



SUMMARY

COMMUNITY-LED CLIMATE CHANGE ADAPTATION IN NEPAL

EVALUATION OF MICRO-HYDROPOWER PROJECT ACTIVITIES

OVERVIEW OF EVALUATION

Lutheran World Relief (LWR) commissioned Austin Lord, a Master's student from Yale University and 2014-2015 Fulbright Scholar in Nepal, to evaluate the benefits and challenges resulting from the construction of micro-hydropower projects (MHPs) as part of LWR's Community-Led Climate Change Adaptation (CCA) Program in Nepal, and provide recommendations for future programming. The program was implemented from November 2011 to September 2014 and was evaluated in August 2014.

PROJECT SUMMARY

LWR partnered with the Committee for the Promotion of Public Awareness and Development Studies (COPPADES) to implement the CCA program in six village clusters in Lamjung District. COPPADES is a Nepal based non-profit organization that promotes social development in rural communities in order to improve the lives of the poor. A major component of the program was to assist in the planning, financing and construction of six MHPs in Lamjung District. The objective of the program was to improve household access to at least one form of alternative and clean energy to reduce dependence on lumber as a fuel source. These MHPs supply a total of 59.5kW of installed electricity generation capacity to about 650 households. This is more than a quarter (25.7%) of the 231.5kW of micro-hydropower capacity currently generated in Lamjung District. This work complemented ongoing electrification initiatives in the area, as well as broader development programs focusing on sustainable local energy systems, rural livelihoods improvement and climate adaptation. Micro-hydropower development is an appropriate technology that could potentially bring electricity to millions of Nepalis living in areas where geographical and political-economic constraints make larger electricity projects improbable or unprofitable.



METHODOLOGY

The study used a qualitative research methodology to assess the benefits and challenges of MHPs in Ilampokhari and Bichour Village Development Committees (VDCs) – local administrative structures that organize groups of villages in a district – based on focus group meetings, semi-structured interviews, a review of relevant policy materials and project documentation. Four of the six LWR-funded MHPs, which represent different geographic orientations within the same sub-watershed, comprising 81.5 percent (48.5kW) of the total LWR-funded power generation, were included in the study. To facilitate a comparative study, the research included two other villages located within the study area that lack access to MHP or grid electricity.

A total of 35 semi-structured key informant interviews were conducted, and efforts were undertaken to represent the views of groups often socially and spatially excluded in Nepal. Institutional stakeholders involved included LWR, COPPADES, the Alternative Energy Promotion Centre (AEPC)¹ and representatives from Lamjung District Development committee (DDC). The project engaged diverse stakeholder groups; however, only 29.7 percent of participants were women, reflecting chronic under-attendance of women at public meetings in Nepal. In terms of ethnic and caste diversity, the overwhelming majority of the population in the study communities was from the Gurung ethnic group, yet 19.1 percent of study participants were from a minority group (Tamang 14%, Jogi 4.5%, Newar 0.6%).

SUMMARY OF FINDINGS

The **community-based decision to invest in MHPs** was based on the perceived **social and economic** value of electricity and the highly speculative estimates of the timeline for larger electrification projects.

The CCA program experienced the following challenges:

- (1) **seasonality**: seasonal fluctuations in streamflow reduced the generation of electricity generation capacity;
- (2) **sub-optimality**: by the end of the project, only three of the four MHPs were in operation;
- (3) **underperformance**: as a result, three of the four projects delivered on average only 68.9 percent of promised generation (80.7 W per household), which reflects an incorrect estimation of capacity. To offset these challenges **alternative and complementary technologies** of power generation can be used, e.g. solar-powered generation can be used alongside hydropower to support renewable energy and resilient climate change.

In addition, the researcher recommended a greater investment in project maintenance (such as spare parts, tools and appropriate training) to prevent production stoppages by empowering the community to make repairs.

The underperforming projects led to supply constraints, which limited electricity use to certain basic needs, and limited the ability of the project to support economic growth. Technical and social limitations on local choices reduce the significance of MHP generated electricity as a substitute for other fuelwood consuming technologies. The main outcome of MHP development seems to be the social value that electricity awards.

PROJECT OUTCOMES

SHIFTS IN HOUSEHOLD ECONOMIES

- **Replacing older kerosene lamps with better quality lighting made domestic work and studying easier**
- **The ability to charge mobile phones significantly reduced the time, energy and cost of communication**

The most significant changes in well-being were at household level through an improved quality of life and a sense of pride. However, the limited supply of electricity meant that household had to prioritize use. Households prioritized lights and television over labor-saving technologies, such as rice cookers, which use fuelwood. This prioritization was not expected in the design of the project and little data was found to support a decreased fuelwood demand.

“Replacing older kerosene lamps with better quality lighting made domestic work and studying easier.”

COMMUNITY ECONOMIC DEVELOPMENT

- **New businesses and community initiatives developed to take advantage of daytime electricity supply. These include the establishment of at least one rice hulling mill per village, and the establishment of furniture shops.**
- **Three types of new part-time employment were generated: employment as a technician or user fee collector for the MHP Committee, employment as an operator in a rice hulling mill or as a carpenter in a furniture factory.**
- **Individuals and groups (particularly *aamaa samuha* or women’s groups) expressed a variety of interests in new business opportunities, and community initiatives including the cultivation of *alaichi* or cardamom.**

The central challenge was creating an allocation schedule for power supply. Additionally, lack of capital, skills and infrastructure (like roads) limited new forms of employment and entrepreneurship.

¹ The AEPC is an independent government institution charged with developing and promoting renewable and alternative energy in Nepal.

