



Customer Satisfaction and Technical Performance survey of the Rope Pump "ROVAI" made by Ideas at Work February 2008

BACKGROUND

In May 2006 RDI/IaW won the World Bank Development Marketplace 2006 competition. This resulted in a grant in September 2006 for building and installing Cambodian Rope Pumps. The Rope Pumps (called ROVAI) are made in the Ideas at Work (IaW) factory while the installation and promotion work was done by Resource Development International (RDI) in their target area in Kien Svay district. After 13 months of installing pumps a survey was carried out to get user feedback and technical performance of the pumps.

METHOD:

The study was done in 2 parts: a customer satisfaction and a technical performance survey (see annex). The interview took 30 minutes and at the same time the technical performance check was carried out. All pumps were in use over a period between 2-13 months.

Surveyors:

- KHOUB Sopheak, independent interviewer
- HUNG Souen, IaW technical staff

No. of interviews/pumps: 40

Survey area: Kandal Province, Kien Svay district:

- Daun Sar village (12 respondents)
- Robos Angkanh village (17 respondents)
- Prek Thom village (11 respondents)

Period: February 20 - 22, 2008



Mr Khoub Sopheak interviewing a Rovai user

Key results from the survey

General information

Every one of the 40 pumps visited were in good working order and none had experienced a break down since being installed.

Global Positioning Satellite (GPS) coordinates were taken for each of the 40 pumps along with their unique pump ID number. This will allow future surveys to use the same pumps again and check on wear rate of the pistons and rope as well as user satisfaction feedback for comparison with this survey.

User Satisfaction results (details in annex 1)

24 of the total 40 interviewees (60%) informed the interviewer that they had purchased the pump themselves and that the pump was used by one family only. 22% were used by two families and 18% of the pumps were shared by between 3-5 families. They found the flow rate of water satisfactory at 34 liter per minute. They didn't have much experience with other pumps; most respondents are using a pump for the first time.

Interviewees reported that they were satisfied (63% very satisfied and 37% satisfied) with the design of the Rovai. Two times it was mentioned that some improvements could be made on the water spill and one time on the noise that the pump makes when operated. In addition users considered the quality of the pump to be 'Excellent' (2%) 'very good' (83%) and 'good' (17%).

Except for one person, all those interviewed mentioned that the pump was worth the money they paid. Interestingly this one person was the only Rovai user surveyed with a car and he mentioned that NGOs should give the pump for free.

Technical Performance results (details in Annex 2)

The average flow rate of the Rovai was 34ltr/minute (max 45ltr/min, min 27ltr/min) and there was no significant difference in performance of the older and the newer pumps. Users were generally satisfied with the flow rate of the pump.

The flow rate is less than what other rope pumps claim for their flow rates. It is believed that this is because rope pump pistons are usually made with an annulus gap of around 0.2-0.5mm. However due to almost a 1mm variation of the inner diameter of the riser pipe this small gap is not possible. As a result some water is lost through this gap and the flow rate is reduced – but not so much that users are dissatisfied.

This first study did not allow the wear rate of the pistons to be determined as the diameter of the first batch of pistons was not recorded. However it is planned to carry out future surveys after another 6 and 12 month intervals on the same pumps so that this can be determined.

All of the pumps had been installed on hand dug wells and had a lift height¹ ranging between 2.26m and 6.39 meter deep. The average depth

¹ Lift height = distance between the static water level and the outlet pipe of the pump.

of the wells was 6.45 meter. The guide boxes were installed correctly at 0.2-0.3m above bottom of well to avoid any sediment from being lifted up.

Observations during the survey showed that at least 24 pumps were installed without the stainless steel nuts and/or washers being fitted under the pumps feet. These lift the feet clear of the cement pad and out of any water that often pools there. Prolonged contact with water softens the paint on the pump and this promotes the onset of rust. 13 times it was found that the installation team likely didn't use the moulds as the rope wasn't situated in the middle of the upper pipe. This could cause early wear and breakage of the rope.

62% of families with a Rovai pump said that they had carried out some maintenance either once a month or more often. However they considered that maintenance is mainly oiling the bearing and cleaning around the pump/well.

The survey team found that 60% of the pumps had no evidence of oil being recently applied to the bearings (dry state). Not applying oil makes the handle harder to turn and is usually much noisier.

It was found that a low number of users were actually checking the rope and pistons. Although 30% said they were confident that they can replace the rope if needed but they would still call upon RDI. None of the respondents knew where to find spare rope and pistons. It was frequently stated by users that if something goes wrong with the pump they have been instructed to call RDI.

According to the respondents the ropes on 3 Rovai pumps had been changed by RDI, and that these were all on pumps that were installed at least 9 months ago. Some other responders mentioned "rope-change" when they actually meant that the rope was tightened up.

