



## **Integrative approach to sustainable livelihoods of mountain communities**

Mountain landscape and a village in the Jumla District, Nepal.  
(Photo: PEEDA, 2023)

### **Introduction**

The sustainability of mountain regions has far-reaching implications for the global environment and human well-being. Mountains are essential for the world's water supply, providing over half of all freshwater resources for our planet.<sup>1</sup> Mountain communities and environments are particularly vulnerable to the currently accelerating socio-economic and environmental crises. People living in mountains often have less access to social and economic infrastructures. They are particularly vulnerable to food insecurity and lack alternatives for economic development. The challenges faced by mountain communities are diverse (they concern various social and economic sectors and different aspects of life) and complex (the dynamics of each sector and aspect entail interdependencies). The responses to these challenges, however, many times target single specialised fields (such as water, energy, health, agriculture) without properly taking into account how they relate to

each other. It is becoming evident that efforts are needed to understand the interactions between different fields in order to exploit synergies and avoid or reduce trade-offs. That is one of the main tasks that we think an integrative approach should fulfil by, for example, combining expertise from different sectors in order to build more coherent responses to complex challenges.

In this factsheet, we report on advances in the development of an integrated approach to strengthening the livelihoods of mountain communities in Nepal, a country located almost entirely within the Himalayan mountain range, with more than 40% of the population living in mountainous landscapes. Thus, mountain communities in Nepal face many of the challenges that people living in mountain regions face. On the other hand, people living in mountain regions also have promising experience, practices and knowledge that can be used, further developed and upscaled in order to deal with the complexity of their challenges.

## Focusing on people's livelihoods through a transdisciplinary process

We propose the sustainable livelihood approach to deal with the mentioned integration tasks for addressing sustainability challenges in mountain regions. This approach focuses on the capacities of individuals, families and/or communities to access and manage key resources to develop thriving, dignified lives.<sup>2</sup> It recognises that these resources are diverse and vary from case to case. Therefore, defining 'what' is key 'for whom' must be a constitutive part of the process of working with the populations concerned. In order to guide this search, five types of resources or assets are proposed, including human capital (e.g., the skills, knowledge and health of individuals), social capital (e.g., relationships, networks and institutions that support livelihoods), natural capital (e.g., land, water, forests and biodiversity), physical capital (e.g., infrastructure, tools and technologies), and financial capital (e.g., monetary income, savings and access to credit). In this way, a broader perspective is taken which can help to explore the relevance of and interrelations between different aspects or sectors that determine people's livelihoods.

## Establishing a methodological approach to bring systemic change

Based on the basic insights from the sustainable livelihood approach, the WISIONS Innovation Lab (IL) Nepal brings together different stakeholders and actors relevant to the current and future development of mountain communities and landscapes in Nepal. In an iterative multi-stakeholder process, local community organisations and governments as well as regional and national actors, private suppliers of technologies and services, and academics contribute to find and test practical responses.

The first phase of this multi-stakeholder process focuses on understanding the development challenges and opportunities specific to the target regions. Rooted in this location-based understanding, and taking advantage of the diverse knowledge and skills of all involved stakeholders, transformative solutions are co-designed. In the experimentation phase of the Innovation Lab, the jointly developed solutions – comprising individual but interrelated projects – are implemented and continuously monitored to assess how they should be adapted to maximize their impact. This phase involves multiple rounds of iteration. After the successful implementation of the co-designed solutions, the process concludes with a collectively conducted co-evaluation of both the solutions and the overall design, experimentation, and implementation processes. Figure 1 schematically illustrates this methodological approach.

