

# Natural Resource Governance at Multiple Scales in the Hindu Kush Himalaya



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# Natural Resource Governance at Multiple Scales in the Hindu Kush Himalaya

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# Foreword

Governance is an important, but often overlooked, issue in terms of research and development in natural resource governance in the Hindu Kush Himalaya. Without accountable, equitable, and robust governance institutions, mechanisms, policies and multiple stakeholders – whether they are statutory or customary - management of natural resources suffers immensely. Within a context of rapid environmental, sociocultural and political-economic change emanating from climate change, globalization and geopolitics that affect even the remotest village in the region, governance across all levels – local, national, regional and global – becomes critical.

In the past, researchers and scientists have tended to focus primarily on biophysical aspects of natural resources. However, an integrated approach to mountain development and the management of environmental resources moves away from such singular perspectives, and instead accords sociocultural and political-economic issues equal weight with biophysical aspects. Hence, research on water sharing, irrigation, forestry, agriculture, protected areas and pastoralism will remain theoretical unless they are nuanced and deepened with human aspects of natural resources, and in particular governance. Whether the issue is governance at the level of the household, community, or vast tracts of land that transgress national boundaries, they are all equally and centrally important for sustainable and equitable development.

This working paper makes a valuable contribution to deepening our understanding of the way governance centrally contributes to sustainable environments, transparent and accountable government, enhanced and equitable livelihoods, and the improved wellbeing of women and men across the vast and diverse cultural landscape of the HKH. It highlights the importance of regional cooperation, conserving natural resources, and improving the wellbeing of diverse people in the region. It highlights both the challenges of weak governance, and the important opportunities created by effective governance knowledge, institutions, and resources. I would like to commend the authors and the invited contributors of this comprehensive study for the breadth and depth of knowledge contained in this working paper. It will be a valuable resource for those interested in bridging the gap between biophysical aspects of natural resource management with governance issues, as well as those wishing to further research efforts and fill urgent research gaps identified in this study on natural resource governance in the HKH and beyond.

**David Molden**, PhD  
Director General  
ICIMOD

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# Acronyms and Abbreviations

AAAS	American Association for the Advancement of Science
BRICS	Brazil, Russia, India, China and South Africa
CFUG	community forest user groups
CONDESAN	Consortium for the Sustainable Development of the Andean Eco-region
DFID	Department for International Development
DIIR	Department of Information and International Relations
EURAC	European Academy of Bolazno
FAO	Food and Agriculture Organization
FCTF	Forest Carbon Trust Fund
GNH	Gross National Happiness
HKH	Hindu Kush Himalaya
ICIMOD	International Centre for Integrated Mountain Development
IG-CEDP	Indo-German Changar Eco-Development Project
IPCC	Intergovernmental Panel on Climate Change
ISCC	International Sustainability and Carbon Certification
LEAD	Leadership for Environment and Development
MEA	multilateral environmental agreements
MODIS	Moderate Resolution Imaging Spectroradiometer
MRD	Mountain Research and Development
NASA	National Aeronautics and Space Association
NORAD	Norwegian Agency for Development Cooperation
PES	Payment for Ecosystem Services
PNAS	Proceedings of the National Academy of Sciences
REDD+	Reducing Emissions from Deforestation and Forest Degradation
SAARC	South Asian Association for Regional Cooperation
UNEP	United National Environment Programme
UNGA	United Nations General Assembly
USAID	United States Agency for International Development
WCED	World Commission on Environment and Development

# Executive Summary

Human efforts to address poverty, enhance welfare, and conserve natural resources and the environment often fail because of faulty governance and implementation. Improvements in governance are consistently viewed as means to address the failures of sustainable development and natural resource management. Indeed, calls by international development organizations, donors, and researchers for decentralization, stronger development institutions, better alignment of private and social incentives, and the protection of ecologies are, at their roots, also calls for improving governance. Effective governance enables and, where appropriate, sets limits on permissible actors and actions, decisions, and decision makers. It helps determine whether and to what extent actions related to development and conservation programmes match the design of such programmes, and their appropriateness in relation to local cultural and ecological contexts.

Answers to what constitutes effective governance become particularly complex in rapidly changing contexts such as those of South Asia and, in particular, the Hindu Kush Himalaya – the focus of this study. In such contexts, governance arrangements have to be instituted with particular care and with an eye to long-term processes so as to reduce the likelihood of perverse outcomes. The empirical focus of this study is on the governance processes that characterize the use of key natural resources such as river waters, transboundary protected areas, irrigation, forest resources, and rangelands. An examination of resource governance highlights governance actors and mechanisms from across the social and political spectrums, their interests, and decision processes. It also brings to the forefront the importance of coordination across scales levels, and the interests and actions of multiple stakeholders that invariably shape governance outcomes.

Six key points emerge from the complex backdrop of resource governance in the region:

The first – obvious but worth highlighting – is related to the diversity of benefits from different kinds of natural resources and the limited coordination that is present for governing them. These benefits may be public or private; local, regional, or global; and immediate or long-term. If the goal is to improve outcomes in multiple dimensions – social, cultural, ecological, and economic – which is critical for the sustainability of natural resources, it is necessary to incorporate the voices of local people into the strategies of governance together with the interests and actions of other stakeholders. Available on-the-ground evidence shows a clear need for involving those who live within or in close proximity to natural resources in decisions about what happens to them and their resources.

The second important point to note is that no single actor, agency, or class of actors has the knowledge, capacity, and interest necessary for improved natural resource governance outcomes. Collaborative relationships across three different types of actors in the private/market, civil society/NGO, and public/government/development sectors are typically relevant to natural resource governance. Governance arrangements that seemingly hinge on the actions and decisions of actors in a single domain, in reality, rely on combined contributions from actors and decision makers in multiple domains and agencies.

A third key finding of the review is that, although collaborations are necessary for effective natural resource governance, they are also complex. Collaborations across different actors and interest groups need commitment, coordination, and the clear delineation of roles, responsibilities, and prospects. The trade-off between more extensive collaborations for resource governance (and thereby the mobilization of greater resources) and higher costs of coordination is evident in a variety of settings and for different resources. Ongoing exchanges and consultations among partners to ensure knowledge sharing in light of changing circumstances are necessary if collaborations are to be successful and effective.

The fourth finding from the review of the empirical evidence is that actors and decision makers involved in natural resource governance use three primary mechanisms/instruments to achieve their ends: information, incentives, and institutions. The specific mechanisms that are in fact deployed may be as varied as trainings, reports, audits,

funds transfers, committees, user groups, rules, procedural changes, reporting requirements, and so forth. But the mechanisms used in practice are the expressions of information, incentives, and institutions, or a combination of these.

The fifth finding is that effective collaborations among different governance stakeholders are more likely when the actors and forms of governance are matched to the comparative advantages they possess in terms of the use of the three different instruments of governance that the review identifies. Civil society actors have a greater comparative advantage in using information to mobilize public opinion and resources, government agencies can effectively regulate choices through institutional and policy changes as well as the use of incentives, and market exchange-based governance strategies such as payments for ecosystem services that hinge on performance-based direct incentives.

The sixth and somewhat preliminary finding is that different forms of governance and different actors have greater or lesser affinities to accomplish particular socially valued goals effectively. Broadly speaking, the involvement of local actors and communities for resource allocation choices is particularly important when local livelihoods are at stake; the contributions of government agencies and actors are critical to enhancing the sustainable and equitable provision and protection of public goods such as biodiversity, ecosystem health, and national security, and private market actors can enable greater efficiency in the use and allocation of benefits from resources.

Addressing governance challenges in the region effectively requires more information than we currently possess about the characteristics, availability, networks, interactions, and dynamics of different natural resource systems. Data gaps about natural resources, their governance, and the relationship between governance strategies and outcomes are widespread. At the same time, the need for more and better information about the governance of natural resources has seldom been more pressing. Regional analysis and regional intergovernmental organizations are uniquely positioned to address both the existing governance challenges and the need to close existing gaps in the knowledge about governance.

Part I

# Effective Governance for Sustainable Environments





# 1. Introduction

Human efforts to address poverty, enhance wellbeing, and conserve natural resources and the environment often fail because of failures in governance and implementation. Improvements in governance are consistently viewed as means to address problems related to sustainable and equitable development and natural resource use. Whereas poor resource governance arrangements make societies and natural resources more vulnerable to shocks and disasters, effective governance enhances resilience and sustainability.

Some of the most prominent global analyses of environmental problems, disasters, and sustainability have identified the critical need for better governance to address widespread environmental decline (IPCC 2007; MEA 2005; World Bank 2010). Problems such as elite capture, corruption, free riding, weak capacities, gender bias, and lack of participation, representation, legitimacy, and accountability are all viewed as being amenable to change through more effective governance (Bardhan 1997, Dasgupta and Beard 2007, Fritzen 2007, Olowu and Sako 2002). Indeed, calls by international development organizations, donors, and researchers for decentralization, devolution, stronger development institutions, better alignment of private and social incentives, bottom-up approaches, gender equality, and the protection of ecosystems are, at their roots, also calls for improving governance across scales. These calls are not just about improving how the nation state and its agencies act. They are more fundamentally about governance processes that span societal sectors, scales, and interests (Cashore 2002, Kersbergen and Waarden 2004, Pierre 2000).

Effective governance enables, and, where appropriate, sets limits on actors and actions, decisions, and decision makers (Grindle 2004). It helps determine whether, and to what extent, actions and impacts related to development and conservation programmes match the design of such programmes. We need to know what forms and strategies of governance of social and ecological domains work better in different settings. An enormous body of scholarly work has helped identify development solutions in theory, but the translation of this work into practical development projects that can reliably secure positive and transformative outcomes has been limited by inadequacies in existing knowledge about governance and its implementation within development. Indeed, development and resource management projects with similar designs yield widely varying outcomes in different sociopolitical, economic, ecological, and cultural contexts (Lee 1996). There is little consensus on how to adjust the governance parameters of projects and programmes for effectiveness across sectors and contexts. Moreover, although effective governance underpins sustainable development and natural resource management, disciplinary silos constrain the engagement of governance issues in research and science (German et al. 2010, Chhotray and Stoker 2008).

Answers to what constitutes effective governance in the context of sustainable development become particularly complex in rapidly changing contexts such as those in much of the global South today. In South Asia and in the Hindu Kush Himalaya (HKH) – the focus of this study – in particular, the sociocultural, economic, and political context of governance is changing in ways that could not have been foreseen two decades ago. These changes are occurring across the national and subnational levels of political economy. They present both challenges and opportunities for those seeking to improve governance and natural resource outcomes in the region. Globalization, accelerated growth, changes in demographic and consumption patterns, a large and growing middle class, enhanced social aspirations, changing gender relations, changing norms, conflict around scarce natural assets, political tensions around the allocation of available resources, changes in forms of government, the increasing role of media and social media, and the growing medium- to long-term threats from climate change mean that governance arrangements have to be instituted with particular care and with an eye to long-term processes so as to reduce the likelihood of perverse outcomes (Hempel 1996).

After situating the context of the study as the changing political-economic conditions that shape the fiscal exigencies and governance capacities of the region's nation states, the paper briefly surveys other pressures related to globalization, demographic change, economic liberalization and urbanization, and climate threats that will likely

affect the outcomes of natural resource governance for the region's decision makers from the local to the national level. The subsequent section focuses more directly on natural resource governance, relevant actors and instruments of governance, and how governance across different levels of social and institutional aggregation must address enduring concerns about inclusion, representation, legitimacy, accountability, responsiveness, and the rule of law.

The empirical focus of the study is on the governance processes that characterize the use of key resources and generate outcomes in both social and ecological dimensions. The paper focuses specifically on the governance of water sharing, river water sharing, protected areas and wildlife irrigation, forest, and pastoralism and rangelands. An examination of these domains of resource governance highlights relevant governance actors and mechanisms and their decisions and processes. It also brings to the forefront the importance of knowledge sharing and coordination across scales, levels, and the interests and actions of the multiple stakeholders that invariably shape governance outcomes. The paper ends with an assessment of the major opportunities and challenges for natural resource governance in the HKH context.

## Key Emerging Issues

Six key points emerge from the complex backdrop of natural resource governance in the region. These issues are summarized here as a point of departure for the paper based on accumulated learning and experiences. Not intended to be an exhaustive or complete list, they nonetheless act as a guide or map for the paper through the sometimes dense and complex academic writings and debates on governance within development contexts.

The first point – obvious but worth highlighting – is related to the diversity of benefits from different kinds of natural resources and the limited coordination in the HKH in their governance. Hundreds of millions of economically poor women and men in the region depend on directly consumable goods from resource systems so as to sustain their lives and livelihoods. These goods include water, fuelwood, fodder, fibre, food, medicines, and non-timber forest products (Bjønness 1983, Nepal and Weber 1995). Natural resource systems also provide incalculable and indirect benefits and services. The benefits include carbon storage, biodiversity conservation, disease containment, soil conservation and fertility, and the regulation of hydrological, carbon, pasture and various nutrient cycles. They may be public or private; local, regional, or global; and immediate or long-term. However, these resources and the livelihoods they support under threat from rapid and ongoing changes in climate, social and political-economic dynamics, and demographic patterns (Sharma and Chhetri 2005; Xu et al. 2009). Appropriate governance arrangements are urgently needed to coordinate synergistic, positive outcomes related to different kinds of natural resources on which humans and other living beings depend in the region. The question of what counts as a positive outcome and whether the same outcome may be viewed positively by some and less so by others is evidently critical. But, at the level of abstraction and for analysis in this paper, 'positive outcomes' can be interpreted from the position of relevant decision makers and stakeholders, with the caveat that in some cases there will be differences over how to define a positive outcome. The management of different resources depends on strategies specific to each resource sector. It occurs through the uncoordinated actions of different ministries and officials, private and public decision makers, and local actors at higher levels, and it is supplemented by plural informal/customary and formal/statutory institutions.

Thus, if the goal is to improve outcomes in multiple dimensions – social, ecological, economic – which is critical for the sustainability of natural resources, it is necessary to incorporate the voices of diverse women, men, and children into strategies for governance (Agarwal 2009, 2010). Available on-the-ground evidence suggests that the involvement of those who live within or in close proximity to natural resources in decisions about what happens to them and their resources presents a strong possibility of improving both livelihoods and resource outcomes (Persha et al. 2011; Sun et al. 2011). The meaningful involvement for people in governance can be mobilized through many processes and will likely be influenced by preconceived notions about local resource users and managers. It is affected by rapidly shifting markets and technologies and is subject to changing parameters of global health, human security, and geopolitics. But it is necessary to secure the participation of local residents, users, and managers in governing natural resources if one seeks to improve multiple mutually supportive outcomes rather than a single governance goal.

Furthermore, the different types of benefits from natural resources and their flows are not necessarily synergistic. That is to say, the same actions in relation to a given natural resource – say forests – may enhance some desired benefits but undermine others, and similar interventions may produce different results from one resource sector to another. Thus, governing forests so as to limit harvesting may enhance resource sustainability and carbon storage, but the effects on livelihoods, household welfare, and gender equality might be negative. Consider another example: interventions that protect vegetation in upstream areas may improve water quality for downstream users, but they will require coordination over benefit allocation and compensation. In this sense, governing natural resources is an effort to balance different actions and policy goals, as well as disciplinary domains within research and development. How this balance is selected can be informed by better science and knowledge, but the execution is also a matter of national to local interests, and how different levels of decision makers view the importance of some outcomes over others. Science cannot decide whether decision makers managing pastures should place more value on one goal among others related to grassland diversity, livelihoods and fodder productivity, carbon sequestration, or social harmony. However, evidence-based research can inform baskets of appropriate options for consideration and also demonstrate what has worked, what the hidden and unintended effects and consequences are, and for what reasons. Governance efforts do not take place in social vacuums and, hence, context-specific social-cultural, political-economic, ecological, and gender realities play critical roles in shaping outcomes, including benefits and losses.

The second important point to note is that no single agency or domain of actors has the knowledge, capacity, and interest necessary for improved natural resource governance outcomes. Collaborative relationships across three different types of actors in the private/market, civil society/NGO, and public/government/development sectors are typically relevant to natural resource governance. Governance arrangements that seemingly hinge on the actions and decisions of actors in a single domain, in reality, rely on combined contributions from actors and decision makers in multiple domains and agencies (Bäckstrand 2003; Karkkainen 2004). For example, community-based natural resource management is not just about community-level decision makers; it also requires inputs from government actors and agencies, and sometimes the involvement of market actors where forest products can be exchanged for cash. More generally, effective collaborations are based on clear expectations, the sharing of information and resources, matching of capacities to expected actions, and well-defined institutionalized arrangements, and they are more likely to promote improved natural resource governance (Conley and Moote 2003; Koontz and Thomas 2006). This highlights the importance of networks and the interconnectedness between actors in an increasingly globalized world. Hence, even the seemingly most isolated communities, such as those commonly found in mountain contexts, are not disconnected from global forms of sociocultural and political-economic processes that connect even the remotest regions in the world (Gupta and Ferguson 1997). The global interacts with the local in complex and multidimensional ways (Mackenzie 2010).

A third key finding of the review is that collaboration for managing resources is complex; it needs commitment and the clear delineation of roles, responsibilities, and resources. Ongoing exchanges and consultations among partners, especially local women and men, to ensure knowledge sharing and learning in light of changing circumstances are therefore also needed for collaborations to be successful and effective (Schusler 2003, Susskind et al. 2012). Improved benefits from natural resources are likely to be secured only with such collaboration among different managers, users, and other stakeholders and across scales of governance and decision making. It is important to note that systematic, informed, evidence-based, corroborated knowledge as the foundation for decision making is more likely to generate confidence and legitimacy, as opposed to ad hoc, stand-alone, dislocated knowledge. However, in emergency and disaster situations where time is of the essence, rapid reactions, readiness, and responsiveness are likely to be more critical (Nellemann et al. 2011). Interdisciplinary and transdisciplinary knowledge, as well as technical and indigenous knowledge, together can provide nuanced and shared solutions to pressing issues – a point to which we will return.

The fourth general point that emerges from the review of different domains of natural resource governance is that the actors involved in governance use three key mechanisms/instruments to achieve their ends: information, incentives, and institutions (Newton et al. 2013). The specific mechanisms may be as varied as trainings, reports, evidence-based researches, audits, fund transfers, committees, user groups, rules, procedural changes, reporting requirements, information centres, land boards, and so forth (Agrawal and Benson 2011). But the mechanisms used in practice are

the expressions of one or a combination of instruments among information, incentives, and institutions. Information and communication are necessary to share knowledge about available choices and their consequences for different interest groups. Institutions shape expectations and incentives. And specific incentives influence the actual choices made by decision makers. These three instruments are deployed variably in the examples considered in this review, but some combination of these is how different stakeholders typically attempt to achieve their goals.

The fifth pattern in the literature is that effective collaborations among different governance stakeholders are more likely when actors and forms of governance are matched to their comparative advantages in terms of use of the three different instruments of governance that this paper identifies: information, incentives, and institutions. Civil society actors have a greater comparative advantage in using information to mobilize public opinion and resources. Government and development agencies can effectively regulate choices through institutional changes or incentives. Market exchange-based governance strategies such as payments for ecosystem services hinge on performance-based direct incentives, while farmer cooperatives bank on the added advantages of collective work, negotiations, and profit sharing in relation to market agents.

The sixth and somewhat preliminary finding is that different governance forms and actors have greater or lesser affinities for accomplishing particular socially valued goals effectively. Very broadly speaking, the involvement of local actors and communities for resource allocation choices is particularly important when local livelihoods are at stake. Contributions from government agencies and actors are critical to enhancing the sustainable provision and protection of public goods such as biodiversity, natural resources, culture, ecosystem health, training and extension services, and national security. On the other hand, private market actors have the potential to enable greater efficiency in the use and allocation of benefits from resources, provided that they operate under commonly agreed rules, regulations, and corporate social responsibility principles that counter elite capture, gender exclusion, land and resource grabs, and unfair trade practices. It is worth noting that international bilateral relations between governments (North-South and South-South) and development agencies play a critical role in the HKH. International and regional intergovernmental organizations ensure greater ownership and buy-in regarding decisions reached through consensus. Development organizations and agencies dedicated to poverty alleviation, environmental conservation, and sustainable development provide technical expertise, implement projects, and pursue development goals (e.g., sustainable development goals, the post-2015 agenda, the Paris agreement, etc). However, their effectiveness is varied in different contexts and dependent on the degree to which they are demand-driven, transdisciplinary, reflexive, and adaptive, and to which they recognize unintended/hidden consequences and respond to the needs of local women, men, and children on the ground.

Because natural resources are so central to human welfare, the survival of innumerable species, and the long-term sustainability of countless social, cultural, spiritual and ecological processes, the ethical imperative is to treat them

as resources held in trust for future generations. The general definition of sustainable development – “development that meets the needs of the present without compromising the ability of future generations to meet their own needs” (WCED 1987, p 43) – is equally applicable to the sustainable management of resources. The degradation of natural resources in the region poses substantial and diverse risks to livelihoods, the maintenance of biodiversity, cultural values, spiritual ecologies, ecosystem and human health, and regional to planetary scale processes that support life on earth.



## 2. Ecologies of Governance in a Rapidly Changing World

Global and regional drivers of change in the HKH have critical implications for understanding the complexities of governance, designing innovations, and addressing challenges facing the region. Together, they shed light on and set the background for concepts, key dimensions, and experiences from diverse natural governance ecologies, as well as sociocultural and political-economic contexts.

### The Hindu Kush Himalaya: A Complex, Diverse, and Dynamic Region

The Hindu Kush Himalaya stretch over 4.3 million square kilometres, encompassing high-altitude slopes, valleys, undulating hills, and plateaus. The region includes the entirety of Bhutan and Nepal as well as the mountain and hill regions of six other countries – Afghanistan, Bangladesh, China, India, Myanmar, and Pakistan.

The complex, evolving, and dynamic features of the region, coupled with its rich environments, multiple ecological zones, sociocultural diversity, and spiritual practices, offer a multiplicity of examples illustrating effective governance possibilities. The natural resources found here are critical for the survival of a large number of diverse people and cultures, furnishing critically important sources of income, food, livestock, medicinal plants, water, and energy, as well as important cultural practices, spiritual ecologies, and sacred sites. As we elaborate further below, governance arrangements in the region are equally complex, dynamic, and diverse.

Figure 1: Map of the Hindu Kush Himalayan region



In these striking mountain environments, livelihoods have been sustained for millennia through creative natural resource management, innovative land use practices, and intimate knowledge of and relations with existing social-ecological systems. A substantial dependence on primary sector activities for livelihoods has meant that local people, especially women, are at the forefront of adaptation to climate change (Nellemann et al. 2011). They are, however, often at the margins of development efforts because lowland agriculture and privatized/individual forms of land tenure are often assumed as the norm in mainstream development strategies.

What happens in the HKH is of both global and regional significance. Not only do the mountains and environments of the HKH offer ecosystem resources for 210 million people living in mountain areas, what happens in and to the mountains affects 1.3 billion people downstream. For instance, glacial lake outburst floods, the flow of black carbon, migration patterns, and instances of too much or too little water leading to floods and droughts impact millions of women, men, and children downstream and in the lowlands.

It can be argued that the sociocultural and political-economic contexts, natural resource use and management practices, topography, culture, ecosystem diversity, and social and gender relations of the HKH region are unique. It is a distinct region of the world, geopolitically, culturally, socially, and economically. This unique character is perhaps the strongest when considering governance in the region.

In terms of its diversity of national-level political organization, the HKH is unique in the world, encompassing the largest democracy, the largest communist nation, a new democracy emerging from a military government, a new democratic monarchy, and countries that have witnessed shifts between democratic and authoritarian regimes. The region includes two emerging super powers and members of BRICS association of emerging national economies (India and China), and emerging markets with rapidly increasing numbers of middle-class consumers. This means that the private and corporate sectors operating in the region are large, powerful, and growing. Their activities have substantial effects on people and their environments. Against this backdrop, economic poverty and large income disparities continue to challenge the region in many ways, especially in response to globalization and rapid economic changes.

The region is also characterized by sharp political sensitivities and sovereignty/territorial issues, and there are a number of long-standing conflicts between specific country dyads. Added to these problems are challenges centred on gender and different forms of social inequalities, high levels of gender-based violence, and resistance to gender transformative changes. However, within this environment, there is also a goodwill and interest to share knowledge, experiences, and best practices. Moreover, some of the strongest feminist movements and champions for equality are found in the HKH, sometimes powerfully driven from the grassroots.

The HKH also has a long history of civil society participation and movements. One of the largest among these movements was the non-violent civil disobedience movement led by Mahatma Gandhi that brought colonialism to an end in India, Pakistan, and Bangladesh. Civil society and civil society organizations continue to play an important role in the governance of natural resources, aided by diverse modes of communication and through recourse to legal systems and social media. These features are relevant for emerging democracies such as Myanmar and Bhutan that have recently opened up to the larger world to varying degrees and with complex outcomes. Isolationist histories have also led to innovative development alternatives, as articulated in the concept of Gross National Happiness, an indigenous development path from the Kingdom of Bhutan (Verma 2016, Priesner 1999).

## **Governance in Mountain Contexts**

Mountain contexts challenges and interesting opportunities for effective governance. Some of these challenges and opportunities are shaped by the physical attributes of mountains and the communities they shelter, while some are influenced by social, cultural, political, and economic aspects. Further, migration, trade, cultural exchange, pilgrimage, pastoralism, travel, and even conflicts have characterized mountain communities in the region, and continue to do so.

Mountain communities are often challenged by inaccessibility and remoteness, which pose problems for the delivery of development and social services; participation in formal/statutory governance bodies and electoral

processes; and access to markets, information, and media. However, this remoteness and inaccessibility also buffers mountain communities from globalization, markets, and media influences, and allows the maintenance of unique cultural, spiritual, and social relations, practices and rituals.

Mountain communities are often situated on steep, hilly inclines, making their environments fragile and hazard-prone. Sloping topographies create problems associated with farming, irrigation, transportation, and forestry, but they also mean that communities and environments are sensitive to environmental, geological, and climate-linked shocks such as floods, droughts, famines, hailstorms, earthquakes, landslides, and avalanches.

According to the Mountain Institute, more than half of the world's 48 ongoing conflicts and wars in 2004 took place in mountain areas (2004). Many mountain regions across the globe are politically sensitive, based on long-standing territorial conflicts, independence movements, and disputed occupied territories. The HKH is not an exception, with ongoing wars and disputes in many crossborder contexts across the region. However, political sensitivities and conflicts are not limited to transboundary conflicts. They also result from claims brought forward to national governments by indigenous people over certain rights, knowledge, and ways of life. Balancing national sovereignty and rights with local rights to self-determination tends to bring to the fore conflicts and political tensions in many contexts throughout the HKH.

