Impact Assessment Study for the Community-based Water and Sanitation Project

Xieng Ngeun Town, Xieng Ngeun District
Luang Prabang Province

June 2008
**Executive Summary**

An impact assessment study was carried out in June 2008 to assess significant change within the project area of a community-based water supply and sanitation project in Xieng Ngeun town, Lao PDR. A number of stakeholders participated in the research and through interviews and questionnaires quantitative and qualitative data was collected. The findings and conclusions are presented in this report.

The community-based water supply and sanitation project has been extremely successful in Xieng Ngeun town, both in its execution and outcome and has had significant impacts in the lives of those households living in the targeted villages. After project interventions, 81.7 per cent of households in the targeted villages of Xieng Ngeun town are now connected to the water supply network and receive safe, piped water direct to their houses for a monthly fee.

A number of areas where changes have been significant have been highlighted in the report. This includes the targeting of poor households through the revolving funds initiative, which allows poorer families to borrow money for water and sanitation connections and pay it back in instalments. Community members and Village Heads believe this allowed for a more equitable project in which all households could benefit from water and sanitation.

Another area in which significant change has occurred is the reduced burden on women. Formally, collecting from spring taps or the river was the woman’s responsibility. However, after the completion of this project women themselves and village heads believe the burden on women and children has now dramatically reduced and women’s ability to engage in productive activities has increased.

Likewise, the majority of households view the impact as allowing for people to engage in socio-economic activities such as farming or raising livestock and this will then improve their socio-economic status in the community. There have also been significant health benefits which are highlighted in the report completed by the Chief of the Xieng Ngeun Department of Public Health. This report states that diseases related to unsafe access to water and poor sanitation facilities has decreased dramatically between 2005 -2007.

Institutional capacities on the part of NPSE-Luang Prabang have also increased, and through training, staff at the district branch are now capable in technical, administration and customer service functions. The financial viability of the project is also deemed a success. Operation and maintenance costs are covered by the NPSE-Luang Prabang, Xieng Ngeun Branch, and a small profit is been made which the Chief of this branch says will be used to extend the network.

Current consumption of water from the reservoir is 600m³/day, while the capacity is 2000m³/day. Expansion of the network to the remaining 3 villages of Xieng Ngeun will increase access and allow the system to be used to its full capacity.
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Section 1: Introduction

Background

The community-based water and sanitation project in Xieng Ngeun Town was undertaken as a means of increasing adequate and safe water supplies to the 8 villages of Xieng Ngeun urban area. In the past the District Authority of Xieng Ngeun had attempted to provide water to the community by pumping water from the Khan River to a small reservoir (50m³). However, with the high cost of diesel to operate the pump and the inability to maintain operation and maintenance costs, the venture only lasted 3 months before collapsing. Without water supplies, but with strong demand, it was decided that different levels would pool resources and each would use their strengths to work towards a sustainable water supply network. Nam Papa would provide money and technical knowledge, the community would contribute their labour by helping dig trenches and the district authority would also help in providing assistance to the project through labour.

The three villages targeted under the first phase of the project include: Par Vaid, Par Khanh and Xieng Ngeun village and was designed as a test pilot where the District Authority and community provided a great amount of input. This first phase of the project was deemed a success and the other villages also wanted to be connected to the water supply network. To help with the extension, UN-HABITAT’s input was requested. An agreement between the parties was established in which UN-HABITAT would provide USD250,000 while Nam Papa and the community would each provide in-kind assistance totalling USD100,000.

Lessons learnt from this first phase provided the basis for the second phase of the project. These lessons included relying on community participation for the success of the project and the District Authority would be the leader in which they would coordinate the project activities, guide the community and negotiate negative impacts. Nam Papa would provide all technical sides of the project. This allowed each stakeholder to capitalise on their strengths. A change in the organisational structure also meant that there would be better coordination between the villages, Nam Papa and the District Authority. This included a project committee at the District level, a Project Implementation Unit, a sub-committee responsible for procurement and one coordinator from each village.

Villages targeted by water connections to their homes included seven villages of Xieng Ngeun District. While eight villages are targeted by the project, one of the villages, Houay Thao, is situated at the water source and it was considered to be unnecessary to connect water to houses when an abundant supply of clean water was already readily available through public standpipes located throughout the town. These standpipes were established before this project and provide a sufficient supply of safe water to the village of Houay Thao. The area was cleaned up and efforts to conserve this supply are undertaken by NPSE-Luang Prabang, Xieng Ngeun branch. All eight villages are targeted by the revolving fund for latrine construction and hygiene training. This second phase was a fast-track pilot project which demonstrated the community’s ability to work effectively with the water supply entity to bring about increased water and sanitation
access for the entire community. Pro-poor water connection charges through a revolving fund were an important element to the project as was the aim of improving community awareness on sanitation and increasing capacities of the NPSE-Luang Prabang and its newly established District branch. The project had three components: Part A. Water Supply, Part B. Policy Support and Capacity Building and Part C. Sanitation.

Specific objectives of the project according to the Cooperation of Agreement between NPSE-Luang Prabang and UN-HABITAT include:

a. Demonstrating how a community can work with a water supply entity to acquire safe water and adequate sanitation that meet its needs
b. Demonstration of pro-poor connection charges and tariffs
c. Improved community awareness of environmental sanitation
d. Enhanced capacity of NPSE-Luang Prabang, and local artisans.

