ASHA Good Practice Paper

SOLAR LIFTING AND MULTIPLE USES OF WATER FOR CLIMATE CHANGE ADAPTATION: A CASE STUDY OF SANIBHERI-8 IN RUKUM WEST[1]

Photo 1: Solar lift and first reservoir tank (©Keshav Kumar B.C,)

***"Today, it's too good to see this here. Very happy time (for me and us). If this had happened in the past, where would we be today*?" said Mrs. Jai Kumari Oli (65), a resident of Bippelek. Here, the good thing she is referring to is the provision of clean and safe drinking water, which has made her and the life of other locals easier.**

1. BACKGROUND

Globally, climate change has exacerbated the issue of water, more specifically, too much or too little water. The problem of too little water has created many challenges in the life and livelihoods of the smallholders in rural hilly areas. Many communities are surrounded by water, providing/provisioning water services to the downstream communities, but themselves are devoid of a facility to access the same. Local Adaptation Plans for Action (LAPA) process facilitated by Adaptation for Smallholders in Hilly Areas (ASHA) project in those area facing climate change has made efforts to improve the climate resilience of vulnerable smallholders through the promotion of climate-resilient community infrastructures, land management activities, climate smart agriculture and renewable energy technologies. One of such measures includes installing water lifting technology and promoting multiple uses of water and the conservation of water source in the critical sub-watersheds.

This good practice paper[1] provides brief information and learning of the ASHA project from solar lifting sub-projects with a case study from Sanibheri Rural Municipality-8 of Rukum west in Karnali Province of Nepal.

2. INTRODUCTION OF SUB-PROJECT

Jugepani Bippelek Khanepani Nirman (JBKN) is one of the drinking water sub-projects completed in ward number 8 of Sanibheri Rural Municipality in Rukum West. It is around 20 Kilometer west of district headquarter Musikot. The water source is called Jugepani natural spring located in the core area of the Surkehti forest. The water collected in a tank from the source is lifted through solar system to the reservoir at the top (300 m above) and distributed to 90 vulnerable households in different settlements of the Bippelek.

3. THE VULNERABILITY CONTEXT

The location was identified as a vulnerable pocket by assessing Simili Sub-watershed (SW) and prioritized by the LAPA prepared in a participatory way at the ward level. Accordingly, major hazards and vulnerability of the area are droughts, landslides, and floods. Draught mainly creates scarcity of water for drinking and irrigating the farmlands.

4. INTERVENTIONS

In order to address the drought of this area, the ASHA project supported social mobilization and installation of a drinking water system through a solar lifting sub-project under LAPA with NRs. 17,50,000 ($14583.332) financial contribution in the year 2018.

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INFRASTRUCTURE: The complete project includes one intake near the source, one collection chamber and four reservoir tanks and installation of taps and water meters for every (90) households. The main pipeline is about 1.1 Kilometers (Km), whereas the distribution line extends about 12 Km in length. The total capacity of the installed solar system is 18 KW. An intake of volume 1 cubic meter near the source and two water collecting tanks with volumes 12 cubic meters and 21 cubic meters were constructed with the support provided by the ASHA for JBKN. Attention has been paid to ensure climate proofing of the sub-project during its design and construction works. Similarly, the cleanliness of water has been ensured through a horizontal roughing filter.

Photo 2: Horizontal roughing filter (©Keshav Kumar B.C.)

Photo 3: Water collection tank (©Keshav Kumar B.C.)

WATER SOURCE CONSERVATION: Jugepani water source is regularly cleaned by collecting leaves that fall in the source, levelling the stones and clearing mud. Further, it is protected using barbed wire fencing around the water source and conserving the surrounding forest, particularly upstream. Only 0.4 liter per second of water is collected from the Jugepani source to intake. The remaining water is left to flow downstream to maintain minimum water flow to support the ecosystem and also considering the capacity of the structure/system. The remaining water flows toward Simili River, which later joins Sanibheri River at the entry of Simli (a small town of Sanibheri RM where the office of RM is situated).

