

Lao People's Democratic Republic
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Ministry of Health
National Water Supply and Environmental Health Programme (Nam Saat)

REPORT ON THE STUDY OF THE PEOPLE'S
PUMP IN LAO PDR



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November 2000

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Acknowledgements

This Report on the People's Pump Study has been prepared by the National Centre for Environmental Health and Water Supply (Nam Saat) with support from the World Bank Water and Sanitation Program East Asia and Pacific (WSP-EAP) Lao Country Office, as part of Nam Saat activities to implement the Annual Workplan for the year 1999-2000.

This study and the subsequent report was made possible through funds from the Swedish International Development Cooperation Agency (Sida).

In particular, for their contributions and review, Nam Saat expresses its appreciation to:

Eleni Karkas, Mr. Bounmy, Mr. Somlat, Mr. Khamoune, Mr. Puthasen, province and district officials in Savannakhet, Mr. Senexay, Mr. Satanam Singaravadielu, Dr Khampiou Syhakang, Dr Soutsakhone Chanthaphone, Dr Keo Oudom Namsena, Kanna Baran, Santanu Lahiri, Chander Badloe and Malin Krook

Special appreciation is expressed to the villagers of Bolikhamxai, Paxan and Pakkading districts, and Savannakhet, Paksong district, who gave of their valuable time and shared their experiences and comments, and whom without no study would have been possible.

The findings of the study were presented in a workshop attended by participants from Nam Saat, World Education, Canadian Volunteer Organisation (CUSO), World University Service Canada (WUSC), Co-operation International pour le Development et la Solidarite (CESVI), UNICEF, and WSP-EAP. Thanks is also expressed to these participants for their comments and suggestions on the content and the format for reporting on the study findings.

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Table of Contents	Page
1. EXECUTIVE SUMMARY	1
2. BACKGROUND TO THE PEOPLE'S PUMP STUDY	
2.1 Introduction	2
2.2 Background	2
2.3 Objectives of the Study	2
2.4 Study Methodology	3
2.5 Location of Fieldwork	4
2.6 Perceptions of the People's Pump	4
3. FINDINGS OF THE STUDY	
3.1 Technical Breakdown	5
3.2 Labour Requirements	5
3.3 Indigenous Drilling Knowledge	6
3.4 Ongoing Maintenance	7
3.5 Water Collection	7
3.6 Decision Making	8
3.7 Socio-economic Aspects	8
3.8 Performance of the People's Pump	9
3.9 Adoption/Diffusion Processes in Case Study Villages	10
3.10 Case Studies	12
3.11 Situation of Tara Pumps	12
4. ANALYSIS OF THE LESSONS LEARNED AND IDEAS FOR THE FUTURE	
4.1 Collective versus Household Ownership	13
4.2 People's Pump More Accessible to More Sections of the Community	13
4.3 Community Preferences	14
4.4 People's Acceptance	14
4.5 Risk	14
4.6 Community Extension	14
4.7 What Niche is the People's Pump Serving?	14
5. RECOMMENDATIONS	
5.1 Recommendations for Next Steps for the People's Pump	15
5.2 Recommendations for Future Studies	16
 ANNEXES	
Annex 1: Sketches of People's Pump	
Annex 2: Household Questionnaire	
Annex 3: Terms of Reference for the Study	

1. EXECUTIVE SUMMARY

The idea for the study of the People's Pump came about during a Sida¹ mission to Lao PDR in 1999, where the pump was discussed as an important and unique example of indigenous technology. The current capacity of the government agencies involved in water and sanitation services in Lao PDR is overstretched, and it is not expected that the provision of adequate water services to all households will be possible to be met in the immediate future. Therefore, it is imperative to try to provide more immediate sustainable alternatives and innovative solutions while at the same time working towards the long-term goals.

The main objectives of the People's Pump study are to establish the key factors determining the acceptance/non-acceptance of pump technology, the technical potential and limitations of this pump within a specific geographic area, to study the maintenance requirements, and to demonstrate interest and commitment in promoting local technology that is sustainable. The overall focus of the study has been on the *social* aspects related to technology transfer, rather than the technicalities of the pump mechanism.

The study shows that the People's Pump is filling an important niche in Lao PDR for the supply of water to people in the rural areas. The main reason for the popularity of the People's Pump is the low level of technology and materials required for making the pump, and that the People's Pump is currently the cheapest option in household pumps available. Another finding from the study is that, if possible, people prefer their own household water source, even if it is of inferior quality, due to the convenience of proximity of the water source and time saved collecting water, and also that the costs incurred for water is directly linked to their own usage. Households are more likely to install a People's Pump in villages where there has already been successful drilling and installation of a People's Pump. Where there are no earlier examples of installation of a People's Pump households appear more reluctant to adopt the technology. However, once the information and knowledge about the People's Pump is spread the financial situation of the household becomes the primary obstacle to construction of the pump. An area which was not studied in this report but which is of interest to study further is how the decision-making process at the household level is developed.

So far the People's Pump is not supported by any agency or organisation. The decision for investment and construction is fully initiated at the household level without the necessity for community level consultation. However, the People's Pump should not be seen as a substitute for the construction of other water supply systems, or be seen as a "saving grace" for Lao PDR. In a long term perspective it is not an effective strategy to focus only on the installation and spread of the People's Pump. However, in the short and medium-term perspective the People's Pump offers an indigenous alternative in the Lao context, where more value is often placed on high technology and capital intensive solutions. Parallel to the implementation of the national Lao *Rural Water System and Sanitation (RWSS) Sector Strategy* for water supply Nam Saat can work on changing the attitudes and practices towards the People's Pump to be more positive and moreover, for example, develop a training manual on the People's Pump technology and improve the design, give people information about their soil conditions in order to encourage the drilling of new boreholes, and also to support local drillers in order to bring the price of drilling down. Furthermore, as the one major advantage of the pump is that materials for it can be found locally, Nam Saat can work with the private sector and local institutions to develop locally produced and manufactured parts for the People's Pump. This would provide a wider range of options and offer improved parts for the construction.

An additional objective of the study was to serve as an introduction and example for future studies to be carried out by Nam Saat. For future studies the composition of the study team should be designed carefully, with emphasis on clear Terms of Reference and roles for each team member. Furthermore a smaller team and the participation of women team members appear to be beneficial for a more positive reaction from rural communities in order to improve information gathering in the field. The timing of the study is also important, for example, so that it will not clash with harvesting, or if carried out in the rainy season interesting, but more remote areas, may be hard to reach.

¹ Swedish International Development Cooperation Agency

2. BACKGROUND TO THE PEOPLE'S PUMP STUDY

2.1 Introduction

The National Environmental Health and Water Supply Centre (Nam Saat) of Lao PDR, as part of the Ministry of Health, under the *National Water Supply and Environmental Health Programme (NWSEHP)*, works with supporting water supply and environmental health (sanitation and hygiene education) activities in the rural and remote areas. The programme follows and promotes the principles and concepts laid out in the Lao PDR Rural Water Supply and Sanitation Sector Strategy and the Guideline National Framework for RWSS. The programme is based on the following essential key components:

- Behavioural change through appropriate hygiene awareness and participatory education
- Improved sanitation facilities, based on intensive community dialogue process
- Improved water supply services, also based on full community dialogue process and participation

The study of the People's Pump was commissioned jointly by Nam Saat and the Water and Sanitation Program – East Asia and Pacific (WSP-EAP). The idea for the study originally came out of a Sida mission to Lao PDR in 1999, in which the People's Pump was recognised as an important example of indigenous technology worthy of further study. In addition to interest in the actual technology of the pump there was further interest in a pump study for its potential to give insight into some problems related to the existing pumps supported by Nam Saat.

2.2 Background

According to figures from 1999² around 54% of the rural population in Lao PDR is estimated to have access to potable water and only around 34% are estimated to have access to adequate sanitation facilities. A key factor in the efforts of improving the coverage of safe water and proper sanitation facilities for the population is the development of low cost technologies, that are easily maintained by the communities, and technologies that will be adopted voluntarily by the communities. The People's Pump is considered to be one such technology.

The People's Pump is an indigenous type of pump technology. It has emerged in Lao PDR in the last couple of decades, and is noted for a few main important characteristics: all materials required for its assembly can be found locally; the parts are inexpensive; and the pump is easy to make, use, and repair.

The capacity of the government agencies involved in water and sanitation services is already strained, and therefore it is not likely that the long-term goals for water and sanitation in Lao PDR, namely to provide adequate water services to all households, will be met in the immediate future. In the meantime, the need for water affects the people in Lao PDR in a number of ways, such as; 1) health and hygiene as related to both water and sanitation, and 2) the productive time spent collecting water, particularly for women who are the primary water collectors. Therefore, it is very important to try to provide more immediate sustainable alternatives while at the same time working towards the long-term goals. In this regard the People's Pump study was selected by Nam Saat as a priority because of its potential to provide insight into sustainable, short-term solutions for the provision of a safe water supply in rural Lao PDR. The full ToR for the study is included in the report as Annex 3.

2.3 Objectives of the study

The main objectives of the People's Pump study are:

- 1) To establish the key factors determining the acceptance/non-acceptance of pump technology
- 2) To establish the technical potential and limitations of this pump within a specific geographic area
- 3) To clearly understand the maintenance requirements, including availability and identification of materials
- 4) To demonstrate interest and commitment in promoting local technology that is sustainable

In order to reach the above objectives, it was determined that information on the following areas needed to be collected and analysed:

- 1) Division of Labour
- 2) Decision-making
- 3) Technical Information

² Figures presented in the Nam Saat Annual Review and Planning Workshop, August 7-11, 2000

- 4) Socio-economic aspects
- 5) Perceptions of pump performance
- 6) Adoption and Diffusion process

The fieldwork for the People's Pump study focussed on collecting information on the above listed areas. The overall focus of the study has been on the *social* aspects related to technology transfer, rather than the technicalities of the pump mechanism. The interest did not only concern the pump, but the social context in which it is found, as well as the barriers and motivations related to acceptance of new technology, which are often social matters rather than technical.

