Incentives for Ecosystem Services (IES) in the Himalayas

A 'Cookbook' for Emerging IES Practitioners in the Region

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Foreword

The Hindu Kush Himalayan (HKH) region has some of the most diverse ecosystems on the planet, which harbour significant water resources, remarkable habitats and biodiversity, including a high diversity of crop and livestock species or varieties and their wild relatives. The provisioning, regulating, supporting, and cultural services from this region contributes to the wellbeing of over 200 million mountain people, and indirectly to billions of people in Asia and beyond.

Yet the continued flow of ecosystem services cannot always be taken for granted, especially when the good or service is more distantly located. In many places, mechanisms are needed to ensure resources are sustainably managed and communities who manage them (for the benefit of others) are adequately incentivized.

Incentives for Ecosystem Services (IES) is a tool that, when applied correctly, can be used to maintain or improve the flow of ecosystem services, while rewarding the managers of that ecosystem service. It provides a triple win: for the ecosystem, for the managing community, and for the service receiver.

ICIMOD is pleased to join hands with GRID-Arendal and CICERO on this publication to share our expertise and knowledge on Incentives for Ecosystem Services in the Hindu Kush Himalayas (HKH). As the name implies, this Cookbook provides the recipe and the ingredients for implementing successful IES systems. It is specifically designed to help communities, institutions and governments to institutionalise incentive-based mechanisms through a practical, 10-step process.

Importantly, it addresses the specificity of the Himalayan mountain context and emphasises that market-based payment mechanisms (as commonly used elsewhere) are not always the only answer. The Cookbook draws on existing case studies from mountainous regions of Nepal, India, China and Pakistan to illustrate different systems and what can be learnt from them.

In these times of rapid climate and environmental change, real action is needed at the grassroots level as well as at the national and global levels. It is our hope that this publication will encourage a range of actors to implement and institutionalise IES systems in their home countries and communities, and to develop supporting policies to facilitate their widespread implementation.

Dr. David J. Molden
Director General, ICIMOD

Executive Summary

Each country and region of the Hindu Kush Himalayas (HKH) faces pressing environmental and developmental challenges, with rural, mountainous areas most deeply affected. Deforestation, changes in land use, and unsustainable soil and water management practices present physical challenges, while outmigration and challenges to health, education, poor infrastructure and market access complicate poverty challenges.

Large-scale solutions for sustainable development and climate action are important, but are often limited to the global and national levels. Urgent focus is needed on small, tangible solutions that may help local development as well as bring sustainable, locally relevant management solutions.

Incentives for Ecosystem Services (IES) can contribute to the Sustainable Development Goals (SDGs) by improving ecosystem functioning, maintaining ecosystem service flows, and supporting biodiversity and habitat conservation and restoration. When applied well, they can improve connections and incentive systems between the ecosystems that create benefits (and the people who manage/affect them) and the recipients of those benefits. Improvements over time to IES systems can lead to meaningful contributions to community and rural development (including local institutions) and cooperation, income diversification and resilience. They can also prove an important source of financing for sustainable development and adaptation to/mitigation of climate change.

IES in one form or another have been applied around the world, often under the definition of Payments for Ecosystem Services (PES). However, IES applications are not a 'one-size-fits-all' solution. IES systems must be locally defined in such a way that they are relevant to the cultures, policies, ecosystems and specific factors affecting demand and supply of ecosystem services in that place. In this Cookbook, we apply the term "Incentives for Ecosystem Services" instead of the more commonly applied "Payments for Ecosystem Services" because experience suggests that many forms of incentives, not only market-based payments, have been applied in the region. This Cookbook highlights several factors from the Himalayan context (ecological, cultural, policy, social, and economic) that have bearings on the application of IES to produce the desired and best results.

This report includes numerous case studies, many from Nepal but also from Pakistan, India and China, dealing with numerous ecosystem services and a variety of buyer/seller configurations. Together, they present a diverse snapshot of the innovative, exploratory application of IES in the Himalayan region. This handbook intends to help newcomers to rapidly gain familiarity with the concept in the Himalayan region, and to support dialogue, inclusivity, and rapid uptake of IES information in the future.

Who is this Cookbook for?

This Cookbook is designed to help people interested in Incentives for Ecosystem Services (IES). It is designed to allow the reader to rapidly gain familiarity with the entire process of establishing a functioning, sustainable and efficient IES system in the Himalayan context.

This Cookbook should be of interest to those who have heard of definitions such as Payments for Ecosystem Services (PES), Incentives for Ecosystem Services (IES) or Incentive-based mechanisms for ecosystem services (IBM), or who have encountered one of their cases in practice, and who perhaps wish to set up an IES scheme themselves.

The number of practitioners and communities who are experimenting with IES is advancing rapidly. Early conceptualization of IES often begins with one or a few innovative and energetic 'champions' searching for a way to do things differently. Once enthusiasm and engagement gives way to tangible and explicit discussion, a few key individuals become 'architects' of the IES system. The people who work directly in and with affected areas and communities on a daily basis are best positioned to help innovate, create and implement new toolkits and solutions for ecosystem services in the Himalayas.

This Cookbook clarifies the 'ingredients' needed to design an IES system, in order to increase familiarity with terms and cases. It is our intention that this Cookbook serve as a catalyst for learning, knowledge exchange and the building of a community of practice, and ultimately as a tool to make advances where IES offers unrealized potential across the Himalayas. In addition, by highlighting the unique conditions and experiences of IES cases within the Himalayas, we believe that it is possible to mobilize the broader international community to support Himalayan experts and innovators in their task of producing sustainable benefits for the billions whose futures are at stake.

The reader of this Cookbook is not expected to be ready to devise or implement an IES system on their own — quite the contrary! Effective IES systems are principally about engaging more people with more diverse values, in order to account for and support benefits that would otherwise be lost. Establishing a new IES programme is a substantial challenge for even the most experienced practitioners, often requiring years of background work, early consultation, solicitation of measurements and information, preparation, and community engagement before an IES system is even proposed. Implementation and measurement of results may not be forthcoming for many years thereafter.

How is the Cookbook organized?

This Cookbook is organized into four sections.

In Part I: Introduction, we describe its purpose and give a brief introduction to IES. We describe mountain ecosystem services and explain why IES in the Himalayas is different from IES in other locations. We also highlight the difference between PES, IES and other existing terminology, to help the reader navigate the multitude of different and often overlapping definitions that exist.

Part II: Ingredients and 'Recipe' for IES presents in detail the steps involved in establishing an IES system.

This is followed by Part III: Cautions, which provides important reminders and guidance to avoid unintended consequences when building a new IES system.

Part IV: Cases summarizes nine IES cases from Nepal and other countries of the Himalayas.

We conclude with a summary review, and a section on references and resources to assist you in establishing IES conversations and future collaborations.

Text boxes are used to emphasize key features of IES design, or particular aspects of a case that make it unique.

Part I. Introduction

The Himalayas' forests, glaciers, wetlands, soil and biodiversity support the lives and livelihoods of millions of people. The combined benefits from nature are known as ecosystem services (MEA, 2005).

These benefits can be tangible — such as food, water, building materials, medicines, and materials used in cultural activities — or intangible, such as places of beauty and spiritual importance. The Himalayas already provide ecosystem services and resources to more than 210 million inhabitants and 1.5 billion people living in surrounding regions and beyond (Karki et al., 2012).

Yet ecosystem services in the Himalayas, and thus the lives and livelihoods they support, are at risk. In many cases, ecosystem services are in decline, with consequences for literally billions of people. Examples include erosion, landslides, loss of agricultural topsoil, water pollution caused by upstream activities, loss of traditionally harvested plants and animals from forests, and loss of forests as a whole. The loss of these services has severe and direct implications for the rural and mountain communities who have traditionally derived direct benefit from those ecosystem services. These communities often access ecosystems directly at the source: food, water, and materials for heating and cultural activities. Ecosystem services that regulate water and land stability (controlling flood levels, soil loss, and providing landslide control) can also be affected by changes to ecosystems.

The combined benefits from nature are known as ecosystem services

When ecosystems and land use or land management change upstream, consequent changes to ecosystem services can lead to more instability and infrastructure challenges for those in urban areas downstream. Communities and land management activities that may have traditionally provided ecosystem services for

Examples of Ecosystem Services

- Forest goods and materials
- Food products (fish, fruit, mushrooms)
- Traditional materials for ceremony, medicine, or cultural activities
- Flood prevention
- Regulation of water quality and quantity
- Erosion control
- Tourism
- Pollination for agriculture
- Habitat for biodiversity
- Aesthetic beauty

other regions (via fluid ecosystem services or products that are transported off site) may struggle to provide the same level of benefits. Services may decline, become less reliable, or cease altogether.

It is anticipated that with a growing population in the Himalayan region, human pressure on ecosystems will continue to grow (Sandhu and Sandhu, 2014). Additionally, climate change is already seen to pose substantial risks and disruptions to ecosystems and their use. These currently have, and will continue to have, direct and indirect impacts for populations that rely on ecosystem services, including extreme weather events, water insecurity and challenges to crops and livestock raising. Poor and rural communities without access to infrastructure are likely to be more directly reliant upon ecosystem services and therefore particularly vulnerable to these changes. This has acute consequences for health, well-being, and future development trajectories in these areas.

Mountain ecosystem services

This publication pertains specifically to mountain ecosystem services, and the mountain characteristics that can affect service flows. These can include ecosystems, markets, changes and disruptions, transports, and community participation, among other considerations. Mountain ecosystem services can be particularly challenging, because there is a strong upstream-downstream connection between where they are sourced (high in a watershed) and where they are consumed (far downstream), especially because producers and consumers may be unaware of this connection.

Management in mountain ecosystems is challenging, not only because of their remoteness and limited access, but also because communities and ecosystems are often closely linked. Management must account for these connections, traditions, and the fact that market-based substitutes for many ecosystem services are often not available. Thus, guaranteeing that flows of ecosystem services continue is crucial to the lives and livelihoods of mountain residents upstream. Similarly, creating awareness in downstream populations and urban areas of where their ecosystem services come from, educating that population that ecosystem services may be at risk, and attempting to establish willingness to pay or to provide other forms of incentives for services among downstream residents, can be challenging. Many upstream communities may already be searching for ways to diversify their economy and income, or help their landscapes and communities become more resilient to climate change. However, they may have limited access to the materials, training and services they need to establish ecosystem service conservation action. In these cases, even small incentives can make large differences to lives, livelihoods, and the ecosystem and its services simultaneously.

> Mountain ecosystem services can be particularly challenging, because there is a strong upstream-downstream connection between where they are sourced and where they are consumed.

In mountain ecosystems, the need for water is often a cause for concern, both in upstream and downstream locations. In many places, water availability and management has an increased focus due to the prognosis for climate-induced changes

Factors making mountain ecosystem services unique

- services often flow long distances (upstream/downstream)
- small changes in climate/precipitation can lead to big changes in services
- challenging geography for transport and infrastructure (access to materials/markets)
- marked contrast between urban lifestyles (perhaps disconnected from nature) and rural livelihoods (with direct ecosystem connection)
- tourism and recreation services may be prominent
- extraction of mineral resources may impact ecosystem services
- development/land use/climate change may affect traditional migration routes
- traditional knowledge may be closely linked with mountain lifestyles
- mountain areas may have hazards/dangers/service disruptions not present in non-mountain areas
- unique spiritual importance of and in mountains which may not be apparent to visitors

to water production in mountain regions. Very small temperature changes can lead to very large changes in water volume, both in the short term (such as extreme events) and across seasons (for example if precipitation that in past years has fallen as snow and been stored in the snowpack/glaciers, instead falls as rain and flows downstream immediately). Water quantity and quality can change quickly as a result of what happens to it along the watershed. Thus, land-use practices (such as bulldozing for sand extraction, and consequent erosion along banks), land cover (deforestation or re-planting) and water-soil-forest interactions (such as trees along rivers and creeks that can cool water and provide fish habitat) are all of interest to ecosystem service analysis.

MOUNTAIN ECOSYSTEM GOODS AND SERVICES
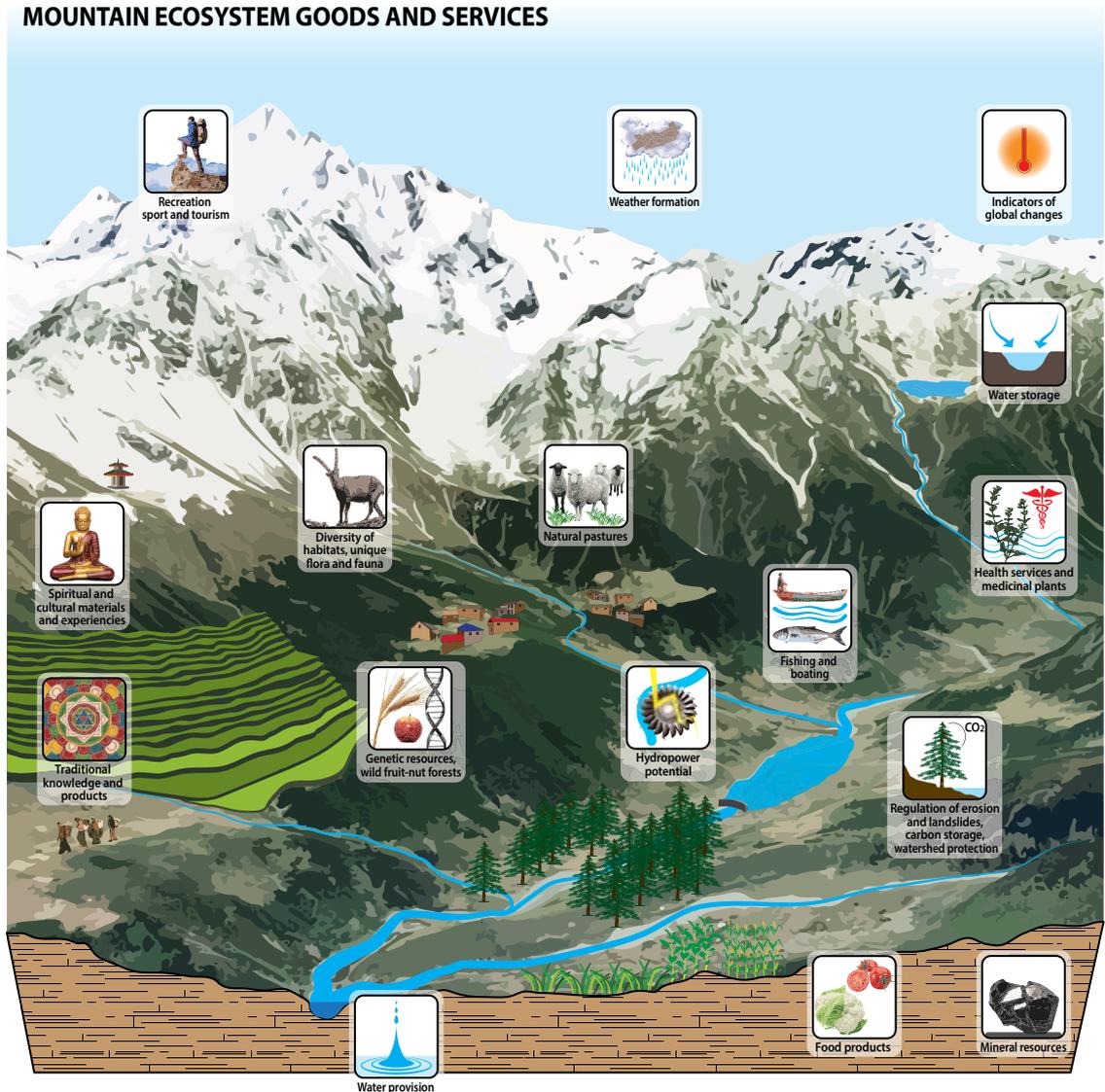
Figure 2. Mountains provide a number of ecosystem goods and services for both upstream communities and downstream users.

