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PEOPLE-CENTRED APPROACHES TO WATER AND ENVIRONMENTAL SANITATION

People's pump in Lao PDR

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The People's Pump is a traditional handpump that has been used for several years by rural villagers in Lao PDR. This handpump can be manufactured with local materials and is easy to maintain. The pump is gaining recognition within the sector and is expected to be included within the water supply informed choice options for demand assessment in Lao PDR. This paper briefly reveals the story of the People's Pump – a story of how a people-centred technology can influence provision of affordable water supplies to rural communities.

Background

The National Centre for Environmental Health and Water Supply (commonly known as Nam Saat) under the Ministry of Health is the responsible agency in the Lao People's Democratic Republic (Lao PDR) to facilitate the planning and implementation of the Rural Water Supply and Sanitation Programme (RWSS). This is done in collaboration with other line agencies and ministries. The Programme follows and promotes the principles and concepts laid out in the Lao PDR Rural Water Supply and Sanitation Sector Strategy. Among many other key principles, the Strategy promotes informed choice options for water supply, latrines and hygiene awareness. Communities can select appropriate options that lead towards better RWSS services and hygienic environments.

The People's Pump, a locally-manufactured handpump, is considered as one such low-cost appropriate option for water supply. It is proposed for inclusion in the water supply informed choice options in Lao PDR.

Development of the people's pump

The People's Pump is a traditional handpump in Lao PDR. It can be easily designed and constructed by villagers. This handpump suits conditions in villages in low-lying areas with high water table. Figure 1 shows a typical People's Pump being used by children.

Earliest reports of this handpump being used in Lao PDR are from Bolikhamxay and Savannakhet Provinces in 1969. However, no information has been found on the People's Pump between the 1970's and 1990's. After launching of the RWSS Sector Strategy in 1997 by the Ministry of Health, Nam Saat initiated to look back to various existing options on water supply services that were being used by communities in Lao PDR.

In this backdrop, Nam Saat carried out a study on the



Figure 1. Children using a people's pump

People's Pump during year 2000 – 2001 in collaboration with communities, and district and provincial Nam Saat staff. This initiative was supported by the World Bank's Water and Sanitation Programme (WSP), Lao PDR Country Office. The main objectives of the People's Pump study were to: -

- assess the acceptability of the People's Pump;
- evaluate the perception of villagers on using the People's Pump;
- determine the effectiveness on operation and maintenance of the People's Pump at the village level;
- determine the performance of the People's Pump.

The study was carried out in two provinces where the People's Pump is commonly seen, popular and being used. The sites selected for the study were:-

- Paksan and Pakkading Districts of Bolikhamxai Province, and
- Paksong District of Savannakhet Province.

The study revealed:-

- The People's Pump is low-cost and easy to construct and maintain. It is well accepted by rural villagers.
- Woman and children feel comfortable to use the People's Pump, mainly because it is easy to lift the handle.
- The spare parts of the People's Pump are readily available at village or district level and, therefore, can be easily fixed if there is a breakdown.
- The performance of the People's Pump largely depends upon the water quality and quantity from shallow aquifers. In many cases, the water quality produced from the People's Pump was bacteriologically unsafe but people still use the water mainly for other purposes, such as, washing, cleaning, bathing etc.

The study opened up a new chapter in the story of the People's Pump. Since 2001, Nam Saat has been providing necessary back-up support to villagers to improve the People's Pump design to make the pump more sustainable and user friendly.

Design of the People's Pump

The People's Pump is a simple direct-action handpump. The pump is built around a down-the-hole cylinder containing a piston. It displaces an amount of water equal to the distance the piston travels. The amount of water that can be produced is limited by the diameter and length of the piston and the number of times it moves in a given time period. A typical schematic diagram of the People's Pump and a drawing of spare parts required for its upkeep are shown in Figures 2 and 3 respectively.

