WELL REHABILITATION AND PUMP INSTALLATION IN IDUNDILANGA DISPENSARY IN NJOMBE

TANZANIA 1

ACTIVITY REPORT

December 2020

SOUTHERN HIGHLANDS PARTICIPATORY ORGANISATION
SHIPO

AUARA
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EXECUTIVE SUMMARY

Idundilanga dispensary in Njombe town did not count with a reliable source of water: the local water authority does not supply in the neighbourhood and the community well equipped with a Rope Pump situated outside the dispensary did not provide enough water in some periods of the year for the dispensary and the community members. Understanding the need for a reliable source of water in health centres, this project had the objective of improving the water supply in Idundilanga dispensary. For that, the existing well was deepened and lined with bricks and a submersible pump was connected to a new storage tank placed in a newly constructed tower. The project was carried out between the end of October and the beginning of December of 2020, when it was handed over to the community. Apart from the delay in the supply of the local materials, which delayed the start of the works, there were no major challenges affecting the development of the project. The Local Government Authorities and the community members, especially the dispensary workers, showed a very good cooperation during the project. Idundilanga dispensary and the community members who fetch water from the rope pump have now access to a reliable source of water: fast recharge rate during the dry season and parameters like pH, turbidity and faecal coliforms within the drinking standards.

1. INTRODUCTION

Idundilanga Dispensary is located in Njombe town, in Idundilanga neighbourhood. It provides primary health service to the neighbourhoods of Idundilanga (2,854 people), Sido (3,819 people) and Melinze (2,710 people), although patients from other areas do also seek medical attention there. Monthly, service is provided to around 1,000 people. In addition to primary health service, Idundilanga dispensary also provides family planning and maternal and newborn care.

Njombe Water Supply Authority (NJUWASA) supplies water within Njombe town. However, the network is often not reliable: cuts and breaks are common. Although Idundilanga is within the town, the neighbourhood has been without water from the authority since the beginning of 2020. The dispensary and nearby commerces and households got water from a community well at the dispensary's entrance that is equipped with a Rope Pump. This well did not provide enough water in some periods of the year, which affected the dispensary and was bringing disputes among the neighbours.

Understanding the need for a reliable source of water in health centres, this project had the objective of improving the water supply in Idundilanga dispensary.

This report summarizes the project activities and results of the project.

2. OBJECTIVES

The objective of this project was to provide Idundilanga dispensary with a reliable supply of water in a sustainable way through:

i. ensuring that the existing well provides enough water to the dispensary and to the local community during the whole year;
ii. ensuring that the water from the well is pumped and stored effectively for its use in the dispensary.

3. ACTIVITIES

The activities for the completion of the project were carried out from the end of October until the beginning of December 2020 in Idundilanga neighbourhood in Njombe Town Ward (Njombe region, Tanzania).

3.1. Initial meetings with the community

Several meetings were conducted at the end of October and beginning of November with the Village leaders and the community of Idundilanga to introduce the project and agree on the local contribution and timeline. Figure1 shows a meeting held in Idundilanga dispensary on 22nd of October where the Village leaders were present together with other community members. In this meeting a contract between SHIPO and the community was signed in which the contribution from the community and the deadline for the start of the works were agreed.

Figure 1: Meeting with Idundilanga community to introduce the project and sign the initial contract.

3.2. Well rehabilitation

The existing hand-dug well was not providing enough water during the last months of the dry season (September - November); therefore, the depth of the well was manually increased by 3 m: from 15 m to 18 m. The well has a very fast recharge rate so a submersible pump had to be used to pump the water out while digging (Figure 2). After the increase of 3 m, the water recharge rate was measured (60 L/min) and it was considered to be enough for both the dispensary and community use by the technical team. Although the soil type in Njombe does not normally lead to the collapse of the wells, for safety reasons, the last 6 m of the well were lined with bricks (Figure 3).

Figure 2: Manual digging inside the well to deepen the well 3 m (left) and the submersible pump used to pump the water out (right).