What are Incentives for Ecosystem Services?

When problems arise in pursuing civic progress, the environment is often pitted against development. In contrast, Incentives for Ecosystem Services (IES) is part of a 'toolkit' that intends to support improvements to environmental quality and human well-being simultaneously.

IES works by identifying and establishing 'win-win' agreements among the providers of ecosystem services (the land owners, managers or communities that influence land, water, goods and services), and the beneficiaries, whether they are nearby — in a downstream urban area — or more distant "users".

In IES programmes, individuals or groups owning or managing a resource or land area receive a benefit (in the form of a payment or other non-monetary benefit) in exchange for managing actions that result in the provision to others of an ecological service that would otherwise not exist (Wunder, 2005). By definition, IES is a voluntary transaction, involving a well-defined ecosystem service, from a specific geographic origin, of a set quantity/quality, over a set period of time. According to a pre-agreed system, the deposit is transferred from the user to the ecosystem service provider, via the IES system. The IES system includes the agreement, the duration, the verification, and mechanisms for consultation and improvement over time.

Incentives for Ecosystem Services (IES) is a tool used to address declines in ecosystem services. Individuals or groups owning or managing a resource or land area receive a benefit (in the form of a payment or other non-monetary benefit) in exchange for managing actions that result in the provision to others of an ecological service that would otherwise not exist.

	Public buyer	Private buyer
Public or communal seller	A municipality pays a community to prevent illegal deforestation and poaching.	A private tourism operator pays a community to remove waste and weeds from a scenic lake.
Private seller	A government programme pays a landowner to plant trees on an eroding hillside to protect water quality for the city downstream.	A decorator pays a higher price for flowers after a grower has documented its organic production and 'pollinator friendly practices'.

Table 1. Types of IES transfers and examples, in this case involving transfer of money

IES incentives are intended to support the livelihoods of those who manage or maintain these ecosystem services. However, if approached solely as a financial mechanism, numerous unintended and negative consequences for both communities and ecosystems can occur. Therefore, a well-designed IES system 1) accounts for benefits to both ecosystems and livelihoods, 2) has a structure for inclusion of and dialogue among all participants, 3) provides explicit monitoring for unintended consequences, and 4) includes system improvement over time. These components will be presented in the forthcoming chapters, as well as in a concluding section presenting tips to avoid unintended consequences.

HOW IES WORKS IN WATERSHEDS

INCENTIVES
cash, assistance, materials, other incentives

Project
Balances upstream and downstream interest

UPSTREAM COMMUNITY
Stewards and providers of watershed services

DOWNSTREAM COMMUNITIES
Beneficiaries of watershed services

Project Creates ecosystem incentives

ECOSYSTEM CONSERVATION ACTIVITY
e.g. reforestation, erosion control actions, halting of illegal activity, waste control, etc.

WATERSHED SERVICES
e.g. water purification, flood risk mitigation, aquifer recharge, food products and drinking water

Figure 1. How IES works in watersheds (adapted from Smith et al., 2013).

The importance of incentives in the Himalayan context

The Hindu Kush Himalayas (HKH) is extremely culturally and biologically diverse, and is characterized by its poverty, remoteness and limited accessibility. Payments for Ecosystem Services (PES) are primarily a market-based solution that has been tested and applied in most regions of the world. However, pure market-based solutions may not be as effective as solutions that mix market and non-market (shared or communal) payments and services, especially in a region such as the Hindu Kush Himalayas.

This section describes a few Himalayan characteristics that will influence whether non-market or mixed market and non-market incentives may be more effective than market payments alone.

Limited land tenure merits special consideration in the Himalayas, which are characterized by rugged terrain, limited and seasonal access, and large expanses over which herding occurs. In many areas, legal land tenure may be very low (in Nepal, the average landholding per household that is suitable for agriculture is about half a hectare). Smallholder farmers are common in mountain areas, where many services (access to water, health, sanitation, banking, markets etc.) may be limited. As a consequence, these smallholders may hold much of their net value in their livestock or in communal assets, or they may operate in cooperatives. Limited structures and ability to save funds or diversify income mean that smallholders in mountain areas may have particularly low buffers to shocks to weather, resources, climate or prices.

In the Himalayas, some ecosystem services may already be managed as a communal asset. For example in Nepal, drinking water supply is considered a basic service, and its provision to meet basic needs is mandated by the government of Nepal. Thus, the government, in the interests of maintaining community well-being and continued service provision, may provide incentives to upstream communities (instead of a private entity or downstream water recipient). However, the treatment of certain resources as common goods also presents challenges in terms of incentives and responsibility for management action.

Communal/forestry management groups may be the most effective at provisioning ecosystem services. In many regions of Nepal, community management groups have already been established, and have a long and effective history of protecting and improving a forest area. Since new payment or other incentive systems require high levels of accounting, transparency, and operational confidence, a pre-existing organization that can organize many participants in a restoration activity may often be best positioned to provide the ecosystem services. Additionally, a forestry management group may have the necessary community forum to gather and build consensus, as well as the structure necessary to guarantee accountability to the contract.

In the HKH, there is a pressing need for basic services and therefore benefit sharing. Some of the most prominent needs in remote Himalayan mountain
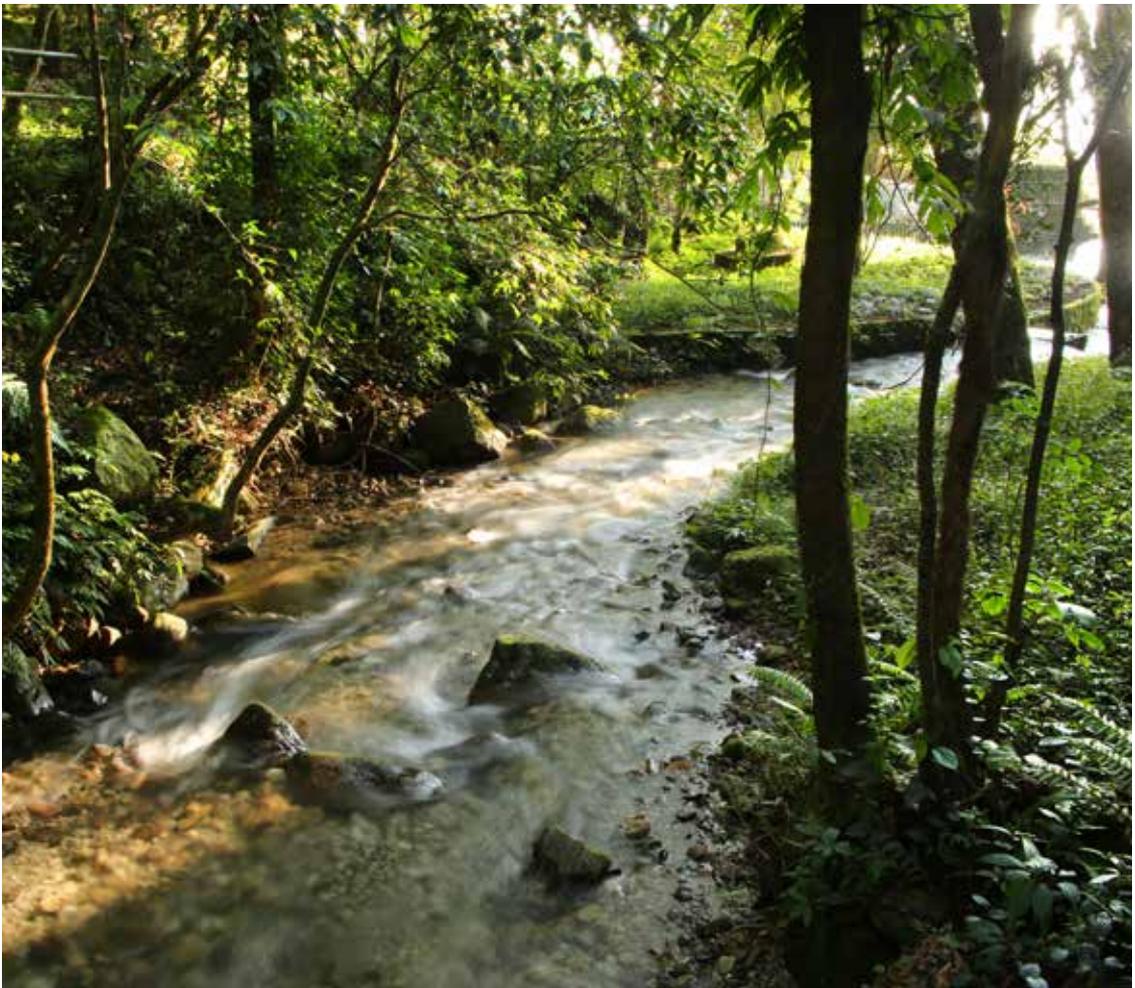
Characteristics that may require adjustments to be made to strictly market-based payment solutions

• limited land tenure (numerous smallholders or presence of herders across large areas)
• high-mountain areas may have limited access to banking, decision-making and community forums
• land management activities may already be performed by a communal organization
• communities may feel pre-existing community or forest management groups are best prepared to gather and distribute payments or benefits
• benefits that are most needed may be of a shared nature (education/healthcare/technologies and services)

communities are for basic services. Services requested by communities may include secured and stable community water sources, health outposts, teachers, schools and education materials, road improvement (especially during the rainy season), reinforced/stabilized slopes to prevent erosion and landslides, and technical or material assistance to create food diversification, such as the establishment of a fisheries co-op. Non-monetary incentives may therefore be proposed as "payments" to upstream communities, including through development projects or materials or services provided in-kind to benefit numerous members of the community. A second motivation for this form of payment may be that downstream communities may themselves be cash-poor, but may have access to more development assistance or resources that are then proposed as payment.

In the Himalayas, technology, infrastructure and facilities (such as banks and institutions to monitor/enforce/adjudicate agreements) may be lacking. Therefore, particular consideration must be paid to the security, transparency, and social equity issues involved when a payment is intended for an individual, community, or group of recipients. In very small upland communities, sometimes a specific household has traditionally taken on the role of recording and distributing resources: for example, community members may gather at a specific house to weigh and sort grains, and prepare them for market. In mid-sized communities, management groups may have already established rules, records, and accurate lists of community members and their participation in community decision-making. This can also facilitate equity and representation in benefit sharing, which is particularly important in ensuring that women are included in decisions about and equitable distribution of benefits.

In the Himalayas, IES may pertain to compensation for the loss of an ecosystem service (for example when a hydropower structure displaces households). In these cases, benefit sharing or a system of distribution must be used. This may involve the creation of a new benefit-sharing entity, or the use of a system that has previously governed or distributed revenue for other purposes. Equity is an important issue in these cases, as conditions for payment distribution — to whom and how much — are often based on unquantified values and conditions. This can create perceptions of 'unfairness' or reinforce power dynamics between communities, governance, or corporate entities which may be undesirable in the long term.

Summary: From PES to IES for the Himalayas

Himalayan communities may be practising subsistence farming, they may have limited landholdings and limited infrastructure, ecosystem services may already be treated as a 'common good' resource, and there is often a high level of direct dependency on forest resources and other ecosystem services that are not replaceable by market-based goods. These create unique conditions for Payments for Ecosystem Services (PES) and affect the likelihood of PES success. As a consequence, a broader incentive-based mechanism for ecosystem services can often be more appropriate than purely market-based payment mechanisms. The following sections therefore focus on mountain-specific communities and cases where many of the above conditions apply.

Part II. Ingredients and 'Recipe' for IES

Basic process and ingredients

This section describes the 'recipe' used to combine the 'basic IES ingredients' to create a fully functioning IES system. First we present an overview of all the steps and the basic ingredients. Next we break down each of the steps, adding more specific information. We then describe in detail the flow between these steps, how to identify opportunities, ensure the involvement of relevant partners, create just and fair incentive schemes and ensure sustainability, and which potential pitfalls to be aware of.

10 steps to building an IES system

VISIONING PHASE

1. ENVISION
2. SCOPE
3. CONSULT
4. QUANTIFY
5. EVALUATE
6. CONVENE
7. NEGOTIATE
8. INITIATE
9. MONITOR
10. IMPROVE

ADAPT PHASE
VALUE PHASE
CREATE PHASE
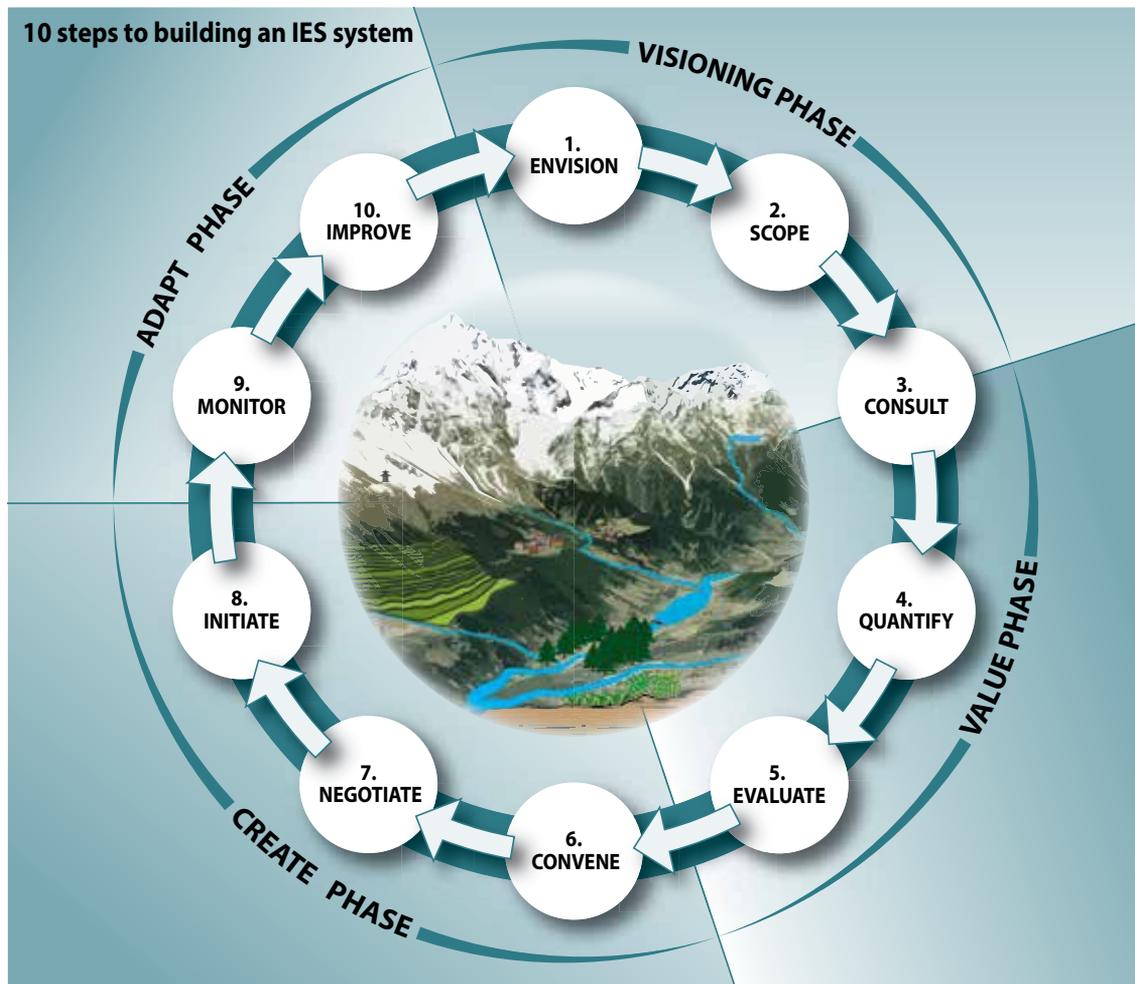
Figure 3. The 10 basic steps of designing and implementing an IES process.