NPSE-Luang Prabang via its District branch was the responsible body for the revolving funds providing guidance and operation of the funds including collection of repayments and administration costs. A survey conducted in coordination with village chiefs and District Authority determined which households would be given priority under the scheme. NPSE-Luang Prabang and the District authority were responsible in the training of local artisans along with the village health unit which was through 1 day of training in each village. Each household was also responsible for helping with labour and construction of the latrines. Those schools that benefited from the revolving funds also required students to assist with labour.

**Project Activities**

Listed below are some of the important project activities and associated outputs:

1. Providing safe water facilities and connections to 6,400 people
2. Setting up and trial of basic billing and collection system with training
3. Develop O&M training (with development of manuals)
4. Design and test revolving fund for water connections
5. Design and trial revolving fund for sanitation
6. Develop and implement community awareness programme
7. Provide training for latrine siting and construction
8. Prepare media production of all processes involved in the implementation of the project.
Xieng Ngeun Town Profile and Before Project Scenario

Xieng Ngeun town is situated in the District of the same name, Luang Prabang Province. It is 30 kilometres south of the historic town of Luang Prabang and has a total population of 6,904 people. Xieng Ngeun town is made up of eleven villages, eight of which are covered by the project and has a total of 1,264 households. Before the first phase of the project began, Xieng Ngeun town did not have piped water connected to any households.

After the first phase of the project was completed, a rapid socio-economic assessment was carried out by UN-HABITAT in February 2006 which found that 96% of those households in the remaining 5 villages who did not benefit from the first phase used water from a spring source. These villages include Done Mo, Suan Luang, Par Thor, Houay Thao and Mout Villages. It was also reported in this rapid socio-economic assessment that March to mid-May are the driest months in which water is minimal and doesn’t provide enough water for daily needs. The rainy season also made the water turbid. To account for both these, alternative sources are used including bottled water for cooking and drinking and also a high majority of people used the river for cooking purposes as well as washing and bathing. The rapid socio-economic assessment highlighted that:

“One person can take two buckets of water (12 litres in each bucket) per trip and about 4-5 trips are required to get sufficient volume of water for the daily use for cooking and other household activities. Because of high turbidity in the rainy season it is necessary to leave the water collected from the river in the tank for 2-3 hours before using so that the sediment is settled in the bottom of the tank”.

A small number of households in the target villages already had a toilet with some of these sanitation facilities consisting of pour-flush toilets with pit latrines usually located between houses. However, it was reported by a number of people interviewed during the current impact assessment that the quality of these toilets was poor and that this greatly affected health of the inhabitants of Xieng Ngeun town.

Also according to the rapid socio-economic assessment, the main occupation for the majority of people in the target area of Xieng Ngeun town is agriculture with 62% of the population working as farmers, particularly rice cultivation. Other cash crops are grown along the banks of the Khan River including cucumber, cabbage, watermelon, maize and other vegetables. 14% of heads of households are government officials working in Par Khan where most of the government offices are located. Some of these officials also engage in other activities as their salary is not sufficient enough to support their family expenses. Roughly 18% of households are running small business such as restaurants, noodle shops or guesthouses within their premises. 2% are employed as casual labour and 2% work in the manufacturing industry. The remaining 1% is classified as employees.
Women, in Xieng Ngeun, are largely responsible for household duties, looking after children, selling cash crops at the markets and are also engaged in farming activities. Some women also run businesses. Water is most crucial for women as collection is their main responsibility from either public standpipes, wells or the Khan River.

**Defining Impact Assessment**

An impact assessment study is undertaken to determine the significant or lasting impacts on a community resulting from interventions such as this project targeting water access and sanitation facilities. This particular study takes the view that impacts, both positive and negative, are important for the design of future water and sanitation projects and to further understand the reasoning behind this change. This requires an examination of a wide number of indicators at all levels and such a broad examination allows for an exploration of both intended and unintended impacts which may or may not be attributable to the project activities. While direct impacts are difficult to determine, change in the community in general is considered. The areas in which impacts are assessed are in institutional, social, environmental, economic and technical change.

**Methodology**

This study draws on interviews and questionnaires to determine significant change by asking specific questions relating to before and after situations. Indicators used to determine change are in the form of socio-economic or health changes such as housing improvements, new houses in the area, growth of small businesses, time saved and reduced incidences of water-borne diseases. While the majority of this impact assessment relies on qualitative data from the project participants and beneficiaries, quantitative data is also used to reinforce qualitative data findings. The methodology for this assessment entails recording community views on their perceived significant impacts resulting from the water and sanitation project. This is established through interviews with households and groups within each of the eight villages of Xieng Ngeun. Village chiefs also partake

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**Graph 1: Occupation in the Villages**

in interviews to determine before and after scenarios and general impacts on the community.

Questionnaires also form part of this impact assessment. There are two types: one for the community which is aimed at participants and/or beneficiaries of the project and one for staff from NPSE who took part in the project. The community questionnaires (see appendix 3 for a copy) attempt to establish what the community sees as the most significant change in their lives as a result of the water supply and sanitation facilities as well as future impacts. These questionnaires will be handed to Village Heads for distribution to households and target approximately 20% of the population of each of the villages. Questionnaires aimed at implementing staff from NPSE will also establish changes in their operations and changes between the water utility and the community (see appendix 4 for a copy).