The diverse and extensive experience of community-based organizations in managing resources in the energy sector (e.g., micro-hydro plants, or MHPs) and in landscape management (e.g., community forests) provides an excellent

entry point for understanding the complexity of the livelihoods of mountain communities in Nepal. Based on the prior experience of local partner organizations, two geographical regions were approached: the valleys connecting Badigad and Nisi Municipalities in the Baglung district and the Tatopani municipality in Jumla district (in the Gandaki and Karnali provinces, respectively). These locations have a relatively high density of well-functioning community-based MHPs and community forest groups (CFGs). The valleys themselves are marked by socio-ecological commonalities (such as villages organized along the rivers through the valleys) as well as similar infrastructural development (such as the national grid and road systems), which significantly shape their livelihoods. The first iteration of the IL Nepal project began in March 2023. Various forms of interaction and exchange among relevant actors were facilitated, involving representatives of community organizations, local government staff (e.g., ward chairpersons and officers from relevant bodies such as soil conservation and forestry), community members, and representatives of national institutions and programs covering energy, soil, and forestry sectors.

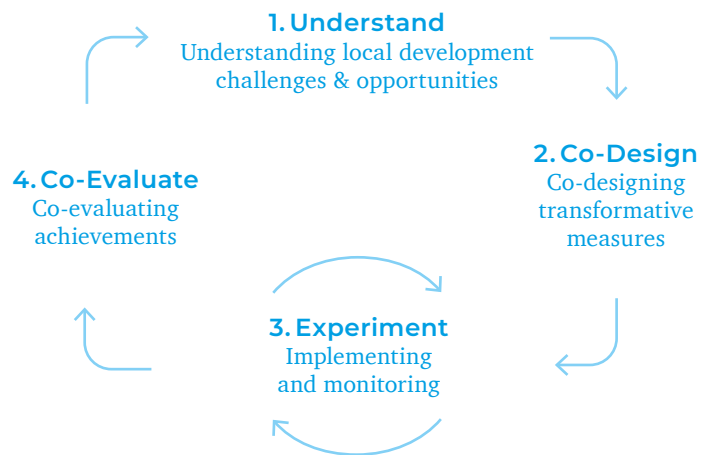


Figure 1: Schematic illustration of the Innovation Lab methodology, that organises a multi-stakeholder processes in four phases



Stakeholder engagement: meeting with staff and members of micro-hydropower management committee in Nisi Khola, Baglung. (Photo: Winrock, 2023)