OPERATION AND MAINTENANCE: The committee consists of three females and four males led by Mr. Narbir Oli. He oversaw the construction and will also be responsible for the operation and maintenance of this solar lift JBKN. As per Mr. Oli, a tap and a meter in each household have been installed to monetize the drinking water which will help prevent water loss and support in collecting funds for operation and maintenance cost as needed in the future. Each household gets water at the tap from 6:00 am to 10:00 am every day. The water distribution is stopped for the remaining hours to fill up the water in the collection tank. Mr Oli explained that every household has to pay a minimum cost of NRs. 200 with the use of 10 unit (1 unit is equal to 1000 liter) of water at maximum. Accordingly, ten units of water are enough for single household consumption. If they use more than ten units, then the household needs to pay NRs. 25 per unit of extra charge above 10 units.

In a month, the committee collects around NRs. 17,500, which is paid by the beneficiary HHs for the use of water. Further, Mr. Shahiram Oli, a well-known local plumber, has been assigned as caretaker for regulating the system by the committee on paid (NRs. 7,000 per month). He is able to maintain and repair minor issues of the system. If there are any major issues to be repaired /maintained, the committee takes care of them through the money paid by the beneficiary HHs and seeking other resources as per need. The operation and maintenance expenditure per month is nearly NRs. 12,000 - 13,000 after adding the salary of the caretaker. It was noted that the JBKN committee had allocated NRs. 150,000 as operation and maintenance fund for JBKN when they started the construction of this sub-project. The local government is also ready to complement local efforts in operation and maintenance whenever required.

Photo 4: Solar lift operation (© ASHA Rukum)

Photo 5: Water collection from the tap (© ASHA Rukum)

5. ACHIEVEMENTS

IMPROVED WATER SUPPLY: The lifted water was initially distributed to 85 households (3 *Dalits* and the rest others) composed of 78.8% very-highly vulnerable households (V4) and 21.2% highly vulnerable households (V3). Later on, five more households in the vicinity were also included as beneficiary households by the sub-project committee. Thus, this community infrastructure supplies clean and safe drinking water to 90 households with a population of 753 from various settlements (toles) of Bippelek, including Bippe, Khume Salla, Palla Lek, Ritha Rukh, Pokharaata, and Kafal toles.

REDUCED WORKLOAD FOR WOMEN AND GIRLS: Drinking water facility has reduced daily work load of women and allowed spending their time in other productive works and agriculture. Mrs. Jai Kumari Oli said, "*We used to go a long distance to fetch water for household use. Now, the time has come that we can use water from our tap*."

CONTRIBUTION IN PRODUCTION AND INCOME GENERATION: In the past, the locals were engaged in traditional agriculture practices. About 5-6 hectare of agricultural land was used to produce the main crops of the area, wheat and maize. Since water is sufficient for drinking purpose and irrigation of their agricultural lands, some households have started orange farming. Now, nearly 16 Ropani (0.8 ha) of land is used for orange farming. Among them, 15 households have started selling their product this year, and nearly 40 households will be ready to sell their product by next year. A cooperative in Simli supports in collecting the products from the smallholder farmers and selling them in a market like Khalanga, headquarter of Rukum West. The chairperson of the JBKN, Mr. Narbir Oli said that due to market linkage through the local cooperative for selling a product, many farmers are interested in starting a small business by producing vegetables and fruits in Bippelek.

Photo 6: Irrigation in orange orchards (©Keshav Kumar B.C.)

Photo 7: Washing hands with tap water (©ASHA Rukum)

IMPROVED SANITATION AND HYGIENE IN SCHOOL: In addition, 75 students (and teachers) from a local Janasewa Primary School uses the water at school for drinking, sanitation and hygiene. Similarly, Saraswati Secondary School of Sanibheri 11, Arma (beyond administrative boundary) uses the clean and safe water from JBKN for nearly 400 students for sanitation and hygiene.

ADAPTATION AND OTHER BENEFITS: In addition to adaptation benefits through multiple water uses, the system uses solar power, clean and renewable energy. Moreover, it supports the upstream and downstream connection in the catchment; the upstream community receives the ultimate benefit of the sub-project and conservation.

CATALYZING RESOURCE LEVERAGE: The support of NRs. 17, 50,000 from ASHA became a catalyst to leverage resources from various organizations. Karnali provincial government contributed NRs. 43,00,000 and Sanibheri Municipality contributed NRs.43,50,000. Likewise, Integrated Project implemented by Rukumeli Social Development Center with support from Save the Children also contributed NRs. 4,95,000, whereas community contribution reached NRs. 13,68,000 (10,80,000 cash and labor cost equivalent to NRs. 3,50,000). This is the best example of resource leveraging and collaboration to tackle the effect of climate change. This collaboration also demonstrated an example of ownership and recognition of LAPA.