The rope on two pumps were found to be in a relatively poor condition and replacements are required. These pumps are currently 11 and 13 months in use.

There was generally more rust on the older pumps and in some cases this was considerable. Although it doesn't have an effect on the performance of the pump in the short term, it does not look appealing. Ideas at work had found the rust problem prior to this survey and had changed the paint system in advance. Only a few pumps with the new paint system had been observed during this survey as these were only installed couple of months ago. Newer pumps fitted in other provinces, outside the survey area, has shown that the new paint system is providing better protection and far less rust is appearing over a similar time period.

Note for RDI:

Respondents are happy with RDI bringing new water sources to their home. Most of interviewees from Robos Angkanh village mentioned that they are still waiting for RDI's water testing result and can not use the water for consumption prior to this. Others were waiting for RDI to assist in digging their well deeper.

QUOTES OF USERS:

ROVAI pump used over 1 year:

- Mrs. You Phan, 52 years old: "ROVAI pump is very easy to use. Even children can use it easily"

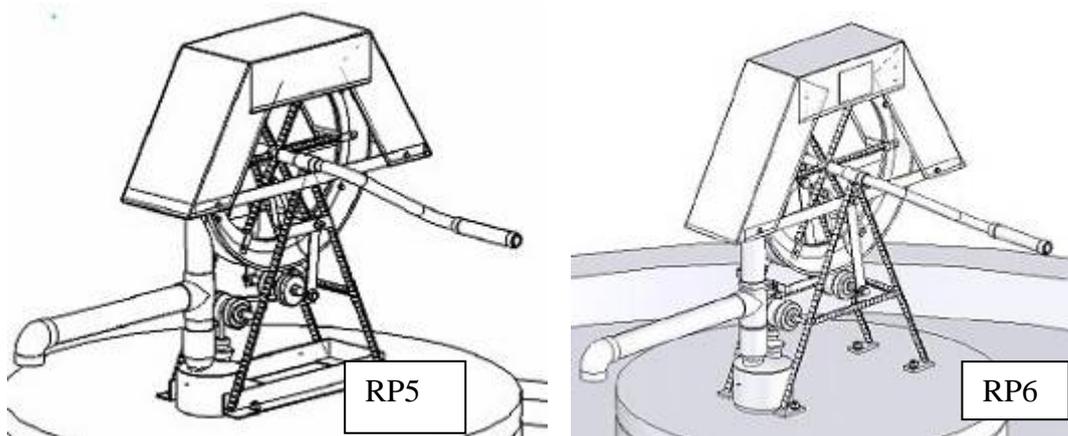
ROVAI pump used over 4-6 months:

- Mrs. Nov Sokhan, 43 years old: "ROVAI pump is very easy to use and helps me a lot. In the past, I spent one thousand riels (\$0.25) to buy a jar of water, which is not of good quality. In my family, I use a jar of water per day. Now I pay only USD 10 per month and I will own the pump after paying all."
- Mrs. Hong Samnang, 38 years old: "The pump is easy to use and not expensive. When I saw my neighbor having the pump installed and using the pump easily, I also wanted to have a pump"
- Mr. Yen Mien, 73: "In the past, I needed to use generator to drain water from the nearby lake every time I needed water. Now I can use water anytime I want because I have my ROVAI pump in my house"

CONCLUSIONS

The RP5 model installed at the beginning of the project has already undergone several improvements. Such as:

- a) Using stainless steel screws instead of plain steel. These now allow screws and nuts to be removed more easily during maintenance. Previously rust prevented the nuts and screws being removed or refitted after around three months.
- b) The design of the base used much less material to reduce the area exposed to rust with no loss of rigidity.
- c) A new three layer paint system that provides much better protection against rust.



The performance of the pump was considered to be acceptable and no major concerns identified when the ROVAI is used on shallow wells. It was not possible to get a better indication at this stage as to how long the rope or pistons would last. However it is scheduled to re-visit specific pumps after a period of time to monitor this and be able to provide this information in the future.

Areas identified for improvement as a result of this survey:

- More focus on transferring maintenance skills to the buyer and pump caretaker. It was hoped that the users would replace parts themselves as and when necessary. This would have helped to demonstrate how easy it was for users to make minor repairs themselves.
- Better attention on buyer's understanding of the maintenance requirements especially checking the rope, pistons also why, how and when to apply oil. This is in the operation and maintenance manual in Khmer which features simple drawings is provided with every ROVAI pump.
- Greater focus on where the parts can be bought; installers need to check which nearby markets has spare rope, PVC end cap and share this with users.
- Greater promotion of spare parts kit and self reliance of buyer.
- Refreshing training for installation teams on the use and benefits of fitting washers and nuts below the feet and for using the "template" during cement cover manufacturing to ensure correct alignment of the rope

