main challenges are (i) there is only one reservoir to store the pumped groundwater before it is supplied to the villagers. The concern with having only one reservoir is that the water supply plant is totally dependent on electricity to pump the groundwater. The government has installed a dedicated power supply only for the water supply plant but, there are instances of disturbance in the electricity supply such as short circuit, etc., which in turn disturbed the supplying of water to the villagers. Since the villagers are

enjoying 24 x 7 water facility for the last three years; they have abandoned the habit of storage of water for other than their daily needs. So any disturbances in electricity disturb the village life. Considering the importance, they have constructed another water reservoir with the same capacity. Further, in order to address the issues of electricity, they are planning to turn to solar energy for the water supply plant. Fortunately, the Manipur Renewable Energy Development Agency (MANIREDA) has agreed in principle to facilitate in development of the solar plant for the water supply plant. However,

there is a constant need to pursue the matter with the department and also with the elected representatives; (ii) the maintenance of the water supply and its component, particularly the water pipes, sometimes are very costly and the committee is not able to manage from their income generated; (iii) the sub-quality of product supplied to the water supply plant and its components, as the villagers were not involved at any level in such procurement. In spite of the success of the plant, there are cases of sub-standard materials which are supplied by the PHED, which might give a wrong message to the villagers and also to the visitors.

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