6. LESSONS LEARNT

In rural hilly areas, intervention like solar lifting has the enormous potentiality to contribute to supplying clean water for drinking purpose and its multiple uses in an efficient manner. It is climate-friendly with the use of solar energy and supporting vulnerable communities to adapt to the challenges of droughts in the face of growing climate change consequences. Similarly, as such sub-projects are needy and aligned with the government priority, there is a high preference and scope for resource leverage from various stakeholders. It reduces the workload of women and girls. It also improves sanitation, hygiene and even income generation opportunities. LAPA prepared at the ward level is instrumental in assessing vulnerabilities and prioritizing adaptation options like this. Local ownership and efforts for operation and maintenance (committee, fund and skilled human resource for basic maintenance of the structure) may need additional backstopping support from government and technical service providers when there is requirement of equipment and skills of high standard and cost beyond capacity of the community.

7. SCALING OUT OF THE PRACTICE

After learning and building confidence from this sub-project, ASHA has collaborated with local governments and different stakeholders to support six solar lift sub-projects benefitting 633 households in Rukum west. There is high scope to benefit many more communities by scaling out of such efforts across similar localities in Nepal and beyond.

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ASHA Adaptation for Smallholders in Hilly Areas

IFAD Investing in rural people

ABOUT ASHA PROJECT

Adaptation for Smallholders in Hilly Areas (ASHA) Project has been implemented by the Government of Nepal under the Ministry of Forests and Environment (MOFE), with financial support from the International Fund for Agriculture Development (IFAD). The 6-year (June 2015 to September 2021) project aims to ***reduce rural poverty in the hilly regions exposed to climate change*** *by reducing the vulnerability of local communities to climate-related risks and the enabling institutional environment for climate change adaptation. The project has three components. The first component focuses on preparing the Local Adaptation Plan of Actions (LAPAs) and capacity building of the participating institutions for inclusive, scalable, Climate Change adaptation within the most climate-vulnerable communities. This component also aims to better address the multi-dimensional risks associated with climate vulnerability and provide a set of reliable tools for mainstreaming this approach across the LAPA preparation and implementation process through sub-watershed planning and participatory scenario development (PSD). Component two focusses on implementing LAPAs on the ground providing technical and financial support to the targeted beneficiaries. Component three covers management and coordination through which its District Project Coordination Units in 6 districts, Technical Support Unit in Surkhet and Project Coordination Unit at Kathmandu coordinates with different tires of government, line ministries/sectoral agencies and stakeholders*

BOX 1: ACHIEVEMENTS IN KEY PERFORMANCE INDICATORS

- *A total of 108,524 households have already benefitted from sensitization and engagement in planning process of 200 LAPAs.*
- *93,433 HHs with access to knowledge of climate resilient farming practices and diversified livelihood options;*
- *88,042 beneficiary HHs are adopting at least one climate resilient agriculture practice;*
- *14559.83 hectare of land managed under climate-resilient micro-watershed management practices (Ha);*
- *17510 HHs adopting livestock stall- feeding with adapted forage and fodder trees;*
- *21942 HHs apply efficient water use techniques;*
- *6324 HHs adopt renewable energy technologies for domestic purposes and*
- *367 Lead farmers contracted by LAPA beneficiary groups.*

ASHA facilitates the LAPA process in 200 local governments (wards) within 30 sub-watersheds covering 30 local authorities (Rural Municipalities/Municipalities), including five districts (Kalikot, Dailekh, Salyan, Jajarkot, Rukum West) from Karnali province and two districts (Rukum East and Rolpa) from Lumbini Province. ***Box 1*** *presents achievements in key performance indicators of the project by March 2021. Target beneficiaries of ASHA project include climate-vulnerable households, including poor, women, Dalit, Janajati and other ethnic minority and socio-economically marginalized groups. Analyzing overall beneficiaries so far, 28% are highly vulnerable, 43% vulnerable, 23% moderately vulnerable, and 6% less vulnerable. The project has reached 20% Dalits, 23% indigenous, and 57% other communities. The percentage of male and female beneficiaries stands at 48% and 52%, respectively.*

For More Information:

Government of Nepal
Ministry of Forests and Environment
Adaptation for Smallholders in Hilly Areas (ASHA) Project

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