Just as people often begin cooking by watching others in the kitchen, we advise readers to work with, observe and ask questions of those already working with IES systems in place (if they are available). 'Real-world experience' can provide much needed context to the steps that are outlined here. See 'References' at the back of this guide for some places to start.

Now, let's get cooking!

Just as chefs do a great deal of improvising and cookbooks are more orderly and formal, on-the-ground IES systems have a great deal of variety that do not always follow a specific form. Collaborators often start with what they have, and may modify, add and remove steps as needed to get an IES system going.

On-the-ground IES systems have a great deal of variety that do not always follow a specific form

The summary image above (Figure 3) provides a basic look at a '10 step process' to help you familiarize yourself with the steps to setting up and implementing an IES system. These steps cover everything from envisioning the basic concept at the outset, to determining what and who to include, to steps to bring people and information together, and steps to monitor progress and improve the system after it has been implemented. Each of these numbered steps will be covered in the following pages. It should be noted that the establishment of an IES system is not a one-time experiment but, as the circular diagram reflects, a process — an adaptive one, whereby for best results and system sustainability, each of the steps must be revisited and improvements implemented over time. Only through continuous improvement and adaptive management can IES systems produce the benefits they are capable of.

In real life, IES systems have many diverse forms of implementation. An IES system may not have all of the 'basic ingredients' listed below, but will follow the basic structure. The most crucial 'ingredients' are highlighted in bold, whereas the other ingredients can help an IES system function efficiently.

IES Basic ingredients

Crucial ingredients needed for an IES system:
- there is a clear demand for at least one ecosystem service that would be valuable to one or more 'consumers'
- the adoption of specific land-use/management practices has the potential to improve the provision of a threatened ecosystem service
- there is at least one 'producer' willing and able to provide this management service
- the IES contract pertains to a fixed scope and time period
- the IES system has the capacity to create a benefit that would not exist without the incentive (payment or other) being provided by the buyer and the resulting action by the seller

In addition, the following are strongly desirable attributes for an IES system:
- a trusted intermediary is available to assist both parties in designing the IES system, and in negotiating, monitoring, improving and transferring payment
- clear criteria and monitoring will ensure that both the producer and consumer uphold their end of the deal
- there is a mechanism for all affected parties to be consulted in an open and transparent dialogue
- there is a method to document and examine unintended consequences, including possible 'negative' impacts, of the incentive itself (see Part III on cautions)
- there is a mechanism to include under-represented or marginalized voices
- incentives will be distributed predictably and equitably to incentivize the desired land-management practice
- land tenure and usage rights are clear, and the timeline is well defined; and/or relevant communal land management or benefit distribution is transparent and deemed most effective
- there is coherence between existing policies/laws and IES requirements.

Step 1. Envisioning

It may sound clichéd, but envisioning the success of a project is the first step to bringing it to reality. This step is often overlooked, but is crucially important. First, because an ability to describe a project in real, vivid and motivational terms will help draw other interested people and collaborators to it. If people cannot imagine an alternate future, they are very unlikely to participate or to invest real time and effort when needed.

Second, the ability to plan a successful IES system relies on the ability to recognize an opportunity with respect to ecosystem services — a gap between the 'business as usual' scenario, and an alternate, more desirable path — especially an ambitious one. Envisioning the desired outcome of an IES system requires describing in specific terms the improvements in ecosystem services, and their benefits and beneficiaries.

IES often joins together positive environment/development solutions in situations where improving the environment may have formerly been seen as in opposition to human development goals. The ability to vividly and specifically describe these win-win solutions can help attract the necessary energy, cooperation and resources to an IES system.

① ② ③ ④ ⑤ ⑥ ⑦ ⑧ ⑨ ⑩

Step 1: Envisioning the desired outcome
- Define specific improvement in ecosystem services
- Define specific improvement in livelihoods
- Describe business as usual scenario and the desired change

Step 2. Scoping

The scoping step is the time to look all around for potential opportunities, resources, partners and obstacles.

This step must identify one or more 'saleable' ecosystem services, many ecosystem service attributes and the affected parties. For an ecosystem service to be 'saleable', the demand for it must be higher than its supply. Furthermore, a more specific and comprehensive estimation of what the system will look like once the IES is in place is needed. For example, if an IES for water supply is to be developed, an understanding of water supply and demand is essential. This could include the number of households consuming water from the possible schemes, their existing payment mechanism or tariff, and current and alternative sources of water.

This step also scopes out the possible management interventions and ecological responses that could occur. For example, if there are any alternative innovations to conserve water, increase water availability or more efficiently distribute water, or if there are any specific interventions that are needed upstream (outside the payment or incentive proposal), this should also be covered in the scoping phase.

Since IES is designed to improve livelihoods, it is natural to focus on the 'producers or managers' of the ecosystem service. However, it is recommended that this phase focus more time and resources on

accurately identifying 'consumers' who have an existing willingness to pay or provide other incentives. This is because the number of possible producers is often relatively large and comparatively easy to identify. What is the level of "demand" of the service requesting group? Can the ecosystem support this level of demand? Additionally, it is important to recognize where consumers' willingness to pay may be low (e.g. due to poverty), but where demand for a service is high; in such cases, a pure market-based mechanism is unlikely to succeed, but other consumer-provided incentives should be explored.

Thus, an important topic for scoping is the range of incentive options and arrangements that are attractive to the producer(s) of ecosystem services. What progress can be made on diversification of income, sustainable development and biodiversity goals, and community resilience to climate change? Who are the affected parties (directly and indirectly)? Which relevant management institutions could help provide trust, transparency and structure (or do these not exist?)? What might be some possible unintended consequences of each proposed payment alternative?

Lastly, it is important to identify existing institutional and technical capacity, as well as relevant knowledge, cases and studies. It takes a village, as they say, to implement an IES system. Numerous practitioners, professionals and institutions are therefore consulted throughout the process, and any new IES system will do best not to 'reinvent the wheel', but to be constructed productively, using existing institutional knowledge, processes and resources, and filling gaps. An important element of scoping is therefore to assess the work in a land tenure context, including existing legal frameworks and policies. If existing rules governing sale and transaction exist, these must be accounted for. There is often a broad range of expertise and experience within institutions (both local management such as forestry services, and distant such as environmental non-governmental organizations (NGOs) with field components), some of which can serve as a sounding board, provide resources and bring momentum to the project as a whole.

Step 2: Scoping the 'whole system'

- Examine possibilities (land or management actions, existing capacities, range of payment or other incentive options)
- Identify a transactionable (quantifiable) ecosystem service
- Identify prospective consumers and producers
- Identify possible affected parties and values, especially those at a distance or under-represented
- Begin to explore possible unintended consequences
- Gather information on existing IES capacity, familiarity, cases, resources, ecosystem services (ES) values and valuation studies

Step 3. Consulting

Beyond general scoping, in any IES system, it is important to identify and consult with key stakeholders, including specific producers and consumers of ecosystem service(s).

Stakeholders include:
1) producers or those who are conserving ecosystem services (the "seller")
2) consumers or those who are using the particular ecosystem service(s) (the "buyer")

3) subsidiary organizations that have a role in facilitating IES systems, such as local NGOs and local government
4) any other organizations that have a stake in IES schemes, such as research or academic institutions, and
5) anyone else potentially affected by the system.
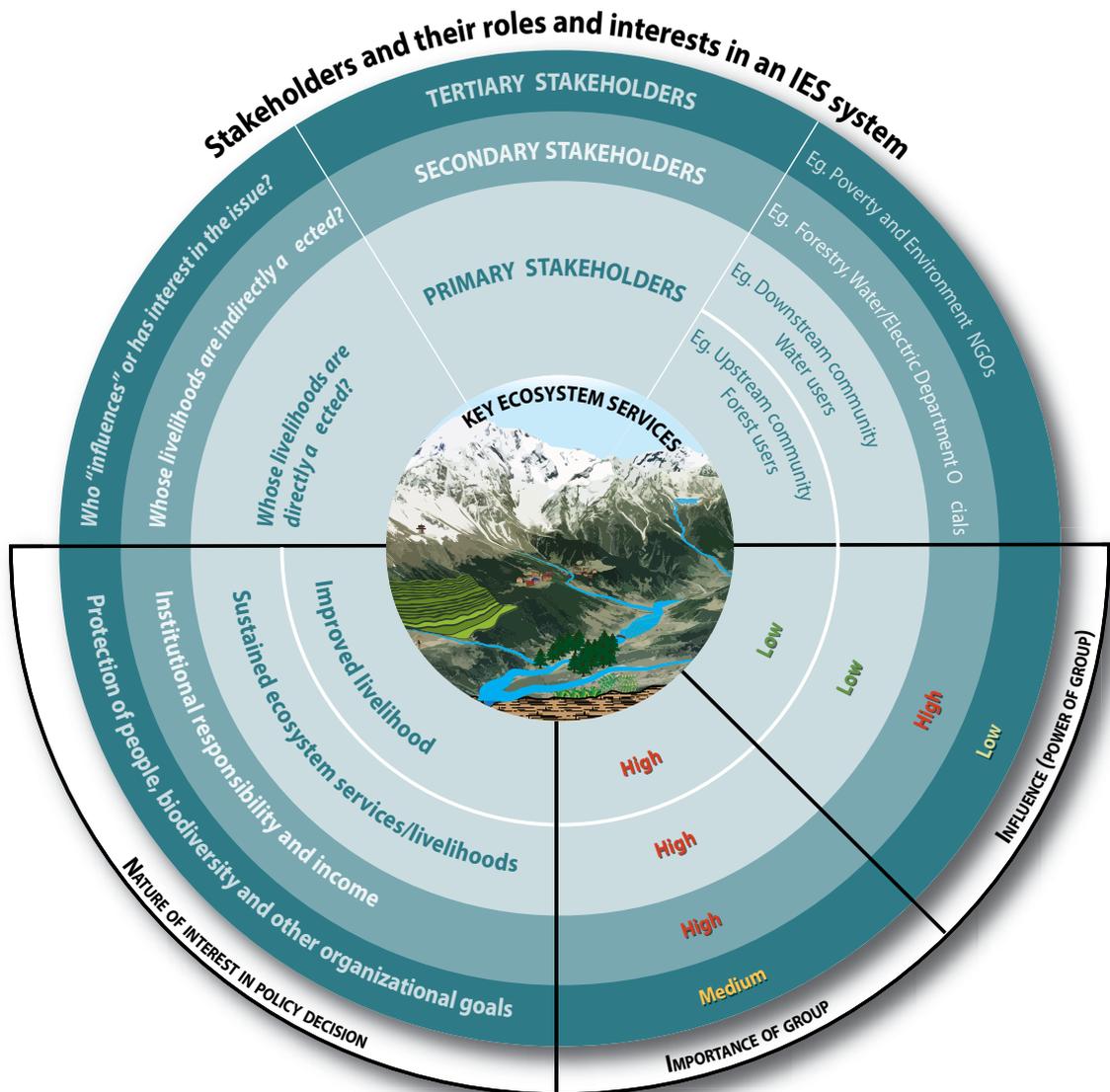
Figure 4. Identifying key stakeholders for an IES system (adopted from the Sustainable Livelihoods Framework, IFAD).

In this step, it is important to understand the motivations, limitations and needs of each stakeholder group. This may occur through discussions with key informants, analysis of existing documents, and research on policy and tenure rights. Consultation may be time-intensive and therefore costly. However, taking the time to travel to or access under-represented groups is extremely important because small changes to the way upstream inhabitants live can have large implications for them — particularly as many in the Himalayas interact directly with ecosystem services. Likewise, an accurate understanding of views and attitudes downstream can be gained through consultation. This is important because many downstream may not otherwise connect the ecosystem services they receive with their origins upstream, or take them for granted, which ultimately undermines consumer willingness to pay.

Prior to the point when IES systems are proposed, a clear understanding of the existing history and power dynamics between stakeholders is also necessary. In addition, understanding the existing institutions and their mandates can help to specify their possible role in making IES systems operational.

There are a number of tools available to analyse stakeholders, with several examples provided in the text box below. Identifying a broad range of diverse stakeholders can often lead to more resilient and inclusive payment proposals and agreements. Indeed, the great diversity of skills required to think through an IES system is never held by one person — it requires many.

Community consultations can help move from 'theoretical' ecosystem service producers and consumers, to insights about specific and real individuals and groups. Community consultations can also help validate questions of reliability, transparency and inclusiveness.

Inclusiveness is one of the most important issues to cover during the consulting step, including accounting for social and caste systems and the traditional versus desired role of women and gender in representation and decision-making. Inclusiveness is also critical to supporting any equitable benefit-sharing mechanisms.

| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |

Step 3: Consulting

- Be aware of power dynamics between stakeholders and establish 'neutral territory' for consultation
- Establish transparent and regular consultation with buyers and sellers
- Reach out to under-represented and marginalized stakeholders
- Investigate those who may experience secondary impacts
- Consult with relevant governing and management entities local to regional scales

Step 4. Quantifying

While a rapid assessment can identify possible upstream and downstream linkages, the quantifying step is to understand which specific upstream activities are impacting the flow of ecosystem services downstream, and which specific actions can be taken to improve the situation, and at what rate.

To inform these dynamics, advanced understanding of the drivers of ecosystem change (scientific information) may be paired with local information (for example, community consultation) on the range of possible activities and impacts.

A crucial question is whether it is feasible for the proposed management activity to be undertaken by the ecosystem service producers or ecosystem managers that have already been identified. How will goals be set?

How will results be documented? Who will participate? How many households will be affected and in what ways?

Ultimately, the willingness to pay or provide other forms of incentives for an ecosystem service, and the willingness to provide it, rests on proof that the management action 'works' and is being performed to the agreed standard. In this step it is important to specify place, time, duration, and the specific management action or actions being considered.

In many cases, it is important to quantify the causal relationship between upstream action and downstream ecosystem service quality. Tools may include:

- GIS based land-use/land-change map analysis
- Participatory community mapping
- Focus Group Discussions
- Direct observation
- Stakeholders analysis/actor constellation
- Statistical estimation of quantified ecosystem service production and change
- Scientific estimation of how different land covers affect ecosystem service provision
- Lessons learned from other cases

1 2 3 **4** 5 6 7 8 9 10

Step 4: Quantifying

- Quantify existing ecosystem service flows
- Quantify management impact on ecosystem service, over specific areas and time
- Assess possible costs of 'transaction' (to formalize, mobilize or secure payments or other incentives)

Step 5. Evaluating

This step evaluates the value of the service for producers and consumers, as well as evaluating aspects such as transaction costs that must also be accounted for when setting up an IES system.

Values can be explored and evaluated using a range of methods and techniques. Evaluation involves considering both tangible and intangible values; whereas tangible benefits can more easily be valued in monetary terms, the non-tangible value of nature is more difficult to assess, making it difficult to account for its loss. An added complication is that in many rural Himalayan communities that may not often use currency, or much of it, applying common (Western) valuation techniques may be misplaced. An alternate, labour-based incentive to manage upstream ecosystems may therefore be more useful in quantifying the value of ecosystem services than a cash-based quantification.

That said, regardless of the situation, if an IES system is to proceed using an in-kind payment, cash payment or any other incentive, then the ecosystem service consumers' willingness to pay must be established, relative to the producers' willingness to provide a given quantity of that good, service or action over a given time.

There are different pieces of information that can help producers and consumers evaluate their position, relative to both the service and to their counterpart in negotiation. Sometimes, existing studies or cases can be used, to transfer a value from another example and thus facilitate discussion. In other cases, professional valuation consultation or study may be necessary. Individuals may state (describe) their values or preferences, or they may reveal them through their behaviour.