2.4 Study Methodology

A large component of this study was doing a household survey based on a pre-designed questionnaire, focusing on households as the users/adopters of the People's Pump. It is commonly known that household questionnaires are most often completed through the head of the household, which in the case of Lao PDR is usually a man. Since the objective of the study was to obtain information by engaging in community dialogue, it was important to ensure that women also had a forum for voicing their views in less formal settings. To reach a broader community base, a number of participatory tools were used to engage both men's and women's focus groups in community dialogue process.

In total, the study consisted of:

- household questionnaires³ (20 households were included)
- 6 discussions/activities with women's focus groups
- 6 discussions/activities with general/mixed focus groups⁴

Regrettably, the questionnaires were subject to a number of unforeseen methodological problems. The questions appeared to not always be understood by the interviewee, and the questionnaires did not contribute to as much dialogue as hoped for, but often became more of one-word answers more or less "prompted" by the interviewer. Due to time constraints during the preparation of the study field pre-testing of the questionnaire could unfortunately not be done. Partly due to the above and also due to the low number of questionnaires completed, it is not useful to present the information in a numerical format because the sample is simply too small. Many of the survey questions were attitudinal, so their relevance was proved in the discussions that followed as a result of the questionnaire. However, the focus group discussions and observations made by the field team helped to provide useful insights to reach the objective of the study.

An additional objective of this study was to present the study in a manner that will serve as an introduction to Nam Saat for research studies in the future.

The Research Team

The research team was comprised of a short-term consultant (STC) from WSP- EAP, and a central Nam Saat counterpart. In each of the two provinces (Bolikhamxai and Savannakhet), which participated in the study, there was a provincial and a district staff counterpart. In cases where more than one district was visited, it was necessary to change district counterparts as the study crossed over into another district. The research team was at all times comprised of four people (the STC and representatives from central Nam Saat, provincial Nam Saat and target district Nam Saat).

Tools for Data Collection:

- 1) Questionnaires
- 2) Participatory tools with men's and women's focus groups (mainly women's groups) as well as mixed groups:
 - Mapping of village water sources
 - Discussing good things and bad things about the People's Pump
 - Discussions about village water issues with women's focus groups

³ See Annex 2

⁴ These groups were aimed to be a balanced mix of men and women, however, the majority of the participants in the mixed groups were men.

2.5 Location of Fieldwork

Bolikhamxai and Savannakhet were selected because of the visibly high density of this kind of pump, and due to the area's lowland topography for which this kind of pump is considered appropriate. The pump can only be used in lowland areas where the water table is shallow.

Districts were selected by the research team, contingent on the approval of provincial Nam Saat. In both Bolikhamxai and Savannakhet there were safety concerns, so fieldwork was restricted to districts and villages near or on route 13. A broader geographical area would have been better for the purposes of examining the adoption/diffusion process, but this was not possible.

The intention was to visit both villages which had adopted the People's Pump technology and villages that demonstrated appropriate geographical conditions but had not yet built or installed any People's Pumps.

In Bolikhamxai, the research team was based in the provincial capital, Paxan, and travelled daily to villages in Paxan and Pakkading districts.

In Savannakhet, the research team was based in Paksong district and travelled daily to selected villages. The research team was permitted to stay overnight in one village in Savannakhet.

The level of water supply was different in every village. Many of the villages also had Tara pumps installed by Nam Saat, supported by UNICEF or the Red Cross, in addition to traditional-use sources such as ponds, open dugwells, and other sources of water which varied seasonally.

2.6 Perceptions of the People's Pump

The initial attitude of Nam Saat staff towards this study was one that did not acknowledge the potential of the People's Pump as a worthy alternative to explore. The characteristics of the People's Pump (inexpensive, low technology, easy to maintain), were perceived as indications that the People's Pump is a backwards development, and therefore not a step in the right direction for Nam Saat, which is an organisation which aims to look forward. Also, Nam Saat staff expressed a fear that future funding for Nam Saat activities might be threatened by a study that supported low-cost options. However, the findings of this study show us that these characteristics are actually the benefits of the technology.

The People's Pump Study does not envision that Nam Saat incorporate the widespread promotion of the People's Pump in its programming. Nor is the People's Pump identified as the answer to the Lao PDR's problems in water and sanitation. All that is hoped for is that the study explain something about Lao people's choices when they develop a service for themselves, rather than through a planned scheme. This includes the choices and preferences that people have for themselves in dealing with the need for water.

The importance of exploring people's own choices and preferences stems from the fundamental view that Lao people have certain *demands* for services in water supply and sanitation, and that the role of Nam Saat is to be the agency which extends these services to the population. Therefore, Nam Saat's programming, or what Nam Saat is supplying to the population, must be related to what the population demands from its services. If this is not the case, the long-term result will be that communities will not work together to support the services that are implemented by Nam Saat.

Increasingly, there are concerns regarding the latter point because of problems meeting the long-term maintenance requirements of the handpumps that are supported by Nam Saat and various other agencies in Lao PDR.

3. FINDINGS OF THE STUDY

3.1 Technical Breakdown

The main reason for the popularity of the People's Pump is the simple level of technology and locally available materials required for making the pump. The questionnaires showed that the main materials used were as follows:

<u>Materials used for drilling</u>	<u>Materials used for making the pump</u>
Metal pipe- main drilling tool Nails-to make slit in metal pipe Hammer-to hammer nails for slit in metal pipe Bamboo- to fit inside the metal pipe as a long handle	PVC pipe PVC connector Glue Wood Metal rod Rubber for piston (rubber shoe, car inner tube, car tire, etc) Nails for handle

The metal pipe for drilling can be bought for less than approximately one dollar, and is made into a drilling tool by the owner or a village blacksmith. Most People's Pump owners have made their own drilling tools, but other villagers often borrow these. In some cases, these tools are rented for a nominal fee of not more than 5000 kip (roughly 0.6\$)⁵.

The materials can either be found for free within the village, or in the case of some materials (PVC pipe, glue, metal) can be bought in the nearest town. The materials bought in stores/markets currently range from approximately 130 000 kip – 200 000 kip (roughly \$15 - \$25).

3.2 Labour Requirements

Drilling options:

- Manual drilling using labour within the household or extended family
- Paid team of 2-4 labourers
- Pay for a driller with a rig (locally assembled or factory made)

The cheapest option, drilling using manual labour from within the household is not always possible in areas where the ground is very hard or rocky. In areas where there is the option of paying labourers to drill manually, or paying for a drilling rig, the paid manual labour is generally cheaper because it does not require the use of fuel. Manual drilling rates vary considerably, and depend largely on the relationship between the customer and the driller, as labour is usually acquired in the village.

One rate quoted by villagers in Paxan was 10 000 kip per day per labourer.



Drilling Rig

⁵ The exchange rate at the time of writing this report was 1USD = 8110 Lao Kip (November 2000)

Overall, we met two drillers with home-assembled drilling rigs, and one driller who bought a 'PAT 201' drilling rig in Thailand in 1990 for 50 000 Baht (at the exchange rate at the time roughly 2940 USD dollars). He rented out his services as a driller for three years, until the machine broke down, at which time he sold it.

3.3 Indigenous Drilling Knowledge

Most people know whether it is possible to drill in their area because of a history of existing dugwells, or attempts at digging wells in the past. People either drill because it is known that it is easy to drill, don't drill because it is known that the soil is rocky, or try to drill because it is known that there is broad soil variation in their village. The latter depends on whether or not the family can afford the risk of wasting days of labour. In villages where there has already been a successful drilling for a People's Pump, other families are more likely to adopt the technology. Where families are in the position of being the first in the village to undertake this process, the risk of failure is perceived as being much higher, and there is more reluctance to drill.

Most of the People's Pump boreholes were the household's first attempt. Some however, were second attempts for two reasons: 1) the first borehole did not reach clean water, 2) the first borehole was not conveniently placed. For example it may have been placed in a spot where the wastewater does not flow away, or too close to the house, making it too muddy near the house.

Some indigenous ways of identifying appropriate places to drill were also identified. 'Appropriate' was defined as a place where there is a lot of water. Here are some of those methods:

Candle Method

This method entails walking through the village on a calm night, carrying a candle. The places at which the candle is put out are said to be the wetter areas where the water table is more likely to be shallow.

Plate Method

This method requires a few holes around 5cm deep be dug in a number of places to test for moisture. The holes have to be the diameter of a plate or bowl. These are inserted upside down at night, and in the morning, the plates which collected moisture are believed to be good places to drill boreholes.

Night Walk Method

This requires taking a slow walk on a cool, calm night in the dry season. During the walk, there may be areas which feel humid. These are considered to have good potential for drilling.

Interview with a Local Driller

Mr. Senexay, from Ban Lahanam, Savannakhet, Sonkone District, started drilling as a business in 1990 in Thakek, and later moved his home and business to Savannakhet where he continues his trade.

Mr. Senexay studied in a technical school in Savannakhet in the late sixties for four years. Later he studied electronics in Vietnam for another four years. Finally, he was trained by USAID between 1971-72 in motor and refrigerator maintenance.

In 1990 he recognised a niche market for the provision of drilling services in the district, and went to Thailand to see how home-made drilling rigs were assembled across the border. Upon his return, he bought all the necessary parts in Laos, and assembled the rig with his son in less than fifteen days.

He has thus far drilled approximately three hundred boreholes of various sizes and fitted with a variety of pumps, but mainly powered by electricity.

His charged price for the boreholes is based on the diameter rather than the depth. This differs from the norm where commercial drilling rates usually depend on depth and width. The approximate cost to the customer for a four-inch borehole, regardless of depth, is currently 6000 Baht.

Most of the drilling requests are in the dry season as it is preferable to drill when the water table is at its lowest to ensure that there will be water from the source all year round.

He currently has three diesel fuelled machines that are in constant use. Three drillers employed by Mr. Senexay operate each machine. He feels that very few people drill manually anymore because it can take up to fifteen days to dig one borehole.

Out of the three hundred boreholes he has drilled since 1990, fifteen have been for factories or large businesses, and two hundred and eighty five have been for domestic use. Of these, thirty-six have been two-inch boreholes fitted with People's Pumps.