Figure 3: Lining of bricks inside the well to avoid collapsing of the soil.

3.3. Pumps installation

A submersible pump of 1 HP was installed in the well to pump water to the storage tank connected to the dispensary. The pump switch was placed inside the dispensary. The Rope Pump which was in the well before the start of the works was reinstalled but the rope with pistons was replaced with a new one. The rope pump was installed with a new concrete slab, the apron was maintained as before but the soak away was lengthen and some stones were added at the end to avoid stack water (Figure 4). Figure 5 shows the trenches where the connection pipes to the tank were set.

Figure 4: Finalized Rope Pump with the slab, apron (a) and lengthened soak away (b) and the installed submersible pump (c).

Figure 5: Digging the trenches and installing the connection pipes from the well to the storage tank.

3.4. Tank tower construction

The water storage tank and the wooden platform present in the dispensary were in bad condition; therefore, a tower was built with bricks and cement and a new and bigger storage tank were provided: the tower can bear a 5,000 L tank and it is 3.5 m high to ensure that the water is supplied with enough pressure. Figure 6 shows the different steps of the tower construction.

Figure 6: Different steps in the construction of the tank tower.

3.5. Storage tank installation

The 2,000 L tank, which was not in a good condition –too old and dented – was substituted with a new PVC tank of 3,000 L. The logos of the back donor (CNC), promoter (AUARA) and implementer (SHIPO) of the project were painted in the tank together with a short explanation about the project. The tank was connected to the inlet pipe of the dispensary directly; no tap was placed outside in order to avoid that external people fetch water from the tank.

Figure 7: Painting the logos in the storage tank, lifting the tank to the tower and connecting the pipes to the inlet pipe of the dispensary.

3.6. Handing Over ceremony

On December 1st, the works were completed and the Handing Over ceremony was conducted. The ceremony was attended by several stakeholders: the Village Executive Officer, the Town Medical Officer representing the Njombe Town Director, a representative of NJUWASA, the Chairperson of the Idundilanga dispensary committee, SHIPO staff, several workers of the dispensary, members of Idundilanga community and a journalist from a local radio. The objective of the ceremony was to hand over the project to the community, which from that moment on is responsible to take care of it and run it. For that, an agreement (Annex E) was

signed by the Town Director, the Village Executive Officer, a representative from the dispensary and a representative from SHIPO. During the event, the participants could hear about the finalized project: the activities carried out, the project costs and the local contribution. They also visited and tried the full supply system. The community had the opportunity to present further challenges they are facing in the dispensary. SHIPO took the chance to raise awareness on the importance of drinking clean and safe water and the problem related to plastic pollution, especially from water bottles, by providing a ceramic water filter to the dispensary.

Figure 8: Various moments during the Handing over ceremony at Idundilanga.

4. RESULTS

The **water flow** was a key issue in this project. The current flow after project implementation is **1 m^3/h** which is enough to meet the demand of both the dispensary and the community. Moreover, the flow was measured in December which is the end of the dry season, meaning that this represents the "worst case scenario" in terms of water availability.

The **quality** was tested for both the water from the rope pump and the water inside the dispensary coming from the storage tank. 3 parameters were measured: pH, turbidity and faecal coliforms. pH test strips were used to determine the pH of the water and in both cases a pH in the range of 6-7 was measured. A turbidity tube test showed that in both cases the sample had below 10 NTU. Faecal coliforms were determined through the membrane filtration method in FC agar medium and no colonies were observed in the 3 samples tested for each of the two cases. The water quality results show that the water is appropriative for human consumption for the parameters tested (Table 1). Figures 9 and 10 show different steps of the water quality analysis.

However, it cannot be ensured that with time these parameters will remain constant, that there will not be other types of contamination or that the water will not be polluted during transportation and/or storage; that is why the importance of treating the water before drinking with for example a filter, was highlighted during the handing over ceremony.