The many methods and forms of valuation are beyond the scope of this publication. For the purposes of the agreement, the key is that both the consumer and producer agree on a "price" or other form of payment. This must be more or less congruent with an "international standard" for the payment and type of work involved, rather than just a local agreement without further knowledge of which values are being transacted in different areas. In some cases, specific valuation studies can be commissioned, which can bring to light values and willingness to pay. This kind of exercise can help managers set payment tariffs, as well as help identify new groups of beneficiaries and willingness to pay that may remain otherwise unknown and undervalued.

Whatever the case, the most efficient solution will produce the desired result at the lowest cost. This 'lowest cost' must also account for the transaction cost (to verify, stabilize, document or make transparent) the IES system, across all possible management, participation and payment options.

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Step 5: Evaluating
- Evaluate costs and benefits of management and payment options (direct vs. indirect, individual vs. communal)
- Conduct specific research on the value of the ecosystem service; compare it with other values and ranges (locally, nationally, internationally)
- It is typical and most often necessary to seek professional assistance to establish market value

Step 6. Convening

The place, time and circumstances of IES brainstorming, exploration, negotiation and execution are an important and often overlooked element of IES planning. It should be as transparent, clear and inclusive as possible in order to encourage fair power dynamics and representation among all concerned parties.

An important part of convening is careful examination of who is involved in providing the service in question, and who will benefit from the payments or other incentives. Are they all at the table, and if not, how can they be brought in? Proper convening must account for rights, legislation and conflicts. It must also address logistical considerations such as tradition, expectation, and practice for setting up meetings and agreements, as well as inviting and paying proper respect to the relevant parties.

Community consultation and convening needs to be well prepared in advance, providing a discussion agenda. An effective approach can be to convene first: upstream or producer groups, second: downstream or consumer groups, and third: both upstream/producer and downstream/consumer groups together. It is important to note that not all IES systems are vertical (upstream-downstream); they can also be horizontal. In horizontal IES systems, proper identification of producers and consumers may be more complicated. As noted in Part I of this publication, in some cases in the Himalayan context,

state authorities can themselves be consumers or buyers on behalf of the general public.

Proper convening means initiating IES discussions and setting the stage for a path towards agreement. This involves establishing an environment in which all stakeholders are involved and heard, and experts are present at meetings to not only provide information but also to document stakeholder perceptions and understanding. Proper convening will also ensure that dominant partners do not over-run the conversation or set the terms of agreement, but that the process is as inclusive and equitable as possible.

IES projects often find that "no one can do everything, but everyone can do something". We intend this Cookbook to help maximize familiarity and engagement across all skill sets, backgrounds and perspectives. The more familiar the 'champions' are, the more they can reach out to, and gain feedback from, community members with valuable insight, and organizational and leadership abilities. The inclusivity of the approach is especially important in communities where few have formal preparatory backgrounds.

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Step 6: Convening

- Identify feasible and transparent means of consultation and face-to-face meetings
- Establish current status, participation, perception, and power dynamics among participants
- Explore together the impact of actions over time
- Explore unintended consequences, and ask "Who is not at the table?"

Step 7. Negotiating

Initiating negotiations between producers, consumers and intermediaries is not a trivial matter. It involves identifying and resolving technical issues, understanding land rights, resource rights, and beneficiary issues, as well as balancing information and power disparities among individuals at the table.

A critical step in designing an IES system is negotiation between producers (resources managers) and consumers (resources users). Negotiations may be lengthier and involve consideration of a much broader range of information than one might expect, including community structure, customary practices, state of identified ecosystem services and their needs, role of subsidiary or facilitating organizations, and presence or absence of local leadership. During negotiation, the facilitating organization needs to carefully identify key issues, demand and supply scenarios, possible willingness to pay from consumers, as well as local policies and legislative instruments if they exist.

A third party takes an impartial role in supporting the negotiations. This party may also become an independent monitor of the performance of IES systems. Representatives from local government and research or academic institutions may be best placed to carry out such monitoring, and resolve conflicts should they arise.

During negotiations, it is important to discuss and agree on the roles and responsibilities of both producers and consumers of identified ecosystem service(s). Consumers of ecosystem services may be unwilling to pay if upstream communities or producers are not, or are insufficiently, providing the ecosystem services upon which parties agreed.

Strong negotiation skills may be needed to bring producers and consumers to a point of agreement. Beyond negotiation between these two groups, negotiation within them may also be necessary, for example in establishing and coming to agreement on benefit-sharing mechanisms. Experiences in the Himalayas indicate that poorly planned benefit-sharing mechanisms can at times create conflict relating to perceptions of equity, rights, inclusiveness and fairness. This is a particular risk when ecosystem services are being managed as common property, or if there is perception of payments and funds in the past having been managed unfairly/inefficiently. Benefit-sharing plans must therefore pay particular attention to the administrating institution (who will consumers pay?), the recipients (who will be paid and what specific actions qualify them for payment?), safeguards in place to monitor impact and verification of participation over time, the specific individuals and entities that handle the revenue and accounting (and how transparent this is), and also how grievances or feedback can be addressed, and how long improvement cycles should be.

Linking with local government plans/conservation/district plans is another important consideration of the negotiation step. Local government and line agencies play a crucial role in successful IES systems, as many ecosystem services in the Himalayas are considered as common property. In most cases, local government also has its own operational plans, frequently with a year (short) and five-year (medium) terms. The IES system needs to be in line with these plans, which also support long-term management of ecosystems and the services they generate.

It is also important in the negotiation phase to examine local plans to see if there are any similar provisions to incentivize producers of the identified ecosystem services. In some cases, local government could be the buyer of ecosystem services (such as municipal water supply), in which case these provisions would need to be streamlined within local government plans. On the other hand, it could be that the IES system under consideration is already redundant.

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Step 7: Negotiating

- Initiate negotiations between producers, consumers and intermediaries
- Establish willingness to pay/willingness to accept
- Specify concrete and well-defined management actions and quantified goals for the ecosystem service
- Identify and resolve technical, land-right and beneficiary issues
- Consider pro-poor financing and benefit sharing
- Control for power dynamics when needed
- Establish verification and reporting requirements, as well as consequences for unfulfilled agreements

Step 8. Initiating IES

This step involves formalizing arrangements and initiating management and payment schemes. This can often be the 'make-or-break' moment for IES systems, particularly as concerns and barriers may arise at the last moment.

Transparency and clarity are important to IES initiation. A formal agreement between producers and consumers of identified ecosystem services will act as the legal document for an agreed geographic scope, number of participants and period of time. The formal agreement should include 1) the rationale and background 2) identification of all stakeholders and their roles 3) identification of the specific producers and consumers and their roles 4) agreed payment or other incentive mechanism 5) monitoring provisions 6) agreed ecosystem service supply 7) legislative instrument(s) supporting this agreement, 8) conditions if both parties are not performing as expected 9) third party monitoring mechanism(s) 10) time-bound measures 11) possible benefit-sharing mechanisms.

There is no standard format for the formal agreement at this point. Agreements from other areas can be modified, or a new agreement can be made and signed in accordance with local needs and context. The formal agreement needs to be signed by both parties with witnesses, and care must be taken to ensure that those signing have the authority to commit to the agreements. A copy of the formal agreements should also be made available to the local authorities, resource managers and facilitating organization well in advance of the initiation, in order to include and incorporate feedback including legality, policy and jurisdiction issues, and to address any unforeseen details.

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Step 8: Initiate IES
- Formalize arrangements, verify policy and legal context
- Initiate management and incentive scheme

Step 9. Monitoring

Willingness to pay for ecosystem services relies on the fact that the payment or other incentive system is producing the intended benefit. Monitoring must be pre-agreed (before the signature phase) and document a baseline as well as management change impacts at regular and pre-agreed intervals.

Monitoring also provides an important opportunity for follow-up: is the ecosystem able to support the service? How satisfied are producers and consumers of the IES system, and are adjustments needed? Are the producers still committed to providing the service? Have there been any unforeseen changes in land tenure or property rights that affect the IES system and payments?

Strong and transparent monitoring can reinforce the credibility, assurance and sustainability of the IES system. In addition, continuous monitoring through a third party monitoring mechanism can be important to gauge the very long-term sustainability and effectiveness of the IES system.

Generally, assessment will also include suggestions for modifying, continuing or renewing the IES system. This can include suggested revisions, new forms or terms of payment or other incentives, new goals for the targeted ecosystem services, and incorporating or changing ecosystem service producers and consumers.

Aspects to consider while monitoring

- Is the agreed review time too long, too short, not frequent enough?
- If upstream partners are not conducting or complying with monitoring, are they aware that buyers may lose the incentive to keep paying?
- What does the performance/monitoring mechanism measure specifically (geography, time, unit measurement)?
- Are there 'free riders', or is the benefit exceeding the rate of payment?
- Has the future outlook for downstream needs been incorporated into planning?

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Step 9: Monitoring
- Observe system for unintended consequences
- Verify that management action and payment is occurring

Step 10. Improving

This step is crucial to creating sustainable, resilient IES systems that have enduring impacts. Actions that are taken to identify, rectify or resolve unintended consequences can be crucial to building trust in host communities, and when conflicts around IES arise, they must be quickly neutralized and addressed. Regular consultation and community participation in the improvement process itself to generate solutions can often go a long way to rebuilding goodwill.

Far from being a one-off action, the IES system must respond to adaptive management, and improve over time. Participation from all counterparts and also newly identified, peripheral or marginalized stakeholders is an important part of the improvement process. Furthermore, benefit sharing with other interested parties, watersheds, communities, and governance forums is a crucial component in IES experimentation and learning.

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Step 10: Improving

- Address unintended consequences, seek additional input
- Share learnings from cases
- Scale up action, expand or include more participation

Part III. Cautions

Addressing unintended consequences

Designers and implementers of IES systems are obligated to monitor all affected parties and verify whether the intended outcome is being produced.

This also explicitly includes attention for the emergence of unintended consequences (and sometimes benefits). The nature of these changes should be incorporated into the adaptive management strategy, to improve the system over time.

Unintended consequences can take many forms: social, environmental and distributional. Social impacts are the consequences that alter how people live, work, play, relate to one another, organize to meet their needs and generally cope as a society (IGCP, 1994). They include cultural impacts, including changes to norms, values and beliefs and therefore relationships, agreements and power distribution. Examples include labour rights, gender equity, access to education, health and sanitation, and cultural identity (Richards and Panfil, 2010).

Unintended environmental consequences can occur when pressure to improve one part of the system results in the deterioration of another part of the system.

Distributional impacts can affect the power balance, peace and resilience of a community. Contributing factors can include how secure a community's livelihood is; whether deep differences in access to capital, loans and secure banking exist; whether there are large gender differences in access to resources, participation and empowerment to manage lands, finances or agreements; how resilient the community or households are to economic risk (for example for new businesses); whether buffers to broad systemic changes exist (petrol shortages, inflation etc.); and

differences in access to new technologies and integrated value chains (communication/cooperation with other producers) (Richards and Panfil, 2010). Sometimes actions can tip a longer-brewing disagreement into outright conflict, which may have negative impacts for the community.

Checklist for avoiding unintended consequences

- Systems analysis and mapping of land management/practice alternatives and drivers (If a change is made in one place, will it trigger an undesired change elsewhere?)
- Inclusive, deliberative, transparent and ongoing community consultation
- Is there social opposition/taboo/social tendency for the practices to remain the same, regardless of agreement or laws?
- Travel to and consultation with the more remote community members
- Have past agreements been upheld and their integrity maintained?
- Examination of gender participation, actions for inclusion and distributing benefits
- Understanding how finances or other incentives are 'usually' handled, documented and distributed. Are all users satisfied, do they trust the system?
- In rural/remote areas are some groups or households better represented/participating more and what is the consequence of this?

Case studies

Rupa Lake Watershed

Kulekhani Watershed

Palampur Municipality

Gilgit-Baltistan

Dhulikhel

TAJIKISTAN

AMUDARYA

TARIM

Kabul

Islamabad

AFGHANISTAN

PAKISTAN

INDUS

Indus

NEPAL

BRAHMAPUTRA

New Delhi

Kathmandu

BHUTAN

Brahmaputra

Ganges

GANGES

BANGLADESH

Dhaka

Hindu Kush Himalayas

Major river basins

INDIA

Khayarkh Watershed

Elevation

— 6 000 metres

— 3 000

— 1 000

— 0

Tarbela and Mangla dams

Chitwan National Park

MYA

Figure 5. Case study locations.

Part IV. Cases

The previous sections have introduced the concept of Incentives for Ecosystem Services (IES), described how to set up and initiate a successful IES system, and hinted at the need for caution. Indeed, IES systems have been initiated around the world with varying degrees of success, including in the Himalayan region. In the following section we highlight several existing examples of IES in Nepal, Pakistan, India and China.

The cases cover water management, forest management, and tourism, recreation and hunting. Each case describes the main message, the setting, the service, payment or other incentive, the actors involved, and which steps went well or could be improved in the IES system. These cases provide a variety of examples and approaches to setting up an IES system and underscore that establishing such a system is never a challenge to be taken lightly. IES systems involve long-term collaboration and involvement. Over time, IES systems can be improved, expanded and applied to other places to deepen their impact and ensure ecosystem service benefits continue to flow in perpetuity.

Case 1: Hydropower – Kulekhani watershed, Nepal

Main message: In some cases, IES can partially compensate stakeholders for a prior ecosystem service loss, while facilitating inclusive opportunities for the future. An important step in establishing IES is to solicit input from all affected stakeholders, and evaluate all alternatives from long-term perspectives of equity and inclusiveness. It is of crucial importance to develop a system that separates the compensation payment for the loss of services from the payment for services being provided on a perpetual basis.

Setting: Kulekhani watershed in Makwanpur district is the source of water (and also a source of sediment siltation) for two hydropower plants, Kulekhani I (60 MW) and Kulekhani II (32 MW), which account for 45 per cent of Nepal's hydropower generation.[*] Many households were displaced when the dam for these hydropower plants was built.

Services, payment and beneficiaries: In this case, the buyers of the services are those who purchase hydropower, as the Nepal Electricity Authority (NEA) collects revenue from hydropower sales. The sellers of the services are considered a collective as NEA sends 12 per cent of the revenue to the Makwanpur District Development Committee (DDC) to distribute in payments to upstream communities in Kulekhani and Markhu Village Development Committees (VDCs). Numerous other VDCs (including those downstream) also receive part of the revenue. An Environmental Management Special Fund (EMSF), governed by a multi-stakeholder committee, helps determine which conservation and development programmes are to be funded.

Incentives compensate in part for village displacement and in part for projects that support environmental services (i.e. incentives for forest practices that reduce sediment flows into the river and hydropower plants, as well as avoided deforestation). Beneficiaries receive 1) compensation for the displacement and loss of prior ecosystem services and 2) monetary payment

*Kulekhani III (14MW) is under construction.

(from hydropower- and fish sales) for regulating services (actions that prevent sedimentation of the dam), and 3) payment in the form of conservation and development projects.

A second form of IES is realized when buyers purchase fish that has been farmed in the NEA-established fishery cooperative. The sellers in this case are the cooperative members, currently comprising 753 individuals and 28 permanent staff.

Lessons learned: Since the scheme is originally based on displacement, the beneficiaries are not necessarily voluntary participants in this programme. Upland people have some flexibility insofar as they may choose not to join the IES system and to use forests in a way that does not maximize environmental services. However, the law does not allow them to deforest the area completely. If these people decided jointly to commit to the IES agreement, individual households that did not comply would face pressure from the group. Makwanpur DDC has prepared EMSF guidelines, which stipulate that the funded projects should enhance or at least not diminish environmental services and that priority should be given to projects that benefit poor and disadvantaged groups (Huang et al., 2009).