Many of these tensions and conflicts are about land, territorial boundaries, resource access, cultural identities, self-determination, and contested histories. However, some of the most pressing environmental problems in mountain regions today defy territorial boundaries alone. For instance, climate change, black carbon, water and air pollution, and migration defy national borders. Similarly, distributions of natural resources, biodiversity, and water do not occur by administrative boundaries. Hence, some of the governance solutions to pressing ecological and sustainability problems also require cooperation across national boundaries.

Mountain communities, contexts, and issues often have peripheral and marginal positions in dominant, mainstream development agendas. Hence, demand-driven development needs, priorities, and urgent responses required by mountain women, men, and children sometimes go unheard. As a result, over the past several decades, many global and regional organizations, initiatives, forums, and platforms have been formed to address the specific and context-driven needs of mountain communities, environments, and people. For instance, at the global level, several organizations work on these issues, including the Mountain Partnership hosted at the UN Food and Agriculture Organization (FAO) and the Mountain Forum hosted by the Consortium for Sustainable Development of the Andean Ecoregion (CONDESAN) and the UNEP Vienna Interim Secretariat of the Carpathian Convention (ISCC). At the regional level, organizations such as ICIMOD (HKH), CONDESAN (Latin America), The African Highlands Initiative (Africa), and the Carpathians Mountain Forum and European Mountain Forum (Europe) work on advancing mountain issues in their particular regions. Several networks focusing on mountain issues and contexts also exist around the world (see Figure 2). In particular, the Convention on the Protection of the Alps and the Convention on the Protection and Sustainable Development of the Carpathians are mountain-specific conventions that have led to declarations, action plans, frameworks, platforms, and forums for supporting regional cooperation, joint strategies, the conservation of culture and environments, and sustainable development (UNGA 2010, p 5). Several nationally based organizations and institutes, including the Mountain Institute, the Mountain Research Institute at the University of Berne, and the European Academy Bolzano (EURAC), are also dedicated to researching and advancing mountain issues.

Mountain-focused actors have achieved success in advancing such issues and agendas through various governance arrangements and to varying degrees. While the 'mountain agenda' has taken time to gain momentum, consensus, and impact, there have been some notable successes recently in ensuring the inclusion of mountain issues in international governance mechanisms, most notably through United Nations General Assembly resolutions. An important political mandate for this at the international level is evidenced by the inclusion of mountain issues in Chapter 13 of Agenda 21 from the United Nations Conference on Environment and Development and General Assembly Resolution 64/205 (UNGA 2010). The seven-page resolution outlines notable advances through various institutions, mechanisms, organizations, forums, networks, and platforms; UN-observed year and days; links to other international conventions; mountain specificities and challenges; the role of various governance actors; and

encouraging greater financial support, knowledge, action, capacities, and collaboration (ibid.). Similarly, and more recently, the Rio+20 document 'The Future We Want' (UNGA 2012) advocates for mountain issues through three dedicated paragraphs on mountain development, captured and highlighted in their entirety in Figure.

Figure 2: **Mountain networks around the world**

### Mountain Networks

(source, Byers, 1998)

#### GLOBAL

- Mountain Forum and Mountain Forum e-mail list
- Mountain Protected Areas Network
- FAO Mountain Programme and Interagency Task Force on Agenda 21, Chapter 13
- International Mountain Society and Mountain Research and Development Journal
- International Geographical Union, Commission on Mountain Geocology and Sustainable Development
- World Mountaineering and Climbing Federation (and its many national affiliates)
- Banff Centre for Mountain Culture

#### AFRICA

- African Mountain Forum (in the formation process)
- African Mountains Association
- African Mountain Protected Areas Network
- Lesotho Mountain Research Group
- Community Environment Network, South Africa
- MF-Africa e-mail list

#### ASIA AND THE PACIFIC

- Asia Pacific Mountain Forum and Asia Pacific Mountain Network
- Australasia-Pacific Mountain Forum
- North Central Asia Mountain Forum
- West Asia Mountain Forum
- South East Asia Mountain Forum
- North East Asia Mountain Forum
- Australian Mountain Protected Areas Network
- Australian Institute of Alpine Studies
- Nepal Studies Association and Himalayan Research Bulletin
- Nepal Forum of Environmental Journalists
- Himalayan Explorers Club and HimalayaNet e-mail list
- Kathmandu Environmental Education Project

#### EUROPE

- European Mountain Forum (in the formation process)
- Carpathians Mountain Forum
- Caucasian Mountain Network and Caucasus Mountain Forum
- Central/Western Middle European Mountain Forum
- Central/Western Middle European Mountain Forum (French Jura)
- Central/Western Middle European Mountain Forum (Czech Sudeten)
- Northern European Mountain Forum
- International Commission for the Protection of the Alps
- CH-Regio
- Man and the Biosphere (Russian Federation and CIS)
- International Association of Academies of Science, CIS Mountain Research Programme (in the formation process)
- MF-Europe e-mail list

#### LATIN AMERICA

- Latin American Mountain Forum and MF-LAC e-mail list
- Consortium for the sustainable development of the Andean ecoregion (CONDESAN) and Info Andina
- Andean Mountains Association
- Red de los Andes Centrales-Perú
- Selvas de Montaña
- Asociación para Desarrollo Campesino, Red de Páramos
- Red Latinoamericana de Estrategias hacia la Sostenibilidad
- MF-Discuss e-mail list (Andean Paramos)
- Latin American Protected Areas e-mail list

#### NORTH AMERICA

- North American Mountain Forum (in the formation process)
- The Corridor (Southern Appalachian Culture and Natural Heritage Forum)
- Appalachian Restoration Campaign/Heartwood
- Southern Appalachian Forest Coalition
- Rocky Mountain Institute
- MF-N America e-mail list

The issues and efforts described above are invariably made more complex by the sheer diversity and variability of culture, social relations, religion, spiritual practices, political-economic arrangements, ecologies, biophysical attributes, altitudes, and environments in mountain contexts around the world and in the HKH. Added to this is the dynamic nature of mountain communities and environments. In this regard, culture and social relations are not fixed or static but constantly adapting in response to globalization, technical development interventions, climate change, policy reforms, geopolitical shifts, etc. The complex situation characterized by diversity, variability, and dynamism suggests that governance in mountain contexts therefore needs to be adaptive, flexible, responsive, creative, and context-specific in light of multiple drivers of change.

## Drivers of Sociocultural, Political-economic, and Ecological Change

It may be argued that the HKH is experiencing unprecedented rates of changes not experienced before. Such rapid changes in the region have several consequences for governance.

### Economic Growth and Fiscal Transformations

Nearly all countries in the HKH region have been growing rapidly in the early years of the twenty-first century.

Indeed, the World Bank has called South Asia the fastest growing region in the world.

Faster economic growth in recent decades has been accompanied by increasing inequality as government regulations were reduced, market-based economic policies took hold, and the effects of economic liberalization were felt widely. But faster growth rates and increasing government revenues also enabled a number of countries to expand their programmes for poverty reduction and social safety nets, with an appreciable impact on poverty. The effects of these economic policies and social support programmes were felt less deeply in the HKH region compared to the impacts on national economies. Further, average growth rates have been lower in Nepal and Pakistan compared to other HKH countries.

The global recession of 2008 undermined growth rates in South Asia, but overall growth was still much faster than it was in the second half of the twentieth century. In the last few years, optimistic expectations about a continued rapid rate of growth have diminished. Persistent bottlenecks related to infrastructure development, growing inequalities, conflict, corruption, and fiscal deficits have reduced growth rates and related declines in poverty to much lower levels than in the first five years of the twenty-first century. Although the most recent projections from the World Bank for economic growth include some modest revisions upwards for the period 2013–15 (World Bank

Figure 3: Excerpt related to mountains from the UNGA Resolution 66/288 (Source: UNGA 2012)

### Excerpt from Resolution adopted by the General Assembly, Sixty-sixth session

Agenda item 19, A/RES/66/288 on the Future We Want

#### Mountains

210. We recognize that the benefits derived from mountain regions are essential for sustainable development. Mountain ecosystems play a crucial role in providing water resources to a large portion of the world's population; fragile mountain ecosystems are particularly vulnerable to the adverse impacts of climate change, deforestation and forest degradation, land use change, land degradation and natural disasters; and mountain glaciers around the world are retreating and getting thinner, with increasing impacts on the environment and human well-being.

211. We further recognize that mountains are often home to communities, including indigenous peoples and local communities that have developed sustainable uses of mountain resources. These communities are, however, often marginalized, and we therefore stress that continued effort will be required to address poverty, food security and nutrition, social exclusion and environmental degradation in these areas. We invite States to strengthen cooperative action with effective involvement and sharing of experience of all relevant stakeholders, by strengthening existing arrangements, agreements and centres of excellence for sustainable mountain development, as well as exploring new arrangements and agreements, as appropriate.

212. We call for greater efforts towards the conservation of mountain ecosystems, including their biodiversity. We encourage States to adopt a long-term vision and holistic approaches, including by incorporating mountain-specific policies into national sustainable development strategies, which could include, inter alia, poverty reduction plans and programmes for mountain areas, particularly in developing countries. In this regard, we call for international support for sustainable mountain development in developing countries.

(United Nations General Assembly, 2012:41)

Figures 4a and 4b: **Economic growth and poverty in South Asia**

	2013	2014	2015	2016	2017
<b>South Asia real GDP (at market prices, by calendar year)</b>	6.3	6.8	7.0	7.4	7.6
Percent change					
<b>SAR Current account balance</b>	-2.1	-0.8	-0.8	-1.5	-2.3
(Percent of GDP, Calendar year)					
<b>Real GDP growth (at market prices, by fiscal year)</b>					
<b>Afghanistan</b>	3.7	2.0	2.5	5.0	
<b>Bangladesh</b>	6.0	6.1	5.6	6.3	
<b>Bhutan</b>	2.0	5.2	6.7	5.9	
<b>India</b>	6.9	7.2	7.5	7.9	
<b>Maldives</b>	4.7	5.0	5.0	-	
<b>Nepal</b>	3.9	5.5	5.0	5.0	
<b>Pakistan*</b>	3.7	4.1	4.4	4.6	
<b>Sri Lanka</b>	7.3	7.4	6.9	5.6	

Source: <http://www.worldbank.org/en/news/press-release/2015/04/13/south-asia-cheap-oil-reform-energy-pricing>

2013), the challenges mentioned above will continue to hinder positive economic transformation in the region. Moreover, as economic growth rates increase, growing gaps in wealth within nations challenge assumptions about the 'trickle down' of wealth to economically poorer sectors of society. It is also useful to note emerging research that indicates that measures of economic growth such as GDP (gross domestic product) may not be the most effective measures of a nation's health in terms of wellbeing and development (Costanza et al. 2014 SNDP, 1023).

## Globalization, Regional Integration, and Infrastructure Development

The economic and fiscal changes mentioned in the previous section have been part of the wider process of globalization in the last two decades. Driven both by changes in communication technologies and the widespread accessibility and digitization of print and visual media, as well as economic integration, globalization processes have had ubiquitous but variable effects on the region's economies and sociocultural processes. At the same time, regional integration in the HKH has been a slow and interrupted process, even if apocalyptic predictions of disintegration are often built on shaky evidence (Dossani and Rowen 2005; Kaplan 2009).

Broadly speaking, integration efforts in the region have been driven by the perceived benefits of greater economic interdependence, trade, and crossborder investments. Although talks of a common currency seem unduly optimistic (Saxena 2005), South Asian nations have made a number of efforts to create preferential trade agreements within the region, and to move towards a free trade area (Pitigala 2005). As early as 1995, Bangladesh, Bhutan, India, the Maldives, Nepal, Pakistan, and Sri Lanka agreed to seek full implementation of the free trade area by 2013. These steps were motivated in part by the fact that intraregional trade had been weak. For example, exports in South Asia only doubled over the 20 years between 1985 and 2005. In East Asia, exports grew by more than ten times in the same period (Wilson and Otsuki 2007). Some of the HKH countries have seen quite rapid increases in their bilateral trade: total trade between China and India, for example, went from a miniscule level of around USD 3 billion in the early years of the previous decade to more than USD 70 billion in 2011. Even with some decline in 2013, this figure is on target to reach USD 100 billion by the middle of this decade. Even unilateral trade liberalization efforts can boost benefits from trade, and thereby help diversify the current narrow export bases towards the development of new comparative advantages (Pitigala 2005).

However, efforts towards integration are hampered by political differences. The major powers in the region – India, Pakistan, China, and Bangladesh – have been involved in different conflicts since 1950 and continue to have

border disputes. Afghanistan has seen remarkable levels of political unrest and transition (Goodson 2012). Nepal's economic growth has been adversely affected by one of the most intense internal conflicts in recent times. Despite achieving a political resolution, the effects continue to obstruct Nepal's movement towards a fully functioning democratic polity (Murshed and Gates 2005; Sharma 2006). But perhaps the most important impediment to greater regional integration are the widespread perceptions of India and China being insensitive to the needs of smaller regional economies and polities (Nathan 2010). Benefits from regional integration in the HKH, especially on issues that are of common interest, will require stronger efforts at accommodation by the major powers that dominate political relationships in the region.

### **Demographic Change and Consumption Patterns**

The total population of the HKH exceeds 210 million people. Mountain populations have long been characterized by high rates of birth and population growth, outmigration, remittances, movement towards non-agricultural occupations and employment, and greater interdependencies with lowland economies (Hoermann et al. 2010; Ives 2006; Massey et al. 2010). More than 30 million people from the region live outside their native countries, according to ICIMOD, constituting roughly 15 per cent of the world's migrants (n.d.). According to some observers (Axinn and Ghimire 2011; Baland et al. 2007), increasing population and growth have resulted in environmental degradation. However, others have questioned any easy relationship between demographic and environmental change (Agrawal and Chhatre 2006; Williams 1995).

Among the key transformational dynamics that characterize the HKH, demographic shifts and emerging consumption patterns because of a rapidly growing middle class are the ones that will have substantial long-term effects, particularly on economic growth, resource conditions, cultural shifts towards materialism, carbon emissions, and governance. There are very few comparative studies on how these changes are affecting the HKH region.



However, according to a WWF study on the eastern Himalaya, population growth rates continue to be high for the region – with some exceptions (i.e., China and Bhutan) – despite slowing down in the last few decades (AAAS n.d).

## Climate Change and Other Environmental Challenges

Mountain regions are changing rapidly. Climate change, globalization, neoliberal market forces, geopolitical shifts, and other drivers of change are creating new challenges and dilemmas as well as opportunities for mountain communities and ecosystems. The effects of such drivers are experienced in various ways, including urbanization, migration, climate-induced impacts, and social, cultural, identity and land use changes.

In terms of climate change, the Tibetan Plateau, also known as the Third Pole or the water tower of Asia, which holds the ice sheet of the HKH region, is heating faster than previously anticipated (DIIR 2012). As a result, glacial meltdown, permafrost degradation, desertification of grasslands, and changes in river hydrology, including the shrinking and drying up of lakes, wetlands, and rivers, are evident (ibid, pp 10–12). Research from the region indicates that the rate of warming in the HKH is significantly higher than the global average with great spatial and temporal variations. For instance, in the eastern Himalayan region – including Nepal, Bhutan, northeast India, north Myanmar, northwest Yunnan, and southern parts of the Tibet Autonomous Region – from 1977 to 2000 the average annual temperature increased by 0.01°C in the foothills (< 1,000 masl), 0.02°C in the middle mountains (1,000–4,000 masl), and 0.04°C in the higher Himalaya (> 4,000 masl) (Tsering et al. 2010). Increased warming results in impacts on ecologies and human-environmental relations. For instance, preliminary research indicates an exacerbation in women's workloads related to natural resource management in rangelands (Verma and Khadka, in press). The Tibetan Plateau is illustrative of the way climate change and other drivers of change are not only affecting the food security of pastoral men and women but also ecosystem services. Changing climates in rangelands impact the availability and quality of pastures and other natural resources such as water, soil, and biodiversity of plant species (Lenton 2002; Thornton 2009; Klein et al. 2007). In Pakistan, climate change impacts include a reduction in crop production, desertification of land, loss of soil fertility, and increase in pests (LEAD 2008).

For millennia, mountain women and men have adapted to changing seasons and extreme weather conditions (Leduc and Shrestha 2008), often in response to regularly occurring disastrous events involving too much or too little water and extreme temperature changes (UNEP 2004; Rhoades 2007; ICIMOD 2009a). In response, they have evolved adaptation techniques in terms of disaster preparedness and mitigation, food security planning, and water shortage management (Salick et al. 2009; UNEP 2010). The success of local and national responses depends centrally on effective and responsive governance, although increasing climate variability is likely to pose significant threats and pressures in the future.



Part II  
Conceptual Framings



# 3. Concepts, Actors, Mechanisms, and Rights in Natural Resource Governance

Governance comprises an ensemble of institutions, powers, and knowledge through which human and social decisions and actions are made. All governance is political. Effective governance affects decision makers, decisions, actions, and outcomes. It influences what people know and do not know, what they do and do not do, as well as what they get and do not get. Governance is not the same as government: it includes the actions of the state as well as those of actors such as communities, businesses, development actors, and NGOs. Key to different forms of natural resource governance are the political-economic relationships that institutions embody and how these relationships shape identities, actions, and outcomes (Ostrom 2001; Jagers and Strippel 2003; Agrawal 2005). Because governance occurs through customary and non-organizational institutional mechanisms as well (for example, when it is based on market incentives and self-regulatory processes), there is no escaping them if one is concerned about natural resources. Natural resource governance is “varied in form, critical in importance, and near ubiquitous in spread” (Lemos and Agrawal 2006, p 298).

## Defining Natural Resource Governance

Natural resource governance is the set of interventions that change incentives, information, and institutions related to natural resource use and management and thereby influence decisions and behaviours of agents at multiple scales. Following Lemos and Agrawal (2006), natural resource governance refers to the processes, mechanisms, and organizations through which political actors exercise power despite physical absence to influence actions and outcomes related to natural resources.

## Conceptual Underpinnings: Knowledge and Power Relations

It is difficult to discuss natural resource governance at different scales without at some point discussing issues of power, knowledge, and resources – key concepts for the approach that underpins this paper. We translate the pillars of our approach by focusing specifically on the institutions, information, and incentives that influence natural resource outcomes.

Figure 5: The many definitions of natural resource governance

A few of the prominent definitions of governance and their common elements are presented below. In these definitions, the normal emphasis is on identifying what governance is, what it does, and, in some cases, how governance accomplishes goals.

Perreault (2006, p 151) conceptualizes natural resource and environmental governance, “as the legal frameworks and institutional arrangements through which decisions about natural resources are taken, and the management practices by which those decisions are enacted.”

Larson and Soto (2008, p 214) view governance as the “formal and informal institutions through which authority and power are conceived and exercised.”

Lebel et al. (2006) citing Young defines governance as “the structures and processes by which societies share power, shapes individual and collective actions (Young 1992). Governance includes laws, regulations, discursive debates, negotiation, mediation, conflict resolution, elections, public consultations, protests, and other decision making processes.”

In discussing gender dimensions, Brody (2009) suggests that governance is about decision making by a range of stakeholders with different advantaged or disadvantaged positions in terms of power relations, including those in formal and informal institutions, as well as citizens. These decisions significantly affect the ways women and men lead their lives, the rules they are expected to abide by, and the norms that shape where and how they work and live. They also shape how public, government, and development resources are allocated and whether services (and access to them) take into account women’s and men’s interests.

Governance by its very nature is political because it involves political actors such as governments, customary institutions, etc. Hence, issues of power, knowledge, and resources are central to its understanding and analysis. Of importance to this paper, natural resource governance includes and at the same time extends beyond politics, as its focus is on natural and environmental resources and the various mechanisms, processes, and organizations that shape it. Therefore, natural resource governance brings biophysical and sociopolitical issues together in interesting and important ways. Although many development projects and programmes have a heavy orientation towards technical fixes, it is important to seek solutions beyond the biophysical that meaningfully integrate issues of culture, social relations, knowledge, and power into thinking and practice (German et al. 2010).

Based on the above, it is useful to analyse differences in power between varying actors, for example corporations and local people, and their implications for the principles of good governance. At all levels and scales, important differences also exist between and among women and men, the economically poor and rich, the urban and rural, and the agricultural and pastoralist that must be taken into account. For instance, the extent to which interventions related to natural resource governance in mountains differentially benefit women and men depends on their meaningful and effective engagement in institutions of decision making, as well as governance institutions, incentives, and development processes, which are in turn influenced by relations of power.

Most importantly, it is necessary to attend to the changing, contextual, and fluid characteristics of power, knowledge, and resources when it comes to resource governance. The exercise of power, for instance, is not a zero-sum game (Long and Villareal 1994; Long 1992). Individual citizens are not 'powerless', and governing bodies are not 'all powerful'. Even authoritarian governance institutions are influenced, affected, and subverted by those typically considered 'less powerful' (Villareal 1992). Hence, rather than being possessed, power (and knowledge) is constituted in interaction (Verschoor 1992). Therefore, governance does not act down en bloc on citizens and actors, but is actively interpreted, negotiated, and resisted. Hence, it is important to address and ensure the principles of good governance elaborated further below. Similarly, incentives and resources do not exist in political and social vacuums but are actively negotiated and contested. As we elaborate later, rather than assume a top-down relation, it is useful to explore the way, through their interrelations, governance dimensions (institutions/information/incentives), and the people and natural resources they are aimed at are mutually constituted (Mackenzie 2010).

## Actors and Institutional Forms

The different roles of key governance actors and the critical importance of decisions and powers being wielded by agents most suited to do so have been enduring concerns for scholars of governance. The major interventions in this regard, as Larson and Soto (2008) point out, include studies of polycentric governance (Ostrom 1999b, 1972), pluralism (Wollenberg et al. 2005), and institutional choice (Ribot 2006, 2007; Ribot et al. 2008), and include debates regarding the role of customary authorities (Ntsebeza 2005) as well as user groups and stakeholder committees (Manor 2005).

Variations in forms of governance create distinctive incentives for those subject to governance, and therefore prompt different kinds of actions related to the use, management, and conservation of natural resources. A review of different literature relevant to multistakeholder governance shows that much of it recognizes three ideal types of governance arrangements, where the ownership of resource rights may rest with one of these different actors. These include public ownership, where the key actors are central government agencies that make decisions and own rights; private ownership, under which market actors such as companies and individuals own rights of different kinds, particularly ownership rights; and collective arrangements, which cover a wide range of practical arrangements where local communities and their members or groups of individual decision makers jointly own natural resource rights. Depending on how rights are vested in each of these actors, governance arrangements can be broadly viewed as falling under public, private, or communal forms. In practice, rights over resources may be finely divided and distributed among different social groups. For example, Peluso (1996) identifies highly nuanced distinctions in the allocation of fruit and other trees in Indonesia to different family and community members.

Schlager and Ostrom (1992) point to four basic elements relevant to the use and governance of natural resources: access and withdrawal rights, management rights, exclusion rights, and alienation (transfer) rights. When an individual, household, community, or group has access and use rights, they can gather benefits from that resource. When they also hold management rights, they can be viewed as a 'claimant' to the benefits that has the power to decide how the resource should be used and/or protected. Those who have access and use rights, management rights, and the right to exclude other users can be viewed as 'proprietors'. Finally, owners have all the rights that constitute the full bundle of property rights including the right to transfer these rights to others. Often, these rights are influenced and shaped by specific cultural norms.

Whether rights to use, manage, exclude others, and transfer resources rest with communities, private owners, or public agencies has major implications for governance outcomes. Some forms of tenure and distribution of rights are more likely to lead to greater economic efficiency and higher levels of output. In a review of property rights and tropical deforestation, one study suggests that private ownership of forests in the United States was responsible for high levels of deforestation of mature forests during the nineteenth century, but it also generated high levels of economic benefits for the US economy and private owners. However, the study also suggests that deforestation does not always lead to economic benefits; badly designed institutions, lack of property rights, and subsidies for agricultural expansion may lead to deforestation without sufficient increases in economic wealth. In such a scenario, short-term/individual gains are advantaged over long-term/collective interests, and environmental costs are externalized.

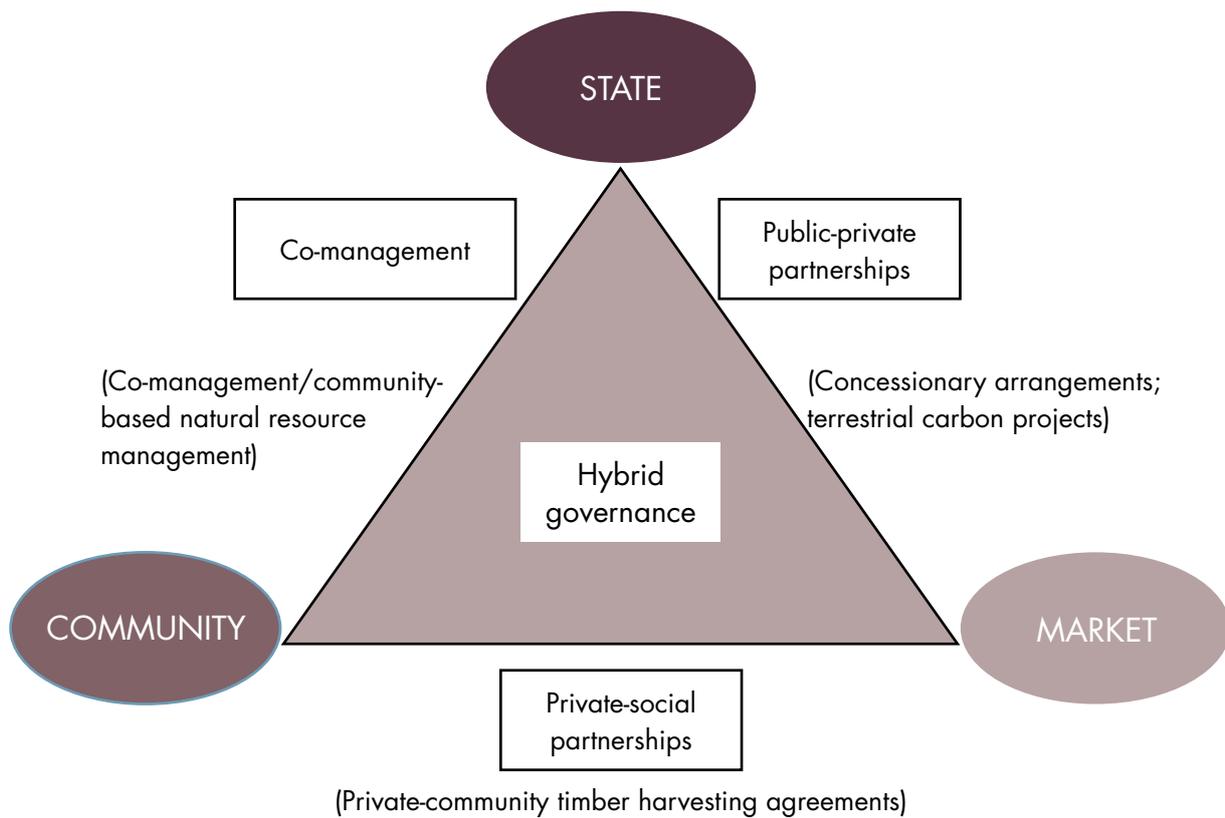
Just as private ownership of natural resources may have a positive association with high economic benefits (and resource depletion), other tenure arrangements such as government ownership are seen by many as being necessary for the longer-term preservation of resources. Because externalities accompany the use and exploitation of most natural resources, governance regimes that prompt decision makers to internalize the costs of their actions are necessary to reduce resource overexploitation. Hence, as Ostrom (1990) has highlighted, the common prescriptions are for either privatization or government control over resources. However, community-based or cooperative resource governance by different actors including community-level decision makers is superior when the costs of government enforcement are high and there are substantial transaction costs associated with the formal delineation of tenurial rights and arrangements. Thus, it is likely that different combinations of tenure rights are supportive of different ecosystem services from social-ecological relations. This point is elaborated more directly with reference to different ecosystem benefits associated with forest resources (see below).