Table 1: Results of the parameters to determine the quality of the wáter and the maximum permissible values according to WHO [Retrieved from: https://www.who.int/teams/environment-climate-change-and-health/water-sanitation-and-health/water-safety-and-quality/drinking-water-quality-guidelines)].

Parameter	Unit	Rope Pump sample	Dispensary sample	Max. WHO permissible standards
pH	--	6 - 7	6 - 7	6.5 – 8
Turbidity	NTU	<10	<10	<10
Faecal coliform	n. colony/100 mL	lack	lack	lack

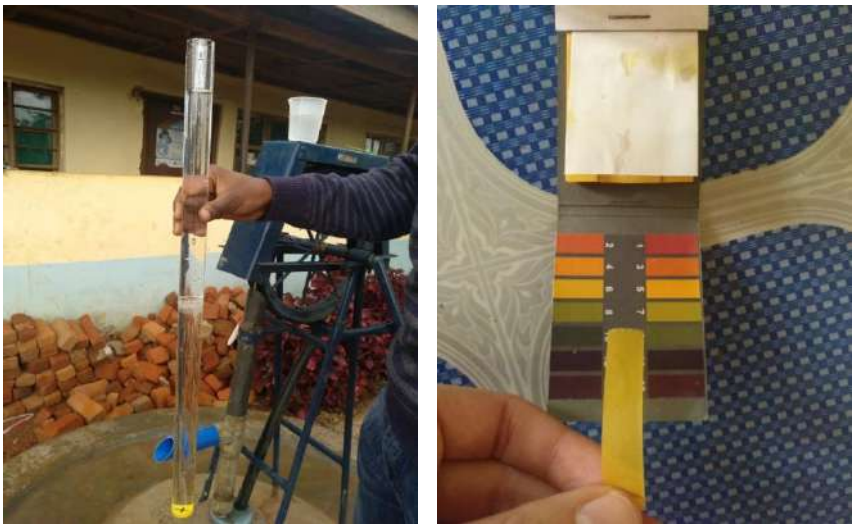

Figure 9: Turbidity test performed in the sample from the Rope Pump (left); pH strip showing the range for the water collected in the dispensary.

Figure 10: Faecal coliform determination: filtration equipment (a), setting the incubator (b) and end result with no observed colonies in the plates (c).

5. ACHIEVEMENTS AND DIFFICULTIES

The project has been successfully completed and the Idundilanga dispensary patients (around 1,000 people per month), the 7 health workers and the community members who live and work around the dispensary are already benefitting from the project. The well supplies enough water to meet the current demand at the end of the dry season (the worst-case scenario). The dispensary gets water directly at the premises with no need of hand-pumping and with enough pressure. Figure 11 shows the storage tank and tower before and after the project.

Figure 11: Storage tank before and after the project implementation.

Since the WASH needs assessment performed in July, a big interest in the project from the LGA-s and the dispensary workers was observed. The community contribution in terms of local materials (Figure 12) to the project was a bit higher than initially expected but the community representatives agreed to increase their contribution after the evaluation by the technician.

The election period is always hectic in Tanzania. Presidential elections took place on 28th

Figure 12: Materials contributed by the community: bricks, sand and aggregate

October and as the LGA-s were busy the days before and after, there was a delay in the supply of the local materials and therefore, the works started some days later than initially planned.

Despite that challenge, in general, the LGA-s and especially the workers in the dispensary showed a very good cooperation whenever required: organizing meetings, providing data and information, doing follow-up of the works, etc. For instance, the day of the handing over ceremony, there was a funeral in Idundilanga neighbourhood which the LGA-s and community members had to attend. In spite of this emergence, they managed to arrange the ceremony properly and involve the necessary people for the handing over ceremony to be successfully accomplished.

6. RISKS & OPPORTUNITIES AND MITIGATION MEASURES

Thanks to the project, now Idundilanga dispensary gets water supplied into their premises. However, the water distribution system inside the dispensary is outdated and needs renovation, as it can be seen in Figure 13. The system should be renovated soon so that the dispensary can fully benefit from the project.