Both upstream and downstream communities currently receive IES payments. However, while communities within the bounds of the current Kulekhani reservoir lost their lands (and therefore are in part being compensated for ecosystem service loss), upstream households are the ones involved in sediment

control activities, providing the action that would not occur without the incentive. Perceptions of 'fairness' regarding the distribution of revenue between upstream and downstream communities remain a source of confusion and ongoing tension for many stakeholders, with many downstream households viewing the current distribution of revenue as unfair compared with the consequences of displacement they bore. In 2015, this disagreement resulted in an additional (NPR 1million ~ US$ 10,000) payment to the Kulekhani VDC. Moreover, upstream communities supplying the sediment control service to the hydroelectric plants are not directly targeted by the revenue payments (Upadhyaya, 2003).

Possible improvements: The scheme has strong points in terms of local involvement, communication and the monitoring schemes that are in place. However, substantial improvements could be made by more clearly associating the payment with quantified and verified services provided. For example, while some payments are distributed to upstream households, there are no specific actions that are known to be contributing to soil conservation, slope stabilization or erosion control.

One solution could be to earmark 50–60 per cent of the current payment from the electric company to the District Development Council for job creation and specific, measurable actions to prevent forest losses, replant deforested areas, and support other actions that reduce soil erosion. The Community Forest User Groups (CFUGs) could be useful intermediaries in this process, as they have proved to be reliable administrators and organizers of activities in IES programmes in other regions. In this way, the distribution of payments could be better targeted to the service providers, or extended to other downstream areas such as Rapti River (Chitwan National Park). Monitoring and enforcement could be decentralized to improve their alignment with regulations and standards. For example, communities could be empowered to prohibit bulldozers and mass sand/rock removal in erosion-prone areas. Study and monitoring of social-environmental conditions over time may help enhance actions that improve both ecosystem services and livelihoods over time. On the positive side, some actions are already being considered, such as the inclusion of high-value products (lemons, medicinal plants, mushrooms, vegetables etc.) in farming.

Case 2: Sustainable tourism – Chitwan National Park, Nepal

Main message: Tourism incentives offer many opportunities for ecosystem service producers and consumers, with implications for the protected areas, buffer areas, and the surrounding communities and economies. Often the producers under- or over-estimate the willingness of visitors to pay. Encouraging the service sector (hoteliers, tourist industry, etc.) and value added services from them can create a new paradigm of support for ecosystems and communities.

Setting: Chitwan National Park is the first national park in Nepal. Established in 1973, it is home to sizeable wildlife populations, including the tiger, and has the second largest population in the world of the Greater White Horned Rhino. The core area of Chitwan National Park, located in Chitwan District, covers 932 km2. An additional area of 750 km2 surrounding the park was declared a buffer zone in 1996. This buffer zone consists of forests (45 per cent). The remaining 55% is private lands, including cultivated lands (Silwal et al., 2016). There is a population of 223,260 in the municipalities in the buffer zone. The national park receives about 160,000 visitors per year (Table 1), 86 per cent of whom are international tourists, indicating a potentially higher amount of revenues with value added services.

Services, payment and beneficiaries: As authorized by the (National) Buffer Zone Management Regulation mandate (1996), the government must pay 30–50 per cent of the total revenue generated from entry fees to the Buffer Zone Communities, although it is not clear how the 30 to 50 per cent values were determined. This revenue provision principally serves to preserve the cultural and aesthetic value of biodiversity.
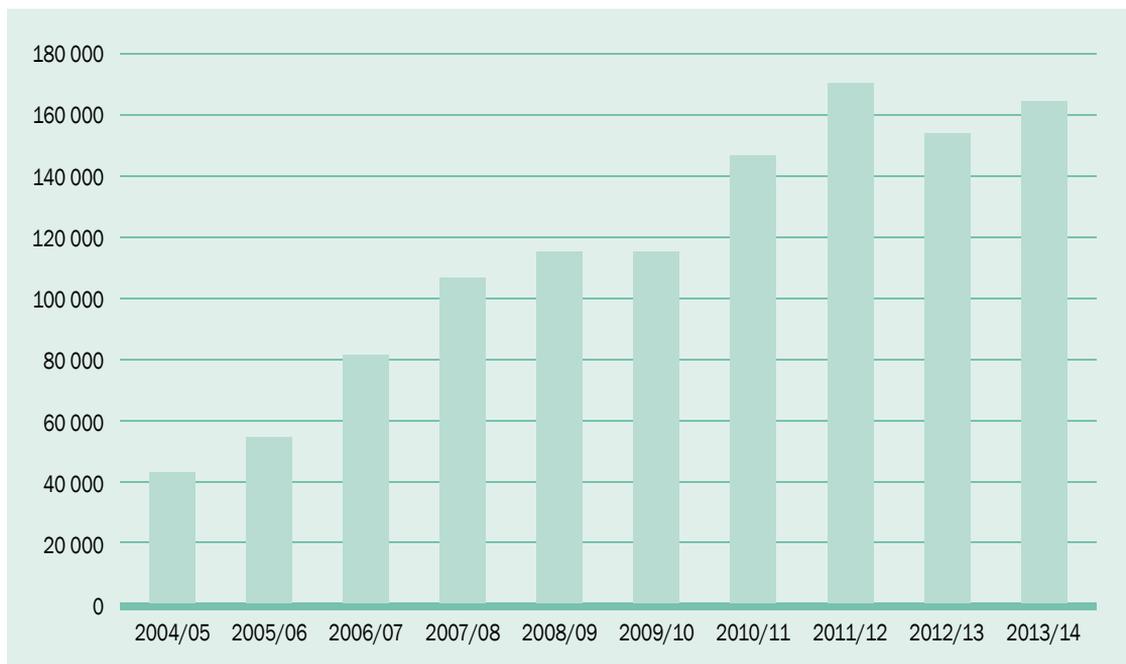
Table 1. Annual Tourist Arrivals to Chitwan National Park. Source: DNPWC Annual progress report, 2016)

The buyers of the service — tourists that pay a one-off, multiple-entry fee of NPR1500 to enter the park — are willing to pay for biodiversity. Astonishingly, the park entrance fee in Chitwan is about half that of other National Parks in Nepal. The seller of the service, the Chitwan National Park (CNP), is responsible for collecting tourist revenues and regards the local buffer zone residents' quality of life as a contributing factor in the existence of biodiversity. Therefore, payments are used to fund community development in the buffer zone, including skills development, income generating activities and other facility improvement activities that generate employment.

Besides the buyers and sellers, the Department of National Parks and Wildlife Conservation, the Nepal Trust for Nature Conservation and the District Forest Office assisted in community tree plantations in the 1990's.

The Buffer Zone Management Committees are highly involved and practice regular and transparent accounting procedures. They received 5.5 million NPR from the CNP in 2014 for monitoring. A Buffer Zone Management Regulation exists, as well as institutional support via existing laws and regulations. However, if payments are to be distributed differently, legal provisions will need to be established.

In addition to the biodiversity service being provided, there is a separate wildlife damage fund, which has been earmarked to compensate buffer zone residents in the event of crop depredation from park wildlife,

S.No.	Fiscal year	Annual budget (NPR)
1	2010/11	60,897,000
2	2011/12	44,343,000
3	2012/13	50,000,000
4	2013/14	200,000,000
5	2014/15	199,461,000
6	2015/16	150,000,000

Table 2. Annual funds disbursed from the Department of National Parks and Wildlife Conservation to buffer zone management. Source: Annual report of the Department of National Parks and Wildlife Conservation, 2016.

amounting to NPR 1.36 million per year. This incentive intends to maintain local community support for the park and its wildlife, despite crop losses.

Lessons learned: Momentum and community support for forest cover in the buffer zone has been sustained by building community participation in existing buffer zone forests. Handing over administration of these buffer forests to several communities appears to have created sufficient incentives for local cooperation (Silwal et al., 2016). Increased access to important resources and participation has led to a high perception of ownership of community forests (Jones, 2007). Among the most successful community-led initiatives is the Baghmara Community Forest, which has become a model of sustainable community forest conservation in Nepal, reclaiming and reforesting degraded, deforested and over-grazed land, and which now generates significant ecotourism revenue.

Possible improvements: Community provision of products and services in the tourism sector is not as integrated as it could be. Public-private partnerships and exploration with Buffer Zone Management Committees may help local communities provide more value added services in the tourism sector, such as local agriculture, cultural activities, and waste and water conservation efforts. These services can go beyond enhancing the benefits to tourists, to reduce the negative impacts of the tourism industry such as impacts of consumption, congestion, trail compaction, habitat damage and carbon emissions.

Hotel and tourism entrepreneurs consider themselves direct beneficiaries of the wildlife and scenic beauty of CNP and have expressed their willingness to pay an additional tax, as well as voluntary investments.[*] In addition, park entry fees for Chitwan are far lower than those for other national parks, and international entrance fees are several times lower than economists' willingness to pay estimate. These proposals are most likely to succeed and generate the most revenue if specific plans and actions can show the tourists and providers the impact of their conservation funds. Current proposals include installing solar light sources inside the park and constructing an inner-park wildlife viewing tower.

*Opinions generated through informal discussions with these groups.

Case 3: Carbon Sequestration – Khayarkhola watershed, Chitwan District, Nepal

Main message: In spite of a successful history of community forestry, deforestation continues to be a threat in the Himalayas, and active experimentation in stakeholder involvement and best practices to support livelihood is under way. Community-based REDD+ Pilot Programmes in Nepal offer specific cases that underline the focus of international priorities to experiment with REDD+ approaches, while simultaneously accounting for local priorities via stakeholder suggestions. Such cases provide evidence that positive change can be made over short time periods.

Setting: In Nepal, a national REDD+ demonstration project of sustainable forest management is being piloted in three geographical regions: the Khayarkhola watershed of Chitwan, Ludikhola watershed of Gorkha and Charnawati watershed of Dolakha Districts. A total of 10,266 ha of tropical to temperate landscapes are managed by 105 Community Forestry User Groups (CFUGs) (ANSAB, n.d. a), with 18,005 households participating. In Khayarkhola watershed, the pilot site covers an area of 23.81 km2 with an altitude ranging from 245 metres to 1,944 metres. There are 16 CFUGs and 3,935 households in the Khayarkhola pilot site.

Services, payment and beneficiaries: The International Centre for Integrated Mountain Development (ICIMOD) developed the project in collaboration with the Asia Network for Sustainable Agriculture and Bioresources (ANSAB), the Federation of Community Forestry Users, Nepal (FECOFUN) and local CFUGs. Community forests that were subject to local extractive use (wood, fodder and forage). In particular, Shorea robusta trees were being sold at a reduced rate of NPR 6,000 per cubic feet to local users, and forests were facing pressure due to in-migration, leading to increasing demand of wood for cooking.

A Forest Carbon Trust Fund (FCTF) seed grant (US$ 100,000 per year for 2011–2013) through the Climate and Forest Initiative of the Norwegian Agency for Development Cooperation (NORAD) was established to offer performance-based financial incentives to local communities for conserving forests, preventing deforestation and enhancing carbon reserves (Maraseni et al., 2014).

REDD+ payments were allocated to local communities based on four criteria:
1. the quantity of forest carbon saved above the baseline
2. the number of households of indigenous peoples and minority groups
3. the ratio of men to women, and
4. the number of poor households within the project area.

CFUGs require a step-by-step process in order to access awards (ICIMOD, 2012). Through the scheme, CFUGs in the Kayarkhola watershed sequestered slightly more than 2.5 million tons of carbon in 2011, which represented an increase in 12,087 tons compared to 2010. In total, the watershed was awarded US$ 21,905 (ANSAB, n.d. b).

The FCTF transferred funds to Community Forest User Groups involved in the pilot project: Shree Janapragati CFUG, Pragati CFUG and Samfrang CFUG. Funds can be used for community forest management activities, livelihood-improvement activities, or group-strengthening activities such as capacity-building, awareness-raising and carbon monitoring. Through consensus, a CFUG may also decide to give a portion of the seed grant money to the poorest households in their community. For example, Janapragati CFUG used its grant mainly for poor and Dalit people, including house building, and a "Paada-paadi" (goat farming programme) was also initiated. A small portion of community forests inside the CFUG was
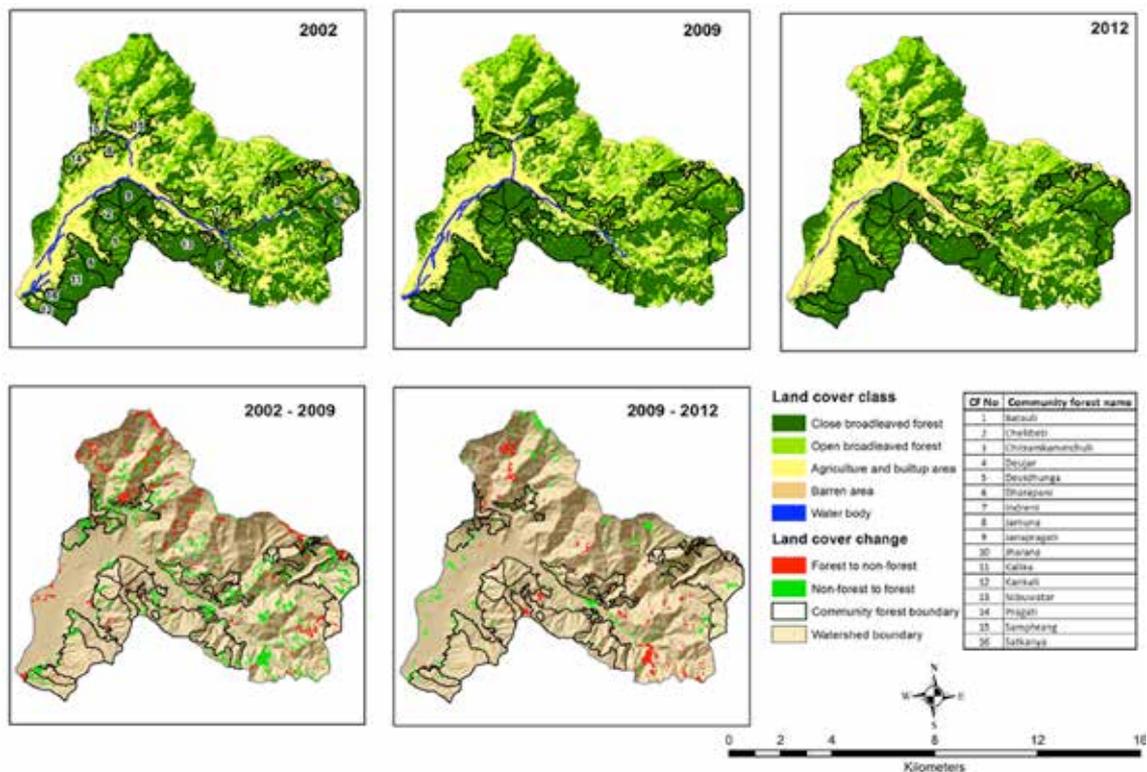

Figure 6. Land cover in the Khayarkhola watershed for 2002, 2009 and 2012 (top row, left to right) and changes in land cover for two periods, 2002-2009 and 2009-2012 (bottom row). Source: (Gilani et al., 2015)

leased for cultivation, and 25 per cent of the budget was allocated for income generating activities and separate pasture land.

At the CFUGs' request, in some cases the FCTF also provided NPR 5,000-10,000 per household to purchase biomass briquetting presses, improved cooking stoves and biogas installations, to reduce the pressure on wood resources. Many CFUG members in the watershed area were aware that the money given by REDD was intended to incentivize forest conservation.

Regarding monitoring and verification of this pilot, FECOFUN and ANSAB collected baseline data on forest carbon and the economic status of the community. Sixteen females and 93 males from within the Kayarkhola watershed were involved in the forest carbon measurement survey. The project was closely monitored by the Nepal Federation of Indigenous Nationalities (Janajati Mahasangh), the Forest Carbon Trust Fund Advisory Committee, the Ministry of Forests and Soil Conservation, the REDD Forestry and Climate Change Cell, the Himalayan Grassroots Women's Natural Resource Management Association, ICIMOD, FECOFUN, ANSAB and the REDD networks from the three watershed sites.