Likewise, impacts on the local utility, Nam Papa State Enterprise -Luang Prabang and the District branch of NPSE-Luang Prabang in Xieng Ngeun are examined through interviews with Nam Papa officials at the Provincial and District level and village heads as well as households. Both the questionnaires and interviews attempt to determine changes to the operation of the utility and any significant impacts that are likely to affect future dealings with this particular community or others in Luang Prabang Province.

While this is the first impact assessment study for UN-HABITAT in Lao PDR, this is a learning process and attempts to provide lessons for future impact assessments. Recommendations at the end of the project also incorporate possible alternative directions for Nam Papa staff based on findings that reflect community views and these findings will also help to direct future projects of UN-HABITAT. It is also important to note that while significant change may be visible in the short-term, a follow-up community directed impact assessment study will need to be undertaken to determine lasting, sustainable impacts on the community and to assess the changes to the water utility that have influenced long-term operations.

**Problems Encountered**

The eighth village (Houay Thao) to benefit from this project is situated in an area that is difficult to access during the rainy season. The field visit to Xieng Ngeun was undertaken after heavy rain and hence it was deemed too difficult to access the village. While this village does not receive water connections to their houses, because of its location at the water source, they do benefit from the sanitation component of the project and efforts are taken to clean up the spring source at this village as well as conserve this water source. An impact assessment undertaken in a few years time should include this town to assess long-term impacts on their village including impacts on the spring water source.
Section 2: Findings

Significant Change

After project interventions, 81.7 per cent of households in Xieng Ngeun town are now connected to the water supply network and receive safe, piped water direct to their houses for a monthly fee. It should also be noted, on top of this figure, 17 households have access to water connections via their cousin’s house, however, a separate meter wasn’t installed and their usage is charged with their cousin’s usage. The number of households with a latrine is now 85.4% with the remaining 184 households yet to install a latrine. The area has also seen an increase in inhabitants with 61 new households moving into Xieng Ngeun town which has increased the population from 6,650 in 2005 to 6,904 in 2007.

Through face-to-face interviews conducted in 7 of the 8 villages, it was established that this access means that households themselves feel that they are now more comfortable, the burden on women and children is reduced and people have more time to engage in other socio-economic activities such as agriculture and farming.
Table 1: Total number of water connections and number of HHs using revolving funds for water and sanitation

<table>
<thead>
<tr>
<th>Name of Village</th>
<th>Total no. of HHs</th>
<th>No. of connections to water by village</th>
<th>No. of HHs using Revolving Fund for water</th>
<th>No. of HHs using Revolving Fund for sanitation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Xieng Ngeun</td>
<td>197</td>
<td>177</td>
<td>17</td>
<td>9</td>
</tr>
<tr>
<td>Done Mo</td>
<td>200</td>
<td>135</td>
<td>13</td>
<td>1</td>
</tr>
<tr>
<td>Par Khanh</td>
<td>119</td>
<td>149</td>
<td>9</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(29 of these are offices and not included in total HHs number)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mout</td>
<td>162</td>
<td>143</td>
<td>12</td>
<td>1</td>
</tr>
<tr>
<td>Par Vaid</td>
<td>164</td>
<td>145</td>
<td>6</td>
<td>0</td>
</tr>
<tr>
<td>Suan Luang</td>
<td>296</td>
<td>228</td>
<td>14</td>
<td>13</td>
</tr>
<tr>
<td>Par Thor</td>
<td>73</td>
<td>13</td>
<td>0</td>
<td>13</td>
</tr>
<tr>
<td>Houay Thao</td>
<td>53</td>
<td>0</td>
<td>0</td>
<td>11</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>1,264</strong></td>
<td><strong>990</strong></td>
<td><strong>71</strong></td>
<td><strong>50</strong></td>
</tr>
</tbody>
</table>

Note: Houay Thao village is situated at the water source and hence water supply is already convenient. The project made efforts to clean up and conserve this source. For this reason, Houay Thao is excluded from the final percentage of households connected.

Source: Village heads and NPSE-Luang Prabang, Xieng Ngeun Branch.

Graph 2: After project intervention - Current total connections to formal water supply network per village

Source: NPSE-Luang Prabang, Xieng Ngeun Branch
Pro-poor Connections

Table 1 shows the number of households who have benefited from the revolving fund for water and sanitation connections. A number of households interviewed expressed that this revolving fund was significant for poorer families who would otherwise not be able to afford an upfront payment for the connection which is about USD75. The latrine upfront payment would also be roughly the same. It can be noted that some families also preferred to take out the loan for latrine construction before connection to water. One woman interviewed from Xieng Ngeun village had used the revolving fund not for a connection to the water network but to build a latrine which she was very happy with. She had already paid half the loan and has two remaining instalments before her loan will be paid in full. She has plans to connect to the water supply, but also felt that she wanted to first connect to electricity.

The Deputy Director of NPSE-Luang Prabang, Mr Somsannith Thippasouda, believes that as a result of the revolving funds households are now more responsible for operation and maintenance of these latrines as they have invested time and money in the construction. In this instance, households take more care and are more likely to fix the latrine that they have paid for it as opposed to if they had received it for free.