## An integrated approach to strengthening the livelihoods of mountain communities in Nepal

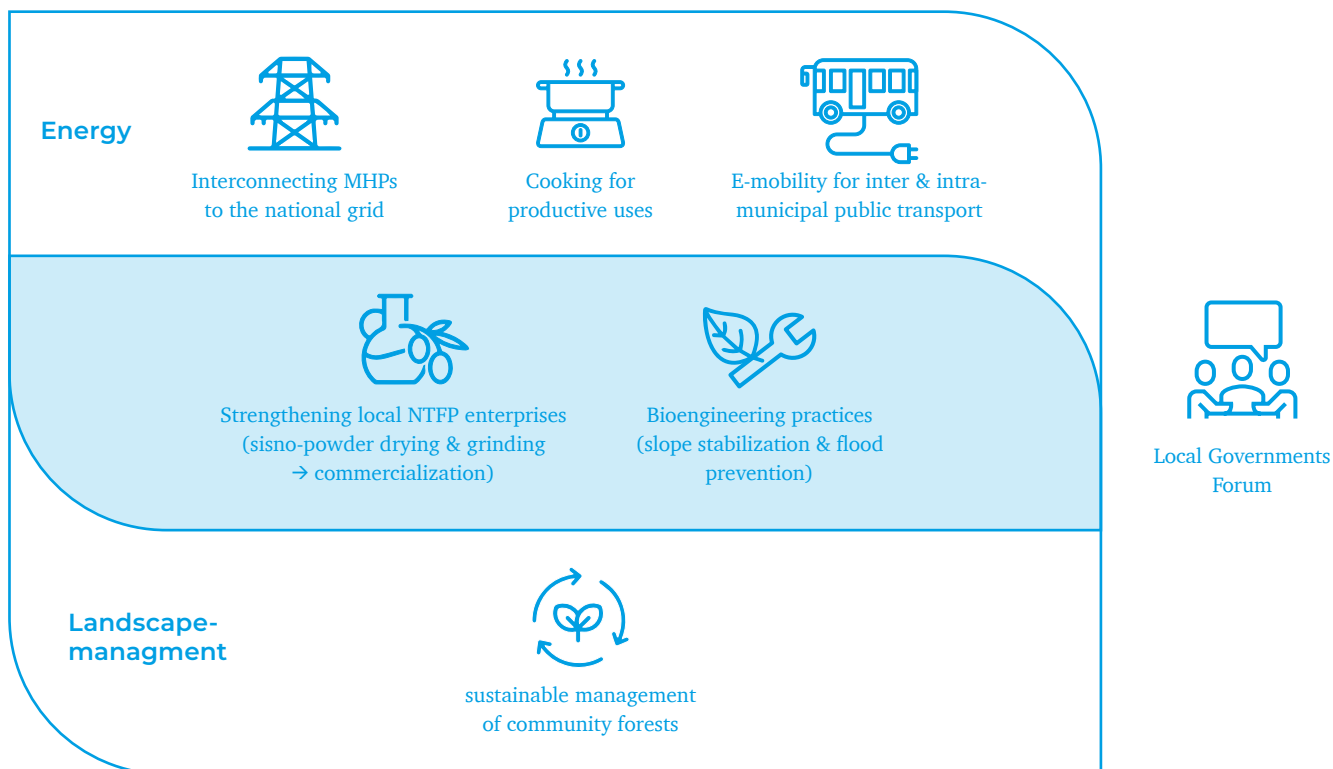


Figure 2: Set of sustainable solutions that were co-designed and applied in the framework of the WISIONS Innovation Lab Nepal

During the process of consultations and exchange with all the actors mentioned, a panorama of possible and relevant solutions (i.e., experience, practices, technologies and knowledge) emerged. The focus subsequently shifted to identifying solutions that could be combined to exploit synergies between the broad fields of energy and landscape management while at the same time addressing (at least some of) the most pressing tensions shaping the realities of mountain regions today. Figure 2 shows the selection of solutions that emerged from this process in Baglung.

### Shifting to business-oriented MHP management models (including grid interconnection)

The user committee model has been most common for MHPs in Nepal. However, shifting towards a cooperative model provides clear incentives to generate revenue and enhance management, and promotes the productive use of energy in the communities. A promising possibility is to connect the MHPs to the expanding national grid. Once connected to the national grid, MHPs can operate under a cooperative, which encourages accountability, transparent financial management, and proper maintenance planning. The IL Nepal demonstrated a support scheme designed to initiate and guide the transition from relatively weak MHP user committees to strong, well-governed local energy cooperatives.

The support scheme comprised a tailor-made combination of awareness raising, capacity building in technical and governance aspects, connecting to appropriate agen-

cies and actors and on-demand technical support. In the scope of the project three MHPs have successfully shifted to a cooperative management model and connected their assets to the national grid: Nishi Khola II (in Nisikhola rural municipality), and Chachalghat and Girindi Khola (in Badigad rural municipality).<sup>3</sup>

### E-cooking for SME's

The rural commercial cooking sector in Nepal continues to rely heavily on Liquefied Petroleum Gas and biomass, despite the country's vast hydropower potential and improving grid reliability. Though electrification rates have increased significantly in recent decades, productive uses of energy such as electric cooking remain limited. Promoting the use of electric cooking solutions by local micro enterprises (such as tea shops and restaurants) represents an opportunity to increase the productive use of electric power that is generated locally. The IL Nepal has demonstrated an approach for promoting the uptake of e-cooking among micro enterprises by combining demonstration campaigns, tailor-made design of eCooking sets and differentiated subsidy schemes and internal wiring and circuit breaker upgrades where necessary. A total of 20 local micro entrepreneurs have successfully integrated suitable e-cooking solutions in their business. The IL Nepal also generated important insights into enabling conditions for e-cooking adoption by demonstrating that even partial transitions to electricity deliver substantial economic benefits. Furthermore, critical barriers to scaling-up, including grid reliability, limited availability of induction-compatible cookware or high upfront costs were highlighted.<sup>4</sup>