At the same time as REDD, an additional women's empowerment programme was initiated, and participation was high. Both male and female heads of households were recorded as participants, which reportedly had a positive impact on the representation and visibility of women.

Lessons learned: This project incentivized local communities' efforts to increase their forest carbon stock, with payments based on the following indicators in the pilot: a) total increase in carbon stock, and b) socioeconomics and institutional arrangement. Despite some challenges, the project has shown the capability of local communities to monitor carbon in their forests, make verifiable claims for REDD+ carbon payments, and manage a benefit-sharing mechanism in a fair, equitable and transparent manner (ICIMOD, 2012). There is also evidence that the REDD+ pilot had a positive effect on forests and carbon: even within the short time frame of this pilot study, an increase in forest cover after the REDD project was observed through remote sensing imaging. Table 3 below shows the status of the forest cover after the payments ended compared with the period before.

Possible improvements: Led by the community, the project could be more comprehensive, in particular for women, and include more biogas constructions, scholarships, education and health camps. Long-term establishment of funding (beyond the seed grant) and long-term management plans and agreement would be desirable.

		Area (ha)	
	Land-cover class	**2002-2009**	**2009-2012**
Watershed	Forest to non-forest Non-forest to forest	250 531	140 168
Community forests	Forest to non-forest Non-forest to forest	25 180	1.1 33
Leasehold forests	Forest to non-forest Non-forest to forest	3.6 14	0.3 9.5

Table 3. Forest cover change in Khayarkhola watershed for two periods of time, (2002-2009 and 2009-2012). Source: Gilani et al., 2015.

Case 4: Clean water and recreation – Rupa Lake watershed, Nepal

Main message: Working with local networks and community groups can help establish diverse and strong support for holistic watershed management. Rupa Lake Restoration and Fishery Cooperative has actively targeted multiple ecosystem service offerings, and a wide variety of service providers. The resulting services are used by watershed inhabitants and lake visitors alike. This case proves that often overlooked ecosystem services, if managed and marketed well, can enhance resilience and health of the ecosystem, and even produce more services that can be pivotal in sustainably managing the ecosystem.

Setting: Rupa Lake is located approximately 16km from the touristic city of Pokhara, in the Lekhnath municipality of Kaski district at 600 metres above sea level. The watershed, extending over 30 km2 of steep slope comprising forest and arable land (Chaudhary et al., 2015), includes approximately 15,000 inhabitants and a total of 17 CFUGs (Kugel and Huseynli, 2013). Rupa Lake, its adjacent marshes area and the overall watershed are a hotspot for biodiversity, including wetland plants, reptiles, indigenous fish, and more than 150 species of birds and ducks (Regmi et al., 2009; Kafle et al., 2008).

The lake was traditionally an open-access resource used by only a small population of Jalahari (fisher folk) households. By the 1990s, sediment loads increased due to unregulated stone mining, road construction, overgrazing and deforestation resulting in landslides

(Chaudhary et al., 2015). This sediment resulted in the Rupa Lake area shrinking from 127 hectares in 1958 to 107 hectares in 1996. Sediments, nutrient levels from agriculture, and upstream effluent had also started to impact fishery users.

In 2000, the Rupa Lake Rehabilitation and Fisheries Cooperative (RLRFC) was created by two community organizations and representatives of both upstream and downstream communities to provide incentives to communities to conserve the catchment. The RLRFC also manages fishery sales on behalf of the cooperative members, including establishing a fixed price for the fish at market. Collective management has resulted in

a rise in annual net profits and fish catches between 2002 and 2013 (Chaudhary et al., 2015).

Services, incentives and beneficiaries: Since 2008, the cooperative has also focused on setting aside 25 per cent of its annual net profit to Payments for Watershed Services (PWS). The watershed (environmental) services were incentivized based on negotiations between the RLRFC and upstream communities, as per their earlier Constitution. As the buyer (beneficiary) of these services, the RLRFC benefits from the provisioning of clean water for the fish farming operations in the lake. A secondary service provided by the lake is recreational. For example, the Chayanpur community

Groups or individuals supported (no.)	Activities performed	Support in cash NPR in 2013 (US$)
Mothers groups (6)	• Preservation of indigenous plant species in the watershed • Management of wetlands surrounding Rupa Lake • Awareness-raising on biodiversity conservation • Hands-on organic training • Low-tech and high-reward income generating activities	45,000 (500)
CFUGs (17)	• Protection of natural forest for healthy watershed • Bioengineering activities to stabilize active landslides • Afforestation of degraded lands • Protection from forest fire	50,000 (556)
Schools (19) Students (52)	• Awareness-raising on the importance of wetland biodiversity • Education on the importance of ecotourism in the area • General information on the consequences of climate change • Essay competition on local and global environmental issues • Scholarship support to the children of economically marginalized members of the community, such as Jalahari	25,000 (278) 26,000 (289)
Youth clubs (5)	• Community development through engaging youth • Skills training on income generating activities such as bee keeping • Training on the value of biodiversity conservation • Hands-on training on home gardening	4000 (44)
Total investment NPR (US$)		**150,000 (1667)**

Table 4. Activities conducted by the collaborators supported by the Rupa Lake Restoration and Fishery Cooperative Ltd. Adapted from Chaudhary et al., 2015.

forest and parts of the Pachvaiya community forest in the north were proposed as sites for the establishment of a natural zoo.

The sellers of the services are the 753 RLRFC shareholders living within the watershed area. Direct payments are made to a number of groups in the watershed, including mothers' groups, CFUGs, schools and youth clubs (see table).

Lessons learned: Management action has resulted in additional services besides the targeted ecosystem services. For example, water weeds provide supplementary food for the farmed fish. Jalahari or indigenous fishermen have maintained their livelihoods through cooperative fish management and also coordinated weed-cleaning activities for the lake. Maintaining nurseries of native fish species provides income diversification and food resilience for local communities in the long term, while increased community support for management of the area can support further conservation activities.

Possible improvements: Promotion of alternative energy, preferably bioenergy, could help manage the lake more sustainably at a lower cost. Protection of the forest is necessary, but not sufficient to protect the lake. Intense pressures remain including encroachment, non-point source pollution and the regular deposition of silt from large upstream areas, while siltation and invasive weed species are considered a major problem in Rupa Lake. Using invasive species to generate bioenergy will not only control these unwanted species, but will also probably provide a sustainable solution to the problem. Some green foot trails have been constructed with Reed plant (Phragmites karka), broom grass (Thysanolaena maxima) and bottle brush (Callistemon viminalis) to improve the access of some local communities to markets, and this network could be extended.

Case 5: Drinking water supply – Dhulikhel, Nepal

Main message: In rural Himalayan areas, where infrastructure is not adequate to facilitate direct payments to individual landowners, community groups can play a vital role in receiving and distributing financial and in-kind payments. As many communities are involved, care must be taken to ensure that promised payments are made to the service providers, and that they have the tools and conditions to prevent resource degradation. Otherwise, even a well-established IES system can run into various risks.

Setting: Dhulikhel municipality is located in the Kavre district of Nepal and has a population of 16,263 (in 2011). The municipality has a high and growing demand for drinking water due to the expansion of tourism services, infrastructure development and rapid urbanization. Securing drinking water has been a key challenge for Dhulikhel because the municipality lacks high mountain ranges that could supply water. To address this problem, the Dhulikhel drinking water supply scheme was set up, which is the only urban water supply system that is managed by users in Nepal (Bhatta et al., 2014).

The first step of this scheme was the laying of a 14km pipeline to provide safe drinking water to the residents and institutions of Dhulikhel city from the upstream water source. This upstream source is governed by the Bhumidanda Village Development Committee, which has 4,700 people living in its watershed. The pipeline extracts 20 litres/sec of water from Kharkhola and was completed in 1992.

Services, payment and beneficiaries: In addition to the laying of the pipeline, a payment scheme was set up in 2010 between Dhulikhel municipality and Bhumidanda to formalize the extraction and supply of water. In this scheme, both parties agreed on providing cash contributions and in-kind incentives to upstream communities for their contribution to conserving the water source (Laxmi et al., 2014).

The pipeline system is managed by the Dhulikhel Drinking Water and Sanitation Users Committee (DDWSUC), which supplies water to 1,978 private connections and provides the direct and indirect payments to upstream communities. NPR 1 million (approximately US$ 10,000) are transferred per year to upstream communities, with an increase of 100,000 NPR every five years. Downstream water consumers in Dhulikhel pay a tariff based on water use volume. In-kind compensations to the upstream community include a Kathmandu University scholarship for one upstream student, trainings for upstream teachers at the Kathmandu University, salary for the forest guards and proposed health service discounts at the local hospital.

Table 5 shows the types and amount of payments that Bhumidanda receives per year. Table 6 displays the rates of water tariffs for water supply by volume.

Lessons learned: The system is predominantly community-managed and is supported by the local government, which acts as a mediator in making proper agreements. This enables the community to supply water at a reasonable price and more efficiently than government agencies. Furthermore, because the water demand in this scheme is high, buyers are willing to pay more to upstream service providers (Laxmi et al., 2014). This is particularly important when addressing some of the challenges unique to community management systems (for example, recovering the maintenance costs of the system via mutually agreed tariffs (Ojha, 2015)).

As the value of water becomes more apparent, agreements may also need to be re-negotiated. Previously signed agreements between Bhumidanda

Use of payment	Fiscal Year					Total (NPR)
	2010/11	2011/12	2012/13	2013/14	2014/15	
To buy drinking water pipe	–	510,256	–	–	–	510,256
To construct school buildings	–	300,000	–	–	–	300,000
To construct Indradevi temple	35,000	–	–	–	–	35,000
For irrigation	50,000	–	–	–	–	50,000
Schoolteacher salary	200,000	200,000	200,000	200,000	200,000	1,000,000
To conserve forest	12,000	36,000	36,000	36,000	36,000	156,000
Bhumidanda VDC	265,000	1,335,000	800,000	800,000	800,000	4,000,000
Total	562,000	2,381,256	1,036,000	1,036,000	1,036,000	**6,051,256**

Table 5. Direct payments received annually by Bhumidanda VDC. Source: Mr. Rit Narayan Shrestha, personal communication, Sep 9, 2015.

Dhulikhel drinking water supply system		
Units	Rate of water tariff (Before 2010)	Rate of water tariff (From July 2014)
Up to 10,000 litres	NPR125 per month	NPR 160 per month
10,000–25,000 litres	NPR17 per 1,000 litres	NPR 22 per 1,000 litres
25,000–50,000 litres	NPR25 per 1,000 litres	NPR 38 per 1,000 litres
More than 50,000 litres	N/A	NPR 76 per 1,000 litres

Table 6. Rate of water tariffs for water supply. Source: Mr. Rit Narayan Shrestha, personal communication, Sep 9, 2015.

and Dhulikhel are now being challenged because those upstream are more aware of the uses and multiple taps on their resources downstream. Upstream dwellers have perceived that their water sources are producing less water and anticipate that they will face water scarcity in the future and will not meet their water demands for agriculture (Neupane, n.d.). According to DDWSUC, the discharge rate in Kharkhola dropped from 52 litres/sec in 1987 to 37 litres/sec in 2005, representing a decrease of 29 per cent. These changes are likely related to a broad-scale shift in the hydrological regime, while downstream uses are also changing and intensifying, such as shifts from subsistence to commercial farming, and an increase in the use of water for commercial/industrial production.

Possible improvements: As gravel mining activity, for example, has badly damaged critical water zones (Neupane n.d.), areas prone to erosion should be better managed to protect existing water flows and quality. More attention needs to be paid to which species are planted, as tree species have an impact on water held and released from the landscape e.g. native species of Shorea can improve the water-retention capacity of upstream areas. Specific activities to conserve the source should be identified and performance-linked compensation should be introduced to the upstream communities.

On the downstream side, possibilities to reduce water use or identify other sources need to be explored. For example, promoting rainwater harvesting at the household level could be an option. Lastly, the process of setting up the IES scheme could be institutionalized through legal frameworks and policies to give more responsibility to the government and develop solidarity between upstream and downstream communities (Neupane n.d.). Otherwise, the long-term sustainability of the scheme appears to be at risk.

Case 6: Drinking water supply — Palampur Municipality, India

Main message: a functioning IES system does not have to happen all at once. Sometimes IES experience and learning is passed from one project to another. IES schemes can grow in phases, adding "pieces of the puzzle" over time. For example, helping stakeholders experience the difference between strong and weak management practices can build crucial support. In this case, municipal members and youth become powerful advocates for action.

Setting: Palampur town underwent rapid growth in the late 1990s, which intensified demand for high quality drinking water. Palampur's water supply is connected to a spring in Bohal Panchayat from Dhauladhar mountain, in the Neugal river catchment.

This case highlights that crucial steps (e.g. sensitizing stakeholders and facilitating dialogue) can sometimes be met by creative means. In this case, elected municipality members (who had the ability to change payment and policies) and schoolchildren (aged 9–16, serving as 'messengers to households') were targeted. The strategy was to raise awareness in Palampur town and quickly build support for new actions in upstream protection.

Services, payment and beneficiaries: In 2007, a Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) project helped the upstream community to understand the logic of protecting the Bohal spring and began preparing the proposal for the upstream community to receive payments from Palampur municipality. Key upstream stakeholders were the 'sellers' (mainly the nomadic Gaddi inhabitants of the Bohal spring catchment area), the forest department, Bandla Panchayat (the formal institution elected by the community of Bandla Panchayat), and the buyers (Palampur Municipal Council and the Irrigation and Public Health Department). Agreements were formed to help protect the catchment and secure the water supply, creating in essence the first IES proposal. Under it, Palampur Municipal Council provided annual financial payments to local watershed management committees for actions that would protect and manage the Bohal spring high infiltration catchment zone. It is believed these payments were to be in exchange for reforestation in upstream areas, land-use management, water conservation efforts, and spring protection.

This project did not develop via a single project, or by a single effort. Rather, momentum and inclusion were built over several years, by incorporating feedback, improvements and suggested actions from stakeholders over time. A particularly strong focus on awareness-raising and inclusivity is highlighted below.

A fast-changing climate and perceptible reduction in water yield stimulated awareness-raising on the importance of the water supply and the conservation of upstream catchments for water sources. Therefore in 2006, over 50 schoolchildren were led on transect walks over two days, downstream to upstream, along key streams (e.g. Neugal and Mol) to assess the quality of water, type of invasive vegetation, and type and quantity of rubbish. The students themselves then outlined the perceived threats and possible solutions. These students, facilitated by Himachal Pradesh Eco-Development Society (HPEDS), recommended conserving water at home (e.g. using a common bucket to take a bath rather than a shower), and a household-based campaign to raise awareness of water degradation causes was created. They shared their results with the President and members of Palampur municipality.

In a follow-up action, members of the municipality visited Bangalore (Karnataka State) and Vrindavan (Uttar Pradesh) to learn how these cities were

sensitizing local populations on protection and action, and bringing mass behavioural changes in conserving drinking water. These awareness-raising interventions proved to be the turning point in changing the mind-set of municipality members, stimulating their resolve to protect the upstream source of the Bohal spring.

A new group sponsored by GIZ, called WASH (Water Availability through Self-Help), then began to support public participation, and advocate ecosystem service payments in public utility services. The main goals of such payments were to support Panchayati Raj institutions to plan, implement and manage safe drinking water and minor irrigation systems in a sustainable manner.