Materials required for installation of a typical People's Pump are as follows (refer Figure 2):-

- wooden timber handle
- rubber disk
- rubber or timber disk drilled with holes
- rubber cover
- wooden stopper with holes
- 90° ½ inch PVC Pipe
- T-shaped ½ inch PVC pipe
- PVC 1½ inch pipes
- PVC 2 inch pipes
- Glue

Spare parts required are as follows (refer Figure 3):-

1. PVC 1½ inch pipes
2. Steel rod 6 mm diameter
3. PVC ½ inch pipe
4. Rubber/wooden timber stopper
5. 90° ½ inch pipe
6. T-Shaped ½ inch pipe
7. Rubber tube with hole
8. Bolt No. 10
9. Metal ring

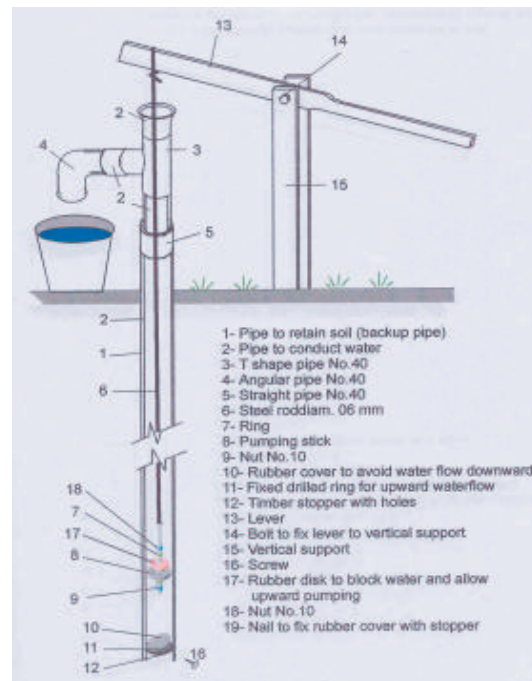


Figure 2. Schematic diagram of people's pump

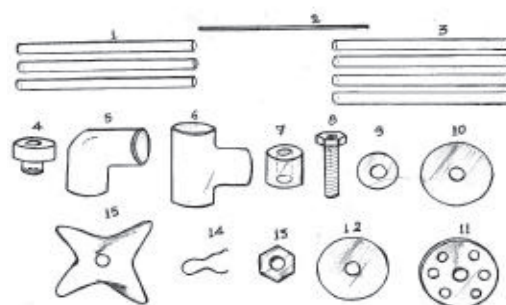


Figure 2. Schematic diagram of people's pump

10. Rubber disk
11. Rubber/Wooden timber drilled disk
12. Rubber cover
13. Nuts
14. Metal fastener
15. any kind of cotton cloth

People's pump application in Lao PDR

The main findings from the application of the People's Pump in Lao PDR up to now are as follows:-

Acceptance of the people's pump

In many places it is common to see that villagers install their own People's Pump at their premises. The main reason to have their own handpump for individual family use is to have full ownership and control over their asset. This helps them to operate and maintain the handpump effectively,

especially to use the handpump with proper care so it doesn't breakdown frequently.

Nam Saat Central estimated that, so far, more than 5,000 People's Pumps have been installed in Lao PDR. Most are in the southern and central provinces. It is not known whether any NGOs or any other agencies are supporting the use of this type of handpump. All these handpumps are being installed by the villagers themselves with the help of local technicians.

Water quantity and quality from the people's pump

The quantity of water pumped by the People's Pump depends upon the groundwater aquifer. Generally, the People's Pump supplies good quantities of water throughout the year. Problems occur during drought, when shallow groundwater tables often run dry.

The quality of water from the People's Pump might not be always bacteriologically safe since it comes from shallow groundwater tables. Generally communities use the People's Pump water for other purposes than drinking. However, if they use this water for drinking, often they boil the water first.

Cost effectiveness of the people's pump

Nam Saat Central made a cost comparison (refer Table 1) between all the handpumps that are currently being used in Lao PDR. It shows that the People's Pump is the cheapest option, both in terms of capital and recurrent costs.

Operation and maintenance of the people's pump

The use of local materials and the simple technology makes the People's Pump easy to repair by local people. The recurrent costs for maintenance of this hand pump are very low and affordable for poor households.