## Multiple and Overlapping Rights

One way to frame how natural resources are governed is through an examination of how private, public, and community/civil society actors may combine their complementary interests and capacities (Lemos and Agrawal 2005). Governance arrangements related to natural resources typically comprise a variety of rights and capacities for specific actors that are separable in practice. Thus some hybrid governance forms may provide community-level actors the rights to access, use, and manage a resource, while the right to exclude other users and transfer the resource are vested in government agencies, and market actors are involved in the harvesting and marketing of resource products. Such co-management arrangements have become common for nearly all natural resources, and they are particularly visible in the case of forests, fisheries, rangelands, and irrigation systems. Other mixed forms may bring together different community or civil society organizations that have different rights. Consider, as an example, the implementation of community-based resource governance by non-governmental organizations. And, of course, other examples may include public-private partnerships in which irrigation infrastructure may be built by private market actors and then used by community users. Indeed, there are many efforts to build amalgams of governance arrangements that seek to combine the interests of private, communal, and public decision makers. The figure below summarizes some of the existing and potential forms of hybrid tenure and governance arrangements in relation to natural resources.

Figure 6 suggests that contemporary forms of governance of natural resources are highly diverse and rely on the differential strengths of different constituent actors and decision makers whose actions have important effects on

Figure 6: **Actors and modes of natural resource governance**



(Adapted from Lemos and Agrawal 2005)

environmental outcomes. As the discussion on specific resource domains below will clarify, there are scarcely any resources where the actions and choices of actors at a single level or of a single type pose the only consequential impacts. Different forms of co-management, private-social partnerships, and public-private partnerships have major effects on how resources are managed as well as their prospects for long-term sustainability. These are in turn affected and shaped by the differential power relations between them.

The central box in the figure – hybrid governance – is a special case of integrated governance in which ideal-typical forms combine. It can be viewed as an approach to governance that is relevant for particularly complex mixed-use outcomes related to both sociocultural and ecological dimensions of natural resource governance.

## Mechanisms of Governance

Many different kinds of social mechanisms can help accomplish governance objectives. Existing writings on the subject certainly cite a multitude of examples from this wide range of possibilities. For example, Ebrahim (2003, pp 816–823) focuses on five mechanisms that NGOs use to enhance accountability in governance: disclosure statements and reports, performance assessments and evaluations, participation, self-regulation, and social auditing. Devas and Grant (2003), although they do not carry out a systematic review, mention such mechanisms as elections, participation, opinion surveys, audits, media reports, meetings, and grievance procedures mechanisms that are also cited in earlier writings on decentralization and governance (Blair 2000: 32; Goetz and Gaventa 2001; Rakodi 2001). Grant and Keohane (2005) present a classification of seven mechanisms in their review of accountability in international politics: hierarchical, supervisory, fiscal, legal, market, peer, and reputational. Ribot (2004) similarly lists a large number of means through which different dimensions of governance relationships – representation, accountability, inclusiveness, responsiveness, and so forth – can be enhanced and made to work better. His discussion includes the separation of powers, courts, media, third-party monitoring, social movements, public discussions, reporting, meetings, supervisory oversight, trust and reputation, etc.

Other studies of governance focus on specific mechanisms to highlight the importance of the mechanism in question, whether it is participation, elections, reports, evaluations, audits, exits, or protests (Agrawal and Ribot 2012). Instead of reviewing this entire panoply of different mechanisms, it is useful to discuss some of the key emphases through brief discussions on revenue transfers, public reporting, participatory processes, and elections as different governance mechanisms. The first three correspond to incentive-based, informational, and institutional mechanisms – the analytical focus of this section – and the fourth, elections, constitutes a hybrid mechanism combining aspects of all three mechanisms.

Resource transfer to reward desired achievements in performance is one mechanism whereby the expectations and choices of actors and decision makers at a given level can be shaped by higher-level decision makers. But the reverse also holds. Moore (1997) argues forcefully about how governments that are dependent on the taxes they collect from their citizens are also more likely to be responsive to the taxpayers – in part because populations are then more likely to make demands on the government. Therkildsen (2001, p 30) has found that user charges serve a similar function. Governing agencies that depend on outside assistance (such as development aid) are less likely to be influenced by their populations (Guyer 1992; Siegel-Jacobs et al. 1996).

Public reporting, discussions, and meetings offer other means through which influence can be exercised by helping different stakeholders gain knowledge about the performance of those exercising power and making decisions and by enabling improvements in the quality of service provision based on better data (Marshall et al. 2000). If information is available publicly, it increases transparency and enables citizens to arrive at their own conclusions about whether decision makers have performed at a satisfactory level. The practice of holding public meetings with representatives to discuss budgets and policy decisions can also increase transparency (Adams 2004; Roberts 2002). At the same time, it should be noted that public forums can have serious limitations since women, religious minorities, or migrants are sometimes excluded and therefore may not find it easy to voice their views. The public reporting of budgets or other information such as employment rolls for public work programmes can be another mechanism to hold decision makers accountable (Lee 2004). If budgets, decisions, spending, and the salaries/benefits/land holdings of elected officials and planned programmes are publicly posted, it becomes easier for citizens to discern whether their local government is serving their interests. National surveys, such as national censuses or Bhutan's Gross National Happiness (GNH) and its articulation through an index of measure, also provide both policy makers and the public periodic data on the performance of governments (Verma 2017). The common set of indicators in the GNH index enables Bhutanese citizens to hold leaders accountable, evaluate whether government policies are effective and being fulfilled, and assess current and future support for the conditions of wellbeing and happiness in relation to policy contexts (Ura et al. in press).

Participatory processes can improve dialogue between government agencies and their constituents. As Fung (2006, p 69) observes, "discussions and decisions exert a communicative influence on members of the public or officials". The exchange of information through participation can help citizens learn about the services government agencies can provide, lead them to revise their expectations about what kind of benefits and/or services they should get, and teach them how to make demands on their representatives or government officials (Wampler 2004). Participation can also increase public involvement in decision making in a way that complements or strengthens other representative organs of a government, and it adds to the public's ability to make demands on authorities (Gaventa 2002; Brett 2003). In this sense, it leads to a representational influence on decision makers by members of the public. Other scholars have argued that there are many different varieties of participation in the context of natural resource governance (Agarwal 2001), and that there is no definite link between participation, accountability, and governance effectiveness (Ribot 2004). Fung (2006) sees participation along dimensions of who participates, how they participate – as in voice versus deliberation – and the degree to which participatory decisions are backed by powers of implementation.

Elections are central and pervasive means of limiting the arbitrary exercise of power, and therefore a major mechanism associated with effective governance. Grant and Keohane (2005) differentiate between the participation and delegation models of accountability through elections, because elections serve a key role in enabling both. According to the delegation model, elections allow voters to exercise some control over those they elect as their representatives and decision makers because, in case of non-performance, the representatives can be voted

out of power. This fear of sanctions forces decision makers to perform the functions of their office while keeping the interests of their constituents in mind (Przeworski et al. 1999). Under the participatory model, elections help voters participate in decision making and in having their preferences represented through those they elect. The representatives make choices that satisfy their agents' (voter) preferences. For example, Yao (2007) finds that the introduction of village-level elections in China is associated with higher expenditures on public goods rather than administrative expenses, as well as with greater income equality. However, an overemphasis on re-election can also render a government unable to perform its tasks effectively. Ultimately, the degree to which elections can serve the purposes of effective governance depends at least in part on the extent to which voters view elections as opportunities to punish past non-performance as opposed to opportunities to assess candidates in terms of their capacities to deliver on promises about the future (Fearon 1999).

Generating lists of mechanisms and investigating specific ones are useful steps in understanding how different mechanisms to pursue governance may be relevant to particular situations or to organizational relationships in a given domain. As discussed above, the literature discussing these different mechanisms forms a narrative in possibilism. When effectively implemented, a given mechanism may improve the performance of decision makers, enhance democratic processes, and enable improvements in project outcomes. But it is not easy to use the existing literature to offer an assessment of the conditions under which some mechanisms of governance perform better than others, and of whether there are elective affinities or likelihoods of association between certain classes of mechanisms and resource outcomes.

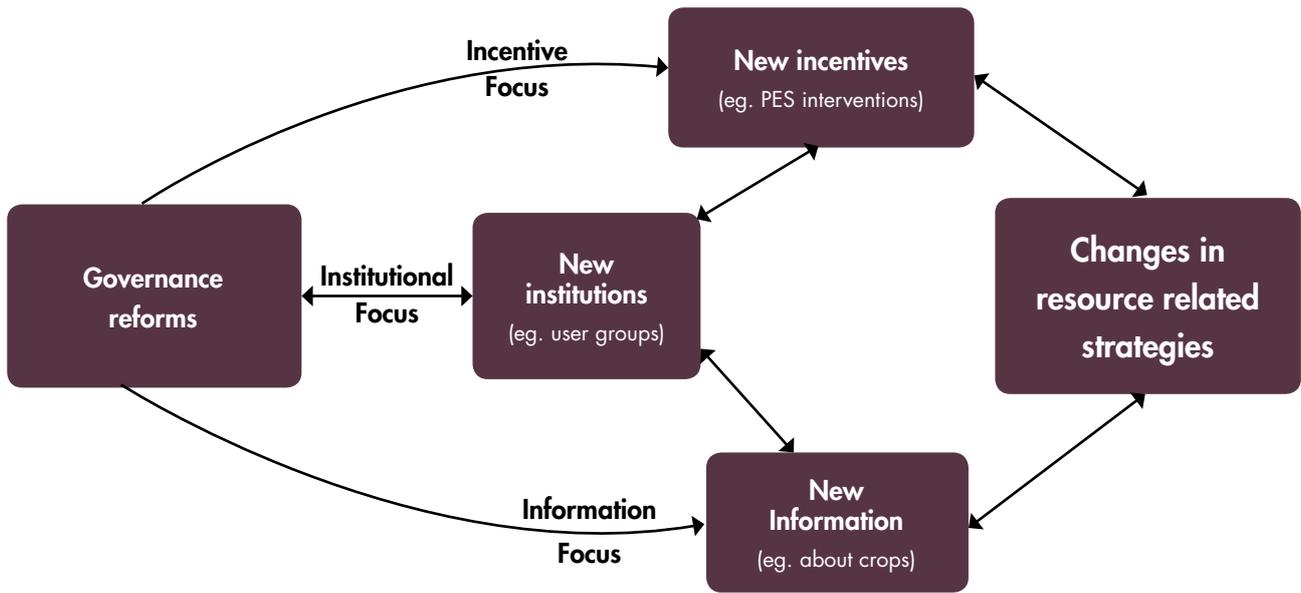
An assessment of different mechanisms in terms of their utility, analytical scope, effects, and relative advantages requires, therefore, an approach that can enable their classification deployed in practice along some underlying common dimensions, as well as comparisons across different types of mechanisms with respect to some common criteria. To facilitate such a comparison, it is possible to distinguish among three analytical axes that underpin the observed practices or mechanisms of governance (e.g., audits, elections, protests, resource transfers, and so forth).

These three fundamental axes are incentives, information, and institutions, as outlined earlier. This conceptualization of the analytical underpinnings of governance mechanisms used in practice builds on existing literature but also goes beyond it. For example, a recent World Bank study of decentralization notes that, if civil society actors are to hold service providers accountable, "relevant and accurate information" must be available to them (World Bank 2009, p 74). Schroeder (2003), in a careful review, focuses on four sets of actors at the local level (residents and citizens, local governments, higher-level governments, and service providers), and identifies the flows of information and incentives as the two basic keys to influence local governments. Although Schroeder schematically describes the institutional arrangements linking the four sets of actors that have been listed, his analysis does not recognize that the flow of information and incentives itself is structured by institutional arrangements, and that reconfiguring institutions, rather than focusing on incentives or information, can also restructure how local governments govern.

More importantly, the three axes – incentives, information, and institutions – make up the fulcrum around which organizations and decision makers construct the observed practices related to their governance. Thus, resource transfers, shares in the use of available natural resources, fines and punishments, and payments for the monitored provision of environmental services are examples of incentive-based mechanisms through which governance reforms can affect changes in relationships among actors, their expectations, and project/policy outcomes. Audits, reports, and evaluations are ways to use information to craft mechanisms through which changes can be brought about in governance practices and outcomes. Analogously, changes in rules or in reporting requirements, the creation of new centres of decision making, and the exercise of power by new organizations such as community user groups are examples of the use of institutional mechanisms to restructure governance.

Figure 7 below summarizes how these three domains structure choices made by actors and organizations involved in governance relationships. According to the logic represented in the figure, agents and decision makers involved in natural resource governance can deploy various combinations of the three governance mechanisms as they attempt to reconfigure what governance accomplishes and how. The figure does not attempt to capture all the different influences on outcomes of development and conservation interventions. Instead, it attempts only to represent how governance mechanisms may have an influence on outcomes.

Figure 7: Institutions, incentives, and information in natural resource governance

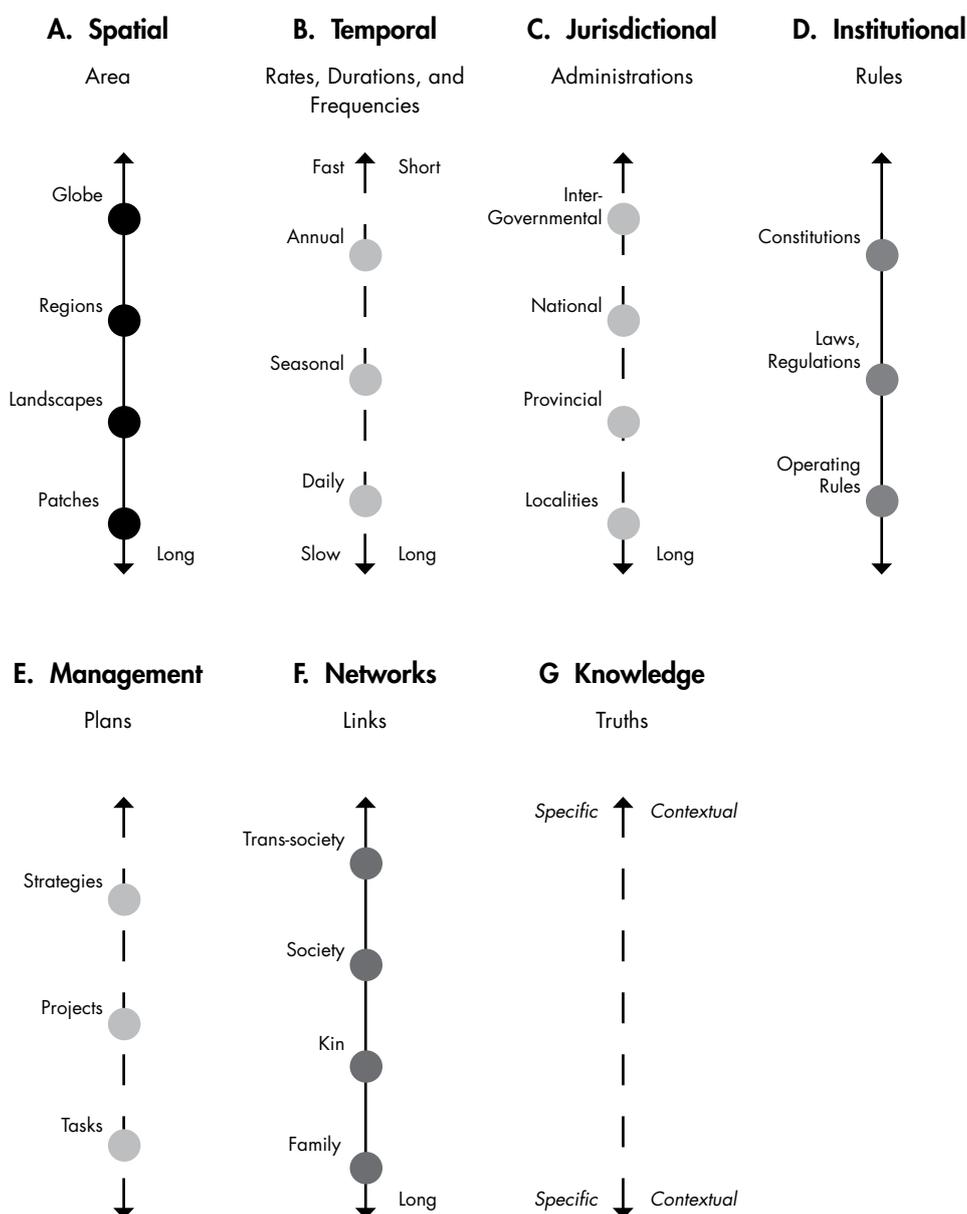




# 4. Key Dimensions of Effective Multiscale Governance

In an important paper on governance and scale, Cash et al. (2006) remark on the complexity generated by influences that operate across scales and levels of governance. Following Gibson et al. (2000), they “define ‘scale’ as the spatial, temporal, quantitative, or analytical dimensions used to measure and study any phenomenon, and ‘levels’ as the units of analysis that are located at different positions on a scale.” Figure 8 represents the different scales that are relevant to natural resource governance processes, and the units of analysis that are often used to represent different levels for the scales.

Figure 8: Scales and levels relevant to natural resource governance



(Cash et al. 2006)

The role of multiscale, multilevel interactions and their complexity has increasingly been recognized in writings on natural resource governance (Brondizio et al. 2009). Together with this recognition have come tools and approaches to study cross-scale and cross-level social and ecological phenomena. But, as Cash et al. (2006) highlight, the dominant mechanisms of cross-scale interactions are still not well understood. Brondizio et al. (2009, p 254) identify five relevant factors through which such interactions are enhanced and amplified: global market chains for land and water resources, overlaps among government jurisdictions, interregional migrations and interconnections among social groups; regional trade blocks, and changes in global climate patterns. To these, one might add at least three more integrating mechanisms and forces: interconnected financial and commodity markets, the related flows of aid for conservation and development, and the digitization and globalization of media technologies. The social complexities of these influences and forces make it necessary that governance structures and strategies take into account how interventions at one point and level in the complex web of relationships may influence outcomes at points that are at a substantial physical, social, cultural, or temporal distance.

In particular, natural resource and social-ecological systems characterized by high levels of interconnectivity in flows of influence across scales and levels are also more likely to be highly dynamic and have tipping points and thresholds, complex non-linear relationships, and feedback loops among parts and subsystems. These characteristics increase the need and importance of coordination among decision makers across scales and levels, systematic monitoring, decision-making flexibility, and adaptive management strategies for more effective governance. Careful and systematic monitoring is critical to detect changes in a timely fashion. Flexibility is necessary to address unpredictable changes. Adaptive management responses are needed to address the potentially perverse consequences of management interventions. Finally, coordination among decision makers across scales is necessary so that the impacts of interventions at one point can be assessed and addressed by decision makers operating at other levels and scales in interconnected social and ecological systems.

In the context of natural resource governance, another way to interpret the issue of scale is to consider some of the key dimensions of governance and how they are related to efficient, equitable, and sustainable natural resource outcomes (Brondizio et al. 2009). In this context, three basic dimensions of governance strategies are important: legitimacy, accountability, and inclusion/representation.

## **Governance, Legitimacy, and the Rule of Law**

A substantial amount of research now makes the distinction between government and governance. A number of scholars, attempting to explain the retrenchment of state capacities and the emergence of new collective forms such as networks, have sought to understand the role of alternative organizational logics beyond that of the state (Rhodes 1996, 1997; Stoker 1998). Another set of writings, approaching the problem of governance by focusing on civil society organizations, has examined how these organizations accomplish their ends as well as their relationships with corporations, state agencies, and international bodies (Elkington 1998, O'Brien 2000). But both these bodies of work have raised similar questions, even if implicitly, about the nature of the relationship between the state and new organizational forms, and about the extent to which networks and civil society organizations can be legitimate and effective.

Because the state can be viewed as both the agency through which laws are created and enforced as well as the institutional means that has a monopoly over the use of coercive force, the legitimacy of new forms of governance also rests on their recognition by state agencies and their adherence to the rule of law. Additionally, an alternative source of legitimacy of new governance forms may stem from their capacity to accomplish tasks that the state itself may not be well equipped to manage. Doubts about state capacity may stem from the need for greater efficiency, limited time, and place-specific knowledge about natural resources that are critical for effective management but not easily available to state agencies – or because of these agencies' problems related to the delegation of tasks.

## Governance, Accountability, and Responsiveness

Discussions of accountability are pervasive in popular as well as scholarly writings. From shareholders wanting accountability from managers and board members (Bradley et al. 1999; Roberts et al. 2005; Valor 2005) to citizens wanting it from decision makers (Kitschelt 2000; Strøm 2000) and politicians wanting it from civil servants (Huber 2000; Müller 2000; Moe 2001), the need for accountability is all-present when it comes to organizations and governance (Mulgan 2000). Effective accountability relations improve the performance of organizational tasks, make the delivery of services more efficient, and enable the accomplishment of the goals for which an organization stands (Adsera et al. 2003; Halachmi 2002; Heinrich 2003). They are indispensable for modifying processes, changing course, and achieving specific goals when organizations function in ways that diverge from their stated missions (Brown and Moore 2001; Devas and Grant 2003). The breakdown of accountability in an organization is often tantamount to the breakdown of the functioning of that organization.

Koppell (2005, p 96) identifies five dimensions to accountability in the exercise of power: transparency, liability, controllability, responsibility, and responsiveness. These dimensions can be seen as being equally important for accountability to exist in natural resource governance. Transparency refers to whether information is available about how power is exercised, the purposes for which it is exercised, and the consequences of the exercise of power. Liability refers to whether powerful decision makers will face the consequences of exercising power inappropriately or making decisions that they are not entitled to make. Controllability concerns the degree to which a decision maker's actions and decisions can be influenced during the exercise of power and making of decisions. Responsibility simply pertains to whether decision makers in fact make the decisions they are expected to make. Finally, responsiveness is about whether a decision maker acts in accordance with expectations about the appropriate exercise of power, especially where such exercise concerns those affected by decisions (West 2004). Issues of corruption, elite capture, grabbing of resources, and violation of governance rules through the exercise of arbitrary power arise in natural resource management, as has been the case with recent large-scale land transactions, or land grabs, in the global South (Verma 2014a).

Clearly, these dimensions of accountability are related, although empirical work on the degree of overlap between them remains unavailable. One major question in relation to accountability in natural resource governance has to do with the identity of stakeholders involved in an accountability relationship: who is accountable and to whom is the agent accountable. Agrawal and Ribot (1999) contrast downward and upward accountability based on whether decision makers can be called to account by those above or below them in a territorial-administrative hierarchy. Further, they argue for the importance of downward accountability in ensuring that decision makers exercise power to advance the interests of those on whose behalf they are entrusted to make decisions. In some ways, then, responsiveness in an institutional setting may be viewed as being analogous to downward accountability.

## Inclusive, Equitable, and Representative Governance

Debates around inclusive, equitable, and representative governance focus on the relationship between formal governance actors and everyday citizens. These dimensions are often linked to the depth and quality of participation, equity, and diversity in governance and decision-making institutions and practices (Brody 2009). It is often argued that these dimensions of governance strategies – equity, representation, and inclusion – are both principles as well as goals of good governance, in that they strive for the right of all citizens to have an equal say in governance processes and benefit equally from their outcomes (ibid.).

