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**Piloting private spare parts supply shops for Afridev hand pump in Amhara to scale – up in country and beyond**

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*To achieve MDG and UAP targets, the WSSDP of Ethiopia has adopted a number of technologies for rural areas, among which the greatest majority is sinking hand dug wells. As a result, several Afridev hand pumps are installed each year. This will continue in a large scale in the coming 4 years and beyond. To serve sustainably, fast and slow wearing parts of this pump need to be replaced timely and when broken respectively. However, so far, spare parts supply chain for the pump was not established. Hence, a large number of this pump is functioning without regular preventive maintenance and some are already dysfunctional. The later will hamper both MDG & UAP targets for water supply. Therefore, it is timely for the actors in the sector to support the private sector in piloting spare parts supply shops. The lessons learned would facilitate scaling-up and the development of WatSan centers in country and elsewhere.*

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## **Background**

In its 15 years (2002-2016GC) plan, the Water Supply and Sanitation Sector Development Programme (WSSDP) of Ethiopia has proposed the implementation of nearly 22,000 hand dug wells for rural areas throughout the country. Later on, due to the Universal Access Plan (UAP) target on water supply, which is set to achieve 98% access by 2012, implementation of rural water supply schemes has been speeded up. Consequently, a large number of hand dug wells have been constructed in the past few years and a lot more will be constructed in the years to come.

Afridev hand pump is manufactured for public use. The SKAT (Swiss Centre for Development Cooperation in Technology and Management) specifications are supported by UNDP - World Bank Water and Sanitation Programme and are used in partnership with hand pump fieldworkers and development organizations in many countries. The pump is capable of lifting water from depths of 10 to 45 meters and is suitable for boreholes with casing sizes of 100, 115, 127, 150 or 200mm internal diameter. Furthermore, it is a village level operation and maintenance (VLOM) type of pump, which could be maintained with simple tools in a short time. As a result, Afridev hand pump is widely used by the rural water supply sector in most parts of rural Ethiopia including Amhara region.

Like any other moving machine, Afridev hand pump has fast and slow wearing spare parts. This pump has five different types of fast wearing parts, which are made of rubber and PVC. The fast wearing parts mainly serve as cushion and to reduce friction between the main moving parts. Depending on the number of users of a pump and the frequency of use, these parts need to be replaced every 3, 6 or 12 months, or otherwise the main (slow) moving parts are exposed to wear rapidly.

The pump also has a number of slow wearing parts, which need replacement when broken or damaged. Therefore, for the pump to serve sustainably, both the fast and slow moving parts need to be replaced accordingly.

According to the manufacturer's manual, if both fast and slow wearing parts are replaced regularly, this pump could serve 10 to 15 years. However, so far, the spare parts supply chain for this hand pump was not established in a sustainable manner.

## **Policy environment**

The Water Resources Management Policy issued by the Federal Democratic Republic of Ethiopia in its “Introduction” recognizes that “Lack of operation and maintenance activities of water schemes” was one of the significant factors that have so far caused adverse impacts on the sustainability of water supply schemes. Therefore, the “Policy” adequately addressed this relevant issue in the chapters, sub-chapters and sections to follow.

In general, the ultimate objective of the policy regarding Rural Water Supply Schemes (RWSS) is that the user communities will have full ownership and are able to manage and cover the costs required to run their water supply schemes. However, in this case, only those points related to the Operation and Maintenance Management (O&MM) of rural water supply schemes are presented in the following sections.

Section “D” of sub-article 2.2.3. of the “Policy” on “Cross Cutting Issues” clearly explains ownership and operation and maintenance issues for sustainable water supply systems. The “Finance” and “Tariff” sections of sub-article 2.3.1.4 of the “Policy” on “Sectoral Issues” further elaborates that communities own their water supply systems and are responsible for operation and maintenance. Based on this, section 4 of sub-article 4.1.11 of the Ethiopian Water Strategy stipulates the promotion of the establishment of integrated operation and maintenance system so that water projects could provide reliable and sustainable services. In this context, the “Strategy” encourages the direct involvement of local communities in O&M activities; recognises that deferred maintenance is more expensive than the regular maintenance; underlines the necessity of developing guidelines and procedures for undertaking inspection, preventive, routine and major maintenance and operation of water schemes; and monitoring mechanisms for O&M.