Lessons learned: It is difficult to develop an IES mechanism in mountain communities, unless the downstream communities find value in protecting upstream flows of ecosystem services. Once

the connection between upstream action and downstream impact is made clear to them, upstream communities are often well placed to suggest feasible and low-cost solutions to identified problems. Youth awareness is critical, with young people representing good investment as 'change agents' to families and households, and providing long-term support to conservation. Awareness in local and municipal offices is also important, without which formal negotiation with upstream communities cannot proceed.

Possible improvements: Institutions play a crucial role in successful IES systems. While pilot systems can be organized at the local scale with a temporary facilitating institution, the sustainability of IES schemes can be enhanced by streamlining the system within existing government entities and institutional frameworks. It is also important to ensure active participation of both upstream and downstream users, and to recognize their role.

Case 7: Community-Based Trophy Hunting – Gilgit-Baltistan, Pakistan

Main message: In rural Himalayan areas, there are many traditional and customary practices to manage ecosystems. These can be made more effective and sustainable if they are incorporated well into ecosystem management, including IES schemes. The Pakistan Markhor hunting scheme was designed based on such customary practices (present prior to the 1960s). Traditional/customary institutions can contribute significantly to the success of IES schemes in the Himalayas.

Setting: Pakistan has a rich biodiversity which includes almost 200 mammal species, 20 of which are threatened and four endemic (Emerton et al., 2006). These species are threatened by habitat loss due to human encroachment and overexploitation. Specific threats include local subsistence activities (hunting for food), which is driven by lack of income and employment in communities (Emerton et al., 2006).

The Community-based Trophy Hunting Programme (CTHP) in Bar Valley, Nagar is an incentive-based, scientific approach to manage threatened, rare and endemic species in remote mountain areas. The programme works to strengthen local incentives for conservation through the generation of hunting revenues. It is a form of IES wherein coveted trophies of wild ungulates are exclusive ecosystem services and where revenues are shared with the communities.

Step	Action
Step 1: Community organization	• Establish a Valley Conservation Committee (VCC) • Register the VCC with local government as per law of the land
Step 2: Conservation Plan	• Facilitate community to develop their Conservation Plan • Conservation Plan approved by District Conservation Committee (DCC, headed by Deputy Commissioner) • Approved Conservation Plan is implemented by VCC with technical assistance from custodian department, line agencies and relevant private organizations • Implementation of conservation plan monitored by DCC
Step 3: Certification	• Wildlife census held and census report presented in DCC (for recommendations) • Gilgit-Baltistan Wildlife Management Board (GBWMB) allocates tags/licences to conservation communities (meeting the criteria) • National Council for Conservation of Wildlife (NCCW) approves hunting tags
Step 4: Marketing of trophies	• Group presentation at Safari Club International for bidding of coveted trophies • Hunting licences marketed to hunters
Step 5: Tag confirmation	• NCCW and GBWMB meetings to confirm tag allocation to communities • Communities informed of their allocations
Step 6: Facilitation	• Identification of trophy animal(s) • Local hospitality and facilitation • Custodian department for regulation in line with trophy hunting procedures.

Table 7. Process of setting up the CTHP.

The programme initially focused on the Siberian ibex (Capra ibex sibirica) but at a later stage, the International Union for Conservation of Nature (IUCN), the Wildlife Conservation Society (WCS) and other conservation organizations extended the programme to conservation communities in Gilgit-Baltistan and other parts of Pakistan for other game species. At the request of the World Wide Fund for Nature (WWF) and IUCN, in 1997 the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES) allowed Pakistan to authorize Markhor trophy hunting on the condition that the programme involve local communities in conservation and management of Markhor and other species. To address illicit hunting and poaching that endangered threatened species such as the Markhor from, WWF-Pakistan jointly with the Aga Khan Rural Support Programme (AKRSP) and the government of Gilgit-Baltistan (then called the Northern Areas Administration) initiated an IES scheme called the Community-based Trophy Hunting Programme (CTHP) in Bar Valley, Nagar district (Gilgit-Baltistan) in 1989.

WWF and IUCN were instrumental in the IES design and set up. They introduced the concept, mobilized local communities to transform subsistence hunting into trophy hunting for livelihood, and built the

knowledge and capacities of local communities and government agencies to carry out wildlife population surveys, species identification and population monitoring, habitat assessments, conservation and habitat management, prey-predator relationship assessments, conservation planning, sustainable resource use regulatory framework, conservation institutionalization etc. Furthermore, they developed institutional mechanisms for resource use regulation, accountability and responsible stewardship.

There are numerous criteria to setting up a CTHP under this formulation. Among them, sites must be registered with a community-based conservation organization and provide information about all huntable species, including baseline information on population (size, structure and distribution) of trophy animals. This information is used to develop monitoring plans and techniques, including an informed approach to determining the population density of the species to be hunted and establishing the appropriate hunting seasons. As part of the CTHP, sites must establish agreements to cease illegal hunting/ poaching and habitat degradation. With respect to use of payments, the funds collected must be used in different sectors, and conservation initiatives must support wildlife conservation goals.

Services, payment and beneficiaries: The sellers are members of upstream communities, for the most part agropastoral mountain dwellers who take care of Community Managed Conservation Areas (CMCA). In some cases, these individuals are former hunters, engaged as service providers for wildlife sighting, surveys and monitoring. Payments come from the buyers: either national and international trophy hunters or foreign and downstream resident visitors who purchase ecotourism services (e.g. wildlife sighting, nature camping, traditional food, rowing in mountain rivers, angling, yak polo and cultural activities). Custodian departments (the Forest, Wildlife and Environment Department in the case of Gilgit-Baltistan) help to negotiate, monitor, and institute policy, and may distribute some community funds collected to beneficiary households.

Payment mechanisms are export permit fees and licence fees (where 80 per cent goes to the local communities for conservation and development and 20 per cent goes to the government for regulation costs). In the 2014-15 hunting season, the licence fees per head for Markhor, Blue sheep and Ibex were US$ 67,500, US$ 8,800 and US$ 3,100 respectively. Similar programmes now exist in the Toshi Community, Chitral Pakistan (covering 14,850km2 and 20,000 households), where permits for Markhor have increased from US$ 15,000 in 1983 to present rates of US$ 81,000 per head.

There is a ban on big-game hunting across Pakistan except where CTHPs have been established. Hunting is carefully planned and monitored to ensure minimal impacts on wild species. The annual quota for permitted hunts is very low due to the small populations of the species. For example, in the 2003–2004 hunting season, only 30 permits were issued for Ibex, 12 for Markhor and four for Blue sheep (Emerton et al., 2006). The National Council for Conservation of Wildlife and Gilgit-Baltistan Wildlife Management Board play an important role in monitoring and verifying the programme, confirming tags allocation for hunting and informing communities of their allocations.

Lessons learned: Trophy hunting programmes can effectively contribute to conservation efforts and helping reduce unmanaged subsistence and poaching activity, provided that revenues are properly spent on awareness-raising, management, protection and habitat conservation (Blua, 2005). Local community leadership and responsibility for programme impacts has been seen as key to programme success.

The Community-based Trophy Hunting Programme is seen as a simple, economical and environmentally beneficial IES scheme that has been an effective conservation tool for the protection of biodiversity (in general) and ungulates (in particular) in mountain areas of Pakistan, helped strengthen the participating communities' social infrastructure, offered economic benefits to conservation communities for their social, economic and environmental well-being, and helped reduce illegal and unregulated hunting of rare and unique wild species in the region, which are an important mountain ecosystem service.

Anecdotal evidence from the study area reported an increase in revenue to local communities in Gilgit-

Baltistan in 2011–2014, compared with data recorded in prior years beginning in 1999. Wildlife population data in 2008–2009 for Ibex and Blue sheep were also higher than in 2006–2007. Furthermore, one study documented that in Bar Valley, uncontrolled hunting had been nearly eliminated, poaching had declined, and communities were displaying more positive attitudes towards wildlife and conservation in most areas with Community Trophy Hunting Programmes (Emerton et al., 2006).

With regard to the Markhor, which IUCN declared endangered in 1998, its official population numbers rose from 275 in 1993 to 3,500 in 2015 due to its protected status in the CTHP. Following this increase, the IUCN down-listed the animal to 'near threatened' in 2015 (Khan, 2015).

Possible improvements: There is clearly controversy about the benefits of trophy hunting worldwide, and scrutiny regarding how much reaches the affected households/community members. Without this information, it is not explicitly clear whether payments are invested in conservation and support local communities. Although local numbers suggest that the intensity of unregulated subsistence hunts has

been abated and there is local social pressure against poaching activity, it is difficult to document causation without control area examples for comparison. There is still a great need for more data and information in the local communities to support strong, local programme leadership. This may include technology transfer for monitoring, and surveys, methods of interaction with outfitters and hunters, and marketing of hunting in line with the conservation objectives. In cases of threatened and endangered species, extreme caution must be taken to prevent bottlenecks in population management, while in the face of possible broad-scale shifts such as climate change, a large population buffer must be established to prevent unintended consequences.

Whereas there is some evidence for increased populations of trophy animals as a result of the programme, populations of non-trophy animals such as Ladakh urial and Musk deer are either stagnant or have declined. As some transfer of subsistence hunting pressure among species is likely occurring, strengthened management efforts are needed to ensure local ecosystem service food provision to the communities living in the area, as well as maintaining a sustainable wildlife population.

Case 8: Participatory Watershed Management Projects – Erosion control in Tarbela and Mangla, Pakistan

Main message: Hydropower is key to development in many parts of the Himalayas. In order to sustain large hydropower projects, it is important to involve communities and share benefits with them. However, such benefit sharing or payment may not necessarily come in the form of cash, but can take other forms, including project-based support, which could be more sustainable for upstream land-use management. Local institutions, whether formal or informal, play a significant role in making such incentive-based projects effective and transparent.

Setting: The Tarbela and Mangla watersheds in Pakistan are home to two of the largest earth-filled dams (13.69 km3 and 9.12 km3 respectively) in the world and two hydropower stations generating 3,478 MW and 10,000 MW of electricity respectively.

The two watersheds experience high rates of reservoir sedimentation and soil erosion caused by human and physical factors such as deforestation on slopes, cultivation without soil/water controls, and grazing intensity (Khattak, 1991). Both dams have lost volume and the ability to regulate flow for irrigation, with the Tarbela reservoir losing one third of its volume and the Mangla losing 20 per cent since its construction in the 1970s (Butt et al., 2011).

To reduce the high rates of reservoir sedimentation, the Pakistan Ministry of Water and Power started two participatory watershed management projects in 1980. Entitled "poverty reduction through participatory watershed management" projects, they involved five two-year disbursements from 2004–2007, with the smallest projects costing US$ 0.6 million in the Mangla watershed and US$ 3.3 million in the Tarbela (Pakistan Environmental Annual Plan, 2004).

Services, payment and beneficiaries: These projects incentivized local communities to adopt best management practices in soil and water techniques such as check dams (small agricultural dams that slow water flow), terracing and reforestation on commercial plantations (Porras and Neves, 2006). The sellers of the ecosystem services are the farmers and private landowners of upstream areas of the reservoir who adopt improved land management techniques. They receive direct payments from the Water and Power Development Authority (i.e. the government is the buyer of the service). Payments have been in-kind compensations and technical assistance along with other inputs to construct upstream soil and water conservation structures in the dam reservoirs. There are direct negotiations between the stakeholders involved and national government entities, such as the Ministry of Water and Power and the Forest Department, which operate as administrators of the Tarbela and Mangla dams.

Lessons learned: The project watershed conservation activities have supported emerging community organizations and have generated employment opportunities. From 2004 to 2005, investments in the Tarbela watershed resulted in 96 nurseries, a plantation of 8,000 acres, the provisioning of check dams on 2,320 acres, terracing on 525 acres and general maintenance activities on 30,000 acres of land. Similarly, in the Mangla Watershed Management Project, 4,500 acres of land were afforested, upon which silt traps, check dams and terracing were constructed. This resulted in the sediment load being reduced by 25 per cent, reduced peak flows and increased total water supplies (Porras and Neves, 2006).
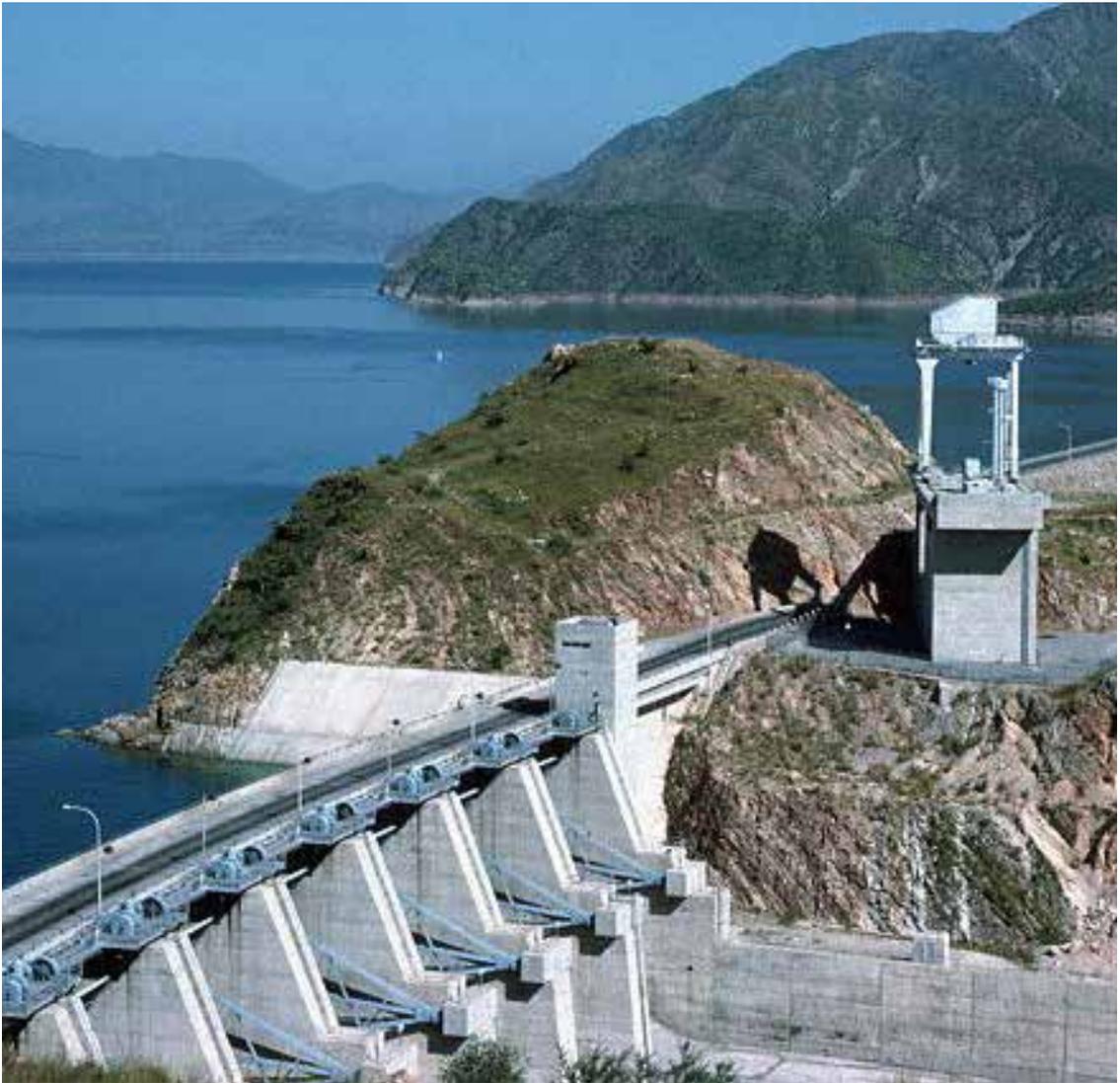
Possible improvements: Currently the participation in both watersheds is patchy, with treated areas separated by untreated areas. As the programmes are voluntary, more landowners could be included, and the work could be coordinated strategically to create a bigger effect. More data collection on the current project would enable fuller analysis and case improvement. For example, when commercial forests are reforested with public funds, it is not clear whether a private corporation benefits or where the revenue flows (into or out of communities). Similarly, other project contracts are unclear in terms of their length, their monetary value, how renewable they are, or how payment is distributed.

