

## About costs and financial organisation to maintain access to safe water in rural areas of Sierra Leone

What is the cost of maintaining a well or a borehole equipped with a hand pump in rural areas? How much does it represent per family user? Is it affordable? How villagers can be organised for managing a contribution in a transparent way? This short note gives some key elements on these questions through the perspective of the approach implemented by Inter Aide (cf. also <http://www.interaide.org/pratiques/content/hand-pumps-preventive-maintenance-strategy-sierra-leone>).

The experience has proven that, once a hand pump is restored to a certain standard, its yearly maintenance is relatively cheap and can, in most of the situations, easily be afforded and managed by the users, provided some conditions are fulfilled.

### 1. A first repair/restoration of the hand pump necessary to then enter in a cycle of preventive maintenance

In most of the situations, it is nonsense to envisage “maintaining” the pump without making first a complete repair/restoration of the pump, in order to reach (back) certain standards. This initial repair/restoration is costly, because it usually has never been done since the installation. But once the basis is good, the costs to maintain the pump in good conditions are lighter and affordable for users in the rural areas.

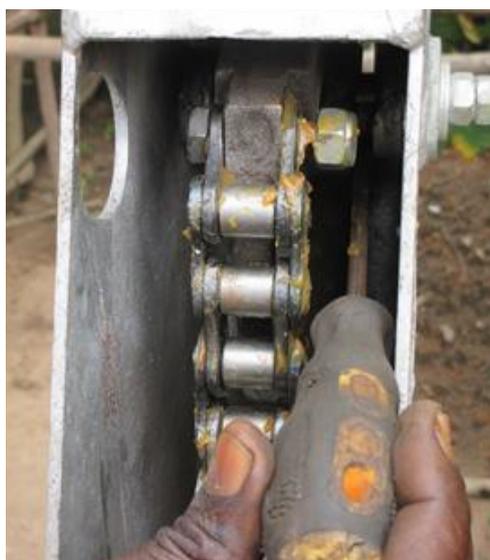
But to this end, two conditions must be filled:

- The head of the pump must be greased once or twice per month (except for Afridev), the nuts and the chain tightened and the area must be kept clean. These simple operations can be executed by a villager trained to this extent, usually known as “Pump Caretaker”;
- A yearly complete inspection of the pump must be completed (meaning that the pump has to be fully dismantled) to change the parts that are worn-out. This operation is more complex and usually requires the support of an external competent person, known as “Pump Officer”.

**Two types of costs need therefore to be differentiated:**

⇒ **The cost of initial repair/restoration of the pump** : the first repair or upgrade of a pump to certain standards represents an important cost because most of the time 1/ it has not been (properly) maintained for a long time and a lot has to be done; 2/ it has been equipped with non stainless parts that became rusted.

⇒ **The cost of yearly maintenance**: once the pump is restored back to a proper state, it then requires a yearly maintenance, which mainly consists in controlling and changing used parts.



*Regular maintenance of the pump consists in greasing the chain, tightening the nuts and the chain, and keeping the area clean. Once a year, a complete dismantling of the pump allows to make a full diagnosis and to replace the parts that are worn-out.*

## 2. How much does it cost in 2014?

Most of the following figures are based on 3 years of record which allows to consider them as reliable source to evaluate the cost of different elements<sup>1</sup>.

- The cost of a preventive maintenance:	<b>100'000 Le/year (17 € or 23 \$)</b>
- The cost of a first repair/restoration of a pump:	<b>1'000'000 Le</b>
	<i>(10 times the cost of a yearly maintenance!)</i>
- The cost of a rehabilitation of a well that is dry part of the year:	<b>2'300'000 Le (380 € or 530 \$)</b>
	<i>(excluding local contribution: material and labour provided by the community)</i>
- The cost of a new hand-dug well (including the installation of the pump):	<b>11'000'000 Le (1830 € or 2535 \$)</b>
	<i>(excluding about 1.500.000 Le of local contribution: material and labour provided by the community)</i>
- The cost of a new IM2 pump:	<b>3'000'000 Le (500 € or 690 \$)</b>
	<i>(equivalent to 30 years of maintenance)</i>

### Notes:

● **About the initial repair/restoration of the pump**

Considering 75 systems, the average cost for the initial repair was **921'543 Le** (50'933 for the intervention of the Pump Officer and 870'520 Le for the material). The average contribution of the communities for these 75 repairs was 207'340 Le, which also includes participation for the purchase of a tool kit and, in some cases, of a cash box. These two expenses have not been included in the calculation cost for the initial repair.

The main sources of expenses are: the replacement of riser pipes, connecting rods, nuts & bolts to stainless as well as the change of cylinders.

➔ The initial repair/restoration of the pump is costly and can hardly be supported by the users only, without external support. This repair is however unavoidable before entering a cycle of preventive maintenance, which can make the system last for years.

● **About the yearly maintenance:**

Once the pump is well restored/repared, it can usually work for several years without major breakdowns, provided it is regularly greased and maintained.

➔ If we consider 120'000 Le per year as a reference (which corresponds to a maximum level of expenses), it is largely enough to cover the yearly maintenance costs and even to make some provisions. For 20 contributing families, it corresponds to a monthly fee of 500 Le<sup>2</sup>.

Forecast for yearly maintenance	
Pump officer	60.000 Le
Transportation	10.000 Le
Spare parts (max.):	30.000 Le
Chlorination :	10.000 Le
Provision :	10.000 Le
<b>Total</b>	<b>120.000 Le</b>

<sup>1</sup> As a comparison, the cost of HHWT: 175'000 Le initially for the material + about 24'000 Le per year for the chlorine (or respectively per family, about 15'000 Le for material + 2'500 Le per year for chlorine) – see also <http://www.interaide.org/pratiques/content/household-water-treatment-sierra-leone>

<sup>2</sup> The Gross National Income per capita in Sierra Leone is 48 \$ per month, equivalent to 200'000 Le

### 3 How can these contributions be organised and managed transparently at village level?

An internship of 6 months was carried out in 2013 by a student to observe and document different types of organisations developed by the communities for fund management. Globally, what came out from this study is that there are more obstacles in the organisation and the management of the contributions, than in the amount of contribution itself. It came out that the most successful communities' organisations were those having:

- a census of the contributing families,
- users knowing the yearly maintenance cost, and therefore, having a clear objective for the fee collection,
- a simple management system to guarantee a safe and transparent use of the contributions (see below).

Therefore, a key message to be given to the communities is that the cost of a preventive maintenance is affordable (120'000 Le per year) and is also 10 times less costly than a major repair! Usually, a monthly contribution of 500 Le to 1'000 Le per household is sufficient, once the pump is restored back to adequate working standards.

**As the yearly amount for the pump maintenance is relatively small, it does not require a complex organisation!**

A simple system that seems very efficient is the use of locally made cashbox (costing 50.000 Le) with 2 padlocks and kept by the chairlady. The chairlady is in charge of keeping the cashbox and two persons own one key of one padlock. So, for any movements in the cash box, the three persons need to gather. Also, based on the list of the households established by an initial census, the secretary (or treasurer) can also follow-up the contributions and monitor the correspondence with the cash flow.



More information can also be found here:

<http://interaidewatersl.over-blog.com/community-training-for-hand-pump-maintenance>