### **E-mobility for inter & intra-municipal public transport**

Nepal's expanding electricity access, particularly through hydropower generation and rural electrification presents a significant opportunity to transform transport systems through electric mobility. As a first step, we have conducted a pre-feasibility study exploring the opportunities for deploying electric vehicles (EVs) as an answer to the region's urgent need for affordable and sustainable public transport. The study combines field visits, key informant interviews and structured surveys with drivers and passengers to capture the local mobility pattern. It also employs financial modelling to assess the technical, socio-economic, and operational feasibility of deploying EVs along key routes in the corridor. Results show that electric vehicles, especially 14- and 11- seater vans are well-suited to the rural, hilly terrain, offering moderate to high return on investment and quicker payback compared to internal combustion engine vehicles. To realize opportunities related to EVs, a detailed feasibility study (DFS) is recommended to validate assumptions and refine implementation models.<sup>5</sup>

### **Bioengineering practices**

In Jumla and Baglung, floods and landslides claim lives of people annually and increasingly damage critical infrastructure such as MHP intakes, powerhouses, canals, and transmission lines. Therefore, through bioengineering practices, physical infrastructure is being integrated with biological and ecological principles to prevent landslides and floods that threaten MHPs, other local infrastructures and livelihoods. The most critical sites around the MHPs Girikhola (in Jumla) and Nisikhola III (in Baglung) were prioritized for intervention within the IL Nepal. A combination of low-cost bioengineering techniques — including bamboo crib walls, retaining walls, gabions, wattling fences, and plantation of native species such as Salix — was applied to stabilize slopes, reduce erosion, absorb flood energy, and prevent scouring around key infrastructure. This approach demonstrated that bioengineering can serve as a cost-effective and locally adaptable alternative to civil engineering solutions, enhancing watershed resilience while reducing maintenance costs and reducing the risks for people's livelihoods.<sup>6</sup>

### **Scaling up the value chains of sustainable non-timber forest products (NTFP)**

At the project sites, the leaves of the nettle plant *Urtica dioica* (locally known as Sisno), growing wild in adjacent community forests and on barren land, have high commercialisation potential. Through using a value chain approach – from sustainable forest management and harvesting practices to collection, quality control, mechanical drying, milling, packaging, branding, and market linkage development – fair participation of local communities in value creation can be ensured. The production of Sisno powder includes many steps such as drying, grinding, sealing, and labeling. These processing steps were mechanized by using electricity supply from the community-based MHP Nisikhola III. By shifting from the raw material sale to

value-adding processing at community level, the production of Sisno powder strengthens local income generation while contributing to more stable energy loads during the day.<sup>7</sup>

### **Strengthening sustainable forest management practices**

While sustainable forest management through community forest user groups (CFGUs) has a long tradition in Nepal, it is common to find cases of weakened forest governance and maintenance capacities. Updating sustainable forest management practices has the potential not only to improve the overall condition of forests, but also to contribute to improving the participation of local communities in non-timber forest products value chains. It is also important to consider that the community needs to be incentivized in some ways to keep their engagement continued in forest management. Considering the same perception, under the IL Nepal, forest operational plans of two CFGUs Indreni and Srijana in Nisikhola rural Municipality were renewed: These community forests were once a major source of firewood, fuel and timber to the beneficiary community of IL Nepal. However, with the changing dynamics of relationship between people and forest with decreased dependency of communities on forest products, forest management has been abandoned, resulting in the operational plan, which is a major legal document for a community forest to operate, not being renewed for years. Hence, under the IL Nepal, support was provided to renew these operational plans including the “Sisno harvesting plan” which will be one of the income generating opportunities to the communities by utilizing a non-timber forest product that has gone unutilized and unnoticed for years. During this process, the communities were consulted to know their reasons for the operational plans not being renewed and further they were also made aware about the new provisions introduced into the plans through a general assembly.