## **Past experience in Amhara region**

Before a decade, repairing hand pumps and in fact any rural water supply scheme was the responsibility of the Government. This resulted from the supply driven approach exercised in the past. As a result, the Zone & Woreda Water Offices were required to repair the schemes. To repair Afridev hand pumps, the Water Offices had either to cannibalize old pumps or use spare parts which were imported with new pumps. But, since there were not too many old pumps and the parts which were imported with new pumps did not last more than two years, a large number of this pump was left to function without preventive maintenance and hence became non-functional.

During the last five to six years, the situation gradually started changing. Due to the introduction of the principle of community management, community’s participation in planning, decision making and management of rural water supply schemes increased. At the moment, most of the communities in 18 RWSEP districts of Amhara region are well aware about O&MM requirements and are promptly making cash contribution to fulfil these requirements. However, this doesn’t mean the situation is the same in other parts of the region. Many communities in non-RWSEP kebeles and districts in the region still believe that operation & maintenance of water supply schemes is the responsibility of the duty bearer. Due to lack of awareness, some people in the Government offices, particularly at Woreda level also have the same opinion.

The Rural Water Supply and Environmental Programme (RWSEP) is a bi-lateral Programme supported by the governments of Ethiopia and Finland. The RWSEP introduced the principle of community management of rural water supply in the 18 districts. Furthermore, it played a significant role through developing an O&MM Procedure and testing it at community level.

The Procedure which was prepared in line with the Ethiopian Water Resources Management Policy and Water Sector Strategy is the first of its kind not only in Amhara but also in Ethiopia. Later on, based on this Procedure, various manuals were developed and tested at community level in the 18 districts. Prior to testing, the procedure and manuals were discussed, commented and developed by stakeholders at all levels.

As part of the O&MM Procedure, spare parts management options were also developed in the RWSEP. Likewise, these options were presented to stakeholders among which the government supply option was selected and implemented.

## **Government/other/supply channel**

Some local initiatives supported by NGOs, Bi-lateral and Multi-lateral Organizations unknown to the Author might have taken place in the region. But, the only major attempt was the imitative taken by the Rural Water Supply and Environmental Programme (RWSEP) in Amhara Region.

At the end of 2004, the RWSEP, through the Water Resources Development Bureau of the same region sponsored a one-time spare parts distribution to the 18 districts. The RWSEP made this distribution after

ensuring that district level experts are trained on O&MM, spare parts sales, how to conduct annual needs assessment of spare parts and how to prepare annual budgets for spare parts. The RWSEP also trained district level Artisans to carry out corrective maintenance and community level pump attendants for preventive maintenance.

The ultimate objective of the RWSEP was to test the government supply chain, which among other options was selected by stakeholders and the Regional Coordinating Committee. According to this supply chain, district level water offices agreed to conduct spare parts needs assessment and to allocate budget annually and transfer the allocated budget to the Water Resources Development Bureau (WRDB) at the end of each budget year requesting it to procure the required spare parts. In relation to this, the WRDB also agreed to handle the requests from the districts, i.e., import the spare parts in bulk from abroad and distribute them to the respective districts.

However, an assessment sponsored by the RWSEP and carried out in the beginning of 2007 revealed the following:

***A. Government supply chain management (region and woreda level)***

- In spite of the increasing demand, none of the visited districts exercised follow up on spare parts stock, carried out needs assessment and allocated budget to at least replace those ones, which are out of stock.
- The bureaucratic procedure applied in the sales of spare parts at district level has already discouraged representatives of the user communities. Many water & sanitation committee (WATSANCO) members and community representatives have spelled it out clearly, that had there been an alternative at district level, they would not mind to buy spare parts even for relatively higher prices.
- Even if requests and corresponding budgets were transferred from the districts, the Water Resources Development Bureau at region level was not in a position to carry out bulk procurement of spare parts from abroad because of the strict financial regulations issued by the regional government.
- The RWSEP stopped supporting O&MM activities since 2005. The current programme document of the RWSEP also indicates that, it will not continue supporting O&MM activities in the future.

***B. O&MM fund raising and saving (community level)***

- All user communities in the visited districts were willing and able to pay for O&MM of their water supply services. As a result, they have been and still continue raising funds and saving for O&MM.
- In four districts alone, communities saved over 77,000 USD. This amount was saved to buy spare parts and to pay Artisans, when the latter carry out corrective maintenance.