Two schools also participated in the revolving fund thus allowing for the school children to benefit from the project. The Village Head from Done Mo also believes the revolving fund was very effective and has been allocated to poor families, government officials without extra income and army officers who get paid every three months. He believes this makes the project more equitable and those who cannot afford upfront connection costs can pay over a period of time without incurring interest. Once the fees are paid back, other households in the village can then apply to use the funds.
Women

Five of the seven Village Heads interviewed specifically highlighted that this project directly reduces the burden on women and children. A number of households also expressed that the improved water supply will directly impact women allowing them to engage in more productive activities. The Lao Women’s Union (LWU) played an important role in this project, encouraging women to participate in terms of their labour or funds. According to the Head of the LWU district office in Xieng Ngeun, this mobilisation by LWU was successful and now, even after the completion of the project, women continue to work to maintain the system.

The Head of LWU also sees women’s participation as important to this project as it is women who collect and use dirty water and this has caused a lot of diseases:

“Clean water means that the health of women improves which in turn increases the economic status of households. This is because collecting water took time, perhaps 20-30 minutes and this time saved can now be used to care for the children, to cook, or to earn money from selling things. Sanitation is also an important area for women and their rights and role has improved considerably. Their involvement in sanitation training was important as they are highly influential on spreading the word on the issues of sanitation”.

Also according to the LWU, women’s decision-making in the water sector has also improved as they now feel they have greater responsibility and it is not just Nam Papa who takes charge. Women are most likely to protect and maintain the water connections and will usually be the one’s to raise technical issues and therefore it is important that there is strong decision-making on the part of women. Nearly all women interviewed took part in the project by contributing their labour in digging of trenches and the LWU claims that actually more women were involved in the project than men. The impacts on
women are therefore significant and further long-term impacts are also likely to be evident in which improved socio-economic status will have impacts on families.

**Improved Socio-Economic Status**

The community in general felt that time saved was the most significant outcome of this project which they believe will result in increased socio-economic status due to the ability to engage in more productive activities. The number of new businesses in the area since the project completed is 19, with all of these new businesses also connecting to the water supply. Of those households interviewed a few had also started small-scale businesses as a direct response to improved water access.

![A shop on Highway 13, Xieng Ngeun Village](image)

**Case study 1: Noodle Soup Business**

A man and his 9 other family members from Xieng Ngeun village live in a 2 storey concrete and bamboo house. He expressed that connections are very convenient for him and his family. Before the project, they had to bring water from the Khan River (about 300 meters away) and had to use less water than his family required. Now with the water supply, the man has started a noodle soup business at the front of his house which is bringing in money for his family. He and other family members are also able to dedicate more time to farming which he believes is improving their livelihood.
The vast majority of respondents to the questionnaire completed by the community believe that they are now able to save time and labour and most saw that this would result in an increase in their socio-economic status as they would be able to engage in other productive activities such as livestock raising or agricultural activities. Question (f) of the community questionnaire (see Appendix 3) saw 70.6% of households as being able to save time or labour and/or improve their socio-economic status as a result. Other responses to this question included that households saw that their lives would be more comfortable, there would be reductions in poverty as well as reductions in diseases.

Graph 3: Responses to community questionnaire on how they perceive their lives changing as a result of the project

Source: Results from community questionnaire
Along with smaller scale businesses, a number of larger businesses are also flourishing. The Village Head of Suan Luang believes that a number of businesses in the area have grown and water has directly influenced this increase. These include the “Pure Drinking Water” company (see Case Study 2 below), the gas station currently under construction on Highway 13, a small ice factory in Mout village, a number of businesses selling clothes and other products as well as the growth of the market in Par Khanh.

The District Governor of Xieng Ngeun, Mr Somdy Douangpasith, sees the expansion of the market as extremely beneficial to the area. Along with increased capacity, the extension of opening hours will mean more people have access at other times of the day. The market only stayed open till 8am, whereas now, businesses are encouraged to stay open all day. The District Governor also was making efforts to attract more businesses to this new market area by granting 20-year concessions on the fees.
Case study 2: “Pure Drinking Water” company

The owner, Kamman, and his family live in Mout Village and were living off their land as farmers. Yet, they felt they were getting older and wanted to increase their income. With access to water supply he and his family could start this business. The “Pure Drinking Water” company opened in October 2007, less than a year ago, and business has increased ever since.

Water from the new water supply network is treated with UV rays and delivered to households in Xieng Ngeun District and also to some households of Luang Prabang District. Daily sales average between 300-400 20/L bottles and this is growing every month. Before Pi Mai in April 2008, they only had one truck. Yet, with such demand the owner decided to invest in another to help with the deliveries. They currently have 7 workers including 4 who deliver, 3 who work at the treatment plant and clean and 3 administration workers.

The “Pure Drinking Water” company sells water for 3,000 kip per 20/L which is cheaper than Luang Prabang suppliers who charge 4,000 kip as they are closer to households and transport costs are considerably less. Kamman expressed that their standard is very high and the water quality is tested every 2 months by the Provincial Department of Food Supply and Medicine.

The owner also believes that he is investing in a niche market as there are lots of other businesses and small shops but with water supply and high demand it was a great opportunity to start his “Pure Drinking Water” company. He felt that his community would now change and grow and he also had plans to extend his business to also produce ice.