It is not currently clear whether downstream households or community members are aware of their connection with and dependence upon upstream action, and this can affect their willingness to pay. Land-use improvements and investments can target more intensive management of all mountain resources, including road/erosion improvement, forest planting and sustainable forestry management. As projects are currently ad hoc and dependent upon individual projects, longer-term planning could help institute more consistent and permanent actions and payment mechanisms to support longer-term sustainability.

Case 9: Local communities' involvement in tourism activities — Xihu wetland, Yunnan, China

Main message: Tourists are willing to pay for tourist services and scenic beauty in Xihu National Wetland Park. Both private tourism companies and the local villagers are beneficiaries of these payments. However, the cost of maintaining the ecologically sound environment to support tourism is borne mostly by local villagers, with some support from government funding. More ecological costs could be borne by the private sector, and more actions could be taken to retain the IES revenue in the local community rather than it leaking out via externally owned businesses, imported foods, imported labour and imported building materials.

Setting: Xihu Lake, or West Lake, is located at the source of Lake Erhai in Eryuan County. The lake's wetland (352.70 km2) coverage is 68 per cent water and 32 per cent marsh land, and constitutes 26.05 per cent of Eryuan West Lake National Wetland Park. The wetland's 90 islands are home to 930 households, or 4,355 people across six villages.

The ecosystem services from the wetlands support resident livelihoods and provide fertile soil and other materials for agriculture.

The local residents, called Bai people, use boats for transport and to collect material resources. The lake and wetland also deliver cultural and spiritual

ecosystem services. For example, the Bai Torch Festival on the first day of July by the lunar calendar involves boating, lantern lighting, traditional foods and paying tribute to the lake for its supplies.

The wetland park is home to 26 fish species (primarily Siluriformes) and 76 bird species. Their shifting seasonality makes them a dynamic tourism product and encourages return visits. There are 36 water birds, of which 10 are present year round, 21 are wintering species and five are summer species.

Services, incentives and beneficiaries: The natural resources of the national park and the wetland in it are managed by the Wetland Management Bureau of Eryuan County. However, part of the national wetland park is run by a private tourism development company which in 2000 signed a contract with Xihu administrative village, a collective owner of the lake. In 2014, a second contract was signed with a subsidiary of the Dali Tourism Corporation to run a tourist centre and recreational activities for tourists.

The two companies employ about 70 permanent staff, the great majority of whom are locals. About 78 local residents are employed in boat tourism, earning between 1,000 and 3,000 RMB per month depending on low and high season.

Park visitors pay either a simple entrance fee of 58 RMB or a package fee of 148 RMB, which includes the entrance fee plus boating and other activities. In 2014, Lake Xihu welcomed 200,000 tourists, who brought a total of 9 million RMB in revenue.

Lessons learned: Despite the high levels of local villagers participating in boating activities, they have only limited involvement in the full tourism product, and its future development is still limited. Nevertheless, the ecosystem services and the cultural and social linkages between the wetland villagers and the wetland could potentially enrich the tourism product, and incentivize and add revenue to further

conservation activity. Local agriculture and wetland food products could also be further integrated into the tourism offering.

There is a lack of benefit sharing in this IES scheme, which has created a conflict between the private companies and the local villagers. The costs of supporting the ecological services are mainly borne by the local people, who may have entered agreements to forgo activities such as cow raising and agricultural cultivation, despite being dissatisfied with the compensation they are offered.

The government's intervention has both positive and negative results. It compensates the farmers who bear the costs of maintaining a natural environment favourable to tourism development. However, through the implementation of its tourism plan, this approach seems to have created a division between the farmers, the natural surroundings and tourism development itself.

Possible improvements: The negotiation process needs to be improved among the different stakeholders, to reach a common understanding of a reasonable benefit-sharing scheme. More specific and measured conservation actions can be targeted, especially to mitigate those that are caused by the tourists themselves (waste assimilation, carbon emissions, water purification etc.). Tourists visiting conservation areas often have a high willingness to pay for these services, especially when they can see where their payments are going. The engagement of the local villagers could be strengthened by linking payments for tourism and ecosystem services with customary activities in the area.

Part V. Summing Up

Lessons learned

In this section, we revisit some of the unique characteristics that have been covered in the prior sections and cases regarding IES in the Himalayas. We have described how incentive structures for IES often differ in the Himalayas from the more specific and formulaic applications in other regions of the world.

However, "the devil is in the details", and it cannot be argued that these adaptations to IES criteria are uniformly positive adaptations, because they do come with associated (albeit sometimes necessary) costs. Therefore, this section provides a more in-depth look at how or why incentives that are provided in kind to a community may be of maybe more or maybe less benefit than a purely market-based or financial payment. Also, we provide a more in-depth discussion of why providing benefits to a community, as opposed to specific individuals (as is more common in other regions of the world), may have other unconsidered benefits and drawbacks.

Collectively managed resources are already prominent across Himalayan landscapes, governance and cultures. This may necessitate incentive structures that are tailored to that collective management rather than to individually managed resources. Collective management raises completely different problems to individual management, as inclusivity of many stakeholder groups, land-ownership, and the potential for uneven distribution of benefits and costs among group members present important considerations. That said, the use and strengthening of existing community decision-making groups, forums and regular governance 'practices' can strengthen and prepare communities for facing other, non-IES challenges.

The choice between monetary and non-monetary payments is an important one, particularly since it has important implications for individual and community incentives. Individual payments may not be appropriate or effective in collectively managed resources, and may indeed undermine individual interest in contributing to the common good. Concerns about fairness or disputes about individual payments can also erode delicate or long-standing social relationships, particularly in villages that traditionally have not dealt in a monetary economy. Furthermore, it is unclear whether cash payments equate to recipient satisfaction or may in fact produce the opposite result (dissatisfaction, a greater tendency to compare or induce conflict). For many goods and services with non-monetary, spiritual, ethical or personal value, cash payments may be entirely inappropriate.

It is not always clear to interested ecosystem service 'producers' why they may not qualify for market-based (PES) schemes, particularly if they have taken good care of their ecosystem to date. One qualifying criteria for market-based PES is that the quantity or quality of the ecosystem service flow must be under threat. Thus, communities that have been strong land and ecosystem service stewards to date are often not candidates for PES. This can appear a somewhat 'backward' incentive to some participants.

Recent analyses (see Kerr et al., 2014) conclude that the combination of direct and indirect, cash and non-cash reward types encourage institution-building. Stronger community cooperation may also encourage inclusivity and discourage free-riding. However, non-cash payment systems are not a panacea — they have also been found to be perhaps less strict, transparent, quantified or clear-cut. This may result in weaker evidence that the IES has specifically resulted in

the desired change on the landscape or ecosystem service. It may also prevent the IES from scaling up, or becoming 'officially certified', which may prevent an IES action being offered on a broader market (such as carbon trading).

Unintended consequences of IES require a great deal of prior examination, consultation and forethought to avoid conflict, equity issues and unsustainable arrangements. Where groups are newly formed or have little or no tradition of collective natural resource management, an IES initiative may contrast with the need to build cooperation gradually. However, once established, management of common resources enables collaboration to advance on projects that support the community common good and sustainability,

as opposed to individual profit extraction and less sustainable initiatives. The same collaborations that serve in IES may also serve in improving agricultural, educational or community management. Improved leadership and representation can strengthen the community response to climate change.

Ultimately, the long-term impact of the IES is related to both the direct incentives and action it stimulates in terms of conservation, but also in terms of its longer-term impact on community function and institution-building. The key is to understand the conditions under which a payment or reward will stimulate collective action and conservation, as well as understanding which conditions (perhaps at a later date) might bring perverse or undesired outcomes.

Concluding remarks

This publication has given a basic overview of IES in the Himalayas. IES systems are evolving as they are implemented in different regions, cultures and societies. We have pointed out elements that make IES in mountains different, and what makes IES in the Himalayas unique.

To help beginners rapidly gain familiarity with IES, we have provided an overview of the different steps from scoping, to initiation, to monitoring an IES once it is up-and-running. We have also described certain keys and strategies to avoiding unintended consequences.

To show how IES is currently working in the Himalayas, we have highlighted several case studies to use as examples or draw lessons from in order to make a new IES scheme even more successful. In providing these examples, we have tried to be careful to describe 'desired' versus 'real-world' conditions, and present many of the 'cautions' to be aware of in order to avoid unintended consequences.

It should be clear to the reader that IES are not always simply payment schemes for a service, but that they may be complicated by issues regarding culture and traditions, sense of ownership, and justice. There are many issues to take into account, and the setting up an IES system must not be rushed: there are many stakeholders, and trade-offs or concessions likely have to be made on one side or another along the process.

Each IES setting will be unique, but much more can be done to expand the role of IES solutions and increase the number of people benefiting from innovative systems. Our hope is that this Cookbook will help increase the number and diversity of people participating in creating and expanding IES opportunities in the Himalayas. Furthermore, it is the 'real-world experience' that also informs work at the larger scale (for example, establishment of national level policy). These policy changes are greatly needed, in particular given the projected decline in many ecosystem services and the increasing impacts and ecosystem service disruptions anticipated due to climate change. Thus, this set of guidelines and

examples is suitable not only for local IES architects, but we hope it will also provide some 'common ground' for new discussions around IES and policies at the local, regional and national levels.

There is a broad, active and interested international community that can provide assistance and serve as a resource and (at times) frame of reference for how to improve IES in the Himalayas: the 'wheel' does not have to be reinvented! We acknowledge that many publications have already been written about both PES and IES. This publication takes the perspective of adapting general PES protocol and principles to the unique needs of Himalayan communities and mountain ecosystem services, under a broader IES framework.

We hope that by presenting this work, including case studies, we have shown that it is possible to apply what has been learned to date, to seize IES opportunities more quickly. There are also numerous possibilities to improve existing IES to greater benefit both Himalayan communities and ecosystem services.

Many ecosystem services produced in the Himalayas affect enormous populations, located far away (for example water provision), while many impacts to ecosystem service systems (for example global emissions affecting climate and Himalayan glacier run-off, changing agricultural and pastoral climates, and other climate impacts) are beyond the control of IES systems. However, IES benefits can include funds, resources and support to communities to adapt to these changes.

Understanding what makes a successful IES requires comparison across ecosystem type, compensation package and incentives, spatial and temporal scales, institutional arrangements and policy frameworks.

For IES, small details can make big differences in terms of inclusion, leadership development, representation and the sense of empowerment a community gains from participating in these programmes. All of these factors can also have an impact on the community's trajectory in the face of unpredictable futures.

The main lesson from the IES cases and descriptions we present in this Cookbook is that 'whole system awareness' is crucial to involving the broadest and most complete set of collaborators. Furthermore, it is possible to use this information to gain 'early awareness' of unintended consequences, and address them. The fundamental basis for a sustainable, efficient and inclusive system that genuinely delivers IES benefits remains the discussions that are begun early, that seek diverse viewpoints, and that are used to test mental models of how an IES system could function and troubleshoot repeatedly, before they are implemented. We wish the readers of this publication the best in becoming active advocates and participants in this and other exciting conversations to come.

Acronyms

AKRSP   Aga Khan Rural Support Programme
ANSAB   Asia Network for Sustainable Agriculture and Bioresources
CFUG   Community Forest User Group
CICERO   Centre for International Climate and Environmental Research
CITES   Convention on International Trade in Endangered Species of Wild Fauna and Flora
CMCA   Community Managed Conservation Area
CNP   Chitwan National Park
CTHP   Community-based Trophy Hunting Programme
DCC   District Conservation Committee
DDC   District Development Committee
DDWSUC   Dhulikhel Drinking Water and Sanitation Users Committee
EMSF   Environmental Management Special Fund
ES   Ecosystem Services
FCTF   Forest Carbon Trust Fund
FECOFUN   Federation of Community Forestry Users, Nepal
GBWMB   Gilgit-Baltistan Wildlife Management Board
GIS   Geographic Information System
GIZ   Deutsche Gesellschaft für Internationale Zusammenarbeit
HKH   Hindu Kush Himalaya
HPEDS   Himachal Pradesh Eco-Development Society
IBM   Incentive-based mechanisms (for ecosystem services)
ICIMOD   International Centre for Integrated Mountain Development
IES   Incentives for Ecosystem Services
IUCN   International Union for the Conservation of Nature
NCCW   National Council for Conservation of Wildlife
NEA   Nepal Electricity Authority
NGO   Non-governmental organization
NORAD   Norwegian Agency for Development Cooperation
PES   Payment for Ecosystem Services
PWS   Payment for Watershed Services
REDD/REDD+   Reducing Emissions from Deforestation and Forest Degradation
RLRFC   Rupa Lake Rehabilitation and Fisheries Cooperative
SDGs   Sustainable Development Goals
SWOT   Strength Weaknesses Opportunities and Threats
VCC   Valley Conservation Committee
VDC   Village Development Committee
WASH   Water Availability through Self-Help
WCS   Wildlife Conservation Society
WWF   World Wide Fund for Nature

Currencies:
NPR   Nepalese Rupee
RMB   Yuan Renminbi
US$ US Dollar

Resources and References

Resources

To learn more from IES and PES in other settings besides the Himalayan mountains, several links and resources can be consulted. Below we list just a few of these that may help you further:

Food and Agriculture Organization (FAO) – contains several resources regarding PES development, especially related to forestry, food security and agriculture.
http://www.fao.org/fsnforum/forum/discussions/pes
http://www.fao.org/forestry/84884/en/
http://www.fao.org/docrep/014/i2100e/i2100e00.htm

UN Environment – contains some interesting evaluations of the Global Environment Facility and other funded projects promoting PES.
http://www.unep.org/evaluation/keywords/pes

Convention on Biological Diversity (CBD) – search for the keyword "PES" to find several interesting evaluations and reports.
http://www.cbd.int/financial/payment/

Center for International Forestry Research (CIFOR) – has a web page dedicated to PES, with links to the latest relevant publications.
http://www.cifor.org/pes/_ref/home/index.htm

Forest Trends/The Katoomba Group – has a dedicated web page on PES and links to various learning resources and evaluations of PES effectiveness worldwide.
http://www.katoombagroup.org

The Economics of Ecosystems and Biodiversity (TEEB) – their web page provides a wealth of educational resources, case studies and guidance related to the valuation of ecosystems and biodiversity and their inclusion in policymaking.
http://www.teebweb.org/about/

World Resources Institute (WRI) – keyword searches such as "ecosystem services" produce a number of interesting publications.
http://www.wri.org/

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This Cookbook is designed to help people interested in Incentives for Ecosystem Services (IES). It is designed to allow the reader to rapidly gain familiarity with the entire process of establishing a functioning, sustainable and efficient IES system in the Himalayan context. This Cookbook should be of interest to those who have heard of definitions such as Payments for Ecosystem Services (PES), Incentives for Ecosystem Services (IES) or Incentive-based mechanisms for ecosystem services (IBM), or who have encountered one of their cases in practice, and who perhaps wish to set up an IES scheme themselves.

This Cookbook clarifies the 'ingredients' needed to design an IES system, in order to increase familiarity with terms and cases. It is our intention that this Cookbook serve as a catalyst for learning, knowledge exchange and the building of a community of practice, and ultimately as a tool to make advances where IES offers unrealized potential across the Himalayas. In addition, by highlighting the unique conditions and experiences of IES cases within the Himalayas, we believe that it is possible to mobilize the broader international community to support Himalayan experts and innovators in their task of producing sustainable benefits for the billions whose futures are at stake.

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