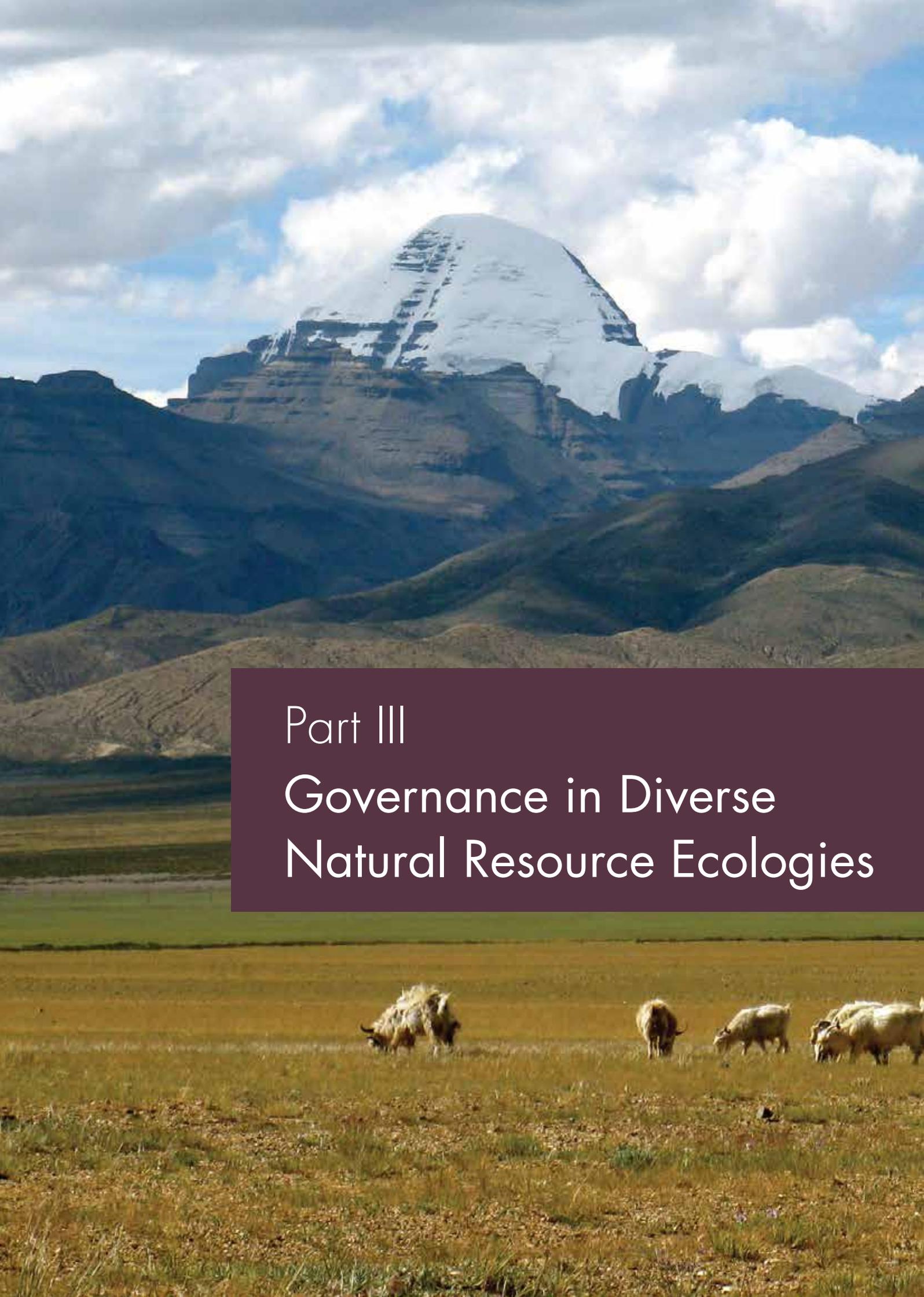
A key focus of interest and advocacy is groups of people who are disadvantaged in terms of equitable participation, voice, and representation in governance institutions and decision making (from meaningful involvement in informal and customary to formal and statutory processes), generation and access to information, and access to and benefits from resources and incentives. They often include women, men, children, or indigenous people differentiated by class, caste, status, identity, nationality, race, ethnicity, age, marital status, etc., or an intersection of these domains of difference, as is often the case. Hence, literature on the governance of natural resources often explores the ways different groups of people resist dominant forms of governance that may be experienced as being exclusionary,

inequitable, oppressive, and non-representative (see for example, Scott 1990, 1985). Scholars have researched the ways that women and men negotiate different governance dimensions, including institutions/power, information/knowledge, and incentives/resources related to development in varying contexts (Mackenzie 2010, 1995; Verma 2001; Kabeer 1994; Carney and Watts 1990). Noteworthy findings indicate that even the most top-down governance arrangements are actively negotiated and/or resisted by local women and men, thus pointing to their agency and knowledge in negotiating important dimensions that affect their lives. Such forms of gender struggles, resistance, and negotiations take place at the intra-household, inter-household, community, district, provincial, national, regional, and international levels.

In the HKH, the existence of gendered institutional and legal barriers, socioculturally constructed norms and practices, as well as skewed gender power relations – particularly in relation to land and property – perpetuate gender inequalities that especially disadvantage women in many contexts (Verma 2014c). Concentrations of power and decision making often advantage men and elite actors in terms of access to legal and development institutions, information, and resources. Skewed gender power relations are the most limiting factors towards women's equality, underlying all issues including land, property, and justice. In other parts of the world, women's inequality within overall social, economic, and political inequalities mean that women are regarded as the 'property' of men or as 'dependants', whereas men are viewed as 'commanders' of the household (Tsikata 2011; Verma 2001). These concepts have real influence in terms of practices within institutions and policy frameworks, which in turn reinforce and perpetuate women's disadvantaged status and negotiating power.

The HKH region is characterized by governance, legal, and justice arrangements that discriminate against women in many ways: limiting their access to justice in statutory and customary legal domains, allowing for impunity in the violation of women's rights and violence against women, and creating multiple political-economic and sociocultural barriers that block their access to land and property resources and opportunities. Women's knowledge, agency, organization, rights, and contributions to different productive, reproductive, community, and governance spheres also tend to be undervalued and under-researched. The result is discriminatory policies and mechanisms that do not meet women's needs, benefit them in terms of meaningful participation, knowledge and capacities, or facilitate their strategic or practical interests. Given that land and property rights "are fundamental to the life and operation of society" (Commission on the Legal Empowerment of the Poor, 2008:51), gender inequalities negatively impact women, the societies they live in, and the region. Hence, manifold dimensions of exclusion and discrimination result in the fact that women are disadvantaged in many governance arrangements and processes.

Given the above context, gender and governance issues are areas of growing interest, consciousness, and attention in the region. However, efforts to ensure gender equality in governance reforms have often been slow, superficial, and under-resourced. To ensure gender equality, efforts must address gender-related accountability issues. When they are narrowly limited to privatization or market orientation, governance reform efforts are unlikely to be sympathetic and may undermine gender equality goals (UNRISD 2005). For gender inequalities to be tackled and overcome, it is critical to take into account the way governance institutions, information, and incentives are shaped by unequal gender power relations; without such recognition and active advocacy/reforms, unequal gender relations are likely to be reproduced (ibid.). Such reforms might include support to changes in statutory and customary laws and institutions, the creation and strengthening of dedicated institutions for gender equality, increased access to information and knowledge (as well as the capacity to engage in its production, analysis, and dissemination), equitable access to incentives and resources for women (including gender positive quotas and affirmative action), and the strengthening of incentives for gender champions – both women and men. Recent studies have also indicated the importance of shifting from failed and outdated gender 'mainstreaming' approaches (Cornwall et al. 2007) to gender transformative approaches that are multidimensional (e.g., research, policy, capacity strengthening, organizational change, action, etc.) (Verma 2013, 2014b). In order to realize this potential, discerning attention will need to be paid to governance issues such as accountability, representation, access, control, ownership, justice, equality, voice, meaningful participation beyond mere numbers, and – most importantly – a shift in gender power relations that enables sustainable natural resource management.



Part III

# Governance in Diverse Natural Resource Ecologies



# 5. Learning from Experiences of Natural Resource Governance

The empirical review of different types of natural resources and their governance in this section is organized according to the framework introduced in the previous section. It identifies key governance actors and stakeholders, the mechanisms and strategies used to achieve desired outcomes, and some of the relationships among governance arrangements and observed outcomes. The five resource domains – river waters and their sharing across national borders, protected areas and wildlife, pastoralism and rangelands, irrigation, and forests – are among the most important sources of livelihood benefits and ecosystem services for the region. Their effective governance raises issues of levels and scales, coordination among actors and decision makers with different interests, sustainable use versus protection, and equitable access.

## River Water Sharing

River water sharing between countries in the HKH region, and in South Asia more generally, is mainly governed by bilateral agreements, like the one between India and Bangladesh for the effective use of the Ganges-Brahmaputra-Meghna through the Indo-Bangladesh Ganges Waters Treaty of 1996, the Indus Treaty of 1960 between India and Pakistan for sharing Indus river waters, and the Mahakali Treaty of 1996 between India and Nepal for the integrated development of the Mahakali river (Iyer 1999). Nearly 40 bilateral treaties exist within South Asia, and a similar number of treaties have been signed by China with countries outside the region (OSU n.d.). With the sheer number of international agreements for HKH river waters – India being party to most – the sharing of river waters is more a story of the willingness to find grounds for cooperation than one of conflict.

This is not to say that tensions and disagreements have been absent. Nor has the reality of international cooperation come appreciably closer in the past few years despite optimistic assessments in the mid-1990s that such cooperation could be facilitated by higher levels of economic exchange and lead to the mitigation of droughts and floods as well as support for irrigation and industrial development (Crow and Singh 2000). Indeed, existing treaties and agreements have been beset by disputes in many cases, particularly between India and Bangladesh (Brichieri-Colombi and Bradnock 2003) and, at times, between India and Nepal (Subedi 1999). On the other hand, the Indus Treaty between India and Pakistan has been more effective as a basis for water sharing (Sahni 2006) compared to the various treaties signed by India with Nepal and Bangladesh.

## Key stakeholders, interests, and constraints

The key stakeholders in decisions and negotiations around river water sharing are national governments and their relevant agencies. Indeed, this is one area of natural resource governance where hybrid forms of governance are notably absent, and much of the overall framing and enactment of governance is undertaken by national politicians, central government agents, and their representatives. Implementing partners tend to be multinational or national engineering firms and government agencies. A challenge in this power-laden arrangement is the meaningful inclusion of local knowledge and the participation of local communities. Moreover, interests and constraints are changing in response to the different drivers of change that result in increased consumption patterns, which demand greater quantities of hydropower; climate change, which affects water supply and quality; as well as too much or too little water, which results in disasters.

## EXPERIENCES FROM THE HKH

### **A Call for Improved Water Governance for Sustainable Hydropower Development and Management**

By Shahriar Md Wahid

Contemporary global and regional changes pose immense challenges to water management in the Hindu Kush Himalayan river basins because of their diverse topography, young geological formations, high degree of glaciation, and strong monsoon influence (Babel and Wahid 2011). Though countries in the region have put in place national policies and strategies for sustainable water management to reduce water-related vulnerabilities, there is a critical governance deficit for basin-wide cooperation and extensive regional engagement for water resources management that can overcome narrow national or bilateral interests and instead address shared concerns in a concerted manner (Babel and Wahid 2008).

A particular case in point is the region's renewed interest in 'green' hydropower development, which is touted as a "passport out of poverty" (Dixit and Gyawali 2010) in the face of rising energy demands and the price of fossil fuel. However, these development plans remain controversial in part because of concerns about the redistribution of the region's hydrology with concomitant impacts on fisheries, livelihoods, aquatic ecosystems, and environmental services as a whole (Dharmadhikary 2008; Moore et al. 2010). For example, past experience in Nepal clearly illustrates the immense challenge of resettling displaced people. Sedimentation of reservoirs, financial and institutional implementation modalities, and questions about the overall contribution of hydropower projects to national development processes are also issues. At the same time, the Nepal government's policies of decentralization and regional benefit sharing have stimulated intracountry competition over hydropower development in order to generate financial resources. At the regional level, hydropower projects also raise new questions about the sharing of transboundary water resources between countries, questions that are long-standing sources of disputes (Rahaman 2012).

Some of the controversies, conflicts, and solidarities emerging around hydropower development in the Hindu Kush Himalayan region have evolved in the last few decades, as have the concerns and positions of the protagonists. Important new investors including the private sector in emerging economies such as China and India have different approaches in dealing with the social and ecological consequences of hydropower development compared to traditional development funders like the World Bank or the Asian Development Bank. At the same time, the information revolution is raising the awareness of even remote and marginal mountain communities, potentially empowering them to find new ways of engaging in discourse related to hydropower (Moore et al. 2010).

However, the ferocity of the debate around hydropower development should not fuel a priori 'anti-dams' stance, but instead the need to understand how development trajectories might reallocate land and water resources, incomes, and risks, and therefore have different consequences for different social groups. The challenge is largely to address the question of how different stakeholders and resource users will organize themselves to initiate and sustain coordinated and collaborative actions to harness hydropower. Thus, attending to the structures and interrelationships of organizations, sharing strategies, sophisticated monitoring and communication mechanisms, and coordinated response structure must form the core of resource management. Broad, regional umbrella mechanisms (e.g., SAARC, ICIMOD, etc.) within which international and regional environmental institutions can work with national focal partners should be strengthened for effective governance (ICIMOD 2011). Recent regional development like the Koshi Basin Programme and the Himalayan Climate Change Adaptation Programme initiated at ICIMOD provide new avenues to bring together diverse stakeholders on a common platform for basin-wide cooperation, provoke social action, and advise policy makers to arrive at more socioecologically robust and egalitarian governance transformations. These initiatives can be further strengthened through the establishment of adequately mandated regional groups/bodies – hosted by a relevant organization – to independently facilitate and coordinate regional dialogue and the strategic processes of regional water governance.

## Principal mechanisms of river water governance

The main mechanisms of river water sharing and governance include all the three main types discussed above: information, incentives, and institutions. It is necessary to have information about hydrology, water flow, sedimentation, costs and benefits of different infrastructure options to regulate water flow and sharing, historical allocation of water, environmental and social impacts, and the returns to different stakeholders from projected water allocations. But the information is only a starting point for negotiations – specific levels of allocation also represent incentives to government agencies and national politicians about how differently positioned citizens will benefit or lose, and thereby promote strong position taking in relation to appropriate water allocation. Finally, different water treaties form regulatory and institutional mechanisms that simultaneously instantiate the existing understandings of how water is to be shared, and expectations about future water allocation.

## Outcomes and relationship with governance arrangements

Although roughly 40 treaties the different efforts to negotiate the allocation of waters in South Asia, and a somewhat smaller number of treaties have been put in place by China, only a few are directly relevant to the key lessons that emerge from a review of these treaties. These cases suggest that, despite tensions over water allocation, the likelihood of conflict in South Asia over water is relatively low. Indeed, few international water wars have ever been fought and the situation is not different in contemporary South Asia. Lessons from other regions of the world may be useful for the HKH, as globalization, climate change, and other drivers of change create massive social, political, and environmental impacts in the region.

Further, domestic politics is as important as international negotiation for assessing the effects of a treaty in terms of effective water allocation and the likelihood of continuing disputes (Wolf 1998). Numerous examples of the ways large water projects have been negotiated exist in the region, including those involving India, China, Bhutan, and Bangladesh. National politicians who negotiate treaties must keep in mind the interests of their domestic constituencies, and these calculations play an important role in deciding the terms of a treaty.

## Protected Areas and Wildlife

Protection of wildlife through land classification and efforts to combine conservation and development goals (Wells and Brandon 1992) have grown rapidly since the 1950s. In the HKH, protected areas exist in all member countries, but their numbers vary. And, although protected areas make up a centerpiece among efforts to protect forests and biodiversity, debates about their success continue (Naughton-Treves et al. 2005; Porter-Balland et al. 2012). Differences in the assessment of the successes of protected areas result at least in part from variations in the scale and location of studies, methods used, and outcomes upon which analysts focus. However, a spate of recent global and national studies uses sophisticated analytical approaches to show that protected areas have successfully reversed or at least slowed deforestation in many contexts, and in some cases helped improve local incomes (Andam et al. 2008, 2010; Nelson and Chomitz 2011). Within the HKH, there are few rigorous studies on the effects of protected areas that employ a counterfactual framework to attribute impacts.

Most studies of protected areas in the region tend to describe outcomes in specific locations or areas (Mishra 1997; Nepal 2000; Seeland 2000; Sharma et al. 2010), with a few prominent protected areas receiving substantial attention: the Great Himalayan National Park and the Askot Wildlife Sanctuary in India (Baviskar 2000; Samant et al. 2000), the Nandadevi Biosphere Reserve and the Chitwan National Park in Nepal (Rao et al. 2000; Sharma 1990), etc. Much of this work points to pervasive conflicts between people and wildlife, exacerbated by the creation of protected areas.

## Key stakeholders, interests, and constraints

The most important stakeholders in efforts to manage wildlife and wild species are the local residents themselves, wildlife biodiversity managers, conservationists, donors, government agencies, NGOs, and researchers at multiple levels. The interests of these agents and the power relations between them are quite divergent, with perhaps the

stark differences being between wildlife agencies and local people – who are the first to suffer from wildlife encroaching on their crops or lands – on issues related to access to vital resources in protected areas.

Donors, NGOs, and biodiversity managers have sought to reduce the costs of coordination across stakeholders and the difference between the public and the private good by providing incentives to local residents through cash, employment opportunities, or restricted access to protected area resources. But the implementation of these strategies is piecemeal and ad hoc, without a clear set of guidelines about the conditions under which local peoples are entitled to support.

### **Principal mechanisms of forest governance**

Protected area governance rests on a similar set of mechanisms as is the case with forests and irrigation. It includes user groups, management committees and regulations, which represent institutions; biodiversity surveys, activity reports, monitoring reports and audits, which represent information mechanisms; and funds transfers, revenue sharing arrangements and training, which serve as incentives. The mechanisms for coexistence between humans and wildlife also vary across cases. There are contexts where humans are barred from protected areas, where they are allowed controlled access, and where they coexist and cohabitate with wild species.

### **Outcomes and relationship with governance arrangements**

Two key outcomes have been noted in the literature on protected areas: Co-governance across scales, information about wildlife and local interests, benefit sharing, and enforcement are critical for improved wildlife outcomes. Given the mobility and long spatial ranges of many wild species, the involvement of multiple actors in different spatial units is a must for effective wild animal governance. Such arrangements help to minimize human-wildlife conflicts and create more open, transparent, and participatory situations.

Ecotourism with local involvement is perhaps the most promising source of revenue that can also contribute to livelihoods and cash incomes for local populations. It has proved to be able to attract economic benefits in other countries and locations and, even in the HKH, remains a key predictor of improved incomes (Kala and Maikhuri 2011). However, questions remain regarding the use of the term ‘ecotourism’ without the proper certification and procedures that make it authentic, or the equitable distribution of benefits to women who often carry out the bulk of the work in supporting such activities.

## **Irrigation**

In early reports on irrigation management, Coward (1977) and Wade (1976) identify three potential strategies for improving outcomes: develop physical infrastructure, create economic and financial incentives, and enhance organizational form. Since that early period, the scholarship on irrigation systems has more carefully described the kinds of organizational and governance reforms that can strengthen the likelihood of superior performance. Over subsequent decades, scholars have continued to critically question large infrastructure investments (McCully 2006), and a slow consensus has emerged that South Asian irrigation suffers from “lack of maintenance, low fee collection, inadequate institutional arrangements, and lack of user participation” (Easter 2000, p 370). Addressing these problems requires major governance changes, extensive efforts to acquire stronger involvement from those that are supposed to benefit from irrigation, stronger attention to gender asymmetries, accounting for externalities including environmental costs, coordination across decision making units at different levels (Briscoe 1997; Moore 1989), and the acknowledgement of indigenous irrigation knowledge and management systems (Lansing 1991). A large body of research has provided careful accounts of institutional reforms (Mollinga and Bolding 2004; Svendsen and Meinzen-Dick 1997) and policy disjunctures (Mosse 2005, 1999, Verma 2009), but actual progress on the ground in terms of improved system performance and outcomes has been slow and limited.

Broadly speaking, irrigation systems in South Asia include both large- and small-scale arrangements. According to some estimates, perhaps half the irrigated land in the region is covered by small-scale systems (Gill 1991), suggesting that the number of small-scale systems is much larger compared to that of large-scale systems. The

## EXPERIENCES FROM THE HKH

### Governance Issues in Shifting Cultivation

By Karma Phuntsho and Kamal P Aryal

In the Hindu Kush Himalayan region, shifting cultivation is found in all eastern Himalayan countries. It is mostly practised by indigenous communities that are socially and economically marginalized. It largely occurs on steep hilly terrains that are unsuitable for terracing, irrigation, or the use of machinery. It depends on basic human labour and simple hand implements. It is mainly a community-based farming system and occurs often on community lands governed by the principles of common property regimes. Shifting cultivators possess time-tested and rich knowledge, land use and management practices, and institutions and traditional tenure. They practise it not just for food, but also as part of their cultural, social, and spiritual repertoire.

There are many variants of shifting cultivation, which involves the slashing and burning of forest fallows followed by cultivation of food crops for one to two years. In general, shifting cultivation with shorter fallows is less sustainable because it prevents the regeneration of forests and limits the revitalization of soil fertility. Other systems are innovative and contribute to biodiversity conservation, the nurturing of forest resources, and the maintenance of sustainable land use. However, many decision makers perceive shifting cultivators as destroyers of natural resources – particularly forests and the associated biodiversity.

Existing government policies across the HKH region promote alternatives to replace shifting cultivation rather than improve it. The alternatives include sedentary agriculture, annual and perennial horticultural crops, forest plantations, community forests, joint forest management, and leasehold forests. Shifting cultivation harbours a great variety of agrobiodiversity. Therefore, replacing it with alternatives such as sedentary agriculture, horticulture, and forest plantations reduces agrobiodiversity.

Practising such alternatives is beset with difficulties. Transforming shifting cultivation to sedentary agriculture or the growing of horticultural crops requires private land tenure to secure the needed credit and investment. Shifting cultivators mostly lack private tenure. In Bangladesh, about 40% of shifting cultivators have been granted private tenure to cultivated land. Similarly, in Nepal, shifting cultivators in the eastern region could only legally register their customarily owned shifting cultivation lands under private ownership. Further, small and privately owned land holdings are unsuitable for alternatives such as forest plantations and perennial horticultural crops. These alternatives do not generate annual income in the beginning, which is critical for the food security of shifting cultivators.

In some cases, for example in Bhutan, alternatives such as perennial horticultural cash crops that worked in the past have failed to survive fungal diseases, and feasible options are yet to be found. However, existing policies do not allow shifting cultivators to revert horticultural lands back to shifting cultivation use. Similarly, in northeast India, alternatives such as joint forest management are not popular among shifting cultivators. By policy, joint forest management is to be set up on state-owned forest lands. Therefore, shifting cultivators resist putting forest fallows of their shifting cultivation lands under joint forest management.

Generally, alternatives are input intensive, and governments are unable to provide the required inputs and investment support. The level of credit needed to develop alternatives, agricultural research and extension support, or marketing support has remained largely inadequate if not absent. Shifting cultivators, on their own, are unable to finance the cost of setting up alternatives. Hence, government policies remain unimplemented to a great extent.

Modernization requires shifting cultivators to deal with increased dependency on external markets and political forces. However, customary institutions and organizations are not well placed to deal with such external forces. Besides, governments have created local government bodies and given these bodies many of the roles and responsibilities of customary authorities instead of strengthening them. So traditional authorities have lost strength and significance, since governments prefer to source both funds and authority through these new bodies (Kerkhoff et al. 2006). There is a need to build synergy between customary institutions and local government bodies.

Customary tenure, collective action, and safeguarding of community interest are good governance practices in shifting cultivation. In the allocation of shifting cultivation resources, customary tenure ensures shifting cultivators equitable access to shifting cultivation lands and the associated natural resources. Sharing and exchange of labour among shifting cultivators enable them to overcome labour shortages. Working together and collective action facilitate exchange of skills, experiences, knowledge, and innovation. Also, customary institutions dictate that community interests supersede individual interests.

ratio is likely higher in the mountains owing to the large variations in slope and topography that constrain the construction of large-scale water distribution networks. Indeed, in his analysis of the performance of 150 irrigation systems in Nepal, Lam (1996) finds that only 14 are large-scale systems. Studies of different kinds of irrigation systems suggest that smaller-scale systems tend to perform better than those that are very large (> 5,000 hectares), and that governance arrangements are central to the superior performance of irrigation systems (Ostrom 1992; Pradhan 1989; Tang 1992).

### **Key stakeholders, interests, and constraints**

Lam's study of small-scale irrigation systems in Nepal (1996) identifies four types of actors and stakeholders relevant to irrigation governance: government officials and agencies, donors such as the Ford Foundation, farmers at the head end of irrigation systems, and those at the tail end. These actors clearly have very different interests, perceptions, and power relations between them: Farmers want more water, but those at the head end do not necessarily recognize scarcities, while tail-end farmers must devise ways to address recurrent scarcities. Government officials have a general interest in ensuring that irrigation systems work well, but to the extent they are accountable to higher-level decision makers rather than to those receiving water, so their incentives to ensure well-functioning systems will be weak. Donors want to see their aid dollars produce positive effects, but they are constrained to work with actors and organizations in the locations where their projects are being implemented; they cannot implement projects themselves. Often, pre-existing indigenous irrigation infrastructure and management systems normally found in mountains that support rice cultivation and/or agriculture remain invisible to government officials, donors, and engineers (Lansing 1995; Verma 2009). This lack of recognition creates overlapping but inefficient, competing, and non-congruent governance regimes, as both indigenous and engineered systems remain invisible to one another. When indigenous systems or actors are recognized, it is sometimes still problematic, especially when certain actors or brokers claim to speak on 'behalf' of a community (Frankland 2003; Lewis and Mosse 2005; Verma 2009).

The idea that irrigation systems and their governance hinge on the cooperation of multiple actors is reiterated in a recent review of agricultural water resource management (Mollinga et al. 2007). Indeed, recent studies on irrigation highlight the connectedness of the interests of actors across different levels of irrigation governance: local level actors – whether they are farmers or decision makers in water user associations – act in ways that are influenced by the decisions of electricity boards, politicians, administrative officials, irrigation engineers, and local-level bureaucrats. Analyses of their actions and interests must therefore also take into account how they are affected by those seemingly at a substantial distance, and differential power relations. It is also worth noting the research regarding the spiritual-ecological aspects of irrigation systems that shape their management and governance (Lansing 1991, 1987; Verma 2009).

### **Principal mechanisms of irrigation governance**

The major existing governance mechanisms in Lam's study concern the incentives of farmers – adequate and more reliable water supply, which translate into higher crop yields and incomes – and government officials – their salary payments and the development of uniform rules that are easy to implement. In general, the key mechanisms through which decision makers in irrigation projects attempt to meet their objectives include infrastructure, information on water use and availability, irrigation schedules, management plans, training programmes, performance evaluation reports, fund transfers, water charges, and, of course, the rules developed by local water user associations and higher-level decision makers (Alauddin and Quiggin 2007; World Bank 2008). Important to the principles of inclusive governance, unless otherwise addressed and taken into account, women are often excluded from decision making as well as water user associations and resettlement schemes, although they carry out a disproportionate amount of labour in agriculture in many contexts within the HKH (Nelleman et al., 2011).

### **Outcomes and relationship with governance arrangements**

Meaningfully and actively involving farmers in new irrigation governance arrangements so as to take advantage of their place-specific and resource-specific knowledge, creating incentives for them to participate in and contribute

to irrigation governance, and ensuring that technical improvements are accompanied by governance changes that enable collective action by farmers are all key to improved system performance according to Lam (1996: 1311). These conclusions point to the need for greater capacity among farmers' organizations to organize and maintain their systems – also highlighted in earlier studies such as Baxter and Laitos (1988). New arrangements will need to take into account pre-existing governance arrangements to avoid tensions between the conflicting goals of different institutional architectures.