“Pure Drinking Water” office located on Highway 13 in Mout Village
Table 2: Total water connections under each category

<table>
<thead>
<tr>
<th>Category</th>
<th>Total number of connections for each category</th>
<th>Official 2008 tariff for water use (in Kip)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Households</td>
<td>877</td>
<td>0-10m³: 1,000</td>
</tr>
<tr>
<td></td>
<td></td>
<td>11-30m³: 1,100</td>
</tr>
<tr>
<td></td>
<td></td>
<td>31-50m³: 1,200</td>
</tr>
<tr>
<td></td>
<td></td>
<td>50m³+: 1,300</td>
</tr>
<tr>
<td>2. Govt. Offices</td>
<td>31</td>
<td>1,500/m³</td>
</tr>
<tr>
<td>3. Small Businesses</td>
<td>77</td>
<td>1,700/m³</td>
</tr>
<tr>
<td>4. Industry</td>
<td>5</td>
<td>1,900/m³</td>
</tr>
</tbody>
</table>

Source: NPSE-Luang Prabang, Xieng Ngeun Branch

Greater Social Cohesion

The Village Head of Par Thor believes that one of the main advantages to the water connections in his village is that there will be more peace as many disputes erupt at the spring taps and people argue over entitlements or queuing. This Village Head sees individual taps as benefiting community relations as households will be responsible for their own tap and thus conflicts and disputes will be less common. The Par Thor Village Head also sees water access as having the ability to improve the economic situation of households as people will have time to do other things which will also help to create more peace within the community. The Deputy Director of the District Department of Public Works and Transport also see that with the spring water taps there were always complaints and disputes but now with individual connections there are fewer problems.
Health and Education

An official health report completed by the Chief of the District Department of Public Health, Xieng Ngeun, clearly indicates that the number of diseases or illnesses that may be caused by dirty, untreated water has reduced considerably in 7 villages (with a population of 5,257) of Xieng Ngeun District from 2005 to 2007. The number of reported diarrhoea cases has decreased from 128 cases in 2005 to 3 cases in 2007. The number of cases of dysentery has decreased from 48 to 0 cases from 2005 to 2007. Likewise, in 2005 there were 53 reported cases of skin diseases and 108 reported cases of trachoma and in 2007 there were no reported cases of these diseases.

Graph 4: Number of reported cases of diseases in 2005 and 2007

While the number of health clinics, health centres and hospitals remains one each of these from 2005 to 2007, the number of pharmacies in Xieng Ngeun District has increased from 4 in 2005 to 7 in 2007. This could perhaps indicate that the rise in socio-economic status has increased expendable income meaning that households have the ability to pay for medicines and as indicated earlier this expendable income may also be attracting a growth in businesses. Also important are figures showing the number of people who attended 4 training sessions on sanitation: 1,834 people and of those, 1,028 were women. This information in the health report indicates that a significant number of people have attended workshops and behaviour change in relation to sanitation as well as improving adequate access to water does impact on the health and well-being of communities. A number of respondents to the questionnaires also indicated that health has improved as a result of the water and sanitation project and of those interviewed, a few did mention that training on sanitation was useful, especially for their daughters.

According to Houmphan Puthavonh, Deputy Chief of Education Office, the students are mobilised to participate in different hygiene trainings and they already have a subject at school entitled: “Things you need to know”, which teaches about different important issues. Amongst the many topics is ‘living in a clean environment’ in which students
learn the importance of washing hands and drinking clean water and keeping their surroundings clean and safe. Mr Puthavonh also saw that the project will lead to a higher standard in which children will develop their awareness of hygiene and sanitation issues at a faster rate. They will not just go to the forest but they will use latrines appropriately and this is cleaner and safer for children. He also believes there is a change in the community in which people now do not have to walk far to stay healthy and clean and to wash.

![Xieng Ngeun Town: “Clean Model Town”, a title given to Xieng Ngeun Village before the water and sanitation project began](image)

**Case Study 3: Improved sanitation**

A group of women sitting in front of their shop in Done Mo village expressed that water connections at the house provided for much more convenience as the public stand pipe wasn’t sufficient and they had trek to the Khan River to bath. On top of this, for these women the hygiene training at the temple was very useful as they didn’t know you needed to boil water or that drinking untreated water causes diarrhoea. They now know more about their health and no longer have problems with diarrhoea.

**Wider health issues**

Another woman from Done Mo was extremely happy with the project and expressed gratitude for the convenience the connections bring to her life. She claimed that the buckets she had to carry from the Khan River were heavy which made her shoulders sore. Now, with access to water at her doorstep, life has improved.

Another group of women interviewed in Par Vaid village who sell Lao desserts are happy now they do not have to walk to the Khan River to collect water which they can access 24 hours a day: “It was difficult to walk to the river, especially at night in the rainy season when it would get slippery”. They also see that the water supply is now cleaner which is much better for their health.
Participation and the Success of the Project

Participation, by the vast majority of people interviewed and who undertook the questionnaire, was very important for the success of the project. Community labour was a significant contribution that made this project possible and this contribution also means that communities themselves are strongly committed to the success as well as continued operation and maintenance of the water network. This was clearly evident in a number of interviews with Village Heads, who, on a number of occasions, suggested that this community participation was highly beneficial to continued sustainability of the water network.

Table 3 highlights that the majority of those with water connections took part in the project and over 96% of questionnaire participants believe that community participation was important for the success of the project.