According to Mr. Senexay, 'Lucky' pumps were also popular in the past, but people have stopped putting in Lucky pumps for the last three years. The vast majority of pump boreholes drilled for domestic use are for electrically powered pumps. He has reduced his prices in the past from 7000-8000 Baht to 5000-6000 Baht, yet most people still cannot afford his services. Out of the five to six thousand Baht that he charges for a mid-range borehole, Mr. Senexay spends the following:

Labour: three people at five hundred Baht each

Diesel: approximately five hundred Baht

Parts: one thousand Baht

Grass Method

Areas which have a certain type of grass cover (called *nya hua ngok*) in the dry season, are believed to be good spots to drill.

Ant Hill Method

Tall ant hills are considered good places to drill because the soil below the ant hill has been softened by the ants carrying up particles for their ant hill.

We did not collect any information regarding the relative reliability of these methods.

3.4 Ongoing maintenance

The head of the household (in all cases, this was identified as the father) is responsible for the ongoing maintenance of the People's Pump. In all cases, members of other households which are in the vicinity, or who are related to the People's Pump owner, also use the pump. Although it is often the case that somebody from outside of the household breaks the pump, the owner always repairs the pump. If the owner happens to be away, only an older son was reported to fix it. Otherwise the pump remains in disrepair until the owner has time to fix it. The household head generally has a few replacement parts on hand for the piston (*foy sub*), which is the most common item that needs replacing.

3.5 Water collection

Women and girls do most of the water collection, but all family members generally contribute. Women generally collect water as needed, or whenever they are at the well or river or pump bathing. They will bring water back with them to store for the household's needs. Men will bring water back if they are going to the water source to bathe, but do not generally go to the water source specifically to bring back water for the household.

Following the introduction of the People's Pump, the water collecting roles of men and women did not appear to have changed, but there were some other interesting changes in water collecting roles. Prior to installing a People's Pump, most people said that their previous water source was an old style uncovered well. The people who were responsible for collecting water were women and children (mainly girls). However, it was not safe for young children to go the well unattended because they could fall in, and in most villages there are stories of people who drowned by falling into the well. Generally, children below the age of seven cannot go to the well unattended, but with the People's Pump, children as young as two years old, can go pump water for themselves and bathe unattended.



Children washing themselves at a People's Pump

As well, prior to getting the People's Pump, many households used the community Tara hand pump, which is quite difficult to use for old people and young children because of the strength required for pumping. With the People's Pump, it is possible for old people to use it, as well as for young children who don't otherwise have the strength to use the Tara hand pump.

These points however, do not mean that the People's Pump is necessarily the preferred water source, but rather that these are advantages as compared to other village water sources. These Points also highlight the user's criteria for using a particular water facility; one that is easy to use by all age groups.

3.6 Decision Making

The People's Pump is not supported by any agency or organisation, and is fully initiated by the owners- the households. Households make a conscious decision to invest in the People's Pump without the necessity for community level consultation. It is at the household level where all decisions related to the People's Pump occur. It is also the household which provides all of the funding for the construction, installation, and ongoing maintenance.

How the decision-making process occurs at the household level (within the family), however, is not as clear. This needs to be examined to a larger degree in a separate study. The questionnaire asked the head of the household what the other members of the family thought about making the People's Pump. The response in all cases was that everyone agreed. However, in addition to the possibility that some family members had unvoiced concerns, there is also the possibility that other members of the household wished to invest in the People's Pump, or take a risk in making it, but these members may have had their decision vetoed by the head of the household. It is this type of decision making that is of interest- how do households go about deciding to make, or not make the People's Pump on their property.

It is important to note that this study cannot confidently report on family-level decision making because we were not able to build relationships to the extent that we could get reliable information in this area. It was not possible to spend as much time per village as necessary to have access to this kind of information. The questions regarding decision-making on the questionnaire were superficial in nature, and resulted in gathering only small amounts of unreliable data that was not backed up by the information collected in discussion groups. This is likely a result of not having spent enough time building a rapport with community members who participated in the study before asking the more complex and difficult questions.

3.7 Socio-economic Aspects

The most expensive, time consuming, and labour intensive part of the People's Pump is the drilling, which the majority of people do manually using labour from the family. However, if people are not confident that it is possible to drill, or that they will get good quality water, then they probably will not drill because they cannot afford to waste days of labour.

Maintenance of the pump is always quick because the materials for pump repair are found in the village. In fact, the research team came across a pump in disrepair only once, and this particular pump was different in that the piston was manufactured, rather than the home-made type that was usual for Peoples' Pumps. As mentioned above, maintenance is usually performed by the head of the household (father) or an older son, regardless of the user group.

Overall, if people felt that it was possible to make a pump on their property, and if they had the money, they would make one. However, there is a grey area in which people have to evaluate the risks involved in making the pump and decide whether or not these risks are worth taking, considering the household's economic situation. Within all of this, there are conflicting interests within the household, particularly the value placed on the convenience of the People's Pump. This value may be greater to members of the household who bear the responsibility of collecting water, and so it may be the case that these members are more willing to risk the household's investment because the rewards would be felt directly. This type of consideration is directly linked to household-level decision-making, an area where this study gathered insufficient data to draw any conclusions on.

The primary constraining factors or considerations for making the pump are:

- Drilling cost- especially in areas where it is difficult to drill and there is no option of doing it manually, a drilling machine must be used
- Materials costs (around 130 000- 200 000 kip)
- Uncertainty (risk of wasting labour)
 - if there will be water
 - if the water will be of useable quality
 - if there will be big rocks in the way of drilling

3.8 Performance of the People's Pump

The main point to be noted about the performance of the People's Pump is that every pump is different, and there are few standards for comparing.

The following are variations of different People's Pumps performance:

- Clean water all year round with little variation in pressure, quality, or maintenance requirements
- Clean water in the dry season, and poor quality water in the rainy season
- Useable only in the rainy season, with no water in the dry season – because it was not possible to manually drill deep enough due to the soil conditions
- Clean water all year round, but extensive maintenance problems in the dry season
- Low water pressure in the dry season
- Poor quality water in the rainy season (small white worms visible)

In many cases, the People's Pump did not meet the household's needs all year round. When this was the case, the household relied on other existing water sources, such as community pumps and dugwells, to fill the gaps. However, many of the previous water sources had fallen into disrepair due to the reliance on the People's Pump. This was especially the case with open dugwells. In one village in Paxan district, the People's Pump could be used all year round, but in the rainy season there are small white worms in the water, so the majority of the village collects drinking water from one favourite well which is reported to taste the best.

Overall, the People's Pump is better than the previous water sources in quality, and this is largely because most of the previous water sources were open dugwells, river/stream, and ponds. It has been noted that it may not be responsible to support the use of the People's Pump due to the possibility of poor water quality from a shallow water table, and the difficulties in doing scientific surveys on water quality. For the most part, however, villagers described the quality of water from People's Pumps as a significant improvement upon their previous water source.

It was sometimes the case that people choose to use the People's Pump despite having access to a Tara hand pump, which the villagers themselves consider to be better quality. Even though the water quality from the People's Pump was lower, the proximity of the People's Pump to the home as compared to the Tara hand pump made it favourable. In a few cases, the Tara hand pump was very near to the house, yet people installed a People's Pump on their property and used both their pump as well as the Tara hand pump. In cases where the Tara hand pump is very near the house, people used their own People's Pump when there were others using the Tara. In some cases, the People's Pump was there before the Tara hand pump, but in most cases the People's Pump was built after because people know from experience that the Tara hand pump will break down in the future and may not get repaired. In general, people surveyed for this study exhibited a strong preference to have their own household pump.

Household spending priorities, ranked by women's focus groups:	
1	Vehicle for plowing rice fields
2	Electric borehole pump
3	Animals to raise
4	Sewing machine

Village water sources, ranked in order of preference by village focus groups:	
1	Electric borehole pump
2	Electric dugwell pump
3	Tara hand pump that is in good working order or another 'modern' pump
4	People's Pump
5	Dugwell with cement rings
6	Dugwell

It is interesting to note that all of the above priorities can be seen as capital investments in the household's long term productivity.

One of the activities carried out with different focus groups was to ask people the good points and bad points about the People's Pump. Results were as follows:

Good	Bad
<ul style="list-style-type: none"> ▪ Nearby ▪ Easy to use ▪ Parts found in village ▪ Can make on one's own ▪ Cheap ▪ Can repair on one's own 	<ul style="list-style-type: none"> ▪ Piston breaks a lot ▪ Still need to invest money ▪ Sometimes dries up ▪ Not the cleanest source

3.9 Adoption/Diffusion Processes in Case Study Villages

There are some marked differences in the adoption patterns of the People's Pump between the provinces of Bolikhamxai and Savannakhet.

In Bolikhamxai, the People's Pump technology was introduced quite recently, and has really taken off only in the past five years. The earliest adopter whom we met was trained by JVC (Japanese Volunteer Cooperation) in 1989 to make the People's Pump, and the latest adopters learned about the pump only in the past year.

In contrast, the Savannakhet villages that participated in the study have a much longer history with the People's Pump technology. The earliest knowledge of the People's Pump technology was diffused by a USAID health project in 1969, but the technology was not actually adopted on a larger scale until the early 1980s. The USAID project demonstrated the technology using a mechanical drilling rig, and so villagers felt they could not reproduce it manually. The pump began to appear in the early 1980s when it was demonstrated that it is possible to drill manually on the Bolavens Plateau.