Farmer involvement in irrigation governance through inputs in the design, construction, operation, and maintenance of systems, together with financial contributions and institutional changes to develop greater local capacity, has indeed been a refrain in studies of irrigation systems in South Asia as elsewhere (Small and Carruthers 1991; Uphoff et al. 1991). The brunt of many of these studies is threefold: There should be opportunities for enhancing farmer participation. Farmers have the capacity, experience, and knowledge to make substantial contributions, and their contributions will improve irrigation system performance (Bruns 1993). However, in efforts to decentralize, the maintenance of irrigation infrastructure has sometimes been offloaded to farmers without the adequate provision of financial and development resources to farming communities.

The slow translation of these ideas in terms of action on the ground can be attributed in no small measure to the high transaction costs around water delivery to small farms, lack of coordination across sectors and ministries, the political economy of elections and water delivery that undermines efforts to charge for the costs of water delivery, and local power asymmetries that prevent the emergence of effective collective action as well as the inclusion of indigenous knowledge and/or pre-existing governance arrangements. Some observers have suggested that stronger involvement of the private sector and privatization of water delivery is a way out (Easter 2000, pp 385-86), but that will come at high costs in terms of equity concessions. As Moore points out, the application of scarcity pricing is rarely practicable in the context of developing countries (Moore 1989, p 1,743). Indeed, the application of such pricing in the case studied by Moore required central government enforcement. Shah et al. (2003, 2008) have highlighted the ecological costs associated with the groundwater boom in irrigation, and suggested that solutions to irrigation problems in the region will require demand side management, resource inventories and planning, and basin-wide management (Shah et al. 2003, Shah et al. 2008).

Other scholars have argued that the limited achievements of participatory irrigation management have resulted from incomplete efforts at reform. Indeed, most of the thousands of water user associations in the countries of the region continue to be weak in terms of their financial, political, managerial, and technical capacities. Yet others have criticized the attention to governance itself (Espeland 1998; Harriss et al. 1995), suggesting that the new institutional-economic focus is convenient for policy makers but detrimental to the cause of actual reforms, because it does not permit an effective analysis of the multiple levels at which politics influences analyses and outcomes (Bernal 1990; Mollinga 2001).

Key contributions in this regard have come from Mosse (1999), whose astute analyses of tank irrigation in south India lays to rest the idea that successful local irrigation institutions functioned autonomously from wider relations of political and social patronage, and on the need to situate institutional analyses of governance in multilevel social contexts of power and oppression. In a related vein, Mollinga et al. (2007) have argued for the necessity of recognizing the multiplicity of interests, institutions, actors, and functions in any analysis of irrigation and governance. From this recognition flow some of their strategic emphases necessary for improved outcomes: implementation of reforms through coalitions, open debates and information sharing towards capacity building (Bruns et al. 2005), and the necessity of state involvement for ensuring adequate financial and technical resources and, most importantly, for moving beyond project-based engagement alone.

Lastly, the lack of congruence between engineered systems of irrigation and indigenous systems requires some attention. As both operate with different governance arrangements including institutions, knowledge, and actors, several disjunctures and conflicts can arise when engineered systems are constructed on top of or with disregard to pre-existing indigenous systems – at times ignorant that such a system exists or is operational (Verma 2009). Effective and representative governance requires recognition, analysis, and the placing of value in such arrangements, including their sociocultural, spiritual-ecological, and biophysical characteristics. Transdisciplinary

approaches that give equal weight to different disciplines and participatory approaches that accord meaningful and equitable decision-making power to and the within local bodies, such as water user associations, are perhaps best in enabling such practices (Verma et al. 2010; Verma 2009).

## Forests

Himalayan forests harbour unique forms of biodiversity and are unparalleled sources of ecosystem benefits. They provide livelihood benefits to millions of households, and most of the agriculture in the region depends on the integrated cycling of nutrients from forests to fields (Bawa et al. 2007). The large volume of literature on these forests attests to the changing governance arrangements for accessing, using, and managing them – with the most recent trend being towards the transfer of substantial areas community control, co-management, or other related forms of governance (Blaikie and Springate-Baginski 2013).

The enormous importance of forests to livelihoods, biodiversity conservation, and, most recently, as a mitigation strategy through terrestrial carbon sequestration may be one reason why there is such a large body of research on forests, forest governance, and forest outcomes in the HKH (Karky and Skutsch 2010). These studies cover both vegetative and ecological (Singh and Singh 1987) as well as social and institutional aspects of forests in the region (Agarwal 2001; Rangan 1997). In latter studies, the role of governance in forest livelihood outcomes is appreciated widely (Agrawal and Ostrom 2001; Buffum et al. 2010; Shahbaz et al. 2007).

### Key stakeholders, interests, and constraints

Because of the integral role of forests in hill agriculture, the range of stakeholders in forest systems includes not only those who derive some direct food or fuelwood from forests but also those farmers and forest users who may depend only to a limited extent on forests for direct benefits. In addition to fodder, fuelwood, and timber, forests in the HKH also provide non-timber forest products and help store carbon, either of which – depending on market prices and demand – may have greater value than more conventional forest products. As a result, local residents, community-level organizations such as user groups and NGOs, government forest and agriculture departments, donors, and politicians are key stakeholders when it comes to forest outcomes.

The interests of these stakeholders in forests are diverse. Some are more interested in longer-term use benefits from forests (local residents and NGOs), whereas others, such as those interested in terrestrial mitigation, would prefer little or no harvesting activities. Forest departments and timber companies are typically interested in the management of forests for sustainable timber yields, although the point at which timber harvests become unsustainable may be a point of dispute between them. Donors and NGOs have diverse interests as well, depending on whether they seek to advance biodiversity conservation, carbon sequestration, or sustainable livelihoods goals (Chettri et al. 2007; Larsen et al. 2005; Negi et al. 2011; Phelps et al. 2010). But these divergent interests are also accompanied by different kinds of constraints on what any of these actors can achieve in forests.

### Principal mechanisms of forest governance

The key mechanisms of forest governance include resource transfers from central governments or donors to lower-level decision makers, revenue sharing in different proportions, management plans to rationalize forest use and also to develop information about how a given forest is being managed, meetings and activity reports by lower-level decision makers, training of villagers, monitoring and sanctioning at the local level and also by guards appointed as government officials, and land cover and use maps through remote sensing and on-the-ground techniques. These different mechanisms can be categorized through a three-way classification of information, incentives, and institutions. But consideration of their specific forms also provides a clearer sense of how they influence forest outcomes.

### Outcomes and relationship with governance arrangements

Public or government tenure, according to much of the literature on forest governance, goes together with an emphasis on the exclusion of multiple types of use rights in forests, a focus on conservation and protection, and the

## EXPERIENCES FROM THE HKH

### REDD+ Governance: Experiences from the Hindu Kush Himalayan Region

By Manohara Khadka, Rajan Kotru, Bhaskar Karky, and Seema Karki

**Potential of REDD+ in rural development:** The global agreement on Reduced Emissions from Deforestation and Forest Degradation (REDD+), with the '+' denoting an emphasis on biodiversity, sustainable management of forests, and enhancement of forest carbon stock (UN REDD 2011; Suzuki 2012), has been central to discussions of global and national mitigation strategies (Seymour 2008). The core idea of REDD+ and related programmes is to reward individuals, communities, projects, and countries that demonstrate good forest management with a focus on reducing carbon dioxide emissions from forests and/or increased forest carbon stock (Angelsen 2008; Phelps et al. 2010; Karky and Rana 2011). REDD+ has the potential to contribute to climate change mitigation, conservation, and development goals if REDD+ governance is inclusive and empowers local communities to have control over REDD+ design and implementation (Phelps et al. 2010; Agrawal et al. 2008). In the Hindu Kush Himalayan (HKH) region, REDD+ can improve the livelihoods of the forest-dependent poor and socially marginalized women and men if REDD+ governance is participatory and gender inclusive and ensures that these people have rights to forest lands and carbon as well as its incentives (Gurung et al. 2011).

**REDD+ governance:** Although the REDD+ process is at an initial stage in the HKH region, we can draw some lessons, especially from Nepal, referring to required institutional structures, policies, decision-making mechanisms, and consultation processes (Agrawal 2012; Yadav 2012; Khadka et al. 2012). REDD+ governance in the HKH context requires recognizing the credible roles and knowledge of female and male forest users in good forest management, and ensuring their rights and decision making roles over REDD+ processes as well as access to benefiting sharing (Gurung et al. 2011).

**Gaps and challenges:** Policy processes related to REDD+, including various piloting activities, are so far influenced by a techno-bureaucratic and centralized approach (Khatri 2012). As a result, urban and rural elite groups have greater access to REDD+ processes and policy debates. Women have not been systematically identified as stakeholders in REDD+ initiatives (Gurung et al. 2011) and are generally excluded from decision making. In general, the discussions so far are undermining the agenda on rights to forest lands, carbon, and participatory governance associated with inclusive incentives from the sequestering of carbon. In addition, biophysical perspectives and male-centric attitudes dominate in the design and implementation of ongoing REDD+ pilots, policy dialogues, research/studies, and strategy preparation methods. Thus, the ten experts consulted in the Ministry of Forests and Soil Conservation in Kathmandu for the REDD+ readiness proposal preparation (R-PP) are all men (GON 2010, p 100). Texts about Nepal's R-PP process appear to be inclusive in terms of the representation of Dalits, indigenous peoples, grassroots women, civil society, and the private sector. However, concrete operational measures that ensure inclusive access to and control over REDD+ policy making, monitoring, reporting and verification, benefit sharing, and participation in decision-making bodies are absent. Tackling existing governance issues such as the lack of transparency in carbon fund utilization, influence of elites and patriarchal values in decision making, and top-down planning and management across all types of actors including at the grassroots forest institutions is a big challenge.

**Good practice in Nepal:** A few pilot initiatives on REDD+ payment in Nepal tend to focus on the inclusion and capacity strengthening of forest civil society organizations in dealing with REDD+. For example, a NORAD-funded pilot project entitled 'Design and setting up a governance and payment system for Nepal's community forest management under REDD+' has led to the development of the Forest Carbon Trust Fund (FCTF), and is supporting its participatory governance mechanism in assessing the forest carbon stock/increment in community-managed forests and defining the amount of REDD+ seed grant to grassroots forest institutions (ICIMOD 2011). The institutional architecture established includes representatives of traditionally marginalized citizens. For example, the national- and district-level FCTF advisory committees have representatives from the forest civil society, women, Dalits, and indigenous peoples, in addition to government organizations. In addition, the watershed-level REDD+ network – a body consisting of both female and male representatives of community forest user groups (CFUGs) – is involved in the determination and reimbursement of REDD+ seed grants (ibid.), although the meaningful participation of women in decision-making processes within the network is inadequate (Khadka et al. 2012). Importantly, the REDD+ pilot project has developed criteria for forest carbon payment to CFUGs, in which socioeconomic dimensions (e.g., percentages of the population of women, discriminated caste/ethnic groups, and poor households) receive high weightage (60% of the total score) over the biophysical dimension (e.g., carbon stock and carbon increment in forests) (ICIMOD 2011). The ongoing national REDD+ strategy development initiative in the HKH can adopt some of the lessons from Nepal's pilot project regarding REDD+ governance.

## EXPERIENCES FROM THE HKH

### **Bridging Forest Sector and Local Governance Divide: Himachal Pradesh, India**

By Rajan Kotru

The joint forest management concept in India was made possible by the National Forest Policy (1988). The policy sought to achieve the goals of forest conservation, productivity improvement, satisfying local needs for forest products, and community participation. Himachal Pradesh in the northwestern Indian Himalaya has been a leading state in terms of promoting local empowerment and good governance for managing forest resources. In alignment with the National Forest Policy (1988) and National Forestry Action Programme (1999), the state of Himachal Pradesh has strongly promoted planning as well as structural and operational processes on decentralization and devolution to local communities, giving them greater responsibility for forest management. This is reflected in the policies and programmes of the state government, donor agencies, and nongovernmental organizations. Several state initiatives including the Indo-German Changar Eco-Development Project (IG-CEDP) based on a watershed approach integrated participatory forest management into planted forests between 1994 and 2006. The project mobilized local communities and enhanced both conservation and production-oriented forestry and livelihood improvements. In its final evaluation, the project was credited with focusing on women's empowerment – social, economic, and political – across all project activities, especially by facilitating institutional space for equitable roles in local decision making.

With the seventy-third constitutional amendment in 1992, India started working on strengthening local governance systems. Taking a cue from the declared policy of decentralization and the empowerment of Panchayati Raj institutions, the IG-CEDP pioneered the linking of selected Panchayats to forest and natural resource management. Given its innovative concept and results, this model of natural resource-based community empowerment was replicated in 92 sites under the Himachal Pradesh Forest Sector Reform Project and, subsequently, in all districts of the state through the Mid-Himalayan Watershed Development Project. The mechanism represents the devolution of sector governance by engaging local governance bodies, inter alia, in forest governance. With community control, for instance, over planting and management decisions, local resource governance has received a positive thrust. Research indicates that there are interesting lessons related to local empowerment, behavioural change, economic transition, conservation of natural resources, and replicated initiatives of microenterprise building adopted by several NGOs and government programmes. One such model initiative is represented by a women's enterprise 'Samridhi', which adds value to wild fruit products and markets these to sustain income and employment for local women. Despite the upscaling of such forestry related good practices, a rapid assessment in the post-project era of the Changar area shows that forest governance in practice is yet to be embedded effectively into local governance systems. Several reasons lead to such a predicament (IG-CEDP 2006).

First, common pool resources are important sources of livelihood for the resource poor. However, econometric estimations indicate a positive fallout shows that, as households grow richer, they tend not to depend on these resources. However, they very much influence local decision making on conservation, often at the cost of resource use restriction for the poor who are left out. Second, among the key public resources, forests have the most controlled land use in terms of state authority. This is evident from the fact that all the participatory forest management agreements under the above-mentioned projects have yet to get the forest department's permission for thinning measures to extract and sell small timber. This brings up the issue of the legal sanctity of these agreements, as well as lack of clarity about larger economic benefits to local communities, through timber sales for instance. Third, given the legacy of fragmented local communities (due to the caste system, politicization of development, multiplicity of informal institutions, etc.) and the resultant inadequate sense of collectivism, local governance bodies are often very weak and not recognized to be able to handle forest resource governance issues that another agency dominates. Fourth, with human migration becoming more of a norm than an exception, formalizing women's participation through their involvement in decision-making institutions and income generation activities is of great significance for natural resource conservation, management, and control for sustainable gains. Fifth, local empowerment and forest conservation are the twin objectives of sustainable forest management. Although civil society, researchers, political leaders, and community champions have advocated for adequately balancing the social, economic, ecological, and climatic values of mountain forests, governance and management deficits have hindered such balance.

To maintain the sustainability of the impacts achieved so far, the following key recommendations are made:

- Lessons pertaining to improved enabling frameworks need to be further validated by studying other state interventions in forest resource governance.
- Participatory approaches must be universally applied (across sectors through local governance bodies) to get maximum integration between a wide range of stakeholders and, first and foremost, the local communities and their institutions.
- Monitoring and evaluation must be effectively carried out to harness innovative knowledge and disseminate learning from science, policy, and practice, leading to an adapted approach to good forest resource governance at all levels of decision making.
- It is important to continue support to policy/practice/science advocates to galvanize debates and research on marginalized issues such as social inclusiveness, poverty, and entitlements to forest yields.
- Continual research is needed to assess how sociodemographic changes (e.g., youth outmigration) and climate impacts will affect forest governance (Kotru 2011).

capacity to restrict use. Indeed, the most restrictively protected forests in the region are under governmental forms of tenure. Governments own most of the protected areas. They also own and manage closed-access forests for soil and water conservation purposes, and they are one of the few groups of actors that can spend more on forest protection than they receive as income from forests.

In contrast, private ownership is associated with greater efficiencies in the management of forests, the capacity to generate greater economic outputs and profits, and to enhance economic development-oriented objectives. Only a small area of forests in the region is under private ownership, but these forests are often managed for profit. Plantations are managed by both governments and private actors, but plantations oriented towards high profits – whether through the sale of timber, cash crops, or carbon trade – tend to be owned and managed by private companies. Indeed, a major new market in terrestrial carbon is likely to become viable in the future owing to efforts by private companies to own more land in tropical countries and secure profits accruing from higher carbon prices.

Finally, customary or community tenure typically goes together with the management of forests for multiple uses and objectives: local livelihoods, promotion of use-oriented diversity in forests, and, often when tenure rights are secure, for enhancing forest biomass. The long-run livelihood interests of communities, local populations, and indigenous groups in forests are seen to translate into a willingness to manage forests for longer-term benefits, and the willingness to protect forests in the short run so as to secure future gains.

Recent studies have also identified a range of more specific relationships between improved forest outcomes and specific governance features. For instance, local enforcement, participation in rule making at the local level, downward accountability of decision makers, and lower levels of economic inequality are all associated with improved forest conditions (Gibson et al. 2005; Ostrom 1999a). In addition, more equitable distribution of benefits from forests is also associated with widespread representation in decision making. These findings are corroborated by a host of both case-based and quantitative studies, and they find their echoes in similar findings in other resource domains as well.

## **Pastoralism and Rangelands**

Approximately 100 million pastoralist women, men, and children in the HKH region derive their livelihoods from rangeland resources (Yi and Muhammad 2010). Rangelands constitute more than 60 per cent of the total HKH region, covering 4.3 million square kilometres (Verma and Khadka, in press; Zhao-Li 2009). Most HKH countries have pastoralist and rangeland regions, which are not only important for natural resources, livelihoods, and survival but also for culture, identity, social relations, and spirituality. Rangelands also play an important role in supporting and regulating water resources, biodiversity with many species of fauna and flora endemic to the region, and ecosystem functions and services, as well as in providing a scientific research base for critical knowledge, retaining clean air and common spaces for recreational purposes, and supporting sacred landscapes (Dong et al. 2009, p 174; Miller and Craig 1997). Pastoralist knowledge and governance practices built up over generations are invaluable for managing fragile, harsh semi-arid to arid, often rugged environments found in mountain contexts.

### **Key stakeholders, interests, and constraints**

Rich and diverse rangeland resources found over vast tracts of pastoralist land mean that several stakeholders, interests, and constraints interact and overlap with one another in terms of governance. Mountain resources such as livestock, high-altitude pastures, biodiversity, medicinal plants, water sources, cultural and spiritual practices, and land are vital for the survival of pastoralists, and play a crucial role in the national interests of HKH countries. Hence, pastoralists themselves – as well as customary leaders; governments; departments that oversee livestock, agriculture, forests, tourism, culture and the environment; and civil society, development, and private sector actors – are key stakeholders in terms of rangeland outcomes. Often, governance in rangeland and pastoral areas involves a multiplicity of customary and statutory institutions and actors. Given the remoteness of many rangeland areas, customary leaders and institutions play significant roles in day-to-day governance decisions. More broadly, because rangelands straddle neighbouring countries, they are important geopolitically as well as in terms of national interests.

Despite the critical importance of rangelands in the region, pastoralists are often marginalized from mainstream policy making, political decision making, and development processes (Verma and Khadka 2016). This is perhaps more critical in mountainous terrains where pastoralists' access to development resources and governance mechanisms is more difficult, arduous, and isolated (ibid.). Pastoralism is a unique and important livelihood, way of life, and culture. Pastoral logic and wisdom provide important knowledge in fragile mountain ecologies, as well as the basis for the coexistence of humans and wildlife through a process of checks and balances over generations (Verma 2007).

### **Principal mechanisms of pastoralist and rangeland governance**

Several mechanisms are associated with pastoralist and rangeland governance. In terms of information, knowledge about livestock and vegetation/crops that can survive in arid to semi-arid regions that are characteristic of the rangelands is important. Similarly, locally specific knowledge regarding the migration patterns of animals and pastoralist as they negotiate changing seasons in fragile landscapes is critical for survival. In many contexts, pastoral livelihoods are characterized by residing in and dividing time between summer and winter pastures. The nomadic and semi-nomadic nature of pastoralist communities means that providing and gaining access to information and development resources can be difficult. Likewise, public reporting, elections, and participatory processes, as well as providing development and government services, tend to be challenging. In some cases, rangeland communities traverse national borders. In such situations, transboundary cooperation becomes especially important. As rangelands are sources for valuable natural resources, they are sometimes subject to extractive industries such as mining, or viewed as good areas for the establishment of national parks or carbon sinks. Information sharing, ownership, and participatory governance processes in these situations are crucial in order to avoid potential conflicts, or the exacerbation of pre-existing ones.

Incentives in rangeland and pastoralist contexts include resource transfers which may involve input, extension, veterinary, and social services and benefits to remote, vast, and sometimes inaccessible mountain territories and communities. Other incentives require information and benefits to be shared with communities, and – where resources are harvested – include intellectual property rights (for example, over locally found medicinal plants), financing mechanisms (for instance, carbon sinks or carbon sequestration), and land rights (normally over common property or communal land). Resource transfers, for instance, take several forms including the transfer of land, which is perhaps the most critical resource in rangelands in terms of being governed through local governance arrangements.

Institutions that facilitate governance processes include both customary and statutory institutions, as well as co-management and/or self-governance arrangements in autonomous regions. Governance mechanisms most often involve livestock, its management, and the services associated with it. However, pastoralist institutions are often dominated by men. Decision making and rights to ownership tend to exclude women and other marginalized groups (Verma and Khadka 2016). Issues of marginalization and accessibility are especially critical when considering the election and representation processes in remote areas.

### **Outcomes and relationship with governance arrangements**

Key outcomes and relationships in pastoralist and rangeland governance arrangements centre on unique aspects of mobility, accessibility, marginality, and common property within the context of rapid change. Often, pastoralist and rangeland communities are located in remote, inaccessible, and fragile mountain and high-plateau environments. This is a double-edged sword. On the one hand, living in these places ensures that rich culture, livelihoods, beliefs, and spiritual practices are preserved to varying degrees. On the other hand, it hinders the provision of development and government services to those communities and creates challenges for them to access the same services that are accessible in urban centres. In cases where pastoralist livelihoods are characterized by nomadic or semi-nomadic lifestyles, ensuring access to development and social services, information, and institutions becomes especially challenging.

## EXPERIENCES FROM THE HKH

### Rangeland and Pastoralism

By Muhammad Ismail, Srijana Joshi, and Wu Ning

Rangelands cover about 60 percent of the 4.3 million km<sup>2</sup> of the Hindu Kush Himalayan (HKH) region and directly provide a source of livelihood to the large population living there. Present-day pastoralism and rangeland management in the HKH is challenged more than ever before by population pressures – over the last 50 years, the number of people has doubled and the livestock population has quadrupled. In addition, two other issues of immediate concern are climate change and the fact that pastoral production is not considered by some as competitive in a globalized marketplace. The important role of pastoralists, the custodians of rangeland ecosystems, has not been sufficiently valued by decision makers. On the whole, rangelands remain a generally neglected sector in terms of research, legislation, government planning, and particularly for sustainable development investments. This situation has resulted in sometimes inappropriate management decisions and has been a root cause of rangeland degradation and desertification.

The economic practicality of mountain pastoralism is itself being questioned as rangelands have low productivity and a long production cycle, lack accessibility to markets, produce undervalued products, and require local people to suffer remoteness and hardship. The livelihood strategies that HKH pastoralists have traditionally used to cope with changing conditions are often ill suited to cope with the demands of contemporary market economy, globalization, and demographic and environmental changes. Rangeland degradation and desertification is taking place throughout the HKH region, thereby diminishing rangeland ecosystem services and the sustainability of livelihoods, not only of the local people but also of those in the region and beyond. A significant area of rangelands has now been put under protected area management. Hence, conflict has arisen between conservation and livelihood related interests as a result of restricting the access of and benefits to pastoralists. There is either limited or no coordination across administrative boundaries among the institutions charged with managing rangeland resources. Long-term monitoring data is required to assess the impact of changes arising from various driving forces on the rangelands, for providing better inputs to sustainable adaptation strategies, and ultimately to adjust policies accordingly.

One of the most important changes that could address a substantial part of the accumulated governance deficit would be to move away from centralized decision making and planning processes for rangeland management to a more 'bottom-up' process in the region. Such a change would make it possible for the voices of local people to be heard by policy makers and will ensure that sound indigenous knowledge can be integrated into sustainable rangeland management practices. Governments and NGOs should also support communities by funding locally employed facilitators to develop and promote local strategies and planning processes for enhancing sustainable rangeland management.

One successful example among governance programmes in rangelands is co-management in the upper Mustang region (Nepal) where an acute shortage of forage led to a breakdown in traditional winter-spring and summer-autumn pasture systems. The disordered use of seasonal rangelands exacerbated the shortage, especially during winter and spring, and increased conflicts between households and village development committees (VDCs). In this context, ICIMOD and some local partners supported the formation and functioning of pasture management subcommittees (PMSCs) at the VDC level. These committees built three-dimensional participatory models and brought the villagers together to use the models to jointly define the boundaries between VDC areas and seasonal pastures. The villagers nominated the PMSCs to monitor and enforce these commonly agreed upon regulations. They also started to grow fodder and forage species for supplementary feeding for livestock in winter.

Similarly, in the sparsely populated Chiang Tang plateau in the northern Tibet Autonomous Region of China, ICIMOD and its partner the Chengdu Institute of Botany documented and provided support to local initiatives for the collective management of livestock and rangelands in Nima county and adjacent areas, after the livestock and rangelands had been allocated to individual households. Through collaborative arrangements, local herders helped each other graze livestock on the vast but not so productive rangelands; they managed to sell their livestock products at markets hundreds of kilometres away and bring back household and other goods at reasonable prices; they organized a surplus labour force to work in local infrastructure construction and factories; and they gathered regularly to share information and discuss new issues. People in these collectively organized communities were able to live well above the poverty line. They are also in a better position to talk to, and obtain support from, local conservation authorities in fencing their winter pastures so as to minimize the otherwise acute livestock-wildlife conflicts.

Enabling better rangeland governance to address contemporary challenges will be a landmark step in improving the conditions of rangelands. Settling divergent interests by creating awareness and incorporating local views into management practices is necessary to make traditional governance systems more responsive to people's needs. The involvement of women and other neglected groups in governance will be helpful in making systems participatory and increasing local ownership.

A roundtable conference to initiate discussions on the views of key stakeholders will be helpful in reconciling differences more amicably and in better understanding various perspectives. Building local governance systems based on the principles of good governance is needed for the sustainability of rangeland areas. Developing separate policies for rangeland management at national and state/provincial levels will be the key to improving the governance and management of rangelands resources.