Table 3: Questionnaire results on participation and its importance

<table>
<thead>
<tr>
<th>Village</th>
<th>No. of questionnaires completed</th>
<th>% of those connected to water interviewed</th>
<th>% of those interviewed who participated in project</th>
<th>% of those interviewed who feel it was important for community involvement</th>
</tr>
</thead>
<tbody>
<tr>
<td>Xieng Ngeun</td>
<td>39</td>
<td>22%</td>
<td>92%</td>
<td>94.8%</td>
</tr>
<tr>
<td>Done Mo</td>
<td>40</td>
<td>20%</td>
<td>100%</td>
<td>100%</td>
</tr>
<tr>
<td>Par Khanh</td>
<td>20</td>
<td>16.8%</td>
<td>95%</td>
<td>95%</td>
</tr>
<tr>
<td>Mout</td>
<td>32</td>
<td>22.3%</td>
<td>93.7%</td>
<td>96.8%</td>
</tr>
<tr>
<td>Par Vaid</td>
<td>16</td>
<td>11%</td>
<td>100%</td>
<td>100%</td>
</tr>
<tr>
<td>Suan Luang</td>
<td>29</td>
<td>9.7%</td>
<td>100%</td>
<td>96.5%</td>
</tr>
<tr>
<td>Par Thor</td>
<td>11</td>
<td>84%</td>
<td>90.9%</td>
<td>90.9%</td>
</tr>
</tbody>
</table>

Note: Houay Thao village did not take part in the questionnaire
Source: Results from community questionnaire

Environmental Impacts

No negative environmental impacts have been expressed by villagers or Village Heads from pipe laying and other installation works. However a couple of other issues were raised that relate to the water supply network. The first is in relation to wastewater and the lack of a drainage network. The issue of wastewater was raised by a number of people including Village Heads, the community and other officials. Currently there is no formal drainage system in the villages to deal with water that is discarded by households for washing or bathing. This wastewater affects other households living at lower levels. The Par Vaid Deputy Village Head expressed that this is especially an issue during the...
rainy season as rainwater washes wastewater into adjacent houses more easily. The Done Mo Village Head expressed concern that a recent outbreak of Malaria in his town may have been caused by people not covering water or lack of an appropriate drainage network. Approximately 100 people were infected, but there were no deaths. The Done Mo Village Head plans to visit households to make sure people are covering water.

In response to this issue, the Deputy Director of the District branch of the Department of Public Works and Transport recognises the need for a good drainage network. His department has plans to work with the community to build small-scale drainage trenches in some of the villages which will be directed to farms and small streams. This highlights that community involvement in projects will continue to occur in which government departments respond to community needs while also relying on this community participation for the success of these interventions and community improvements.

The second issue to do with environmental impacts is that of turbid water in which soil sediments are found in the water supply. All villages reported that their water has been turbid, with varying estimations on when this turbidity began. Some households reported that it began a couple of days before our visit in June, others a week and one house is Suan Luang reported that their water had been turbid for 2 weeks. While we were not able to visit the reservoir during the field visit, it was established that erosion of soil caused by rain was the main reason behind the turbidity.

Chief of the Xieng Ngeun branch of Nam Papa, Mr Chanthalideth, highlighted that the lack of concrete reinforcement around the reservoir could be contributing to the problem. However, one of the major issues could be logging of trees in the water catchment area which may be causing top soil to seep into the spring water source. A sedimentation tank would be costly to install and hence further monitoring and an exploration of possible solutions to the issue will need to be established.

An issue associated with this erosion is the lack of access by car to the reservoir. During the rainy season, the road is unstable and prone to erosion and therefore access to the
reservoir and testing lab is only possible on foot. In the questionnaires completed by the implementation staff of Nam Papa a number of respondents believe that the access road to the reservoir should be fixed to ensure quicker access to test water quality and ensure a timely response to maintenance issues. The dirt from the road also seeps down to the main highway causing the road to be clogged which on occasions has disrupted traffic.

**Nam Papa and Impacts on Institutional Operations**

Deputy Director of NPSE-Luang Prabang, Mr Somsannith Thippasouda, sees that increased capacities of staff as a result of training was comprehensive and covered all aspects of operations and maintenance. Training, which formed part of the project activities, involved reading meters, recording and managing data and learning how to relate and do business with customers. The Nam Papa branch in Xieng Ngeun is responsible for checking meters and also maintenance and reporting operation and maintenance issues. Meters are read monthly by the Nam Papa staff and this is recorded and bills are issued at the Provincial branch of Nam Papa in Luang Prabang (see below on new initiatives for bill collection).

Of those interviewed, most people were satisfied with Nam Papa’s response to maintenance issues. However, concern was raised about the recent turbid water coming from the taps. According to Mr Somphone Chanthalideth, Chief, Xieng Ngeun Nam Papa Branch, this is attributed to erosion during the rainy season which washes dirt into the reservoir. While this problem has not occurred before this year, Mr Chanthalideth believes a sedimentation tank would reduce sediments in the network. However, this is costly and available funds are limited. He also claims that the soil around the reservoir is weak and concrete reinforcement could have helped this problem. Others in the community believed that greater care is needed to protect the water source, particularly by monitoring logging in the water catchment area.
While the current consumption of water in the targeted villages is 600m³/day, the system can produce 2,000m³/day. As a gravity-fed system has been employed, not a lot of electricity is used for distribution and therefore operation costs are low. The Chief of Xieng Ngeun Nam Papa branch highlighted that operation and maintenance costs are covered and a small profit is currently being made. Mr. Chanthalideth says this profit will be used to expand the system to reach the remaining three villages in Xieng Ngeun town as well as encouraging connections for the remainder of households in the targeted towns who are currently not connected to the system.