Villagers with People's Pump

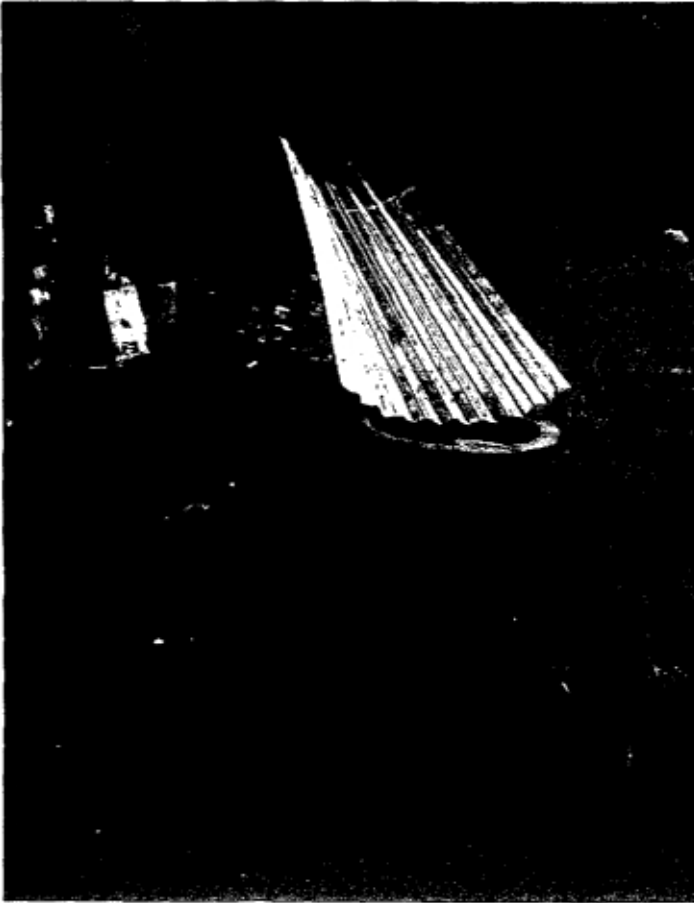
In Bolikhamxai, various villagers described difficulties in acquiring access to the People's Pump technology. This was primarily due to a preference to 'sell' pumps; people who knew how to make the pumps were willing to do the drilling and pump installation for a fee, but would refuse to share the knowledge. Since there were many people who could not afford to pay for the services, they were left with the options of:

1. Figuring out for themselves the internal pump mechanism, based on the visible outer portion. In fact, different varieties of the pump's internal mechanism exist partially because people did not actually see the inside of the pump, but had to figure out for themselves how to pull the water up. The cloth variety piston (made of umbrella) material evolved in this way.
2. Searching for the pump technology a little closer to home (i.e. in a village nearby), where people would be more likely to share the pump technology. A common example is a villager visiting a village quite far away and seeing a People's Pump, but not getting the information necessary to make one because the owner of the pump wanted to charge for the services of making one. One way in which this was resolved was to return to one's home village and seek assistance from a more learned, well-travelled villager such as the village head.

It was often the case that the earlier adopters were local leaders such as village heads who were well travelled and exposed to far more than the average villager. After the technology had been diffused into one's village, the sharing of knowledge was no longer a constraint; the financial situation of the family became the primary obstacle to building the pump.

As more people found out about the technology, it became increasingly possible to use the household's own labour and materials to make the pump, and building a pump was no longer a service that was charged for.

Other Water Sources



Rain Water Jar



Protected Dug Well With Lining



Conventional Dug Well Without Lining

3.10 Case Studies

Ban Lahakok

This village is located approximately one hour away from the town of Paksong, on an unpaved road. Most villagers have rice fields, and only one family is entirely landless. In the past, the main water source was a pond which ran dry for around four months of the year. For the dry season there were wells, but these fell into disrepair once USAID put in a well (with cement and cover) and later a pump in the 1960s. The pond remains as the village's main water source, but to a lesser degree.

A number of families in this village have relatives in the United States, and these families are identified as 'wealthy'. The better conditions of these families were pointed out in a walk through the village.

In 1996, between 10-15 families living in one neighbourhood jointly paid 250 000 kip to install a Tara hand pump. The pump was used, but after two years the quality of the water became *kem*, (salty), most likely due to the alkalinity of the soils (there have yet to be any scientific water quality assessments). When electricity was brought to the village, the same 10-15 families in the neighbourhood jointly bought an electrical pump, and used it on the Tara borehole in the dry season, but moved the electric pump to the pond in the rainy season.

At any point in time, any family in the village can join the water supply system for a charge of 600 000 kip (about 75 USD), or 3000 baht. Approximately 40 families have joined the original group.

No People's Pumps were built in the village, and none of our informants had plans to build any, because of the *kem* quality of the groundwater, and the availability of alternative water sources (both the pond and the electric pump system).

Ban Bong (Paxan, Bolikamxay)

This village is approximately a thirty-minute drive away from Paxan city, and only a few kilometres away from route 13 south. Out of 120 families, 50 use People's Pumps, 60 use Tara hand pumps, and 10 still use open dugwells. There are currently 22 People's Pumps in the village, many of which came after Tara hand pumps were installed in the village. The preference for household pumps is obvious because in some cases, People's Pumps were installed within a few meters of Tara hand pumps. Villagers also know that the Tara will break down at some point in time, and will likely be left in disrepair.

Six Tara hand pumps were installed in this village, but only four are still accessible to the community. Two of the pumps broke down, and two families then took over the costs incurred by fixing the pump. These two pumps now belong to the families who paid for the repairs, and are only accessible for use by these families and their friends and relatives. From the map of this village, drawn by the villagers, we can see that the pace of adoption of People's Pump technology accelerates once it enters the neighbourhood and people become aware that it is physically possible to drill for a People's Pump and get relatively good quality water.

3.11 Situation of Tara Hand Pumps

The general attitude towards community preferences/demands/needs is that the community will readily accept whatever kind of support is provided. While this is true in terms of *acceptance* of the support, it does not mean that the community will *sustain* the support. It is clear that all hand pumps require maintenance, but if the community does not have the capacity to organise around the maintenance requirements, then the hand pump will fall into permanent disrepair. In some cases communities are not able to reach out for assistance from Nam Saat (which has spare Tara hand pumps), while in other cases Nam Saat cannot adequately reach out to communities regarding the availability of spare parts.



Tara Hand Pump

In Ban Nonpay, Savanakhet, one of the Tara hand pumps was replaced by a People's Pump because the community felt that replacement parts are too difficult to access from Nam Saat. The community decided that it would be preferable to replace the Tara hand pump right away, rather than to go to Nam Saat for assistance. Between 2000 to 3000 kip was collected from every family to buy the materials collectively to make the People's Pump using the Tara existing borehole.

4. ANALYSIS OF LESSONS LEARNED AND IDEAS FOR THE FUTURE

4.1 Collective versus Household Ownership

The main point coming out of the People's Pump research is that people prefer their own household water source, even if it is of inferior quality, for two reasons:

1. A household pump is close to the house and reduces the time required for collecting water
2. Households are directly responsible for the costs incurred with their own water usage.

The People's Pumps are mainly used by the members of the household, but also shared with relatives and neighbours in the area. Although most people said that 'anyone' can use it, this is not exactly the case. Owners of the pump complain that too many people use their pump, making their area 'dirty' (muddy), or that there are always too many people coming and going from their property.

In some cases, users who are not members of the household ask if they can use the pump, and are always granted permission to henceforth use the pump. Some people who live near households who have a People's Pump still use a more remote water source because they do not want to ask if they can use the pump along with the owner's household. When users were asked if the owner minds that so many people use their pump, the response was "this owner is nice, so they don't mind like some other people do". Even though it is common to ask the owner of the People's Pump to use their pump, some people do not want to ask to use it for reasons related to the social and power dynamics of the village. In any case, when the pump breaks down, it is always the owner who is responsible for repairs.

The social politics of the village are therefore the determinant of the level of 'communality' of the People's Pump. When another type of communality is imposed, it is initially accepted because most people can understand the rationale that water resources are provided for everyone to share, but when it is necessary to mobilise the support of the community in order to deal with communal pump issues, there is weak participation. The specific attitudes observed in lowland Lao villages can be described as *passive* acceptance of communally organised water pumps (i.e. the Tara hand pump). However, Tara hand pump maintenance issues require the *active* participation of the community to deal with repairing the pump. Therefore, Tara hand pumps are often not repaired due to the community's lack of desire to invest in the pump, or lack of agreement to share in the costs of repair based on differing proximity to the pump, user needs, and levels of wealth.

There were a number of problems related to repair and ongoing maintenance of the Tara hand pumps in the villages visited by the research team. A number of pumps were no longer in operation due to conditions of disrepair. Although it is widely known that spare parts are offered for free from Nam Saat to the village water committees, villagers believe that they must incur costs to get spare parts for Tara hand pumps.

4.2 People's Pump More Accessible to More Sections of the Community

The People's Pump has been noted to be accessible to more members of the village population because it suits the physical needs of these members. These members are:

- Old people who experience difficulties using the Tara hand pump due to a lack of strength
- Children (under approximately seven years old) who experience difficulty using the Tara hand pump due to a lack of strength
- Small children (under approximately seven years old) who cannot use a dugwell unattended

The People's Pump is currently the most inexpensive option in household handpumps available. In the past, the most affordable option was the Lucky pump, but for a number of reasons, the Lucky pump is no longer being installed by households. The main reason for the discontinuation of the Lucky pump is related to the fact that it is not as popular as before in neighbouring Thailand, since Thailand is 'already developed', and has piped water

even in rural villages. Also, the People's Pump has increased in popularity, and shares the same niche as the Lucky pump, therefore reducing the demand for the Lucky pump.

4.3 Community Preferences

The People's Pump is generally not the first choice in water supply, but it is important to see where it fits amongst the range of options, and incorporate this into planning for the future. For example, upgrading options should be explored from the People's Pump to an electric pump using the same borehole.

This study on the People's Pump was designed in part to learn about how people weigh their options against each other, and where people's priorities lie. Essentially, the People's Pump study is not just about the People's Pump, but the contextual situation that creates the People's Pump.

4.4 People's Acceptance

People are willing to accept the People's Pump technology and incorporate it when conditions are appropriate. However, the technology has not always been shared due to some people's preference to charge for this knowledge and drilling as a service. Where this has been the case, it has been difficult for people who are interested in learning about the People's Pump technology to do so, and this has slowed down the diffusion of technology.

4.5 Risk

When people do not have enough information about their soil conditions, it is difficult to make a confident decision to drill, and risk wasting days of labour in the process. As well as the possibility of wasted labour, there may be high costs incurred in villages where it is not possible to drill manually, and the household must take a greater financial risk by paying for a professional driller with a rig.