LIVELIHOODS, MIGRATION AND ECONOMIC OPPORTUNITY

Because of limited opportunity for employment in Lamjung, labor migration represents the most significant source of cash income needed to complement the largely agrarian economy. Remittances and migrant financial contributions are often the driving force in community-scale projects. However, cycles of migration and permanent outmigration risk the ‘hollowing out’ of local economies. Thus patterns of migration both support and threaten the success of development projects.

One positive response to migration trends has been the creation of a locally established Savings and Credit Cooperative, which provides households with loans for migration. Migrants and migrant-sending communities are actively supporting MHPs. By supporting local financial institutions that are providing a social service to migrants, it may be possible to increase both local equity in hydropower projects and to promote more economic autonomy and agency for MHP communities.

GENDER ROLES

- MHPs had very positive effects for women, particularly for women heads of household
- Gendered imbalances in project governance and project benefits were limited overall
- Gurung women were pleased with their role in local decision-making about the MHPs
- At the household level, women seemed to participate equally in decisions over the use of electricity.

There are a few persistent gender issues such as the dominance of males in the political realm, the feminization of labor, the louder voice of men in the public setting during focus groups, and limited participation in the study from lower-class and lower-caste women. To support gender equality moving forward, and ensure equitable distribution of the benefits of MHP development, the promotion and sponsorship of women’s businesses and cottage industries would support the continued success of *aamaa samuha*.

EDUCATION

- Children were given the opportunity to study at home in the evening.
- Computer education programs — a new initiative in education — were developed. These programs were particularly important for girls, whose education opportunities are often given a lower priority compared to boys.

As education is important to marginalized communities, and school fees can be expensive, future programming could ask MHP supported schools to waive school fees/ computer program fees for students from marginalized communities.



“The most significant change for households in the project area was an improved quality of life and sense of pride.”

SOCIAL EXCLUSION AND MARGINALIZED COMMUNITIES

- Marginalized communities received good information on MHP development from the program.
- In two of the villages, MHP Committees had one member from each marginalized community.

Overall, marginalized communities were treated equally during the process of MHP development — in terms of consultation, electrification, and in some cases, representation on project committees. However, despite gains at the household level, significant social barriers prevent marginalized communities from participating equally in benefits at the community level. Future programs — such as providing seed investment in businesses owned by marginalized communities or working with local savings and credit cooperatives to offer favorable or subsidized loans to the marginalized community members — could help promote equitable socioeconomic development within marginalized communities.

GOVERNANCE ISSUES AND POLITICIZATION

Political alliances both supported and frustrated the process of MHP development in Bhumlichowk, partly due to a complex local history emerging during the decade-long Maoist conflict. Political divisions between those who identify as Maoists and non-Maoists remain important in this area. Additionally, conflicts both within and across political parties over MHP governance continue.

CONCLUSION

Overall, MHPs had positive impacts on the local community, and the process incorporated essential principals of social inclusion. However, social hierarchies and prejudices continue to exclude marginalized groups from economic activity. Further efforts and specific programs should be developed to support educational programs, women’s business initiatives and economic development for marginalized communities.

The successful proliferation of MHP in recent years, the expansion of the national grid, and ongoing political instability, have resulted in policy priorities shifting away from micro-

hydropower and toward mini hydropower projects (100kw-1MW generation capacity) that can be incorporated into the national grid. Policies for MHP project finance have also shifted at the national level. The future of micro-hydropower policy is therefore uncertain. It remains a bridge solution in the current era of grid expansion, but its political popularity is dwindling. Local leaders may be unaware of these policy changes, and consequently expect their communities will receive future institutional support and grid integration. It is important that the most current information is communicated to communities, so that they can make the informed decisions.

MHPs are not ideal for all communities. The sustainability of projects is dependent on social and spatial factors, which should be carefully evaluated in consultation with local communities. This study recommends that LWR expand its micro-hydropower development program. As the hydropower development policy in Nepal continues to shift away from community-scale projects, it is critical that LWR remain engaged at this scale.

CONSIDERATIONS FOR IMPLEMENTATION

LWR MANAGEMENT RESPONSE

The program team and partners agreed with the majority of the findings in the evaluation, and partially agreed with two of the findings. In terms of alternative technologies, specifically solar, the team noted that although it certainly offsets some of the challenges experienced with MHPs, it is a more expensive option. Apart from limited use in lighting, operating a black and white television, and charging mobile phones, solar is generally unaffordable for rural communities. The team suggested the development of community solar systems that can be developed for schools and health posts and funded through various sources. Additionally, the team noted that although there is some truth to the finding on the politicization of MHPs, the issue is more about governance than politics. Politicization was only identified as a problem in one of the LWR cases, but was frequently mentioned as a factor influencing other projects in the area — pointing to a risk that needs to be mitigated in the current political environment in Nepal. The team agreed that it is important for community programs to promote and strengthen good governance.

EVALUATION ACTION ITEMS

- Consider adding water flow from nearby sources to increase the electricity generation for the MHPs that are not performing optimally.
- Continue to prioritize awareness building activities related to discrimination against women and marginalized groups.

ORGANIZATIONAL LEARNING

The evaluation provides several recommendations to address the challenges that arose during the implementation of the project, as specified above.

LWR and its partners will use the recommendations to improve the work that we do in supporting community development. Additionally, continued awareness building around discrimination against women and marginalized groups, and encouraging good governance in cooperatives and community organizations is necessary.

NOTE: Three of the six micro-hydro plants were damaged as a result of the devastating earthquake that struck Nepal on April 25, 2015. As of October 2015, two plants have been repaired:

- The plant in Dudhpokhari VDC was repaired by LWR in September 2015.
- The plant in Kolki VDC was temporarily repaired by members of the community.

Funding has not yet been secured to repair the plant in Illampokari VDC, and the plant in Kolki VDC still needs further repair. It is estimated that the cost to repair each MHP is approximately \$15,000.



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