Most notably, pastoralists often find themselves at the margins or excluded from development and government decision making the world over (Verma and Khadka 2016; IUCN 2011). This problem is often exacerbated by the lack of specific pastoralist policies in many countries of the HKH. Rangeland management and policies are often subsumed under departments of forestry or agriculture. Hence, complex issues around livestock management, common property, culture and tenure regimes may not be given the due attention that they require. As pastoralist livelihoods depend on complex interrelations between access; management; and control over lands, pastures, and natural resources (versus private forms of property), this leads to an equally complex domain of overlapping rights that are continuously being negotiated and contested (Scoones 1995). Such rights and incentives are often mediated through relations of trust, reciprocity, and common cultural norms and incentives. Statutory governance arrangements may not always capture the complexity and nuances of such arrangements (IUCN 2011), and it is therefore important to consider governance through a plural legal framework that pays due attention to customary institutions, laws, and norms.

More often than not, mainstream governance arrangements seek 'easy' solutions through the promotion of privatization, commodification, and the enclosure of pastoralist land, which do not reflect the realities or needs of pastoralist communities, and sometimes disenfranchise them from their rights (Verma 2007). On the other hand, pastoralists tend to be in legally and politically weak positions in advocating their needs due to their low visibility and lack of access to information regarding governance institutions, procedures, and incentives (IUCN 2011). This is exacerbated by the fact that customary and communal forms of governance tend to be marginalized or invisible at higher and formal scales.

## Summarizing the Evidence

The review above of five domains of natural resource governance – river water sharing, protected areas and wildlife, irrigation, forests, and pastoralism and rangelands – shows clear patterns in how governance works in the HKH. These patterns relate to key actors and their interests, the principal mechanisms through which governance goals are translated into practice, and the outcomes to which governance leads. Although the outcomes of governance interventions will always remain somewhat uncertain given the enormous diversity of contexts, actors and their interests, and implementation processes, a review of visible patterns still holds lessons for attempts to improve the design and implementation of natural resource governance.

### Summary: Stakeholders, interests, and constraints

The governance of all natural resource domains considered in this review depends on the actions and interests of multiple stakeholders. This is true even in the case of river water sharing, where the principal negotiators for the allocation of water at the national level are central governments and their agencies. The actions of these stakeholders and their negotiating positions are influenced by perceptions about how lower versus higher levels of water availability will affect farmers and irrigation, industries, and urban water users, and the likelihood of floods versus droughts. For wildlife, irrigation, forests, and pastoralism and rangelands, the multiplicity of stakeholders is even more evident. The interests of these stakeholders differ, and the constraints under which they operate include resource constraints, information deficits, lack of access to relevant decision makers, inadequate linkages among organizations at different levels, and the pervasive tension between public and private benefits.

Because key actors and agencies span diverse levels, work across different spatial and social scales, and belong to differing societal sectors – private, civil society, public – coordination among them is not easy. But the differences in the competencies, skills, power, endowments, and capacities of different decision makers that are important to securing improvements means that coordination is needed to yield improvements in governance outcomes. Those with the formal power to manage natural resources have assumed for too long that those without such powers are not relevant to governance, livelihoods, and conservation outcomes. Yet the history over the past several decades of natural resource management demonstrates the flaws in and consequences of such thinking.

Whether they relate to water, forests, pastures, irrigation, or wildlife, the actions of those marginalized from mainstream politics are still consequential for resource outcomes. The interests of these marginal and

disadvantaged groups in improved access to resources for livelihood purposes require that they work to gain the support of other stakeholders who can help secure such access. The interests of civil society organizations involved in resource governance – whether they are about improved knowledge production, supporting marginal groups and representing the relevant demands, or creating better conservation and development outcomes – require that they strengthen the linkages between resource-dependent users and decision makers. Only through such working linkages, greater transparency, and stronger coordination would it be possible to shift away from persistently negative resource governance outcomes. That such negative outcomes lead to unsustainable and inequitable outcomes is critically important to consider and reflect upon.

### Summary: Mechanisms of governance

Of the different mechanisms of governance (discussed in section 3 above), some can be viewed as being specifically about enhancing upward accountability, and others for enhancing downward accountability. Table 1 below identifies a suite of governance and accountability mechanisms, identified through a meta-review of accountability and governance mechanisms in 63 studies on natural resource governance conducted globally. Of these 63 cases, approximately 14 focus on natural resource governance in the HKH.

The studies were selected from a larger set of 446 articles identified by coupling “decentralization” or “governance” with keywords representing specific domains of natural resource governance such as forests, pastures, irrigation, and fisheries, and undertaking a search through the Web of Science citation indices. The selection of the 63 cases depended on whether the studies contained adequate information about higher- and lower-level decision makers

**Table 1: Mechanisms of governance and accountability to connect local- and higher-level institutions, and their effects (N=63)**

Mechanisms	Effects (D = enhance downward accountability; U = enhance upward accountability)
Information mechanisms Accounting reports and audits Mechanisms for reporting corruption Activity reports Management plans Technical oversight	<ul style="list-style-type: none"> <li>- Allow multiple levels of government to influence planning (D and U)</li> <li>- Improve transparency (D)</li> <li>- Improve coordination (U)</li> <li>- Increase accountability of decision makers (D and U)</li> <li>- Provide local institutions and actors better knowledge for making decisions (D)</li> <li>- Reduce corruption (D)</li> </ul>
Information+incentives (Human resource and capacity building) Advice to local authorities Appointment of local officials Approval of local rules and laws Education Training	<ul style="list-style-type: none"> <li>- Increase ability to make decisions and carry out plans</li> <li>- Increase monitoring of resource use (U)</li> <li>- Improve quality of planning and implementation at local level (U)</li> <li>- Promote formal recognition of local management and rules (U)</li> <li>- Promote interactions among local institutions</li> </ul>
Incentive Funds transfers Patronage resources Revenue-sharing arrangements Taxing authority	<ul style="list-style-type: none"> <li>- Improve transparency (D and U)</li> <li>- Increase efficiency</li> <li>- Increase local capacity to implement decisions</li> </ul>
Institutional change and new decision making bodies Authority to monitor, sanction, or adjudicate Authority to recognize user groups Creation of laws, policies, and regulations Elections Government officials serving on user groups Performance monitoring Power to dissolve user group	<ul style="list-style-type: none"> <li>- Create accountability relations between decision makers at the local level and their superiors as well as lower-level constituents (D and U)</li> <li>- Enforce resource-related rules (U)</li> <li>- Increase government recognition of user groups and their management capacities (D)</li> <li>- Promote conflict management strategies (U)</li> <li>- Protect/improve resources and local governance strategies</li> <li>- Reduce free riding (U)</li> <li>- Restrict local authority (U)</li> </ul>

and their relationships so as to enable an identification of the mechanisms that link the two levels of action and decision making. Column 2 of the table below shows the ways in which these mechanisms affect governance and accountability. The letters 'D' or 'U' indicate, where appropriate, whether the effect is to enhance accountability in an upward or downward manner.

In addition to reporting on the encountered mechanisms through which decision makers at local levels of governance are linked, Table 1 seeks to accomplish two other goals. It shows that existing attempts to govern natural resources deploy a substantial diversity of mechanisms to govern concretely. Information, incentives, and institutional mechanisms might seem highly abstract, but they represent concrete examples that produce very different resource use and management effects. The table also serves to provide a catalogue of the different ways in which governance actors interested in revising existing forms of governance and accountability can pick from a menu of options to influence those at higher or lower levels of decision making. Also important to consider are issues of representation and inclusion in mechanisms of natural resource governance.

### Summary: Relationship of governance forms with outcomes

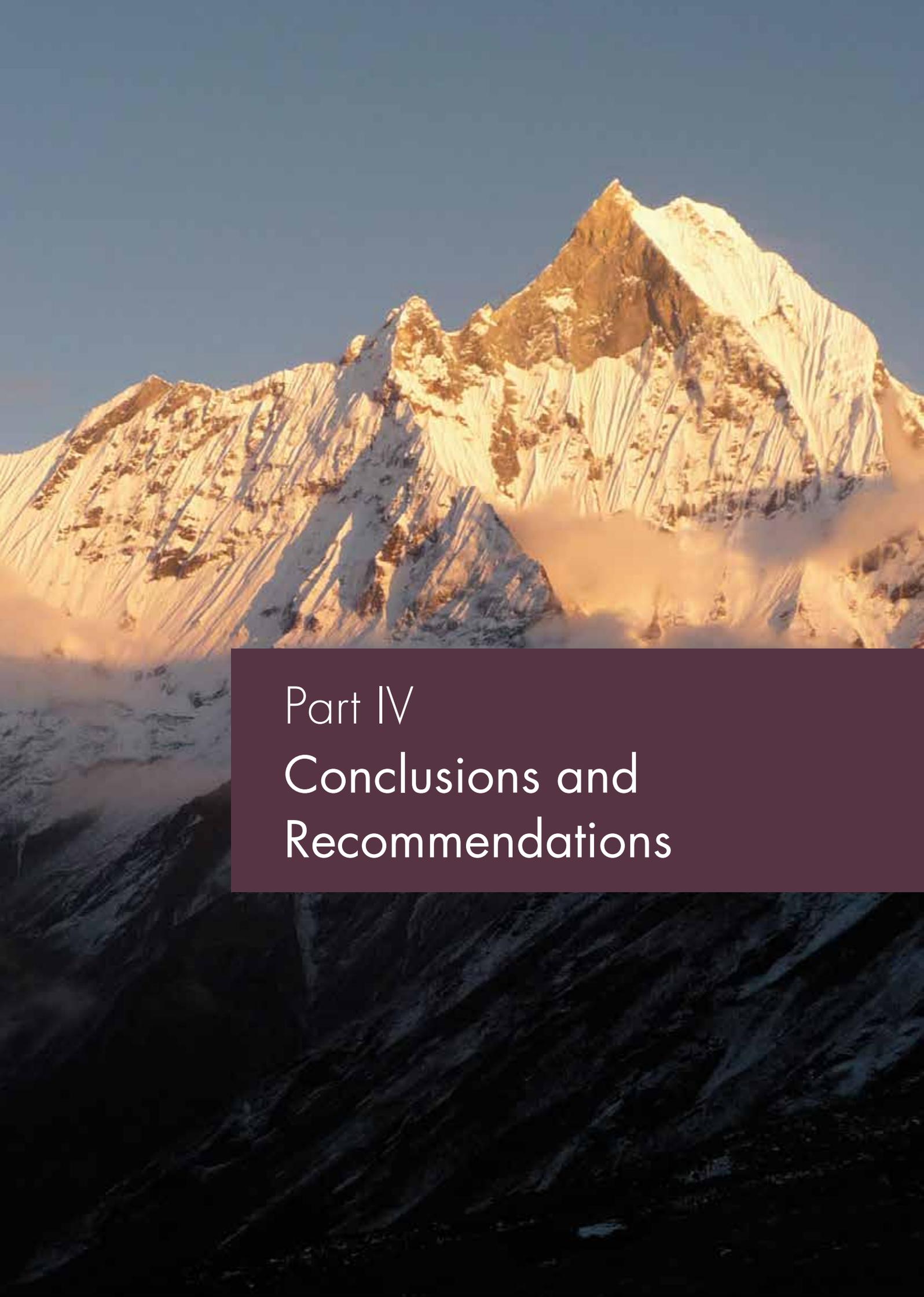
Although an examination of different resource types suggests substantial variation across specific cases of resource governance, it also shows the importance of examining the incentives of stakeholders and how these incentives translate into attempts at creating governance strategies that would improve their share of benefits from resources.

Table 2 summarizes the discussion about the relationship between major stakeholders relevant to different modes of governance and different governance and resource outcomes. It is based on an assessment of the incentives and interests of different actors that exercise governance decision-making powers, and how different outcomes relate to these interests.

The table suggests that none of the three major actors and associated forms of governance is likely to enhance all governance and resource outcomes in which decision makers might be interested. Of the five outcomes listed in the columns of Table 2, some are general across resource types (sustainable livelihoods, greater equity, and resource sustainability); others (carbon sequestration and biodiversity conservation) are specific to particular resources. Trade-offs are likely pervasive in natural resource use and management. It is necessary to recognize their existence, and it is incumbent for decision makers to work with actors and agencies that might be best suited to promote specific combinations of outcomes.

Table 2: **Affinities between governance and socially valued natural resource outcomes**

Outcomes → Major actors and forms of governance ↓	Sustainable livelihoods	Greater equity	Resource sustainability	Carbon sequestration	Biodiversity conservation
Public/ government	Medium	Medium	Medium	High	High
Private/market	Low	Low	Low	High	Low
Community/civil society	High	High	Medium	Medium	Medium



Part IV  
Conclusions and  
Recommendations



# 6. Challenges and Opportunities in Natural Resource Governance in the HKH

## Basic Challenges

Over the past three decades, it has become evident that the mountain of research on natural resource governance has helped build a useful vantage point for understanding and shaping the sustainability of natural resources in the region. The attention to different actors, particularly those in marginal social positions but with high levels of interdependence with and knowledge about resources, has shown that natural resources such as forests, pastures, water, and biodiversity can be managed well even by communities and local user groups, particularly when policies are enabling. These studies have also highlighted the importance of collaborative exchanges and work, and the role of collective action in strengthening natural resource institutions.

Despite the large research output over the past three decades, it is evident that much of the current and historical work remains constrained by different kinds of boundaries that have proved hard to overcome in practice. Although Elinor Ostrom's path-breaking work, *Governing the Commons* (1990), sets an exciting example for subsequent natural resource governance researchers by considering a variety of natural resources together, most subsequent work has tended to focus only on either forests, pastures, wildlife, irrigation waters, livelihoods, or gender in siloed approaches. Attempts to examine the effectiveness of different forms of governance across resource domains remain rare or non-existent.

The siloed nature of research on natural resources is evident in other ways as well. For example, most existing research tends to focus on a single level – whether it is the national, the local, or the regional. Although the importance of cross-scale and cross-level interactions among social and institutional processes are acknowledged by many researchers, the specific ways in which these relationships work is neither spelt out nor assessed with a view to generalization. Other silos also exist in terms of disciplinary research, often driven by biophysical considerations over and above sociocultural ones, thereby creating scientific hierarchies that work against effective governance (German et al. 2010).

Several contradictions and challenges are worth noting. Taking governance into account is critical to advance research and strengthen interventions related to natural resource management, economic poverty reduction, social inclusion, equity, sustainable livelihoods, climate change adaptation and mitigation and sustainable environments. However, structures of governance often remain hidden or neglected in writings about natural resource conditions and resource-dependent livelihoods. Often, different conceptualizations and definitions of governance coexist without efforts to ensure coherence across these various conceptions. The result is typically an apolitical approach focusing on 'technical' issues and lacking engagement with the multiple drivers of change. Avoiding issues of power, knowledge, and agency also means that work on governance is not well engaged with key regional and global debates shaping the landscapes and lives of disadvantaged women and men in the HKH.

Governance needs to become more central to the activities of development research organizations and other boundary organizations that seek to make knowledge relevant to processes of change. Research on the subject has immense potential to serve as a bridge between more technical work on resources, and society and decision making concerned with bringing about improved outcomes. Such research must also seek to overcome natural divisions across resource systems and the resulting research divisions noted above. Indeed, perhaps the most important work on resource governance – *Governing the Commons* (1990) by Elinor Ostrom – shows how studies of governance across resource systems usefully inform policy, as well as the need to move beyond the silos within

which such research tends to remain bracketed. Continued advances along this dimension require conceptual engagement of specific resource domains across levels and scales of analysis and attention to the dynamics, network relationships, relations of power and knowledge, spatial processes, and interactions among resources.

To take advantage of the density of work on governance and to go beyond it requires the adaptation of concepts and theories to institutional priorities and imperatives through focused research, capacity strengthening, networking, organizational change, and institutional arrangements. Although many international development and conservation research organizations have carried out studies of natural resource governance, few are recognized as key contributors to the sociopolitical aspects of governance and natural resource management innovative. Sometimes this is because of low dedicated funding, which makes it difficult to allocate budgetary resources for innovative crosscutting programmes where governance is integrated into various natural resource subject areas. At other times, it is due to lack of understanding or commitment, and action.

## **Natural Resource Governance Opportunities**

Future advances in natural resource governance research will depend on how well scholars address existing gaps in different understandings of the dynamics of resource systems and their connections to social groups, the role of network relationships in shaping resource outcomes, spatial processes, and interactions among different kinds of resources that are in fact connected to each other. But greater understanding by itself is surely inadequate to improve natural resource governance. Improvements in understanding can help identify opportunities, but taking action on the basis of these opportunities will require the links between the worlds of research, policy, and action to be bridged. Stronger links are necessary to enable information flows about the need for new research and policy lessons from existing research.

Achieving advances in these directions will require that international development and conservation research organizations in the region work on building their programmes of research on natural resource governance in a more focused and systematic fashion innovative than the current status. Part of the problem is that with low and, in some cases, declining funding for research, it is difficult to allocate substantial resources to crosscutting areas of knowledge such as governance. Within such constraints, preference continues to be given to biophysical domains and technical aspects (Verma et al. 2010).

One of the most important issues that governance stakeholders must address is that of trade-offs versus synergies across outcome dimensions. Addressing this effectively is likely to require far more information that we currently possess about the characteristics, availability, networks, interactions, and dynamics of different natural resource ecologies in the region. Data gaps about different natural resources, their governance, and the relationship between governance strategies and outcomes are widespread. As a result, the conclusions in this background paper are based on a small number of studies and case-based evidence that follow different research designs, rely on information that is in fact difficult to compare across sectors and levels of decision making, and use analytical frameworks and methods that are at times incompatible. Further research is needed in the future to gain greater confidence in the patterns identified by this paper.

Fortunately, the information networks, modes of sharing, and knowledge base necessary to make informed decisions and find balance among competing goals have improved tremendously over the past two decades – particularly with the availability of spatial and remotely sensed data. Yet, for many resources and areas in the region, there is a genuine lack of needed information, knowledge, and resources. More information and understanding is certainly needed. What is required most urgently are meaningfully coordinated interdisciplinary research efforts that can generate comparable information across resource types and governance regimes – as well as across various levels and scales of decision making – so as to address enduring questions concerning: the extent of reliance of different socio-cultural groups on different kinds of natural resources; trade-offs across resource outcomes such as livelihoods, biodiversity, climate adaptation and mitigation, carbon sequestration, or water conservation; how different types and levels of decision making affect desired outcomes; and the effects of governance versus socioeconomic versus biophysical factors on outcomes. For instance, governments and international agencies need to invest more resources in creating better forest and rangeland information and knowledge infrastructure than is currently available.

## EXPERIENCES FROM THE HKH

### Data Sharing for Natural Resource Management Governance

By Birendra Bajracharya

The text highlights the potential of satellite information and geospatial tools to support natural resource management (NRM) governance at the local and national levels through examples of applications developed by the SERVIR-Himalaya initiative. SERVIR aims to translate satellite data into useful information and streamline access to this information through state-of-the-art geospatial tools to support informed policy decisions that benefit communities and the planet as a whole.

Natural resource management has many interlinked political, socioeconomic, and natural functions that need a delicate balance of conservation and livelihood objectives. Availability of reliable information and its transparent use is essential for good NRM governance. An integrated information management approach combining people, technology, applications, and data with appropriate tools and procedures is required to support the NRM decision-making process. ICIMOD in collaboration with the United States Agency for International Development (USAID) and the National Aeronautics and Space Administration (NASA) is implementing SERVIR-Himalaya, a regional visualization and monitoring system that integrates Earth observations such as satellite imagery and forecast models together with in situ data and other knowledge for timely decision making. Ecosystems and biodiversity are among the thematic priority areas of SERVIR-Himalaya – which are also essential components in NRM. Two applications that are relevant here are the forest fire detection and monitoring system in Nepal and the decadal land cover dynamics in Bhutan.

Forest fires are common in the Hindu Kush Himalayan region during summer, with 80,749 fire incidents recorded in the year 2012, including 3,145 in Nepal. Steep increases in fire incidences and reductions in forest productivity during dry years are observed in the region, which have the both economic and ecological consequences as forests play an important role in the livelihood support systems of rural populations. Among the potential impacts of climate change is a predicted increase in wildfires in forest ecosystems, which means scientific understanding of and capacities for fire monitoring and mitigation strategies must be strengthened. The system developed by SERVIR-Himalaya detects fire locations using Moderate Resolution Imaging Spectroradiometer (MODIS) data downloaded by a receiving station at ICIMOD. The system automatically adds important information such as district and village development committee names, land cover, and elevation to the fire locations by overlaying other data layers. The system then sends email and SMS notifications to subscribers, which include district forest officers and community forestry users. The information is also published online in ICIMOD's mountain geoportal (<http://apps.geoportal.icimod.org/NepalForestFire>). The system is in operation in collaboration with the Department of Forests in Nepal, which manages the user database.

This is an example of using available technology to derive information and sharing it with concerned users that can play important roles in strengthening NRM governance at different levels. Historical information on fire incidences and its analysis at the regional level gives a better understanding of forest fire trends and impacts on ecosystems. At the national level, the information supports the development of suitable fire management strategies, damage assessment on fire risk assessments, and early warning systems by looking at spatial patterns and the times of the year during which there are onsets of fire. The information will be useful in planning awareness campaigns such as FM radio programmes in the districts, which are seen as effective means to reach communities. Similarly, the system is designed to store feedback data for monitoring the responses to each fire incidence at the local level.

Similarly, land cover assessment and the monitoring of its dynamics are essential for the sustainable management of natural resources, environmental protection, biodiversity conservation, and the livelihoods of people – particularly for rural communities in the HKH. The application on decadal land cover dynamics in Bhutan shows the changes in land cover using data derived from LandSat images from 1990, 2000, and 2010. The information on different land cover classes and changes from one class to another are made available through an online web application (<http://apps.geoportal.icimod.org/BhutanLandCover>). Interactive tools are provided to visualize information both in tabular and map forms, and explore the changes by overlaying and swiping different data layers. Users can also look at the change statistics for the whole country or a specific district, zooming into the areas where changes have been taking place over the last two decades. Land cover is considered a fundamental variable that impacts and links many parts of social and physical environments. Such information on land cover and forest changes at national and local levels are important for policy makers dealing with NRM and climate change issues. The spatially disaggregated information will help to understand changes in the local socioeconomic context.

These applications demonstrate how modern information and communication technologies can be used to generate information and be made easily accessible to relevant users. The availability of such evidence-based information and its sharing is indispensable for establishing sound governance mechanisms at national and local levels. The technologies and skills for creating data sharing platforms are at our disposal. It is now high time to start working on relevant policies to facilitate and institutionalize data sharing among stakeholders for the benefit of the larger society. Proper management, maintenance, and access to natural resources data will be valuable to many institutions to reduce the duplication of efforts. ICIMOD's mountain geoportal is one such effort to promote the use of GIS and Earth observation applications, and regional data sharing. Efforts are being made to generate awareness at local and national levels through targeted communication strategies. Building the capacities of institutions will be key to enabling the people to use available information and tools in their decision making processes and enhance NRM governance.

Making a difference in effective natural resource management governance will also require drawing lessons and comparative analysis for regional cooperation in the mountains, as appropriate, keeping in mind the best practices and successful regional governance processes from the Alps, Carpathians, Caucasus, Balkans, etc. Several mechanisms and institutional arrangements at the development to implementation stages offer opportunities for improved governance through regional cooperation. One possible mechanism would be the creation of a Himalayan Council (modelled after the Arctic Council) that is driven by science and research, but also oriented towards dealing with environmental and policy challenges posed by melting Himalayan glaciers, which will adversely affect millions of people. Organizations and institutional arrangements such as SAARC (South Asian Association for Regional Cooperation) and ICIMOD also provide specific models for regional cooperation. SAARC focuses on economic, social, and geopolitical cooperation among eight member states (Afghanistan, Bangladesh, Bhutan, India, Maldives, Nepal, Pakistan, and Sri Lanka) and nine observer states, while ICIMOD focuses on improving cooperation on improved livelihoods and environments through knowledge management, and it involves eight mountainous member states (Afghanistan, Bangladesh, Bhutan, China, India, Myanmar, Nepal, and Pakistan).

Another mechanism that is fully operational is SERVIR-Himalaya (in partnership with NASA, USA), which aims to improve environmental decision making in the region through the analysis, application, and dissemination of earth observation and geospatial information. Such efforts are useful to a range of natural resource management issues, stakeholders, and decision makers at different scales and levels – governments, donors, development practitioners, researchers and scientists, civil societies, and communities – for transboundary issues that could benefit from connecting space information to practical applications in villages. Another institutional arrangement that is being taken forward is the development of the Himalayan University Consortium, which brings together universities from around the region for enhancing research and knowledge, curricula development, learning and teaching, capacity and institutional strengthening, and the exchange of information regarding key mountain subjects and issues. This initiative aims to address some of the challenges that universities in the region may be encountering in terms of capacities, funding, and recognition.

Regional cooperation offers enormous potential to advance the theoretical and empirical frontiers of natural resource management governance. Cooperation with leading research organizations is possible within multiple resource domains. Regional organizations have tremendous opportunities to overcome the so-far siloed nature of research on governance by moving across levels and scales of analysis, resource countries. However, their success gender equality, requires a systematic design of research protocols around ethics, institutional accountability and transparency, meaningful participation, knowledge sharing, equity, gender equality, and interdisciplinarity across ongoing and future projects.

Opportunities and possibilities abound in terms of strengthening the research and policy relevance of natural resource management governance, given the demand that exists for useful research that is rigorous, systematic, grounded,

and applicable among donors, decision makers, and researchers from the South. To achieve this will require due attention to be paid towards training, capacity strengthening, and networking possibilities, which to some extent still remain unexplored and under-researched in the region.



# 7. Conclusions

The research and review presented in this paper lead us to seven key conclusions and related recommendations that can enhance research on governance and lead to a stronger relationship between governance research and decision making.

## Recommendations

Our first recommendation flows from the fact that developing a focused research programme on governance across natural resource management research projects and research organizations is important and does not require substantial new funding. A programme on governance can help identify key opportunities that can strengthen knowledge-policy linkages and a two-way flow of information and knowledge. We therefore recommend that such a programme needs to be and should be established by regional organizations and organizations in the region.

The second recommendation concerns the identification and relevance of governance in ongoing data collection efforts (i.e., how it is exercised, forms, and effectiveness), and the need to address hard data problems and gaps. The governance knowledge-policy interface programme should be charged with addressing data gaps as one of its key tasks.

Our third recommendation concerns funds needed for governance research. Many bilateral organizations (for example, Department for International Development (DFID), Norwegian Agency for Development Cooperation (Norad), United States Agency for International Development (USAID), etc.) are interested in supporting governance and resource management related work that match their mandates in terms of specific resource domains (for instance, at the time of writing, forest governance for NORAD; livelihoods and governance for DFID), as well as in the context of cross-sectoral funding (eg., from DFID). Making concerted efforts to raise funds for governance research is necessary to increase and strengthen capacity.