**Private sector supply channel**

In the past, the private sector even at the Federal level was not attracted to this business let alone at region and district level. This could be associated to a number of factors. To mention a few, the willingness and ability of communities, the low number of Afridev pumps installed in the districts, the low level of awareness of the private sector itself, etc. In spite of the later, at the moment, a few traders in Bahir Dar town, which is the capital of Amhara region, are exploiting the existing shortage in the districts. In most cases, the traders may not have the type and quantity of Afridev spare parts needed by the users. But, when they do, they charge the WATSANCO members or community representatives who travel long distances to Bahir Dar (in some cases as far as 250kms) as high as 300% profit.

**Conclusion**

The result of the assessment in the RWSEP districts indicates that, once the remaining spare parts are out of stock, there is no way to replace them. This implies that the government supply chain will stop functioning and hence is not a sustainable option. On the other hand, the assessment indicates that the communities in these districts were willing and able to pay for O&MM. As a result, they saved a lot of money in a regional saving and credit institute, which has branches in the districts. Even now, communities in the 18 districts have continued to pay for O&MM.

The existing private spare parts supply channel in Bahir Dar town is not convenient to the majority of communities from the 18 districts. After travelling long distances, community representatives may not find the required spare parts. When they manage to find them, they are forced to buy them at exorbitant prices. In other words, this is not a sustainable option either.

Both the inconvenience & the high prices in Bahir Dar and absence of spare parts in the districts will discourage community representatives, which eventually leads them to losing interest. Once community representatives lose interest, they will stop functioning properly. This means that community representatives will stop properly managing their schemes in general and collecting O&MM funds from users in particular. This will lead to disrupting the existing initiative and good beginning in the 18 districts, which could be replicated in other districts within Amhara region and in other parts of the country. Furthermore, it will have direct negative impact on the sustainability of existing and new rural water supply schemes, which in turn will hamper achieving MDG & UAP targets on water supply.

**Recommendation**

The demand for Afridev hand pump spare parts may differ from region to region and from district to district with in a region in Ethiopia. This may be due to mainly the willingness and ability of communities to pay, the level of awareness of the communities and number (small or large) of Afridev hand pumps installed. In any case, the need for the spare parts exists everywhere.

As a result of RWSEP’s intervention, on the average, more than 200 Afridev hand pumps were installed in each of the 18 districts of Amhara region. In addition to this, communities in these districts have shown their commitment by saving funds for O&MM. Some community representatives have even gone to the extent of travelling long distances to buy spare parts to repair their pump. On top of solving the existing chronic shortage, piloting Afridev hand pump spare parts shops in the capitals of these 18 districts would facilitate the testing of private spare parts channel to scale-up in country and beyond.

Furthermore, the lessons learned would pave the way towards establishing water supply & sanitation (WatSan) centers in district capitals in Ethiopia and other countries. However, the business requires knowledge, experience and above all commitment to provide service to rural communities. Therefore, actors in the sector shall join their hands to support the experienced and responsible private sector operators in piloting spare parts shops in these districts.



**Photograph 1. WEDC – A woman fetching water from a dug-well fitted with Afridev hand pump**



**Photograph 2. WEDC – fast wearing spare parts of Afridev hand pump**



**Photograph 3. WEDC – some slow wearing spare parts of Afridev hand pump**

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### References

- MoWR (2001) *Ethiopian Water Sector Policy*: Ministry of Water Resources: Addis Ababa.  
MoWR (2001) *Ethiopian Water Sector Strategy*: Ministry of Water Resources: Addis Ababa.  
MoWR (2002) *Water Sector Development Programme (Volume I&2)*: Ministry of Water Resources: A.A.  
RWSEP (2005) *O&MM Procedure*: Rural Water Supply & Environmental Programme: Amhara Region.  
RWSEP (2007) *Assessment Report*: Rural Water Supply & Environmental Programme: Amhara Region.

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### Notes

1. The Author was responsible for the development of the O&MM Procedure, associated manuals & spare parts management options and eventually testing them at community level in RWSEP Woredas in Amhara.
2. A business plan under the title “PALM Spare Parts Supply Chain Project” was presented by the same Author to the BID Challenge in Amsterdam, the Netherlands in 2007. Out of the 2275 entrepreneurs from 144 countries that competed, PALM spare parts stood third and won a prize.

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