4.6 Community Extension

The example of the JVC training in Bolikhamxai indicates that extension to communities can be effective. Sometimes it's difficult to assess whether or not extension efforts have been successful because the results cannot be seen right away, but with this example we can see that the effects may not be visible for years. While extension is not essential to the spread of the technology, it does make the information available to people more quickly, and can effectively prevent people from not sharing information about the People's Pump in order to make a profit from charging for the service of building a pump.

4.7 What Niche is the People's Pump Serving?

The People's Pump is adopted most readily in areas where:

- There is a shallow water table
- There are a variety of drilling options (manual drilling with family labour, able to hire labour to drill, or there are drilling rig services available)
- There is a desire to have a household water supply

While currently the People's Pump is not the best *quality* pump available, it is the most affordable option (both in terms of start-up costs and ongoing maintenance) for many villagers.

5. RECOMMENDATIONS

5.1 Recommendations for Next Steps for the People's Pump

Nam Saat has a number of options for action to be taken as a result of this study. The following are some possibilities, which are within the capacity of Nam Saat to implement at this point in time. The importance of small efforts such as these can make Nam Saat, as an organisation, feel more self-reliant, as the recommendations to follow are not capital intensive.

5.5.1. Manual and/or training on People's Pump technology

Central Nam Saat can develop a training manual on the People's Pump technology. It should be decided who the audience will be. This could include making training materials for provincial or district staff, or devising materials for trainings to be carried out by provincial and district staff and attended by village representatives.

The districts visited by the research team are all on Route 13 South, and are therefore not very remote. It is possible however, that there are other districts in which people are not aware of the People's Pump technology. Considering the vast differences in the adoption times in Bolikhamxai and Savannakhet, it is very possible that there are still places where people are not using the People's Pump because it is not yet known of. Simple information material/manuals to use at district and village level may prove to be useful in spreading information about the People's Pump. This may be combined with constructing a model pump in these districts, for example at village schools.

5.1.2. Give people information about their soil conditions

A major factor in deciding to drill or not was how confident people were of success. While villagers do rely on indigenous methods to determine where there is water (as detailed above) and do know the history of drilling in their area, additional information would reduce their risk. Training villagers in how to recognise good potential drilling sites could encourage more potential early adopters to go forward with drilling new boreholes.

5.1.3. Support local drillers

An increase in the number of drillers could provide people with more options in terms of price range and availability of local drillers. Nam Saat can assist local drillers by training people with a technical background in the assembling of drilling machines using locally bought parts. In the long run this can reduce the burden on Nam Saat in providing drilling services, since Nam Saat has only a limited number of drilling rigs which are already used to full capacity.

Another way Nam Saat can support and benefit from local drillers is to contract out its drilling activities and pay the local drillers from the funds collected by the provincial water committee from villagers. In this way, more villages will access drilling services where Nam Saat cannot provide them at this time.

5.1.4. Improved Design

There are a number of variations of the People's Pump observed throughout this study, and some are more technologically sound than others. Nam Saat can use the expertise available in the department to develop a better design for the People's Pump, which could then be disseminated by training manuals for Nam Saat provincial and district staff.

5.1.5. People's Pump kits for sale

Nam Saat can work with the private sector or local institutions to develop locally manufactured parts for the People's Pump. The greatest advantage of the People's Pump is that the materials for it can be found locally, and this should not be ignored. However, to provide a wider range of options, it would be beneficial to manufacture some of the parts (the piston in particular). The rope pump is a good example of Nam Saat working with a local institution (Faculty of Engineering at the National University).

5.1.6. Think about community pump issues

Nam Saat should think about the situation of the community pumps supported by Nam Saat and partner agencies in Lao PDR. Over the long-term, these pumps do not have the intended impact of sustained and improved water supply because maintenance requirements are not being met. There are numerous cases of Tara hand pumps which are not repaired once they break down, making the initial investment unsustainable and not worthwhile. Nam Saat should evaluate whether or not this strategy is an appropriate intervention for Lao PDR. As well, Nam Saat should evaluate its capacity to carry out the accompanying activities, which can make Tara hand pumps sustainable. These include working with village water committees to plan for their future needs.

5.2 Recommendations for Future Studies

5.2.1. Women's Involvement

Gender equity within Nam Saat is an important goal to strive for. One of the things Nam Saat can do to improve in this area is to ensure that Nam Saat is approachable for women, by making sure that there are women on the research team. If Nam Saat wishes to engage in community dialogue, then women must be consulted, and in order to speak effectively with village women, the reality is that there must be women on the research team. If the research team is all male, women are not as comfortable speaking to them, and the quality of the information gathered will suffer.

5.2.2. Improved Organisation

The People's Pump study dealt with a number of complications, which were primarily due to the high number of people, levels, and locations which made up the study. From these experiences, we can point out some things to consider.

- The study took place in the rainy season, making it difficult to access some districts which were of interest
- The study took place during rice planting time, making it impossible to spend enough time with villagers and gain more than a superficial understanding of their situation
- Considering the fact that the Nam Saat counterparts do not have experience in carrying out research studies and participatory concepts and tools, the study did not allocate the time to provide an adequate introduction to the study
- The Nam Saat research team (with exception for the STC) was not selected using any logical criteria and without any Terms of Reference

5.2.3. Smaller research team

The political structure of Lao PDR requires that all levels of Nam Saat are represented in a research study, but unless all of the levels have a role to play in the study, there is no point to all officials being present. If quality information is the priority of the study, then the study design should ensure that people are assigned to specific roles, which will contribute to the study goals. The present structure does not appear to maximise the human resources available, but rather places people in the position of 'guarding' or 'taking care of' an external partner, rather than working together with them.

The presence of a large team of government workers can have a detrimental impact on any study, since villagers are often intimidated by outsiders. It is the responsibility of the researchers conducting the study to create a favourable environment for people's participation.

5.2.4. Technical and Social Study Department

Nam Saat is currently planning on developing a Technical Study Department. While this is a positive development, Nam Saat should not overlook the potential of *social* and/or *cultural* studies in reaching the goal of providing sustainable services. Many of the problems in carrying out Nam Saat activities are not technical, but involve the understanding of villagers' perceptions and then creating materials and forums to respond to these perceptions.

Therefore, Nam Saat should consider developing the capacity of some staff in social research methods. It should be noted, however, that individuals selected for this area should be selected according to appropriate selection criteria and qualifications, and that following the training there should be a commitment by the department to allow the trained individuals to carry out research studies. This is important to point out because too often in various departments, trained individuals are transferred, and do not have a chance to carry out the duties they were trained for.

If Nam Saat cannot commit to training staff for a social study section, then researchers should be selected from the growing pool of Lao consultants who specialise in the social aspects of development. If this route is taken, it is not realistic to simply add Nam Saat staff to the study because people who are not trained in participatory research methods cannot adequately participate in carrying out the study. Too often in development, untrained counterparts are required to work with consultants in the name of 'capacity building' and 'partnership'. However, this tends to result in 1) poor training for the counterpart, and 2) a negative impact on the final product.

The presence of district counterparts is crucial in any study because of the district staffs' knowledge of the local communities. Otherwise, Nam Saat should make the decision to either have Lao consultants do it, or have trained internal people such as those in a social study department undertake such studies.

5.2.5. Study Design

The study methodology and tools should be appropriate for the study objectives. This study for example, was designed as a household survey. The questionnaires the survey was based on, however, were subject to a number of unforeseen methodological problems. A field pre-testing of any survey/questionnaire is recommended for future studies. Furthermore, the objectives of the study are largely to understand a number of social dimensions, which bring about the use of the People's Pump. The tools which were most conducive to obtaining good quality information were the discussion groups and focus groups with men and women. Although a survey is important for some information, structured discussion groups can be more comfortable and let the participants lead the way.

5.2.6. More active role for Nam Saat

Nam Saat should develop its own research questions that fit into its larger programming objectives. In order to carry out research without external support, Nam Saat will have to maintain a track record of effective aid management, and not resign to passive aid acceptance. Initiating research studies, which are intended to result in addressing water supply and sanitation issues in innovative ways, are one way to take a lead in promoting the future of the organisation.