Our fourth recommendation concerns the need for capacity building in relation to governance research in the HKH region. Mechanisms to develop such capacity could be new trans-disciplinary trainings and summer courses around natural resource management governance for different stakeholders ranging from researchers to policy makers and civil society members. Such courses are likely to find substantial interest if they are undertaken systematically.

Our fifth recommendation also concerns capacity building for governance research. Efforts at organizing training seminars and summer courses can be usefully synergized with the creation of a regional governance network that reaches out to researchers, civil society organizations, government officials, donors, rural organizations, the private sector, and so forth. Such a network will also have the effect of greatly increasing the visibility of regional knowledge and resource centres for work on governance.

Our sixth recommendation focuses on the human resource needs for staffing such a governance-policy interface programme. Dedicated governance research positions for work on governance will likely pay for themselves and more in terms of impacts and outcomes – not to mention fundraising.

Our seventh and final recommendation is that a knowledge network on governance has the potential to bring both small and large countries in the HKH together given the universal interest in effective governance. We recommend, therefore, that such networks are created and sustained so that institutional arrangements can bring together both small and large countries into dialogue.

In addition to the above, it is worth noting that, although governance is critical for the sustainable, equitable, and effective management of natural resources and the environment in the HKH, it remains an under-researched subject area in the region. The limited research on governance, sustainability, and natural resources is all the more

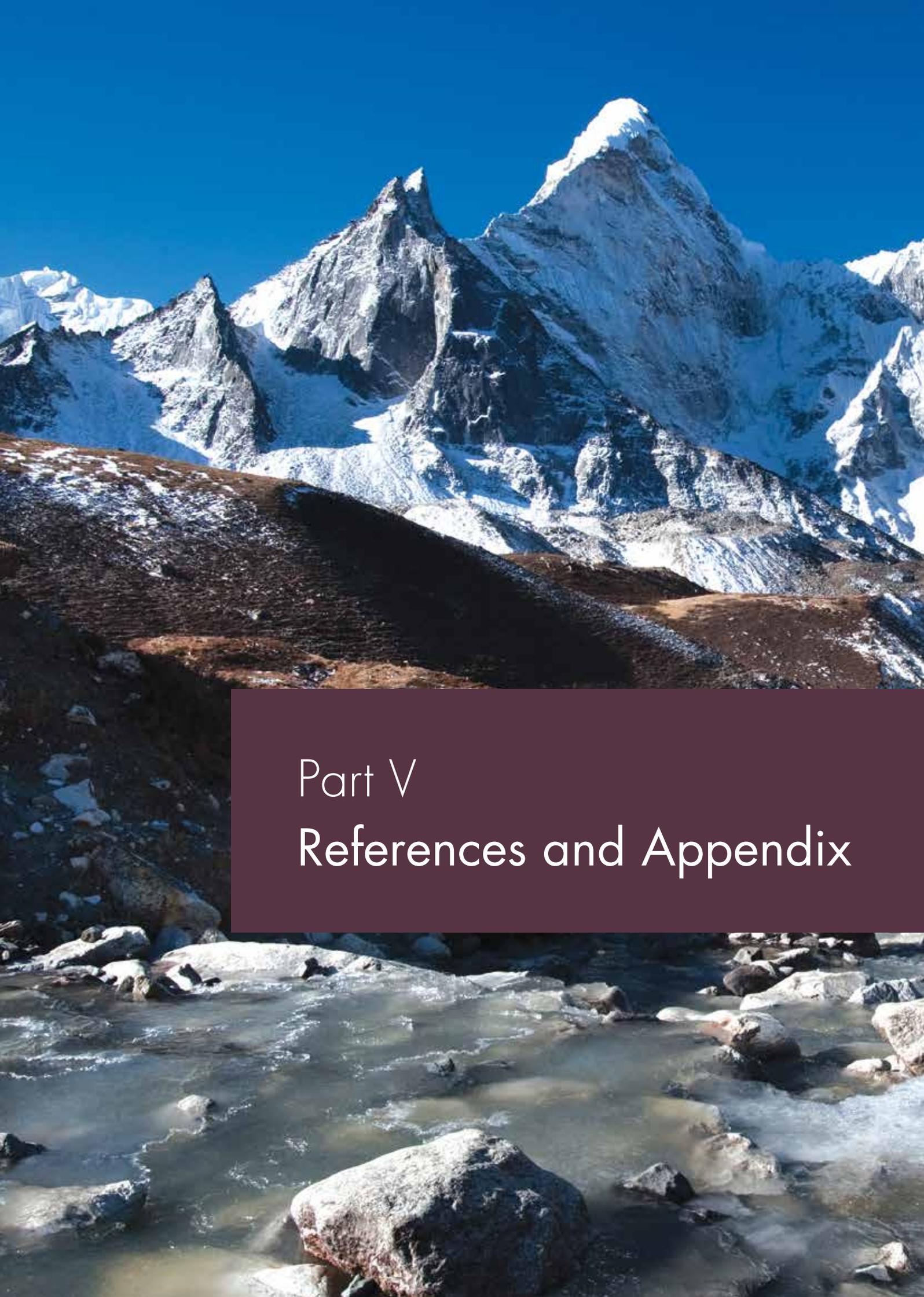
lamentable because a rigorous research programme on the subject has tremendous potential to translate scientific findings into practice, and to improve the science-policy interface in the region.

While governance research cuts across many disciplinary efforts and considerations, it is not always part of the central conceptual frameworks of many natural resource management projects and programmes. The assumption is often that governance will just 'happen' on its own. However, unless research efforts, resources, and conceptual frameworks explicitly integrate governance issues, a crucial component of human-environmental relations will remain unknown. Moreover, critical opportunities for positive outcomes with regard to effective governance, its implementation, and participation in decision making will be lost. Or worse, well-intended development interventions will likely fail or negatively impact the women, men, and children that they are intended to benefit.

If well thought out mechanisms, implementation processes, and institutional arrangements for effective governance are made central to research, action, and policy making, it would be more likely that outcomes effectively address economic poverty, wellbeing, and environmental conservation issues. Although governance improvements can address failures in development and natural resource depletion, they can also do much more. Equitable and participatory governance involving effective mechanisms and processes can support everyday practices, decisions, rules, actors, and norms towards environmental sustainability and improved livelihoods. Research on governance issues can help determine the extent to which actions related to development and conservation programmes are aligned with their design, as well as question their design with respect to the everyday lives, ecological needs, and realities women and men.

The Hindu Kush Himalayan region is experiencing rapid changes driven by climate change, geopolitical shifts, globalization, development, etc., which impact local communities and their environments in crucial ways. The need for effective, participatory, and equitable governance has never been more critical. Likewise, the need for collaboration, cooperation, and knowledge sharing across national boundaries is important for the region. This can be achieved through innovative governance mechanisms and processes that focus on effective institutions, information, and incentives for implementation. To make this happen, research on the management of natural resources must break free from the siloed approach of the past that focused on biophysical factors, and instead head towards one where issues of governance and associated sociopolitical issues play a central role. This is essential given that, in reality, governance issues permeate and mediate all human-environmental relations. When governance becomes central in the conceptual and implementing framework for understanding and managing natural resources, it will be possible to holistically achieve goals of sustainability, and equity and wellbeing.

This review paper has identified both a framework for the analysis of governance by identifying information, incentives, and institutions as the key components for understanding how decision makers can influence resource management outcomes, as well as a structure for analysing concrete governance interventions in different resource domains. The framework for analysis builds on a substantial body of work on governance and prepares the ground for the set of seven recommendations that we have outlined. We believe that action on these recommendations will position regional organizations in the region as important locations for research on governance, help them achieve their goals for informing natural resource decision making in the region, and create new channels for connecting research with policy making that enables positive outcomes for people, sentient beings and their environments.



Part V

References and Appendix



## 8. References

- AAAS (American Association for the Advancement of Science). n.d. AAAS Atlas of population and environment. <http://atlas.aaas.org/index.php?part=3&sec=him>. Accessed on October 12, 2013
- Adams, B (2004) 'Public meetings and the democratic process'. *Public Administration Review*, 64(1), 43-54
- Adserà, A; Boix, C; and Payne, M (2003) 'Are you being served?' Political accountability and quality of government. *Journal of Law, Economics, and Organization* 19(2): 445–490
- Agrawal, A. (1999) 'Accountability in decentralization: A framework with South Asian and West African cases' *The Journal of Developing Areas*, 33(4), 473-502
- Agarwal, B. (2001) Participatory exclusions, community forestry, and gender: An analysis for South Asia and a conceptual framework. *World development*, 29(10), 1623-1648
- Agrawal A. (2005) *Environmentality: Technologies of Government and the Making of Subjects*. Durham, NC: Duke University Press
- Agarwal, B. (2009) Gender and forest conservation: The impact of women's participation in community forest governance. *Ecological Economics*, 68(11), 2785-2799
- Agarwal, B. (2010) *Gender and green governance: the political economy of women's presence within and beyond community forestry*. Oxford University Press
- Agrawal, A., & Ribot, J. (2012) Assessing the effectiveness of democratic accountability mechanisms in local governance. Report commissioned for USAID by Management Systems International (MSI) Project, (380000.12-500), 03-11
- Agrawal, A., & Benson, C. S. (2011) Common property theory and resource governance institutions: strengthening explanations of multiple outcomes. *Environmental Conservation*, 38(2), 199-210
- Agrawal, A., & Chhatre, A. (2006) Explaining success on the commons: Community forest governance in the Indian Himalaya. *World Development*, 34(1), 149-166
- Agrawal, A., & Ostrom, E. (2001) Collective action, property rights, and decentralization in resource use in India and Nepal. *Politics & Society*, 29(4), 485-514
- Agrawal, A; Chhatre, A; Hardin, R (2008) 'Changing governance of the World's forests.' *Science* Vo. (320): 1460-62
- Agrawal, A (2012) 'Natural resource governance at multiple scales in the Hindu Kush Himalaya in South Asia.' Presented in the governance round table discussion at ICIMOD, Kathmandu, 23 May 2012
- Andam, K. S., Ferraro, P. J., Pfaff, A., Sanchez-Azofeifa, G. A., & Robalino, J. A. (2008) 'Measuring the effectiveness of protected area networks in reducing deforestation' *Proceedings of the National Academy of Sciences*, 105(42), 16089-16094
- Andam, K. S., Ferraro, P. J., Sims, K. R., Healy, A., & Holland, M. B. (2010) 'Protected areas reduced poverty in Costa Rica and Thailand' *Proceedings of the National Academy of Sciences*, 107(22), 9996-10001
- Angelsen, A. (ed.) (2008) 'Moving ahead with REDD: Issues, options and implications.' Bagor: CIFOR
- Alauddin, Mohammad, and John Quiggin. 2007 'Agricultural intensification, irrigation and the environment in South Asia: Issues and policy options'. *Ecological Economics* 65(1), 111-124
- Axinn, W. G., & Ghimire, D. J. (2011) 'Social organization, population, and land use'. *AJS; American journal of sociology*, 117(1), 209
- Babel MS and Wahid SM (2008) *Freshwater under Threat: Vulnerability Assessment of Freshwater Resources in South Asia*. United Nations Environment Programme, Nairobi, Kenya
- Babel, MS; Wahid, S (2011) 'Hydrology, management and rising water vulnerability in the Ganges–Brahmaputra–Meghna river basin'. *Water International* 36(3): 340–356
- Bäckstrand, K. (2003) 'Civic science for sustainability: reframing the role of experts, policy-makers and citizens in environmental governance'. *Global Environmental Politics*, 3(4), 24-41
- Baland, J. M., Bardhan, P., Das, S., Mookherjee, D., & Sarkar, R. (2007) Managing the environmental consequences of growth: forest degradation in the Indian Mid-Himalayas. In *Indian Policy Forum* (Vol. 3, pp. 215-266)

- Bardhan, P. (1997) Corruption and development: a review of issues. *Journal of economic literature*, 35(3), 1320-1346
- Baxter, John C. and W. Robert Laitos. (1988) Water control and the maintenance imperative: Evidence from Nepal. *Agricultural Water Management* 15: 115-130
- Baviskar, A. (2000) Claims to knowledge, claims to control: environmental conflict in the Great Himalayan National Park, India. Indigenous environmental knowledge and its transformations: critical anthropological perspectives. Harewood Academic, Amsterdam, The Netherlands, 101-119
- Bawa, K. S., Joseph, G., & Setty, S. (2007) Poverty, biodiversity and institutions in forest-agriculture ecotones in the Western Ghats and Eastern Himalaya ranges of India. *Agriculture, Ecosystems & Environment*, 121(3), 287-295
- Bernal V. 1990 The politics of research on agricultural development: an instructive example from the Sudan. Research report. *American Anthropologist* 92:737
- Bjønness, I. M. (1983) External economic dependency and changing human adjustment to marginal environment in the high Himalaya, Nepal. *Mountain Research and Development*, 263-272
- Blaikie, P. and Springgate-Baginski, O (Eds.) (2013) *Forests People and Power: the political ecology of Reform in South Asia*. London and New York: Routledge
- Blair, H (2000) 'Participation and accountability at the periphery: democratic local governance in six countries' *World Development*, 28(1), 21-39
- Bradley, M., C. A. Schipani, A. K. Sundaram, and J. P. Walsh. (1999) The purposes and accountability of the corporation in contemporary society: Corporate governance at a crossroads. *Law and Contemporary Problems* 62(3): 9-86
- Brandon, KE and Wells, M (1992) 'Planning for people and parks: design dilemmas' *World Development*, 20(4), 557-570
- Brett, E A (2003) 'Participation and accountability in development management' *The Journal of Development Studies*, 40(2): 1-29
- Brondizio, ES; Ostrom, E; and Young, OR (2009) 'Connectivity and the governance of multilevel social-ecological systems: The role of social capital' *Annual review of Environment and Resources*, 34, 253-278
- Brichieri-Colombi, S., & Bradnock, R. W. (2003) Geopolitics, water and development in South Asia: cooperative development in the Ganges-Brahmaputra delta. *The Geographical Journal*, 169(1), 43-64
- Briscoe, J (1997) Managing water as an economic good: Rules for reformers. *Water Supply* 15(4): 1530172
- Brody, A (2009) *Gender and Governance: Overview Report*. Brighton: Institute of Development Studies
- Brown, L. D., and M. H. Moore (2001) Accountability, strategy, and international nongovernmental organizations. *Nonprofit and Voluntary Sector Quarterly* 30(3): 569-587
- Bruns, Bryan (1993) Promoting participation in irrigation: Reflections on experience in southeast Asia. *World Development* 21(11): 1837-1849
- Bruns, B. R., Ringler, C. and Meinzen-Dick, R. Eds. (2005) *Water Rights Reform: Lessons for Institutional Design*. Washington, DC: International Food Policy Research Institute
- Buffum, B., Lawrence, A., & Tempel, K. J. (2010) Equity in community forests in Bhutan. *International forestry review*, 12(3), 187-199
- Carney, J. and Watts, M. (1990) Manufacturing Dissent: Work, Gender and the Politics of Meaning in a Peasant Society, in *Africa*, 60(2):207-241
- Cash, DW; Adger, N; Fikret Berkes, WN; Garden P; Lebel, L; Olsson, P; Pritchard, L; and Young, O (2006) 'Scale and cross-scale dynamics: governance and information in a multilevel world' *Ecology and Society* 11(2):8
- Cashore, B. (2002) Legitimacy and the privatization of environmental governance: How non-state market-driven (NSMD) governance systems gain rule-making authority. *Governance*, 15(4), 503-529
- Chettri, N., Sharma, E., Shakya, B., & Bajracharya, B. (2007) Developing forested conservation corridors in the Kangchenjunga landscape, Eastern Himalaya. *Mountain Research and Development*, 27(3), 211-214
- Chhotray, V., & Stoker, G. (2008) *Governance theory and practice: A cross-disciplinary approach*. Palgrave Macmillan
- Conley, A., & Moote, M. A. (2003) Evaluating Collaborative Natural Resource Management. *Society & Natural Resources*, 16(5), 371-386
- Cornwall A, Harrison E, Whitehead A. (2007) Gender myths and feminist fables: The struggle for interpretive power in gender and development. In *Development and Change* 38(1):1-20
- Constanza R., Kubiszewski I., Giovannini E., Lovins H., McGlade J., Pickett K.E., Ragnarsdóttir K.V., Roberts D., De Vogli R. and Richard Wilkinson R. (2014) Development: Time to Leave GDP Behind. In *Nature*, January 15, 2014

- Coward, E. Walter (1977) Irrigation management alternatives: Themes from indigenous management systems. *Agricultural Administration* 4: 223-237
- Crow, B., & Singh, N. (2000) Impediments and innovation in international rivers: the waters of South Asia. *World Development*, 28(11), 1907-1925
- Dasgupta, A., & Beard, V. A. (2007) Community driven development, collective action and elite capture in Indonesia. *Development and Change*, 38(2), 229-249
- Devarajan, Shantayanan, and Ijaz Nabi (2006) Economic growth in South Asia: Promising, un-equalizing,... Sustainable? South Asia region report, World Bank: Washington DC
- Devas, N., and U. Grant. (2003) Local government decision making-citizen participation, and local accountability: Some evidence from Kenya and Uganda. *Public Administration and Development* 23: 307–316
- Dharmadhikary, S. (2008) Mountains of Concrete: Dam Building in the Himalayas. *International Rivers: Inkworks*
- DIIR (Department of Information and International Relations) (2012) Tibet: The Third Pole, Importance of Environmental Stewardship, paper presented at 6th World Parliamentarians' Convention on Tibet, 27 -29 April, 2012, Ottawa, Canada, Dharamsala: Environment and Development Desk Central Tibetan Administration
- Dixit, A. and Gyawali, D. (2010) 'Nepal's constructive Dialogue on Dams and Development', *Water Alternatives* 3(2): 106-123
- Dong, S; Lassoie, J; Shrestha, KK; Zhaoli, Y; Sharma, E; Pariya, D (2009) 'Institutional development for sustainable rangeland resource and ecosystem management in mountainous areas of northern Nepal.' *Journal of Environmental Management* 90 (2009): 994–1003
- Dossani, R., & Rowen, H. S. (Eds.). (2005) *Prospects for peace in South Asia*. Stanford University Press
- Easter, K. William. (2000) Asia's irrigation management in transition: A paradigm shift faces high transaction costs. *Review of Agricultural Economics* 22(2): 370-388
- Ebrahim, A (2003) 'Making sense of accountability: Conceptual perspectives for northern and southern nonprofits' *Nonprofit Management and Leadership*, 14(2), 191-212
- Elkington, J. (1998) Partnerships from cannibals with forks: The triple bottom line of 21st century business. *Environmental Quality Management*, 8(1), 37-51
- Espeland W. N. (1998) *The struggle for water. Politics, rationality, and identity in the American southwest*. Chicago: University of Chicago Press
- Fearon, J D (1999) 'Electoral accountability and the control of politicians: selecting good types versus sanctioning poor performance' *Democracy, accountability, and representation*, 55, 61
- Frankland, S. (2003) *The Still Waters of the Nile*, in *Negotiating Local Knowledge: Power and Identity in Development*, Pottier, J., Bicker, A. and Sillitoe, P. (Editors), London: Pluto Press, p.298-321
- Fritzen, S. A. (2007) Can the design of community-driven development reduce the risk of elite capture? Evidence from Indonesia. *World Development*, 35(8), 1359-1375
- Fung, A (2006) 'Varieties of participation in complex governance' *Public Administration Review*, 66(s1): 66-75
- Gaventa, J (2002) 'Exploring citizenship, participation and accountability' *IDS bulletin*, 33(2):1-14
- German, L., Verma, R., and Ramisch, J. (2010) *Agriculture, Natural Resource Management and Development Beyond the Biophysical*. *Beyond the Bio-Physical: Knowledge, Culture and Politics in Natural Resource Management*, German, L., Ramisch, J. and Verma, R. (editors), P. 1-21, New York: Springer
- Gibson, CC; Ostrom, E; and Ahn, TK (2000) 'The concept of scale and the human dimensions of global change: a survey' *Ecological economics*, 32(2):217-239
- Gibson, C. C., Williams, J. T., & Ostrom, E. (2005) Local enforcement and better forests. *World Development*, 33(2), 273-284
- Gill, Mushtaq Ahmad (1991) Farm level water management systems (public and private). In *Farm Level Irrigation Water Management* (ed). Asian Productivity Organization. Pp. 79-87. Tokyo: Asian Productivity Organization
- Goetz, AM and Gaventa, J (2001) *Bringing Client Voice and Client Focus in Service Delivery'* (No. 138). IDS Working Paper
- Goodson, L. P. (2012) *Afghanistan's endless war: State failure, regional politics, and the rise of the Taliban*. Seattle: University of Washington Press
- GON (2010) 'Nepal's Readiness Preparation Proposal, April 2010.' Ministry of Forests and Soil Conservation, Government of Nepal
- Grant, R W and Keohane, R O (2005) 'Accountability and abuses of power in world politics' *American Political Science Review*, 99(01): 29-43

- Grindle, M. S. (2004) Good enough governance: Poverty reduction and reform in developing countries. *Governance*, 17(4), 525-548
- Gupta, A. and Ferguson, J. (1997) Culture, Power, Place: Ethnography at the End of an Era, in *Culture, Power, Place: Explorations in Critical Anthropology*, Gupta, A. and Ferguson, J. (editors), Duke University Press: Durham, North Carolina, p.1-29
- Gurung, J; Giri, K; Setyowati, AB; Lebow, E (2011) 'Getting REDD right for women: An analysis of the barriers and opportunities for women's participation in the REDD+ sector in Asia.' USAID
- Guyer, JI (1992) 'Representation without taxation: An essay on democracy in rural Nigeria 1952-1990' *African Studies Review*, 35(1): 41-79
- Halachmi, A. (2002) Performance measurement, accountability, and improved performance. *Public Performance and Management Review* 25(4): 370-374
- Harriss J, Hunter J, Lewis CM. (1995) *The new institutional economics and third world development*. London: Routledge, 1995
- Heinrich, C. (2003) Outcomes based performance management in the public sector: Implications for government accountability and effectiveness. *Public Administration Review* 62(6): 712-25
- Hempel, L. C. (1996) *Environmental governance: the global challenge*. Island Press
- Hoermann, B., Banerjee, S., & Kollmair, M. (2010) Labour migration for development in the Western Hindu Kush-Himalayas: Understanding a livelihood strategy in the context of socioeconomic and environmental change. Kathmandu: International Centre for Integrated Mountain Development (ICIMOD)
- Huber, J. (2000) Delegation to civil servants in parliamentary democracies. *European Journal of Political Research* 37(3): 397-413
- ICIMOD (International Centre for Integrated Mountain Development) (2011) Synthesis Report, Regional Report on Climate Change in the Hindu Kush-Himalayas: the State of Current Knowledge. Kathmandu, Nepal: International Centre for Integrated Mountain Development
- ICIMOD (2011) 'Operational guidelines of Forest Carbon Trust Fund (2011) for regulating seed grant under community forestry REDD+ project, Nepal.' Kathmandu, Nepal: ICIMOD
- ICIMOD (2009) *The changing Himalayas*. International Centre for Integrated Mountain Development (ICIMOD), Kathmandu, Nepal
- ICIMOD (International Centre for Integrated Mountain Development). n. d. <http://www.icimod.org/?q=1238>
- IISD (2003) *Livelihoods and Climate Change: Combining disaster risk reduction, natural resource management and climate change adaptation in a new approach to the reduction of vulnerability and poverty*, International Institute for Sustainable Development (IISD), The World Conservation Union and Stockholm Environment Institute – Boston Centre (SEI-B), 2003
- IPCC (2007) *Climate Change 2007. The Physical Science Basis, Contribution of Working Group I to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change* [Solomon, S., Qin, D., Manning, M., Chen, Z., Marquis, M., Averyt, K.B., Tignor, M., and Miller, H.L. (eds.)]. Cambridge University Press: Cambridge, UK and New York, NY, USA
- IUCN (2011) *The land we graze: A synthesis of case studies about how pastoralists' organizations defend their land rights* Nairobi, Kenya: IUCN ESARO office
- Ives, J. D. (2006) *Himalayan Perceptions: Environmental Change and the Well-being of Mountain Peoples*. Himalayan Journal of Science
- Iyer, R. R. (1999) Conflict-resolution: three river treaties. *Economic and Political Weekly*, 1509-1518
- Jagers SC, Stripple J. (2003) Climate governance beyond the state. *Global Governance* 9: 385-99
- Kabeer N. (1994) *Reversed Realities: Gender Hierarchies in Development Thought*. London, UK and New York, NY: Verso
- Kala, C. P., & Maikhuri, R. K. (2011) Mitigating people-park conflicts on resource use through ecotourism: A case of the Nanda Devi Biosphere Reserve, Indian Himalaya. *Journal of Mountain Science*, 8(1), 87-95
- Kaplan, R. D. (2009) 'The revenge of geography' *Foreign Policy*, (172), 96-105
- Karkkainen, B. C. (2004) 'Post-sovereign environmental governance' *Global Environmental Politics*, 4(1), 72-96
- Karky, BS, and Skutsch, M (2010) 'The cost of carbon abatement through community forest management in Nepal Himalaya' *Ecological Economics*, 69(3):666-672
- Karky, B; Rana, E (2011) *Pilot forest carbon trust fund: Rewarding local communities for forest conservation* Kathmandu, Kathmandu: ICIMOD
- Kerkhoff, E and Sharma, E (2006) *Debating Shifting Cultivation in the Eastern Himalayas*. Kathmandu: ICIMOD