Annex 1: User satisfaction survey summary results

Annex 2: Summary of technical data

Annex 3: User satisfaction questionnaire

Annex 4: Technical performance survey form

Annex 1:

User satisfaction survey summary results

Interviewee user and owner of pump?	95%	Male	33%	
User only	5%	Female	67%	
	10-13			
When did you start using the pump?	months	7-9 months	4-6 months	< 3 months
	12	8	13	7
	interviewees	interviewees	interviewees	interviewees
How many families use the pump?				
1 family	60%			
2 families	22%			
3-5 families	18%			
How would you rate the quality of the pump?				
Excellent	2%			
Very Good	83%			
Good	15%			
Are you satisfied with the design of the pump?				
Very Satisfied	33%			
Satisfied	67%			
Neutral	0%			
		less water spill 2x, less noise 1x, more		
Improvements suggested		water 1x		
Are you satisfied with the flow rate of the pump?				
Very Satisfied	50%			
Satisfied	48%			
Neutral	2%			
When was the last time it was looked after/serviced?		<i>(oil and cleaning mainly)</i>		
Less than 1 week ago	25%			
1-2 weeks	33%			
1 month ago	6%			
Never	36%			
Done by:				
Me or my family	96%			
RDI	4%			
What item was replaced or serviced?				
Rope	3 times	<i>done by RDI</i>		
Piston				
Oil the barring	21 times			
Is amount of time spent maintaining pump acceptable?		<i>(oil and cleaning mainly)</i>		
Acceptable	69%			
Confident in changing the rope themselves	30%			
Is collecting water easier or harder than before?				
Now much easier	83%			
A little easier	12%			
No different, the same	2%			
Just start using it, can't say	3%			
Was the pump worth the money?				
Yes	93%			
No	2%			
Don't know	5%			
What type of information did you receive when the pump was installed?			<i>(probing, more answers possible)</i>	
No information	2 times			
Don't know	3 times			
On cleaning	28 times	<i>(no soap)</i>		

On maintenance	23 times	(oil)
On Repair	26 times	(call RDI)
No children playing	12 times	
Keep away animal dung	5 times	

Annex 2

Summary of technical data

Average installation period (months)	6.3	Average flow rate (l/min)	34
Longest installation period (months)	13	Max flow rate (l/min)	45
Newest installation period (months)	2	Min flow rate (l/min)	27
Average lift height (m)	3.88	Average No. of handle turns to fill 20l bucket	31.7
Max lift height (m)	6.39	Max No. of handle turns	39
Min lift height (m)	2.26	Min No. of handle turns	28
Evidence of oil applied to bearings	40%	Average piston size of surveyed pumps (mm)	28.11
No evidence of oil applied to bearings	60%	Max average piston size (mm)	28.8
Percentage of pumps working	100%	Min average piston size (mm)	27.6



Mr Hung Soeun checking a RP5 Rope Pump

Annex 3:

ROVAI user satisfaction survey – part 1

	Date of survey February 2008
	Survey carried out by	
	Province	Kandal
	Community	
	Village	
	Pump ID	
	Name Respondent	
	Are you the buyer or user of pump, or both	1. Buyer 2. User 3. Both
	Disabled (<i>look at respondent</i>)	yes/no arms or hands, other.....
	Age	
	Gender	1. Male 2. Female
	PUMP & SATISFACTION	
1	When did you start using this pump?months ago
2	How many families use this pump?	1. 1 family <i>go to Q4</i> 2. 2 families 3. 3-5 families 4. 6-10 families 5. >11 families
3	Do any of the other families contribute to purchase of pump?	yes/no
4	Do any disabled people use this pump?	yes/no <i>If yes make separate answers to questions to get feedback from them on Q5&6?</i>
5	Overall, how would you rate the quality of the pump?	1. Excellent 2. Very good 3. Good 4. Poor 5. Very poor
6	Are you satisfied with the design of the pump?	1. Very satisfied 2. Satisfied 3. Neutral 4. Dissatisfied 5. Very dissatisfied
7	What improvements should we make so that your pump is better for you?	in design: in performance:
8	Are you satisfied with the flow rate of the pump?	1. Very satisfied 2. Satisfied 3. Neutral