Table 4: Questionnaire results - attitudes of Nam Papa staff

<table>
<thead>
<tr>
<th>Question responses</th>
<th>Strongly Agree</th>
<th>Agree</th>
<th>Impartial</th>
<th>Disagree</th>
</tr>
</thead>
<tbody>
<tr>
<td>The project was successful in achieving its stated aims</td>
<td>54%</td>
<td>46%</td>
<td>0%</td>
<td>0%</td>
</tr>
<tr>
<td>The training gave you useful skills</td>
<td>61.5%</td>
<td>38.5%</td>
<td>0%</td>
<td>0%</td>
</tr>
<tr>
<td>Working with the community was a pleasant experience</td>
<td>46%</td>
<td>46%</td>
<td>8%</td>
<td>0%</td>
</tr>
<tr>
<td>The community supported the project</td>
<td>92%</td>
<td>8%</td>
<td>0%</td>
<td>0%</td>
</tr>
<tr>
<td>You would be willing to replicate this project in other towns</td>
<td>85%</td>
<td>15%</td>
<td>0%</td>
<td>0%</td>
</tr>
</tbody>
</table>

Source: Results from the questionnaire for 13 Nam Papa staff involved in implementation

The table above highlights that the vast majority of staff saw the project as successful and would be willing to replicate this project in other towns. While one respondent was impartial as to the pleasantness of working with the community, the remaining 12 respondents either agreed or strongly agreed with this statement. These results highlight that for Nam Papa staff the project was highly successful in which training was useful and community involvement was beneficial to the project.

A couple of other issues which affect the operation of NPSE were also raised in the questionnaire completed by implementation staff and in the interviews. One such issue is in relation to the revolving fund. Mr Somsannith Thippasouda believes that there should be a separate budget line for administration costs for the revolving fund. Currently without any allocated funds for administration, Nam Papa has to incur the costs for collecting repayments, labour, bank charges and paperwork costs. Mr Thippasouda believes this is difficult for Nam Papa to maintain and does not actually fall under its required mandate: they are responsible for water not for sanitation. Another issue raised was the lack of experience with working with an International Organisation. A number of respondents to the questionnaire believe that the process of report writing was difficult, especially because of the lack of English which slowed down the transfer of funds thus delaying project activities.


Unintended Impacts

Solid Waste Management

The District Governor, Mr Somdy Douangpasith, saw waste management as one of the only major things missing in his district. There is water, electricity, toilets, and sanitation and now the private sector is involved and collects waste from households and businesses for a small fee.

A number of other people also feel that improved hygiene and sanitation practices have resulted from this project. This is largely due to sanitation trainings both as part of the project and also undertaken by District Health Office which have both reinforced communities awareness of hygiene and waste management issues.

A New Billing System

A new scheme that may prove to be extremely effective in the collection of monthly bills for water usage is through contracting someone in the community, perhaps the village head or deputy or other village members who will be responsible for collecting the monthly fees. The contracted collector will receive a commission of 750 Kip for each bill collected. If 100% of bills are collected this will rise to 800 Kip/bill. If there is 100% collection for three months, a commission of 300,000 Kip will be given. This scheme started in May and Mr Thippasouda believes this will be a much more effective way of collecting fees as the village head or other contracted members of the community know the households and will be able to take time in talking to the community so they understand the fee and the need to pay.
Section 3: Conclusions and Recommendations

It is clearly evident that this community-based water supply and sanitation project has had significant impacts in the lives of the people of Xieng Ngeun Town. This can be seen through a number of indicators such as improved health, time saved to expand productive activities and increased number of businesses in the area. Overall well-being of the community has improved and community engagement with the project has given great strength to the inhabitants.

While there are still households who do not have access to water, the project has achieved its stated aim of reaching the majority of inhabitants of the 8 villages of Xieng Ngeun town. The strengths of the project lie in the community participation as the low investment cost made the project possible and this also significantly contributes to the continued sustainability of the project.

The Chief of Nam Papa, Xieng Ngeun branch believes that improvements to the reservoir and protection of the water source will ensure long-term sustainability and reduce sedimentation during the rainy season. Opportunities for expansion of the network will increase reach to a wider number of households also allowing for the reservoir to be used to its full capacity. However, this requires extra investment which NPSE-Luang Prabang currently does not have.

It is recommended that continued dialogue between the community, Nam Papa, the District Authority and Village Heads will need to take place in order for Nam Papa to respond to community needs. Continued awareness raising in the community on water conservation, safe hygiene practices in relation to water storage as well as continued action in training households on safe sanitation practices will continue to reinforce changing behavioural practices.

Future projects can therefore benefit from lessons learnt from this particular project. These include the incorporation of Water Demand Management (WDM) principles as well as incorporating drainage networks into the project activities to deal with wastewater issues. Monitoring of the issue of turbidity as well as reducing erosion through protection of the water source should also be considered.