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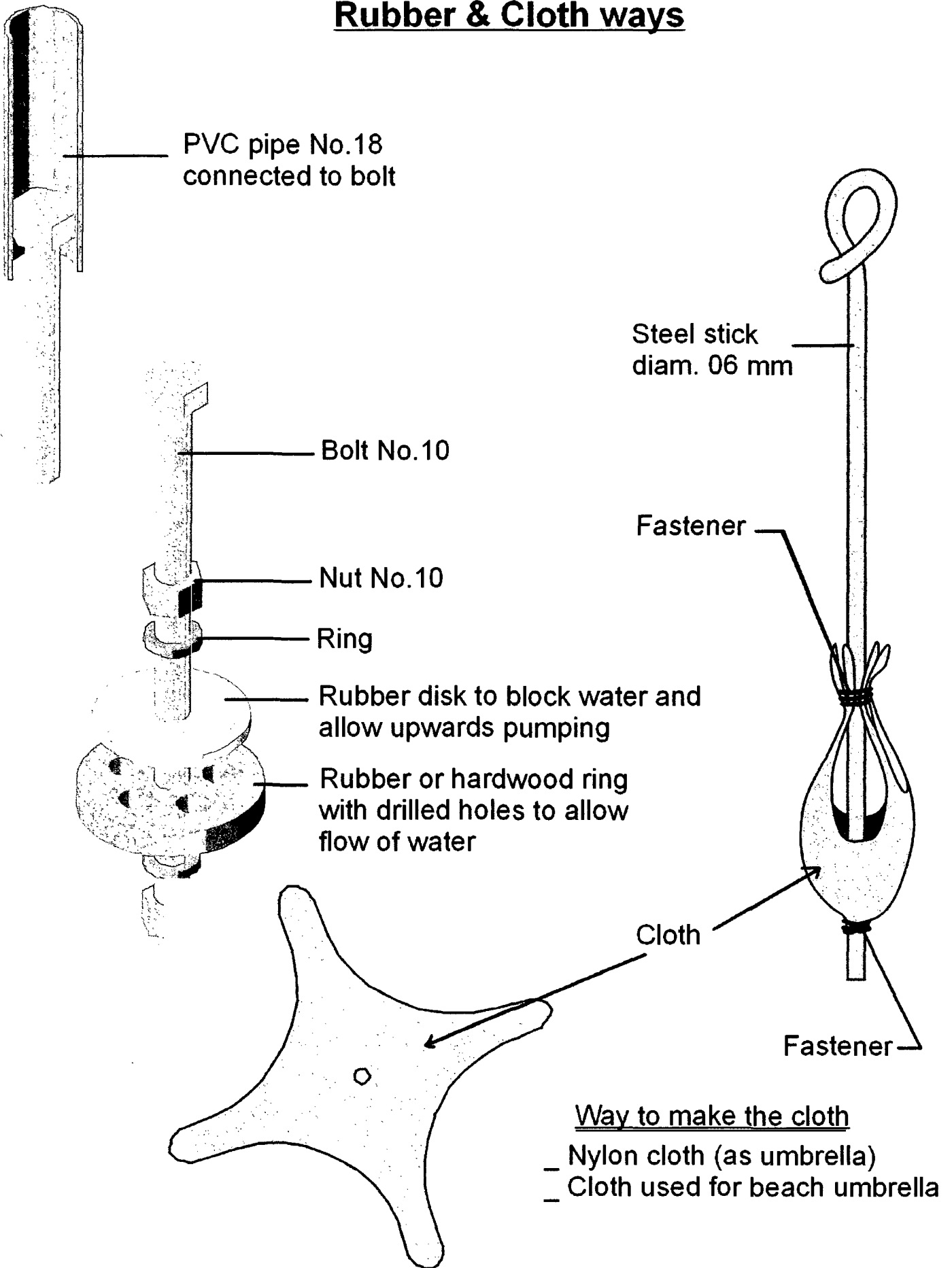
Dr. Nouanta Maniphousay, Director Nam Saat
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Water and Sanitation Program – East Asia and Pacific (WSP-EAP)

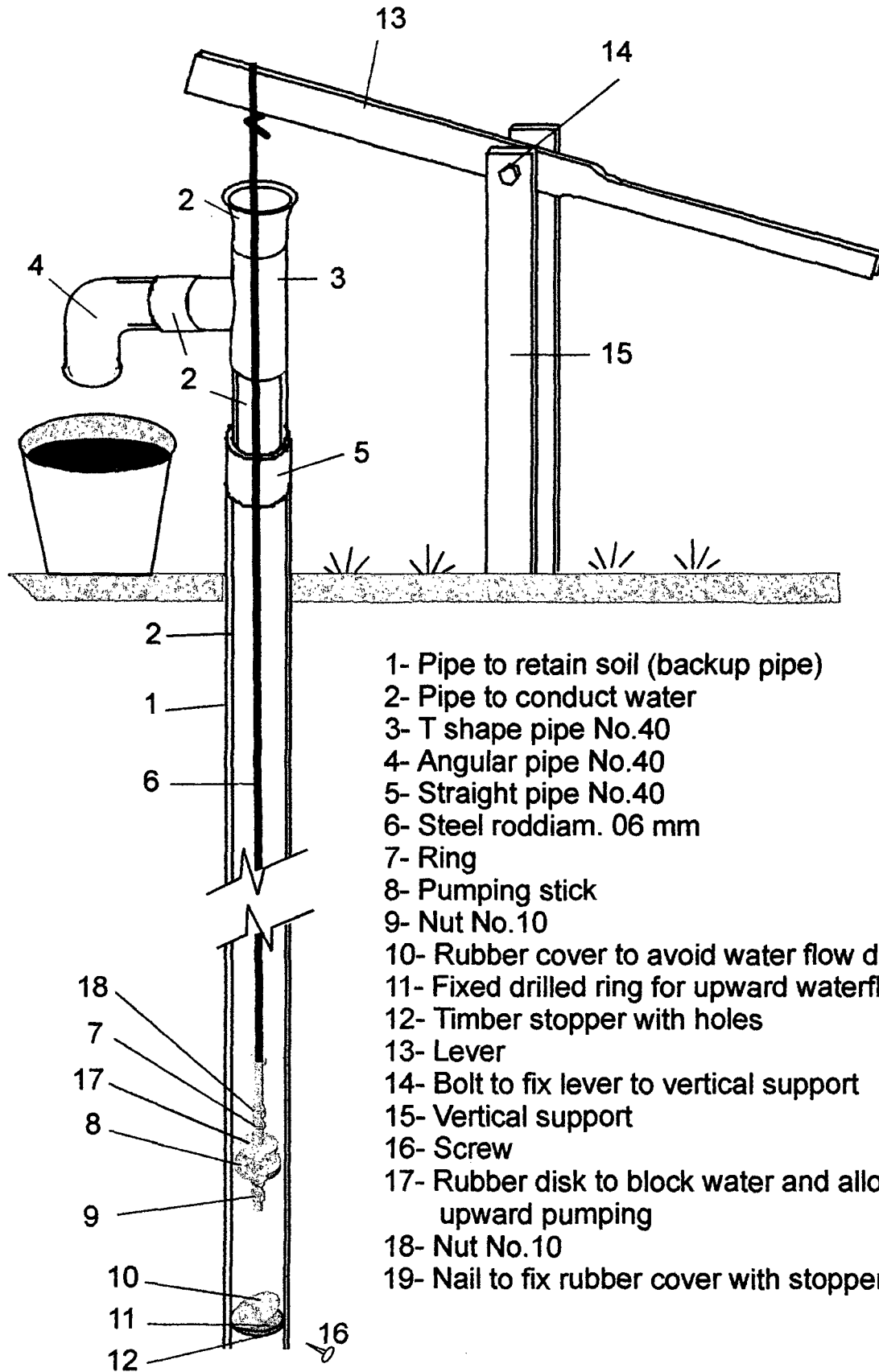
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Annex 1

Enlarged pictures of the pumping stick Rubber & Cloth ways

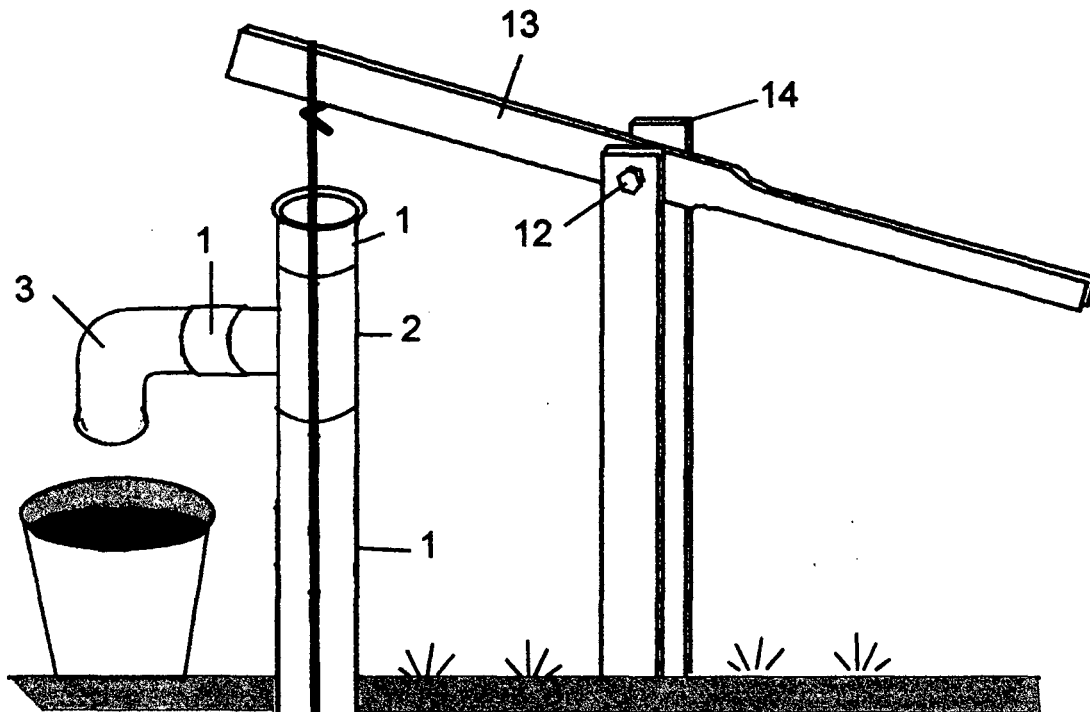


Design 1: Villager's pump (with back up pipe)



Design 2: The following design has no backup pipe to retain the soil. The water conducting pipe acts as retaining wall.