Figure 13: Water distribution system inside the dispensary: a pipe in the wash room (left) and an outlet in the laboratory (right).

The main risks associated to the system installed are related to the low water flow and technical parts like pipes, connections, pumps, etc. which can make the system non-functional. In case the system does not work because of the above-mentioned issues, the *Maintenance Plan* explained in Section 8 will be implemented.

Another recommendation to the Local Government Authorities (LGA-s) and the leaders of the dispensary is to install a float switch. This device would simplify the management of the water system by the dispensary: it would automatically pump water to the storage tank before the tank gets empty and would stop pumping when the tank is full.

The dispensary leaders presented some other challenges that they are facing in the centre such as the bad condition of the roof or the lack of rooms to accommodate all their patients. In case an opportunity arises to support a health centre, SHIPO will consider Idundilanga.

This project is a good opportunity to promote ideas within SHIPO´s mission: self-supply, SMARTechs, clean and safe water, plastic pollution, etc. within the local community in Njombe town and among relevant stakeholders.

7. PERFORMANCE OF THE LOCAL COUNTERPART

Different teams within SHIPO have been working on the project for its successful completion. The technical staff within the SMART Centre unit was responsible for conducting the initial WASH assessment, contacting and planning the execution of the works with the technical group sub-contracted (Uvinjo Group), following-up with the works and reporting. The community department was organizing and conducting the meetings with the LGA-s and the community. The budget and the financial control of the project were done by the Finance department.

Regarding the works, Uvinjo Group was sub-contracted by SHIPO: it is one of the companies formed through SMART Centre´s program on training in digging/drilling and pump production. SHIPO has already worked with Uvinjo Group for many years and as usual, for this project they showed a very good cooperation.

8. OPERATION AND MAINTENANCE PLAN AFTER INSTALLATION

Now the community owns the project and facilities and they are responsible to take care and operate it. However, if any technical problem arises with the installation or the supply of water within the probation period of 6 months after handing over the project, SHIPO will contact the technical group and they will be responsible for repairing the problem within that agreed time.

A couple members of the community who are daily users of the well were trained in simple steps for the maintenance of the rope pump (applying oil, properly placing the rope, etc.). As it is always done by all the groups of artisans trained by SHIPO SMART Centre, the contact phone number of the group was left in a small sheet attached to the pump in case any major problem arises in the future. Since the completion of the project, the community has locked the rope pump so whoever needs to fetch water can ask for the key in a shop next to the dispensary. This will help to keep record and control the use of the rope pump. In this way, it will be easier to get the contribution from users for the maintenance of the rope pump. Figure 14 shows several members of the community fetching water from the rope pump.

Regarding the infrastructure for the supply of water to the dispensary, the LGA will be responsible to cover any reparation needed in the future.

SHIPO will be responsible for doing follow-up of the well and the status of the project for at least 5 years after the completion of the project (until December 2025). SHIPO will inform AUARA in a yearly basis about the status of the project.

Figure 14: Some members of Idundilanga community fetch wáter from the rope pump.

9. CONCLUSIONS

The project was successfully completed thanks to the good cooperation shown by the community members and the LGA-s and the lack of technical challenges during the works. Several meeting had to be arranged with the LGA-s before the start of the works to ensure that all the parts agreed on their contribution and involvement; this was key for the success of the project. The period of the year (November) was appropriate for deepening the well so as to ensure an adequate water flow throughout the year. However, the national election period made the start of the project to be delayed some days. The operation and maintenance plan will ensure the functionality and sustainability of the project.

10. ANNEXES

A. Technical Data

The following tables summarize the technical data for both the rehabilitated well and the storage tank:

Well:

Depth	Before	15 m
	After	18 m
Casing	Material	PVC
Pump		1 hp submersible pump + Rope Pump
Superstructure		Cement slab fixed to the Rope Pump
Supply	Quality	High
	Volume	3 (m^3/h)

Tank:

Storage capacity	3 m^3
Construction	PVC
Coating	No coating
Circuits	Yes
Filters	No

B. Rate of waterbone diseases

The rate of waterbone diseases at Idundilanga dipsensary in 2020 is **1.7%** (or 17 cases per 1000) of all the cases. Typhod and diarrhoea have been considered as waterbone diseases. The data have been provided by the Health Department within Njombe Town Council through personal communication.