Positive areas in which the project has drawn its strength from are community participation as well as the use of a low impact network. The system, based on a gravity-fed system, allows for water to be distributed to the majority of households in the targeted towns with minimal cost. The revolving fund has also been positive as it has allowed for poor households to also have access to the water and sanitation services thus ensuring pro-poor objectives of the project are fulfilled. Significant impacts include improving women’s role and decision-making abilities, increasing the ability for households to engage in socio-economic activities and improvements to health in the community.
Annex 1: Limitations to this Impact Assessment

1. The cause and effect relationship is not linear and some impacts may not be directly attributable to the project. There may be a number of other interventions not associated with the project that could have influenced certain changes in the community. Therefore unintended impacts that may or may not be associated with the project outcomes have been highlighted in this impact assessment however it needs to be recognised that changes could have been brought on by other interventions.

2. Impact assessments that are community driven may be more effective as they allow communities to explore changes within the community and take greater control of these changes. This was not possible in this assessment due to time constraints and lack of resources. However, it is recommended that a follow-up community-driven impact assessment take place. This would allow communities themselves to define and directly participate thus helping to reinforce project objectives and help communities themselves mitigate any negative impacts while focusing on the strengths of positive impacts.

3. In this impact study, questionnaires were used to further the reach of the face-to-face interviews. However, it is recognised that the questionnaires have limitations in that the questions may not have been understood by the households taking part in the questionnaire. These responses may also have been influenced by the person responsible for distributing the questionnaire (in most cases this was the Village Head of each community). Findings from the questionnaire thus should be considered with caution.

4. There are certain limitations to interviews as some people may have been worried that they were saying the wrong thing. However, many people were not afraid to spell out negatives and these interviews were mostly undertaken with a number of people (other family members of other members of the community) and we believe this was important as it allowed the interview to be more of a discussion in which a number of people could share their views.

5. Undertaking an impact assessment study after such a short time may highlight significant impacts. However, lasting or sustainable change within the community would need to be assessed further into the future. Therefore, it is recommended that a follow-up assessment should be undertaken in a few years time to allow for lasting change or any long-term negative impacts to be taken into consideration.
Annex 2: Interviews undertaken 18th – 20th June in Xieng Ngeun District as part of the Impact Assessment for the Community-based Water Supply and Sanitation Project

1. Mr Somsannith Thippasouda, Deputy Director and Project Manager, Nam Papa State-Owned Enterprise-Luang Prabang
2. Mr Somphone Chanthalideth, Chief, Xieng Ngeun Nam Papa
3. Xieng Ngeun Village Head
4. Done Mo Village Head
5. Par Khanh Village Head
6. Mout Village Head
7. Par Vaid Village Head
8. Suan Luang Village Head
9. Par Thor Village Head
10. Lao Women’s Union, District office
11. District Governor of Xieng Ngeun, Mr Somdy Douangpasith.
12. Official from District Department of Public Works and Transport
13. Official from District Education Department: Deputy Chief of Education Office, Mr Houmphan Puthavomh.
15. Owner of ‘Pure Drinking Water’ company
16. Owner of restaurant in Xieng Ngeun Village
17. Households from Xieng Ngeun Village
18. Households in Par Khanh
19. Households in Done Mo
20. Households in Mout
21. Households of Suan Luang
22. Households in Par Thor
23. Households in Par Vaid
Annex 3: Questionnaire for Xieng Ngeun community benefiting from the water project:

Please circle the most appropriate:

Are you:

1. Village Head  
2. Project Committee Member  
3. Participant/beneficiary

a. The project was implemented with your input
   Yes   No

c. Personally, I felt it was important to have strong involvement in the project
   Yes   No

d. The project has adequately responded to my needs
   Strongly agree  agree  impartial  disagree  strongly disagree

e. What do you see as the most significant impact on your life?

f. What aspects of the project could have been improved?

  g. How do you envision your life in the future as a result of this project?

Thank you!
Annex 4: Questionnaire aimed at implementation staff

1. What was your role in the project?

____________________________________________________________________

2. The project has been successful in achieving its stated aims (increased access to water and sanitation)

<table>
<thead>
<tr>
<th>Strongly agree</th>
<th>agree</th>
<th>impartial</th>
<th>disagree</th>
<th>strongly disagree</th>
</tr>
</thead>
</table>

3. The training component of the project gave me useable skills

<table>
<thead>
<tr>
<th>Strongly agree</th>
<th>agree</th>
<th>impartial</th>
<th>disagree</th>
<th>strongly disagree</th>
</tr>
</thead>
</table>

4. Working with the community was a pleasant experience

<table>
<thead>
<tr>
<th>Strongly agree</th>
<th>agree</th>
<th>impartial</th>
<th>disagree</th>
<th>strongly disagree</th>
</tr>
</thead>
</table>

5. I felt the community gave support to this project

<table>
<thead>
<tr>
<th>Strongly agree</th>
<th>agree</th>
<th>impartial</th>
<th>disagree</th>
<th>strongly disagree</th>
</tr>
</thead>
</table>

6. I will be willing to help replicate this kind of project in other towns

<table>
<thead>
<tr>
<th>Strongly agree</th>
<th>agree</th>
<th>impartial</th>
<th>disagree</th>
<th>strongly disagree</th>
</tr>
</thead>
</table>

7. What impacts do you think this project had on the community?

____________________________________________________________________

____________________________________________________________________

8. What is the most significant impact on your professional work?

____________________________________________________________________

____________________________________________________________________

9. What aspects of the project would you have improved?

____________________________________________________________________

____________________________________________________________________

Thank you!
Annex 5: Map of Lao PDR