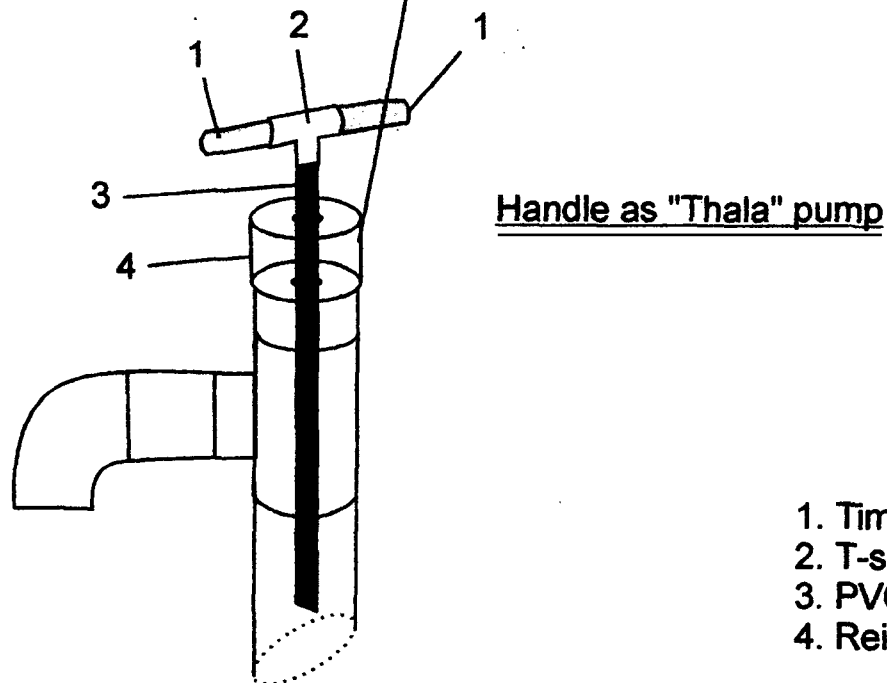
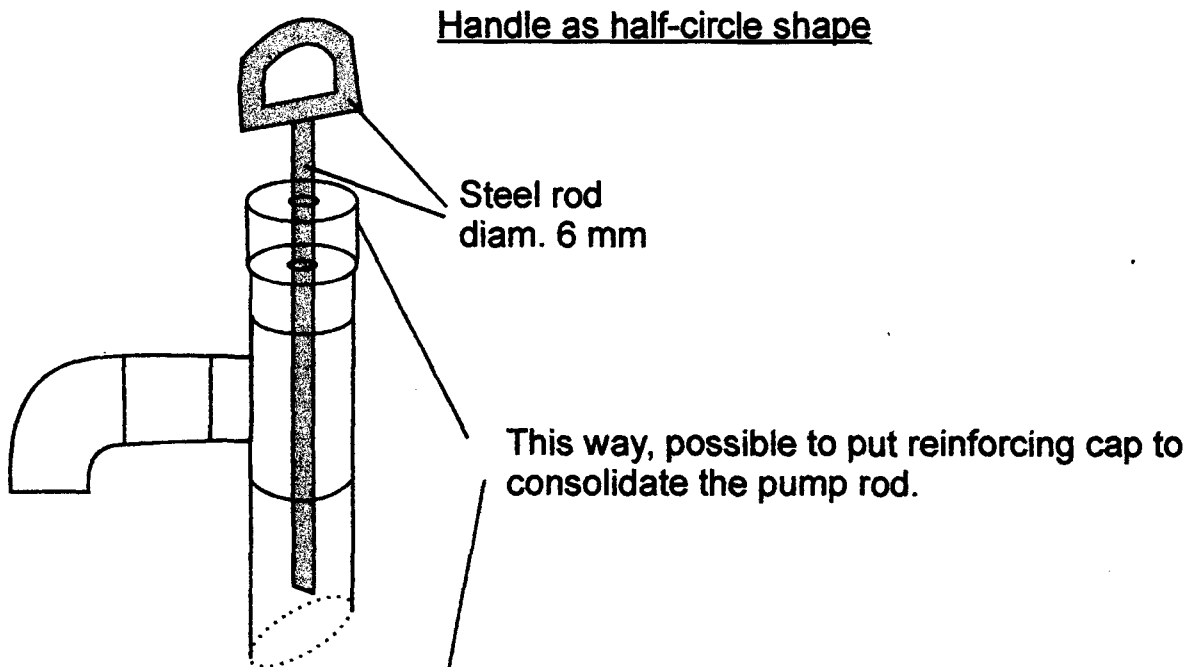
When the rubber cover is damaged the only way to fix it is to remove the whole conducting pipe. Generally too difficult and to fix (unrepairable) (Better drill new whole pipe set).



- 1- PVC pipe No.40
- 2- T-shape pipe No.40
- 3- Angular pipe No.40
- 4- Steel rod diam. 6mm
- 5- Nut No.10
- 6- Ring No.10
- 7- Rubber disk to block water and allow upward pumping
- 8- Rubber or timber drilled disk
- 9- Rubber cover to avoid water flow downward
- 10- Small nail to fix rubber cover to timber stopper
- 11- Timber stopper with hole
- 12- Bolt to fix lever to vertical support
- 13- Lever
- 14- Vertical support
- 15- Screw to fix stopper to pipe

Design 3:

As design two (all elements) however no lever and vertical support. Put a half-circle handle shape or a stick handle as the "Thala" pump.



1. Timber handle
2. T-shape PVC pipe No.18 (1/2")
3. PVC pipe No.18 (1/2")
4. Reinforcing cap

Annex 2

Questionnaire for "People's Pump" users

District _____

Date _____

Enumerator _____

1. Labour Requirements

1	<p>Before the people's pump, where did you get water for the following activities:</p> <p><input type="checkbox"/> laundry _____</p> <p><input type="checkbox"/> bathing _____</p> <p><input type="checkbox"/> drinking _____</p> <p><input type="checkbox"/> fish ponds _____</p> <p><input type="checkbox"/> gardening _____</p> <p><input type="checkbox"/> washing _____</p>	1	River
		2	Stream
		3	Rain water
		4	Pond
		5	Public tap
		6	Pump
		7	Bottled water
		8	Other
2	<p>Before the people's pump, who collected water for the following:</p> <p><input type="checkbox"/> laundry _____</p> <p><input type="checkbox"/> bathing _____</p> <p><input type="checkbox"/> drinking _____</p> <p><input type="checkbox"/> gardening _____</p> <p><input type="checkbox"/> washing _____</p>	1	Mother
		2	Father
		3	Son
		4	Daughter
		5	Grandmother
		6	Grandfather
		7	Other
3	<p>After building the people's pump, where has water been collected or used from for the following:</p> <p><input type="checkbox"/> laundry _____</p> <p><input type="checkbox"/> bathing _____</p> <p><input type="checkbox"/> drinking _____</p> <p><input type="checkbox"/> gardening _____</p> <p><input type="checkbox"/> fish ponds _____</p> <p><input type="checkbox"/> washing _____</p>	1	River
		2	Stream
		3	Rain water
		4	Pond
		5	Public tap
		6	Pump
		7	Bottled water
		8	Other
4	<p>After the people's pump, who has been collecting water for:</p> <p><input type="checkbox"/> laundry _____</p> <p><input type="checkbox"/> bathing _____</p> <p><input type="checkbox"/> drinking _____</p> <p><input type="checkbox"/> gardening _____</p> <p><input type="checkbox"/> fish ponds _____</p> <p><input type="checkbox"/> washing _____</p>	1	Mother
		2	Father
		3	Son
		4	Daughter
		5	Grandmother
		6	Grandfather
		7	Other

5	Who does the drilling for the pump?		
6	Who maintains and repairs the pump?		
7	<table border="1"> <tr> <td data-bbox="258 774 1058 1017">How many people were involved in making the pump?</td> <td data-bbox="1066 774 1372 1017"> 1 1 person 2 2 people 3 3 people 4 group 5 other </td> </tr> </table>	How many people were involved in making the pump?	1 1 person 2 2 people 3 3 people 4 group 5 other
How many people were involved in making the pump?	1 1 person 2 2 people 3 3 people 4 group 5 other		
8	<table border="1"> <tr> <td data-bbox="258 1028 1058 1316">Who does the pump belong to?</td> <td data-bbox="1066 1028 1372 1316"> 1 Household 2 Neighbourhood 3 Village 4 Everyone 5 Other </td> </tr> </table>	Who does the pump belong to?	1 Household 2 Neighbourhood 3 Village 4 Everyone 5 Other
Who does the pump belong to?	1 Household 2 Neighbourhood 3 Village 4 Everyone 5 Other		
9	Who can make a people's pump?		

2. Decision Making

1	Why do people decide to build a people's pump, and not another kind of pump?		
2	Why did you (or your family) decide to build a people's pump?		
3	<table border="1"><tr><td data-bbox="272 808 1070 1111">Who was involved in making the decision to make the people's pump?</td><td data-bbox="1070 808 1412 1111">1 Mother 2 Father 2 Son 3 Daughter 4 Grandmother 5 Grandfather 6 Together</td></tr></table>	Who was involved in making the decision to make the people's pump?	1 Mother 2 Father 2 Son 3 Daughter 4 Grandmother 5 Grandfather 6 Together
Who was involved in making the decision to make the people's pump?	1 Mother 2 Father 2 Son 3 Daughter 4 Grandmother 5 Grandfather 6 Together		
4	What kinds of things did the different people in your family consider when making their decision to build the pump?		

3. Technical Information

1	What drilling tools do you need make a people's pump?
2	Where can you get these tools?
3	Do you: <input type="checkbox"/> borrow <input type="checkbox"/> buy <input type="checkbox"/> rent <input type="checkbox"/> already own these tools?
4	How much does is cost to rent or buy the tools?
5	What skills do you need to do the drilling?
6	What tools do you need to make the rest of the pump?
7	What skills do you need to make the rest of the pump?

8	What materials do you need for the pump?													
9	Where can you get these materials?													
10	How much do these materials cost?													
11	In what way does the pump break down?													
12	What tools do you need to fix it?													
13	How often does the pump break down?	<table border="1"> <tr><td>1</td><td>1 week</td></tr> <tr><td>2</td><td>1 month</td></tr> <tr><td>3</td><td><3 months</td></tr> <tr><td>4</td><td><6 months</td></tr> <tr><td>5</td><td><1 year</td></tr> <tr><td>6</td><td>other</td></tr> </table>	1	1 week	2	1 month	3	<3 months	4	<6 months	5	<1 year	6	other
1	1 week													
2	1 month													
3	<3 months													
4	<6 months													
5	<1 year													
6	other													
14	Is there anything you need to do regularly to keep the pump in good working order?													

15	Who is responsible for maintaining the pump?
16	Where can you put the pump?
17	How do you know where to put the pump?
18	Is there a platform? If yes explain what it is made of <input type="checkbox"/> No <input type="checkbox"/> Yes
19	Where does the wastewater go?
20	How deep is it? How many PVC pipes are used?