C. Local minimum wage

The local minimum wage in Tanzania is set by categories covering various employment sectors. The Table 2 below summarizes the minimum wage for the construction sector according to different classes. The **monthly** minimum wage in the construction is in the range of **250,000 – 325,000 TZS.**

Table 2: Minimum wage in the construction sector in Tanzania. [Retrieved from: Wage Indicator: https://wageindicator.org/salary/minimum-wage/tanzania/6209-mainland-construction-services]

	Per Hour	Per Day	Per week	Per Two Weeks	Per month
Contractor Class I	TZS1,666.80	TZS12,500.95	TZS75,005.75	TZS150,011.50	TZS325,000.00
Contractors Class II-IV	TZS1,435.05	TZS10,770.05	TZS64,620.35	TZS129,240.70	TZS280,000.00
Contractors Class V-VII	TZS1,282.15	TZS9,616.10	TZS5,769.75	TZS115,393.50	TZS250,000.00

D. Graphic material with Permission to transfer images

The graphic materials (mainly pictures) together with the signed agreements of permission of images transfer are sent through a link to the *WeTransfer* platform.

E. Certificate of transfer of the well to the community

The agreement was signed by the by The Town Director, the Village Executive Officer, a representative from the dispensary and a representative from SHIPO during the Handing Over ceremony. The agreement is shown in the next page.

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HATI YA MAKABIDHIANO

Hii ni hati ya makabidhiano kati ya 'SHIPO' na Jamii ya Mtaa wa Idundilanga Halmashauri ya Mji Njombe.

Hati hii ya makabidhiano inahusisha yafuatayo:

Namba ya mradi: TZNJ 117

Mahali: Mtaa wa Idundilanga Zahanati ya Idundilanga Kata ya Njombe Mjini Halmashauri ya Mji Njombe. Mkoa wa Njombe.

Mali zinazokabidhiwa: MUUNDOMBINU WA MAJI (Kitako cha tanki, Tanki la lita 3000 na muunganiko wake kwenye chanzo cha maji)

Kata ya Njombe Mjini hususani Mtaa wa Idundilanga tunakubali kupokea mradi huu kuwa ni mali yetu na kuwa ni wajibu wetu kuutunza, kuuendeleza na kuukarabati.

Mtaa wa Idundilanga tunakubaliana na yafuatayo:

1. Kutia sahihi hati hii ya makabidhiano (kudhihirisha kuwa tunaridhika na ubora wa kazi pamoja na usanifu wa matokeo ya mradi).
2. Kuthamini yaliyomo katika mkataba ambao Mtaa wa Idundilanga tunakubali kulingana na mradi uliotajwa.
3. Kuendeleza na kutunza matokeo ya mradi kulingana na viwango vilivyokubalika.
4. Kushiriki kikamilifu katika shughuli zote za uboreshaji na uendelevu wa mradi huu

SHIPO haina wajibu kwenye uendeshaji, utunzaji na ukarabati wa mradi huu baada ya wadau walioanishwa hapa chini kutia sahihi makubaliano haya:

Tarehe: 01/12/2020

Sahihi za wawakilishi

Jina	Cheo	Sahihi
JAMII:		
1. PHILOTEUS P. NGILANGWA	M/KITI - MTAA	MWENYEKITI WA MTAA MTAA WA IDUNDILANGA NJOMBE MJINI
2. BENJAMIN LEO MSAFIRI	MJUMBE BODI	
SHIPO:		
LEIRE DIEZ	SMART Centre Coordinator	
HALMASHAURI YA MJI NJOMBE		
Dr. Yesaya Mwasubila	Ag. Town Director Njombe TC	Kny: MKURUGENZI HALMASHAURI YA MJI NJOMBE

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