### **Local Government Forum**

During the initial phase of the IL Nepal we got to know about the initiative of a set of local governments, which aimed at coordinating their responses against the common challenges they face in the field of waste management. We saw great potential in this initiative, as a platform that can ensure the regular exchange among neighboring municipalities in order to discuss, identify and build decisions on issues that are common and which very often override the capacities of single administrations. In agreement with the government representatives the IL Nepal supported this initiative. By developing an operational guideline for the Inter-Local Government Coordination Committee comprising seven local governments of Baglung and Gulmi Districts, the IL Nepal contributed to institutionalize a focalized exchange among Seven rural/municipalities. Until now this platform has helped to build a common approach for dealing with the waste management problem. Moreover, for the IL Nepal project, this platform has been key in order to ensure the institutional support for our interventions, for instance by mobilizing local people, facilitating contacts to key local actors or organisations or even by allocating own financial resources to co-finance specific interventions.<sup>8</sup>

### Lessons learned

The practical experiences gathered in the last three years already illustrates that the numerous community-based MHPs in Nepal offer an excellent entry point to understand and intervene in the complexities of the livelihoods of mountain communities of the Country:

- MHPs comprise physical infrastructures that are highly dependent on the health of the landscapes where they are embedded. Particularly the stabilization of slopes and the prevention of flash floods through nature-based solutions represent impactful synergies between the energy and the landscape management sectors.
- The ongoing expansion of the national grid is commonly seen as a threat to community-based MHPs. But our project has demonstrated that it can also be turned into a strong incentive to transform those commonly weak and semi-formal committee models into solid organizational structures that operate a profitable business.
- The arrival of the national grid allows for accommodating larger levels of power demand and the propagation of productive uses of electricity. Our project demonstrated the significant potentials of three use-cases of high relevance for the livelihoods of mountain communities: a) the electrification of cooking practices of local eateries, b) the urgent improvement of public transport and c) the mechanization of NTFP processing in order to increase the value added locally.
- The community forests are a central natural asset for mountain communities. However, its current role for the livelihood of people seems to be declining. The demonstrated whole value chain approach for enhancing local business processing of NTFPs can represent an interesting synergy with the energy sector By increasing the

commercial value of products of the forest it can bring new incentives to CFGUs to strengthen the sustainability of their forest management practices.

A final observation from the field is that our approach can be understood as supporting long standing community-based institutions (MHP committees and CFGUs) to transform themselves in order to adapt to the changing social, economic and environmental conditions; and in this way helping them to remain a crucial instrument for local communities to maintain a stake in the governance of their territories.

### Scale-up potential

Setting the entry point on community-based institutions dealing with energy and landscape management proved to be very fruitful. Those institutions are very common in Mountain regions in Nepal, which points at interesting potentials for scaling the application of these set of solutions in the country. Moreover, we see potential for expanding the approach by considering other sectors of increasing relevance for the lives of mountain communities in Nepal, such as water and waste.

The lessons from Nepal can also guide the implementation of the integrative approach in countries with similar conditions, for example the high socio-economic relevance of mountain landscapes and existing experience with micro-hydro systems. The entire Himalayan region, the Hindu Kush, the Andean region and many more represent potential regions for applying and further developing the approach.

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This factsheet is part of the series “Sustainability Solutions for Mountain People and Landscapes,” developed within the WISIONS Innovation Lab Nepal. The aim is to promote an integrated approach to strengthening the livelihoods of people living in mountain communities. Each factsheet provides information on specific sustainability solutions in the fields of energy and landscape management that have shown promising potential for improving the livelihoods of mountain people but have a low level of adoption in Nepal and other mountain regions. The information is tailored to the specific context of Nepal’s mountain landscapes and offers practical insights and guidance for scaling up the application of these solutions. Additionally, it presents an integrated approach that begins with an understanding of the opportunities and challenges faced by mountain communities, enabling the systematic deployment of synergies between solutions from the energy and landscape sectors.

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