		4. Dissatisfied 5. Very dissatisfied
9	Is collecting water easier or harder than before?	1. Now much easier 2. A little easier 3. No difference, the same 4. A little more harder now 5. Now it is much harder
10	What other extra benefits do you feel you have by using the ROVAI pump?	<input type="checkbox"/> Don't know <i>than probing, more than 1 answer possible</i> <input type="checkbox"/> Faster water collection <input type="checkbox"/> Easier cooking, cleaning, laundry <input type="checkbox"/> Easier showering <input type="checkbox"/> Easy for vegetable garden Other
11	How would you rate the reliability/durability of the pump?	1. Very reliable 2. Reliable 3. Somewhat unreliable 4. Very unreliable 5. Can't
12	Was the pump worth the money?	1. Yes 2. No, why not.....
13	What type of information did you receive when the pump was installed?	<input type="checkbox"/> No information was given <input type="checkbox"/> Don't know <i>only probe after letting them come with first answer</i> <input type="checkbox"/> On cleaning?..... <input type="checkbox"/> On maintenance? <input type="checkbox"/> On repair? <input type="checkbox"/> On children playing? <input type="checkbox"/> Animal dung? Other.....
	MAINTENANCE	
14	Who does maintenance?	<i>more than 1 answer possible</i> <input type="checkbox"/> Me (or my family) <input type="checkbox"/> Village Chief <input type="checkbox"/> WSUG member Other.....
15	What item was looked after/maintained and when?	Rope when last? Piston when last? Oil the barring when last? Cleaning apron when last? Cleaning ROVAI when last? Other.
16	If the rope needs replacing where would it be bought?	<i>do not lead answers but if people don't know tell them to go to hard ware store</i> 1. Village Shop 2. Hard ware store at market 3. Don't know 4. Other place.....
17	If the pistons needed replacing in the future where would they be bought or made?	<i>do not lead answers but if people don't know tell them to go to hard ware store</i> 1. Village Shop

		<ul style="list-style-type: none"> 2. Hard ware store at market 3. Don't know 4. Other place
18	Is the amount of time you spend on maintaining the pump acceptable?	<ul style="list-style-type: none"> 1. Acceptable 2. Neutral 3. Too long
	REPAIR	1.
19	Has your pump ever broken down?	<ul style="list-style-type: none"> 2. Yes, how many times..... 3. No, go to Q24
20	What was broken?
21	Who did the repairs of the pump?
22	Was it easy to fix your pump?	<ul style="list-style-type: none"> 1. Easy 2. Neutral 3. Difficult
23	Did you think the costs of repairing the pump was....?	<ul style="list-style-type: none"> 1. High 2. Acceptable 3. Low
24	If there is a major breakdown who would repair it?	<i>do not lead answers but if people don't know tell them to go to hard ware store</i> <ul style="list-style-type: none"> 1. Technician in village 2. Hard ware store 3. Don't know 4. Other place.....
	OTHER PUMPS	
25	Would you say that the ROVAI pump is easier or harder to use than other pumps you have used?	<ul style="list-style-type: none"> 1. ROVAI is easier 2. The same 3. ROVAI is harder (go to Q26)
26	What kind of pump was it?	
	<div style="display: flex; justify-content: space-around; align-items: center;"> <div style="text-align: center;">  <p>VN6</p> </div> <div style="text-align: center;">  <p>TARA</p> </div> <div style="text-align: center;">  <p>AFRIDEV</p> </div> </div>	
	OTHER	
27	Do you have any recommendations or comments regarding the ROVAI pump?	<i>Interesting quotes of people:</i>

Annex 4:

Rovai technical survey form

Items to prepare and take with you on the survey:

- a) Tape measure, b) vernier, c) GPS, d) pen paper, e) marker pen, f) 20ltr bucket, stop watch

កាលបរិច្ឆេទ

(Date):.....

GPS: N, E,

Elev.....

(Pump ID No.)

.....

អ្នកទទួលបានធ្វើ (Survey carried out by):

.....

Details of installation

1a] Is the Rovai installed on:

Hand dug well , Tube well , Pond well

1b] When was the pump installed?

Month..... Year

2] កំពស់ទឹកក្នុងអណ្តូងពេលមិនទាន់ប្រើប្រាស់

What is the Static depth of well?

Measured, Estimated

3] ជំរៅអណ្តូង

What is the depth of well (full depth)

Measured, Estimated

4] What is the depth of guide box?

Measured, Estimated

Maintenance, condition & performance

5] Evidence of oil recently applied to the bushes:

Yes , no

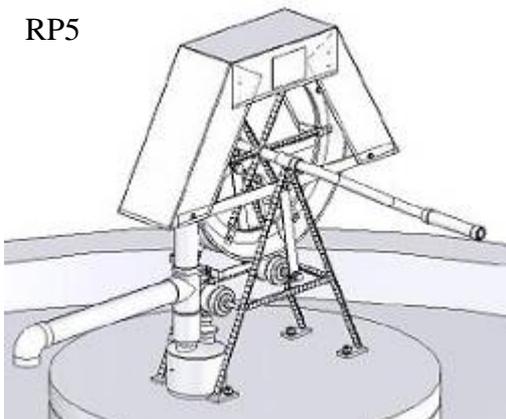
6] What is the condition of the rope?

Replace , acceptable , good

7] Are there signs of rust on the pump?

None , some , a lot

RP5



RP6