Table 1: Cost Comparison between Dugwells and Handpumps in Lao PDR

| Water Supply System | Max. lift depth (m) | Drilling technique | Capital Costs / unit (USD) | O&M Costs/ year/unit (USD) |
|------------------------|---------------------|---------------------------|----------------------------|----------------------------|
| Lined Dugwell | 10 m | Manual | 100 | Not known |
| People's Pump | 10 m | Manual | 36 | 5 |
| Modified People's Pump | 10 m | Manual | 50 | 5 |
| Tara Handpump | 15 m | Manual / Drilling machine | 120 | 30 |
| Afridev Handpump | 30 m | Drilling machine | 250 | 80 |
| India Mark-III | 30 m | Drilling machine | 250 | 80 |

People's pump innovations

There are many innovative applications of this pump in Lao PDR. Two interesting cases are highlighted below:-

Development of the modified people's pump

Nam Saat has repeatedly received feedback from many villagers that it would be better if the People's Pump could have a design similar to the action of the Tara handpump, but costs the same as the long-handled People's Pump. This would make the pump easier to use.

On the basis of this request, the research and development unit of Nam Saat Central developed a 'Modified People's Pump', which can be operate similar to Tara handpump. This handpump costs much less than a Tara Handpump (refer Table 1).

In July 2004, this newly developed model has been installed in Ban Keoku village (refer Figure 4) and Ban Phonekeo Primary School of Keoudom District of Vientiane Province. Both of these handpumps are at a pilot stage. If they work well, then Nam Saat will promote and assist villagers to install more of this type of handpump.



Figure 4. Modified people's pump

People's Pump installed at the first floor

Ban Had Pienkham is a small village on the bank of Nam Ngum River, established in 1986. The village is around 40 km from the centre of Vientiane Capital City. The village is under the jurisdiction of Saithani District. It has a total 41 households with about 250 people. The villagers of Ban Had Pienkham first came to know about the People's Pump when someone visited from nearby Ban Tansang Village. The villagers of Had Pienkham Village collected an amount of 500,000 Kip and paid a driller of Tansang Village to install the first People's Pump in 1996.

Since 1996 up to now, almost all households have their own People's Pump installed by themselves. Because the traditional living area for Lao people is the first floor of the house, eight households decided to install their People's



Figure 5. Showing the people's pump installed at the first floor of a house in Ban Had Pienkham village.

Pump at the first floor level of their house (see Figure 5). Also, another eight households have up-graded their People's Pump with electric motors. The current cost for installing a People's Pump in Ban Had Pienkham Village is around US\$ 30. Technicians from Ban Had Pienkham Village are being hired by neighbouring villages to install People's Pumps, for which the technical charge is around US\$ 20 per unit. The People's Pump has been successfully adopted and adapted by Ban Had Pienkham Village.

Lessons learned on the people's pump

The main learning from the People's Pump application is that in Lao PDR the pump has had a spontaneous transfer of the technology from community to community by the villagers themselves. This transfer of technology has often been achieved through observing the successful application and effective use of the handpumps at other villages, without organizing any mass awareness campaign or promotional activities. The main reason for this successful transfer of technology might be due to the simple, low cost and easy to repair technology of the People's Pump.

However, Nam Saat Central has observed a significant hurdle to the application of the People's Pump. The drilling of the boreholes can be difficult, especially where manual drilling is involved in hard ground. In this connection, Nam Saat Central has initiated a dialogue with staff of an International Non-Government Organization, who have expertise on adapting rice paddy tractors that can be used as drilling-rigs for shallow to medium-depth aquifers. This model has been successfully designed and implemented in the Philippines. Nam Saat Central is now exploring this further to see if these tractor-rigs can be successfully piloted. If successfully

applied, this technology would greatly benefit the RWSS Programme in Lao PDR.

Concluding remarks

The lessons learned from the on-going development of the People's Pump in Lao PDR shows that if a particular technology suits the local culture, tradition and service requirements, and is used successfully by the people for a long period of time, then the technology becomes part of the culture. The necessary supply chains develop within society itself. Such an example of this technology and service level satisfaction is the People's Pump.

Nam Saat's current support to the People's Pump is further fostering community-based initiatives for improved water supply services. This supports will help the overall aims of the Government of Lao PDR to reduce poverty and provide improved RWSS services to achieving the targets of the National Growth and Poverty Eradication Strategy and the Millennium Development Goals for Lao PDR.

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