4. Socio-economic Aspects

1	<p>Are there some people who can afford another kind of pump, but choose the people's pump instead? If yes, please explain</p> <p><input type="checkbox"/> No <input type="checkbox"/> Yes</p>		
2	<p>Are there some people who cannot afford any other kind of pump, but don't build a people's pump? If yes, please explain</p> <p><input type="checkbox"/> No <input type="checkbox"/> Yes</p>		
3	<p>How has the people's pump changed the lives of the different people in your family? (may include mother, father, sons, daughters, grandparents, or anyone else)</p>		
4	<table border="1"> <tr> <td data-bbox="260 1134 1066 1422"> <p>If you had to borrow money for the pump, where or who did you borrow from?</p> </td> <td data-bbox="1074 1134 1399 1422"> <p>1 Family 2 Friends 3 Bank 4 other</p> </td> </tr> </table>	<p>If you had to borrow money for the pump, where or who did you borrow from?</p>	<p>1 Family 2 Friends 3 Bank 4 other</p>
<p>If you had to borrow money for the pump, where or who did you borrow from?</p>	<p>1 Family 2 Friends 3 Bank 4 other</p>		

5. Perceptions of pump performance

1	How was the water you used before?	1	Clean
		2	Dirty
		3	Smelly
		4	Bitter
		5	Cloudy
		6	other
2	How is the water from the pump?	1	Clean
		2	Dirty
		3	Smelly
		4	Bitter
		5	Cloudy
		6	other
3	How is the water pressure?		
4	How does the water change at different times of the year? (rainy season and dry season)		
5	Is the water from the pump better than the water source you used before?		

6. Adoption and diffusion

1	When did you first hear about the people's pump?
2	When did you build it?
3	Why did you wait a long time to build it? (if applicable)
4	Who was the first person you know who made a pump?
5	Do you know how this person learned about it?
6	What was this person like?

Annex 3

The People's Pump in the Lao PDR. Terms of Reference

Case Study to Assess the Performance and Potential of the "People's Pump" as a Viable Technical Water Supply Option in the Lao PDR.

I. Background

The Nam Saat Programme is supporting the implementation of a rural water supply and sanitation projects in all provinces of Lao PDR based on the directions set out in the Lao Sector Strategy and Guidelines National Framework 1998-2002, which calls for techniques and options for community based financing, operation and management.

According to 1996 statistics, around 51% of the rural population was estimated to have access to potable water and only 35% access to adequate sanitation facilities, with figures in poorer remote communes being lower. It is recognised that the provision of potable water and environmental sanitation services to 80% of the rural population is an important step in the development of the nation. Concerted efforts have been made and are ongoing to achieve sustained improvements access to safe water and proper ablutions.

A key factor in this process is the development of low cost, low sophistication technologies that will be adopted voluntarily by the community. The "People's Pump" is one such technology. This device was developed by the rural people and has been adopted in some villages to provide water on a household basis. The adoption of the device has been more extensive in some villages than others. A household survey to detail the design, physical constraints and the socio-economics of the pump's adoption/diffusion process is deemed necessary in order to understand why the take-up of the pump is so irregular. This will then be used to make suggestions for enhancements to the diffusion/adoption process.

II. Scope of the Study

The study will focus on the adoption/diffusion process of the people's pump and the physical factors controlling its application from the perspective of the households for the broader goal of providing water access to rural areas.

More detailed objectives include: 1) to establish the key factors determining the acceptance/non-acceptance of pump technology, 2) to establish the technical potential and limitations of this pump within a specific geographical area, 3) to clearly understand the maintenance requirements, including availability and identification of materials, 4) To demonstrate interest and commitment in promoting local technology that is sustainable.

III. Study Methodology

The study will collect and review data available, mainly through consultations with Nam Saat and other sector professionals that are familiar with this technology at the provincial, district, and village levels. The study will mainly involve field visits to selected villages for further data collection and on-site inspection of the manufacturing, installation, and use of the People's Pump. In-depth discussion and consultation with mainly end users/villagers will be a key part of the field study.

In selecting the provinces for the fieldwork, consideration will be given to the spearhead provinces (i.e. Bolikhamxai and Savanakkhet) and localities within the province where the People's Pump is widely used.

IV. Specific Tasks:

The study will seek the following information in the form of questionnaires, household surveys, and participatory action research:

1. Labour Requirements

- Who performs the drilling
- Who collects water
 - * Before installation of people's pump
 - * For washing, bathing, gardening, drinking
 - * After pump installation
- How many people are necessary to complete the pump
- Changes in division of labour since pump installation
- Who maintains and repairs pump
- Perceptions of who is:
 - * Capable of building people's pump
 - * Responsible for building
 - * Responsible for use (specify which uses)

2. Decision Making

- Who decides to build people's pump
- How is the decision made from initial awareness to building
- People involved in decision (household members and community)
- What is the role of household members in the decision making process
- Gender breakdown of roles in the decision making process
- Characteristics of individuals responsible for decision making in the household and community with relation to the people's pump

3. Technical Information

- A technical breakdown of the drilling tools and techniques
- Skill requirements for drilling
- A technical breakdown of the pump
- Skill required for construction of the pump
- A listing of materials and tools used by the households for the construction of the pump with indications of where this material and the tools are accessed
- Maintenance requirements, (types of, and frequency)
- Materials and tools used for maintenance.
- Skills requirements for maintenance
- Hydro-geological limitations of the drill and pump
- Physical limitations of the drill and pump
- Water quality considerations in adopting village:-
 - * Observable pollution and pollution potentials
 - * Geologically controlled pollution potentials in villages
 - * Results of water sampling performed

4. Socio-economic aspects

- If installation and maintenance is performed by households
 - * Cash items and amounts for installation and maintenance separately
 - * Non cash items (notably labour) for installation and maintenance separately
- If installation and maintenance is performed by others (hired)
 - * Cash items and amounts for installation and maintenance separately
 - * Non cash items (notably labour) for installation and maintenance separately
- Source of funds for investment
 - * What amount of money was borrowed to install the pump and from where?
 - * What amount of money was used from savings to install the pump, and how long did it take to accumulate those savings?
 - * Are there any differences related to gender regarding financing of people's pumps?
- Source of water before installing the pump
- Boiling or not boiling drinking water

5. Perceptions of Pump Performance

- Water availability over seasons
- Technical reliability
- Sanitation arrangements in the vicinity of the pump (spill water / drainage)
- Other perceived environmental impacts

6. Adoption and diffusion in case study village

- How was the technology brought to the village
 - * Who was the first adopter?
 - * From where/whom did he/she learn about the pump?
 - * From whom did he/she learn to construct the pump?
 - * From where/whom did he/she get the device for drilling?
- Pace and rate of adoption in village
- Characteristics of early adopters, (following the first adopter) in terms of social and economic status, gender, relationship to first adopter and/or one another, exposure to the outside world (outside village)
- Characteristics of late adopters in terms of social, economic and gender status.
- Characteristics of non-adopters in terms of social, economic and gender status.
- Ownership of pump (individual household, kinship, neighbourhood groups or community)
- How the need for the drilling device has been satisfied (individually, collectively, by few for lease by others, etc).
- Who has done the drilling, construction and installation, household member, if other then who and on what terms

8 Non adoption in adjacent villages, identify persons with the characteristics of the early adopters in the case study and interview to establish :

- If the existence of the pump is known in the village
- What men and women know about the pump, technical information, costs for construction and maintenance, construction methodology
- Find reasons why the pump can not be found in the villages.

V. Expected Outputs of the Study:

- 1 Technical and other information collected through the study which will form the basis for preparing other documents/reports and/or guidelines.
- 2 Study report, which will include background information, study findings and recommendations for further actions, i.e. recommendations for how the diffusion/adoption process of the People's Pump can be accelerated and how the dissemination process could be made as inclusive as possible with regards to the role of women as the primary water collectors.
- 3 Users guide/manual on "Participatory Research" specifically for Nam Saat use.
- 4 Presentation of the findings of the study, the study report etc. in 2-3 hrs 'workshop' setting to Nam Saat and its supporting partners.

The design, conduct and reporting of the study will be undertaken in close consultation with designated staff from Nam Saat Central, and with WSP-EAP Lao PDR Country Office staff.

VI. Duration:

The completion of the case study preparation, fieldwork and report writing is expected to take around 30 days and includes:

- * Preparation (mobilization, questionnaire preparation, village selection) – 4 days
- * Field Work – 12 days
- * Report writing and presentation – 14 days.

The study is expected to commence between 19-21 June,2000.

The draft study report will be presented to the Central Nam Saat and other sector support agencies two weeks after the completion of field study. The final study report will be presented two weeks following the date of presenting the draft report.

VII Budget Estimate and Timeframe

Data for budget estimate

Per Diem Costs		Sample Size	
Sociologist	\$125.00	Adopting Village	20 households
Enumerator/Translator	\$15.00	Non-Adopting Village	20 households
Enumerator/Computer Data Processing	\$15.00	TOTAL Sample	40 households
DSA	\$8.00	Preparatory Activities	
Vehicle Hire	\$80.00	Mobilisation	2 days
Field Team		Draft Questionnaires	2days
No. Enumerators	2	TOTAL Preparation	4 days
Enumeration Rate	3 hh/day	Reporting	
Enumeration Period	7 days	Data Entry Rate	4 hh/day
Select Survey Villages	3 days	Enumerator/Computeriser	10 days
Pre-test Questionnaires	2 days	Sociologist	14 days
TOTAL Field Team/Work	12 days	Total Reporting:	30 days

BUDGET ESTIMATE

Honorarium / Fees		
Sociologist	30 Days	\$3,750.00
Enumerator/Translator	16 Days	\$240.00
Enumerator/Computeriser	26 Days	\$390.00
Sub-TOTAL Fees		\$ 4380.00

Daily Subsistence Allowance (16 Days)	
Sociologist	\$128.00
Enumerator/Translator	\$128.00
Enumerator/Computeriser	\$128.00
Driver	\$128.00
Sub-TOTAL DSA	\$ 512.00

OTHER COSTS	
Vehicle Hire	\$1,280.00
Vehicle Fuel & Oil	\$160.00
Computer Hire	\$100.00
Sample Bottles	\$50.00
Laboratory Charges	\$400.00
Stationery	\$50.00
Copying	\$100.00
Sub-TOTAL:	\$2,140.00
TOTAL COST ESTIMATE	\$ 7032.00