- Kersbergen, K. V., & Waarden, F. V. (2004) 'Governance' as a bridge between disciplines: Cross-disciplinary inspiration regarding shifts in governance and problems of governability, accountability and legitimacy. *European journal of political research*, 43(2), 143-171
- Khadka, M; Karki, S; Karky, B; Kotru, R; Chapagain, A (2012) Gender consideration in the REDD+ initiative in Nepal: Maintaining or challenging unequal gender power relations? Paper presented at the Bhutan+10: Gender and Sustainable Mountain Development in a changing world, held in Thimphu, 15-19 October 2012
- Khatri, D (2012) 'Is REDD+ redefining forest governance in Nepal?.' *Journal of Forest and Livelihood* 10(1): 74-87
- Kerkhoff, E and Sharma, E (2006) Debating Shifting Cultivation in the Eastern Himalayas Kathmandu: ICIMOD
- Kitschelt, H. (2000) 'Linkages between citizens and politicians in democratic politics' *Comparative Political Studies* 33(6/7): 845-879
- Klein, JA; Harte, J; Zhao, XQ (2007) 'Experimental warming not grazing, decreases rangeland quality on the Tibetan plateau.' *Ecological Applications* 17: 541-557
- Koontz, T. M., & Thomas, C. W. (2006) 'What do we know and need to know about the environmental outcomes of collaborative management?' *Public administration review*, 66(s1), 111-121
- Koppell, J. (2005) 'Pathologies of accountability: ICANN and the challenge of "Multiple Accountabilities Disorder' *Public Administration Review* 65(1): 94-108
- Lam, Wai Fung. (1996) 'Improving the performance of small-scale irrigation systems: The effects of technological investment and governance structure on irrigation performance in Nepal' *World Development* 24(8): 1301-1315
- Lansing, S., (1991) *Priests and Programmers Technologies of Power and the Engineered Landscape of Bali*, Princeton: Princeton University Press
- Lansing, S. (1987) 'Balinese "Water Temples" and the Management of Irrigation' in *American Anthropologist*, 89(2), p.326-341
- Larsen, HO; Smith, P D; and Olsen, C S (2005) 'Nepal's conservation policy options for commercial medicinal plant harvesting: stakeholder views' *Oryx*, 39(04), 435-441
- Larson, Anne and Fernanda Soto (2008) 'Decentralization of natural resource governance' *Annual Review of Environment and Resources* 33: 213-239
- LEAD (2008), *Pakistan's options for climate change Mitigation and adaptation*, Lead Pakistan, Islamabad, Lead
- Lebel, L. Anderies, J. M. Campbell, B. Folke, C. Hatfield-Dodds, S. Hughes, T. P., and Wilson, James (2006) *Governance and the Capacity to Manage Resilience in Regional Social-Ecological Systems*. Marine Science Faculty Scholarship. Paper 52. [http://digitalcommons.library.umaine.edu/sms\\_facpub/52](http://digitalcommons.library.umaine.edu/sms_facpub/52)
- Lee, M (2004) 'Public reporting: A neglected aspect of nonprofit accountability' *Nonprofit Management and Leadership*, 15(2):169-185
- Lemos, MC and Agrawal, A (2006) 'Environmental governance' *Annual Review of Environment and Resources*, 31(1), 297
- Lenton, R (2002) 'Managing natural resources in the light of climate variability.' *Natural Resources Forums*, Vol 26 (2002): 185-194
- Leduc., B. & Shrestha, A. (2008) *Gender and Climate Change in the Hindu Kush Himalayas: Nepal Case Study Kathmandu: ICIMOD*
- Lee, J. W. (1996) 'Government interventions and productivity growth' *Journal of Economic Growth*, 1(3), 391-414
- Lenton, R. (2002) 'Managing natural resources in the light of climate variability' In *Natural Resources Forums*, 26: 185-194
- Lewis, D and Mosse, D (editors) (2006) *Development Brokers and Translators: The Ethnography of Aid and Agencies*. Bloomfield: Kumarian Press.
- Long, N. and Villareal, M. (1994) 'The Interweaving of Knowledge and Power in Development Interfaces' *Beyond Farmer First: Rural People's Knowledge, Agricultural Research and Extension Practice*, Scoones, I., Thompson, J. (Editors), Intermediate Technology Publications: London, p.41-51
- Mackenzie, F. (2010) 'Gender, Land Tenure and Globalisation: Exploring the Conceptual Ground. In *Land Tenure' Gender and Globalization: Research and Analysis from Africa, Asia and Latin America*, Dzodzi Tsikata and Pamela Golah (editors). Ottawa: International Development Research Centre, p.35-69
- Mackenzie, F. (1995) "A Farm is Like a Child Who Cannot Be Left Unguarded": Gender, Land and Labour in Central Province, Kenya *IDS Bulletin*, 26(1): 17-23
- Manin, B; Przeworski, A; and Stokes, S (1999) 'Elections and representation' *Democracy, Accountability, and Representation*, 29-54

- Manor J. (2005) User committees: A potentially damaging second wave of decentralization? In Ribot JC, Larson AM, eds. *Democratic Decentralization through a Natural Resource Lens*. pp. 192-213. London: Routledge
- Marshall, MN; Shekelle, PG; Leatherman, S; and Brook, R H (2000) 'Public disclosure of performance data: learning from the US experience' *Quality in Health Care*, 9(1): 53-57
- McCully, P. (2006) *Spreading the Water Wealth: Making Water Infrastructure Work for the Poor*. IRN Dams, Rivers and People Report 2006. Berkeley, CA: International Rivers Network
- Massey, D. S., Axinn, W. G., & Ghimire, D. J. (2010) Environmental change and out-migration: Evidence from Nepal. *Population and Environment*, 32(2-3), 109-136
- MEA (Millennium Ecosystem Assessment) (2005) *Ecosystems and Human Well-Being, Synthesis*. Island Press, Washington DC
- Miller, D; Craig, SR (1997) Rangelands and pastoral development in the Hindu Kush Himalayas. Proceedings of a regional experts' meeting, 5-7 November 1996. Kathmandu: ICIMOD
- Mishra, C. (1997) Livestock depredation by large carnivores in the Indian trans-Himalaya: conflict perceptions and conservation prospects. *Environmental conservation*, 24(04), 338-343
- Moe, R. C. (2001) The emerging federal quasi-government: Issues of management and accountability. *Public Administration Review* 61(3): 290-312
- Mollinga, Peter P. (2001) Water and politics: Levels, rational choice, and south Indian canal irrigation. *Futures* 33: 733-752
- Mollinga. P. and Bolding, A. eds. (2004) *The Politics of Irrigation Reform: Contested Policy Formulation and Implementation in Asia, Africa and Latin America*. Aldershot: Ashgate
- Mollinga, Peter P., Ruth Meinzen-Dick, and Douglas J. Merrey. (2007) Politics, plurality, and problems: A strategic approach for reform of agricultural water resources management. *Development Policy Review* 25(6): 699-719
- Moore, D., J. Dore and D. Gyawali (2010) 'The World Commission on Dams +10: Revisiting the large dam controversy', *Water Alternatives* 3(2): 3-13
- Moore, M. (1989) The fruits and fallacies of neoliberalism: The case of irrigation policy. *World Development* 17(11): 1733-1750
- Moore, M. (1997) *Death Without Taxes: Democracy, State Capacity, and Aid Dependence in the Fourth World*. Draft. (Later published in G. White and M. Robinson (eds). 1998. *Towards a Democratic Developmental State*. Oxford University Press, Oxford)
- Mosse, D (2005) *Cultivating Development: An Ethnography of Aid Policy and Practice*, Pluto Press: London and Ann Arbor
- Mosse, D (1999) Colonial and contemporary ideologies of "community management": The case of tank irrigation development in south India. *Modern Asian Studies* 33(2): 303-338
- Mulgan, R (2000) Comparing accountability in the private and public sectors. *Australian Journal of Public Administration* 59(1): 87-97
- Müller, W.C. (2000) Political parties in parliamentary democracies: Making delegation and accountability work. *European Journal of Political Research* 37: 309-33
- Murshed, S. M., & Gates, S. (2005) Spatial-horizontal inequality and the Maoist insurgency in Nepal. *Review of Development Economics*, 9(1), 121-134
- Nathan, L. (2010) Power, security and regional conflict management in Southern Africa and South Asia. *Comparative Social Research*, 27, 309-332
- Naughton-Treves, L; Holland, M B; and Brandon, K (2005) 'The role of protected areas in conserving biodiversity and sustaining local livelihoods' *Annual Review of Environmental Resources*, 30:219-252
- Negi, V. S., Maikhuri, R. K., & Rawat, L. S. (2011) Non-timber forest products (NTFPs): a viable option for biodiversity conservation and livelihood enhancement in central Himalaya. *Biodiversity and Conservation*, 20(3), 545-559
- Nellemann, C.; Verma, R; Hislop, L (2011) *Women at the Frontline of Climate Change: Gender Risks and Hopes*. Arendal: UNEP Grid Arendal
- Nelson, A and Chomitz, K.M (2011) 'Effectiveness of strict vs. multiple use protected areas in reducing tropical forest fires: a global analysis using matching methods' *PLoS One*, 6(8), e22722
- Nepal, S. K. (2000) Tourism in protected areas: the Nepalese Himalaya. *Annals of Tourism Research*, 27(3), 661-681
- Nepal, S. K., & Weber, K. W. (1995) Managing resources and resolving conflicts: national parks and local people. *International Journal of Sustainable Development & World Ecology*, 2(1), 11-25

- Newton, P., Agrawal, A., & Wollenberg, L. (2013) Enhancing the sustainability of commodity supply chains in tropical forest and agricultural landscapes. *Global Environmental Change*. <http://dx.doi.org/10.1016/j.gloenvcha.2013.08.004>
- Ntsebeza L. (2005) Democratic decentralization and traditional authority: Dilemmas of land administration in rural Africa. In Ribot JC, Larson AM, eds. *Democratic Decentralization through a Natural Resource Lens*. pp. 71-89. London: Routledge
- O'Brien, R. (Ed.). (2000) *Contesting global governance: Multilateral economic institutions and global social movements* (Vol. 71). Cambridge University Press
- Olowu, D., & Sako, S. (Eds.). (2002) *Better Governance and Public Policy: Capacity Building for Democratic Renewal in Africa*. Kumarian Press
- OSU (Oregon State University). n.d. *Transboundary Freshwater Dispute Database*. Corvallis, Oregon Department of Geosciences, Oregon State University. <http://www.transboundarywaters.orst.edu/database/>
- Ostrom E (2001) Vulnerability and polycentric governance systems. Update: International Human Dimensions Program. *Global Environmental Change*. 3
- Ostrom, E (1999a) Self-governance and forest resources. Occasional paper/Center for International Forestry Research (ISSN 0854-9818, (20)
- Ostrom E (1999b) Coping with tragedies of the commons. *Annual Review of Political Science* 2: 493–535
- Ostrom, E (1992) *Crafting Institutions for Self-Governing Irrigation Systems*. San Francisco: ICS Press
- Ostrom, E (1990) *Governing the Commons: The Evolution of Institutions for Governance*. Cambridge: Cambridge University Press
- Ostrom V (1972) Polycentricity. Presented at Annual Meeting of the American Political Science Association, Washington, DC
- Perreault, T (2006) 'From the Guerra Del Agua to the Guerra Del Gas: resource governance, neoliberalism and popular protest in Bolivia' *Antipode*, 38(1), 150-172
- Phelps, J; Webb, EL; Agrawal, A (2010) 'Does REDD+ threaten to recentralize forest governance?' *Science* Vol. 328 ( 5976): 312-313, DOI: 10.1126/science.1187774
- Peluso, NL (1996) 'Fruit trees and family trees in an anthropogenic forest: Ethics of access, property zones, and environmental change in Indonesia' *Comparative studies in Society and History*, 38(03): 510-548
- Persha, L., Agrawal, A., & Chhatre, A. (2011) Social and ecological synergy: local rulemaking, forest livelihoods, and biodiversity conservation. *Science*, 331(6024), 1606-1608
- Phelps, J., Webb, E. L., & Agrawal, A. (2010) Does REDD+ threaten to recentralize forest governance. *Science*, 328(5976), 312-313
- Pierre, J. (2000) *Debating governance: Authority, steering, and democracy*. Oxford University Press.
- Pitigala, N (2005) What Does Regional Trade in South Asia Reveal about Future Trade Integration? Some Empirical Evidence. © World Bank, Washington, DC. <https://openknowledge.worldbank.org/handle/10986/8972>
- Porter-Bolland, L; Ellis, EA; Guariguata MR; Ruiz-Mallén, I; Negrete-Yankelevich, S; and Reyes-García, V (2012) 'Community Managed Forests and Forest Protected Areas: An Assessment of their Conservation Effectiveness Across the Tropics' *Forest Ecology and Management* 268: 6–17
- Pradhan, P (1989) *Patterns of Irrigation Organization: A Comparative Study of 21 Farmer-Managed Irrigation Systems*. Colombo: International Irrigation Management Institute
- Priesner, S (1999) *Gross National Happiness: Bhutan's Vision of Development and Its Challenges*. Gross National Happiness: A Set of Discussion Papers. Thimphu: Centre for Bhutan Studies and GNH Research
- Rahaman, MM (2012) Water Wars in 21st Century along International River Basins: Speculation or Reality? *International Journal of Sustainable Society*, Vol. 4, Nos. 1/2:3-10
- Rakodi, C (2001) 'Forget planning, put politics first? Priorities for urban management in developing countries' *International Journal of Applied Earth Observation and Geoinformation*, 3(3):209-223
- Rangan, H (1997) Property vs. control: The state and forest management in the Indian Himalaya. *Development and Change*, 28(1), 71-94
- Rao, K. S., Nautiyal, S., Maikhuri, R. K., & Saxena, K. G. (2000) Management Conflicts in the Nanda Devi Biosphere Reserve, India. *Mountain Research and Development*, 20(4), 320-323
- Rhoades, R (2007) Disappearance of the glacier on Mama Cotacachi: Ethnoecological research and climate change in the Ecuadorian Andes. *Pirineos* 163: 37-50

- Rhodes, R. A. W. (1996) The new governance: governing without government I. *Political studies*, 44(4), 652-667
- Rhodes, R. A. (1997) *Understanding governance: Policy networks, governance, reflexivity and accountability*. Open University Press
- Ribot, JC (2004) *Waiting for democracy: the politics of choice in natural resource decentralization*
- Ribot J (2006) Choose democracy: Environmentalists' socio-political responsibility. *Global Environmental Change* 16: 115-19
- Ribot J (2007) Representation, citizenship and the public domain in democratic decentralization. *Development* 50: 43-49
- Ribot JC, Chhatre A, Lankina T (2008) Institutional choice and recognition in the formation and consolidation of local democracy. Working Paper, World Resources Institute
- Roberts, NC (2002) 'Keeping public officials accountable through dialogue: Resolving the accountability paradox' *Public Administration Review*, 62(6): 658-669
- Roberts, J; McNulty, T; and tiles, P (2005) 'Beyond agency conceptions of the work of the non-executive director: Creating accountability in the boardroom' *British Journal of Management* 16(s1): s5-s26
- Sahni, H. K. (2006) The politics of water in South Asia: The case of the Indus Waters Treaty. *SAIS Review*, 26(2), 153-165
- Salick, J., Fang, Z.D. & Byg, A. (2009) Eastern Himalayan alpine plant ecology, Tibetan ethnobotany, and climate change. *Global Environmental Change-Human and Policy Dimensions* 19(2): 147-155
- Samant, S. S., Dhar, U., & Rawal, R. S. (2000) Assessment of fuel resource diversity and utilization patterns in Askot Wildlife Sanctuary in Kumaun Himalaya, India, for conservation and management. *Environmental Conservation*, 27(1), 5-13
- Saxena, S. C. (2005) Can South Asia adopt a common currency? *Journal of Asian Economics*, 16(4), 635-662
- Schlager, E and Ostrom, E (1992) 'Property-rights regimes and natural resources: a conceptual analysis' *Land economics*, 249-262
- Schroeder, L. (2003) Mechanisms for strengthening local accountability. Paper prepared for the decentralization group, World Bank. Pp. 40. Mimeo
- Schusler, T. M., Decker, D. J., & Pfeffer, M. J. (2003) Social learning for collaborative natural resource management. *Society & Natural Resources*, 16(4), 309-326
- Scoones, I. (1995) 'New directions in pastoral development in Africa'. In: Scoones, I. (ed.) *Living with Uncertainty. New directions in pastoral development in Africa*. London: Intermediate Technology Publications Ltd
- Scott, J. (1990) *Domination and the Arts of Resistance: Hidden Transcripts*, New Haven and London: Yale University Press
- Scott, J. (1985) *Weapons of the Weak and Everyday Forms of Peasant Resistance*, New Haven and London: Yale University Press
- Seeland, K. (2000) National park policy and wildlife problems in Nepal and Bhutan. *Population and Environment*, 22(1), 43-62
- Seymour, F. (2008) 'Forests, climate change, and human rights: Managing risk and trade-offs.' Bogor: CIFOR
- Shah, T. Aditi Deb Roy, Asad S. Qureshi, Jinxia Wang. (2003) Sustaining Asia's groundwater boom: An overview of issues and evidence. *Natural Resources Forum* 27: 130-141
- Shah, T., Mehmood Ul Hassan, Muhammad Zubair Khattak, Parth Sarthi Banerjee, O. P. Singh, Saeed Ur Rahman (2008) Is irrigation water free? A reality check in the Indo-Gangetic basin. *World Development* 36
- Shahbaz, B., Ali, T., & Suleri, A. Q. (2007) A critical analysis of forest policies of Pakistan: implications for sustainable livelihoods. *Mitigation and Adaptation Strategies for Global Change*, 12(4), 441-453
- Sharma, K. (2006) The political economy of civil war in Nepal. *World Development*, 34(7), 1237-1253
- Sharma, U. R. (1990) An overview of park-people interactions in Royal Chitwan National Park, Nepal. *Landscape and urban planning*, 19(2), 133-144
- Sharma, E., & Chettri, N. (2005) ICIMOD's Transboundary Biodiversity Management Initiative in the Hindu Kush-Himalayas. *Mountain Research and Development*, 25(3), 278-281
- Sharma, E., Chettri, N., & Oli, K. P. (2010) Mountain biodiversity conservation and management: a paradigm shift in policies and practices in the Hindu Kush-Himalayas. *Ecological Research*, 25(5), 909-923
- Siegel-Jacobs, K and Frank Yates, J (1996) 'Effects of procedural and outcome accountability on judgment quality' *Organizational Behavior and Human Decision Processes* 65(1): 1-17
- Singh, J. S., & Singh, S. P. (1987) Forest vegetation of the Himalaya. *The Botanical Review*, 53(1), 80-192
- SNDP (2013) *Happiness: Towards a New Development Paradigm - Report of the Kingdom of Bhutan*, Thimphu: Royal Government of Bhutan.

- Stern, 2007: Nicholes Stern, *The Economics of Climate Change: The Stern Review*, Cambridge University Press, 2007
- Stoker, G (1998) 'Governance as theory: five propositions' *International Social Science Journal*, 50(155): 17-28
- Strøm, K (2000) 'Delegation and accountability in parliamentary democracies' *European Journal of Political Research*, 37(3): 261-290
- Subedi, S. P. (1999) *Hydro-diplomacy in South Asia: The conclusion of the Mahakali and Ganges River treaties*. *The American Journal of International Law*, 93(4), 953-962
- Sun, Y., Mwangi, E., & Meinzen-Dick, R. (2011) Is Gender an Important Factor Influencing User Groups' Property Rights and Forestry Governance? Empirical Analysis from East Africa and Latin America. *International Forestry Review*, 13(2), 205-219
- Susskind, L., Camacho, A. E., & Schenk, T. (2012) A critical assessment of collaborative adaptive management in practice. *Journal of Applied Ecology*, 49(1), 47-51
- Suzuki, R (2012) 'Linking adaptation and mitigation through community forestry case studies from Asia.' Bangkok: RECOFTC
- Svendsen, M. and Meinzen-Dick, R. (1997) *Irrigation Management Institutions in Transition: A Look Back, a Look Forward*. *Irrigation and Drainage Systems* 11: 139-156
- Small, Leslie E. and Ian Carruthers (1991) *Farmer-Financed Irrigation: The Economics of Reform*. Cambridge: Cambridge University Press
- Tang, Shui Yan. (1992) *Institutions and Collective Action: Self-Governance in Irrigation*. San Francisco: ICS Press
- Therkildsen, O (2001) *Efficiency, accountability and implementation: public sector reform in East and Southern Africa*. Geneva: United Nations Research Institute for Social Development
- Thornton, PK; van de Steeg, J; Notenbaert, A; Herrero, M (2009) 'The impacts of climate change on livestock and livestock systems in developing countries: A review of what we know and what we need to know.' *Agricultural Systems* Vol 10 (2009): 113-127
- Tse-ring, K; Sharma, E; Chettri, N; Shrestha, A (eds) (2010) *Climate change vulnerability of mountain ecosystems in the eastern Himalayas – Synthesis report*. Kathmandu, Nepal: ICIMOD
- Tsikata, D. (2011) 'Introduction' in *Land Tenure, Gender and Globalization: Research and Analysis From Africa, Asia and Latin America* Tsikata D. and Golah P. (editors). Ottawa, Canada: International Development Research Centre, p.1-34
- UNEP (2010) *Too much, too little water: Adaptation to climate change in the Hindu Kush Himalayas and Central Asia*. United Nations Environment Programme, GRID-Arendal. <http://www.grida.no/publications/too-much-too-little-water/> (Accessed 03 October 2011)
- UNGA (2012) *The Future We Want: United Nations General Assembly Resolution 66/288*, New York: United Nations
- UNGA (2010) *Sustainable Mountain Development: United Nations General Assembly Resolution 64/205*, New York: United Nations
- UNEP (2004) *The fall of water*. United Nations Environment Programme, GRID-Arendal. <http://www.grida.no/publications/fall-of-the-water/> (Accessed 03 October 2011)
- UNISDR (2011) *United Nations International Strategy for Disaster Reduction (2011). Global Assessment Report on Disaster Risk Reduction*. Geneva, Switzerland
- UN-REDD (2011) 'The business case for mainstreaming gender in REDD.' UN REDD Programme
- Uphoff, N (1991) *Learning from Gal Oya: Possibilities for Participatory Development and Post-Newtonian Social Science*. Ithaca: Cornell University Press
- Uphoff, N; Ramanurthy, P; and Steiner, R (1991) *Managing irrigation: analyzing and improving the performance of bureaucracies*. Sage Publications India Pvt Ltd
- UNRISD (2005) *Gender Equality: Striving for Justice in an Unequal World*, Geneva: UNRISD.
- Ura, K; Verma, R; Phuntsho, T; Zangmo, R; Chopel, D (in press) *Holistic Development with Values: CBS Strategic Research Agenda 2015-2024*, Thimphu: Centre for Bhutan Studies and GNH Research
- Valor, C (2005) 'Corporate social responsibility and corporate citizenship: Towards corporate accountability' *Business and Society Review* 110(2): 191-212
- Varughese, G., & Ostrom, E. (2001) 'The contested role of heterogeneity in collective action: some evidence from community forestry in Nepal' *World development*, 29(5), 747-765
- Verma, R. (2017) 'Gross National Happiness: Meaning, Measure and Degrowth in a Living Alternative to Development', in *Journal of Political Ecology, Special Issue Culture, Power, Degrowth*

- Verma, R. (2014a) 'Land Grabs in East and Southern Africa, So What's New?: Historical Continuities, Political Disconnects and Gender Dispossessions' in *Feminist Economics*, 20(1): 52-75
- Verma, R. (2014b) 'Business as Unusual: The Potential for Gender transformative Change in Development and Mountain Contexts' *Mountain Research and Development*, 34(3): 188-196
- Verma, R. (2014c) *Moving from Unstable Ground: Women's Access to Land, Property and Justice in Asia-Pacific – Towards a Common Framework for Programming*, Bangkok: UNDP APRC
- Verma, R. (2013) *Gender Transformative Change in the Hindu Kush Himalayas: ICIMOD's Approach to Gender Equity and Analysis 2012-2017*, Kathmandu: ICIMOD
- Verma, R. (2009) *Power, Culture and Development Disconnect in the Central Highlands of Madagascar*. London: School of Oriental and African Studies
- Verma, R. (2007) "We Are the Land and the Land Is Us": The Complexities of Land Tenure for Pastoralists in Kenya, SARD Initiative Study Report on Tenure Security for Pastoralists in Kenya, Rome: FAO
- Verma, R. (2001) *Gender, Land and Livelihoods In East Africa: Through Farmers' Eyes*. Ottawa: IDRC
- Verma, R. and Khadka, M. (2016) *Gender and Pastoralism in the Rangelands of the Hindu Kush Himalayas: Knowledge and Livelihoods From the Margins of the Margins*, Kathmandu: ICIMOD.
- Verma, R. Russell, D. and German, L. (2010) Anthro-Apology? The Clash Between Inter-Disciplinary Collaboration and In-Depth Socio-Cultural Research in the CGIAR. In *Beyond the Bio-Physical: Knowledge, Culture and Politics in Natural Resource Management*, German, L., Verma, R. and Ramisch, J. (editors), New York: Springer, p.257-282
- Verschoor, G. 1992. Identity Networks, And Space: New Dimensions in the Study of Small-Scale Enterprise and Commoditization. In *Battlefields of Knowledge: The Interlocking Theory and Practice in Social Research and Development*, Long, N. and Long, A. (Editors), London: Routledge, p.171-188
- Wade, Robert. 1976. Comment on "Canal irrigation and local social organization." *Current Anthropology* 17: 404-405
- Wampler, B (2004) 'Expanding accountability through participatory institutions: Mayors, citizens, and budgeting in three Brazilian municipalities' *Latin American Politics and Society*, 46(2): 73-99
- West, W. F. (2004) Formal procedures, informal processes, accountability, and responsiveness in bureaucratic policy making: An institutional policy analysis. *Public Administration Review*, 64(1), 66-80
- Williams, G. (1995) *Modernizing Malthus: The World Bank, Population Control and the African Environment*, in *The Power of Development*, Crush, J., (Editor), London and New York: Routledge
- Wilson, J. S., and T. Otsuki. (2007) *Regional integration in South Asia: What role for trade facilitation?* World Bank Policy Research Working Paper #4423. The World Bank: Washington DC
- Wolf, A. T. (1998) Conflict and cooperation along international waterways. *Water Policy*, 1(2), 251-265
- Wollenberg E, Anderson J, Lopez C. (2005) *Though All Things Differ: Pluralism as a Basis for Cooperation in Forests*. Bogor, Indonesia : Center for International Forest Research
- World Commission on Environment and Development (WCED) (1987) *Our common future*. Oxford: Oxford University Press
- World Bank (2004) *Natural Disasters: Counting the Cost*, News & Broadcast, World Bank, on line, <http://go.worldbank.org/NQ6J5P2D10>
- World Bank (2008) *An impact evaluation of India's second and third Andhra Pradesh irrigation projects*. A report from The Impact Evaluation Group, Knowledge Programs and Evaluation Capacity Development. Washington DC: The World Bank
- World Bank (2009) 'Linking citizens and the state: An assessment of civil society contributions to good governance in Cambodia' Washington DC: World Bank
- World Bank (2010) *The World Development Report: Development and Climate Change*, The World Bank, Washington DC
- World Bank (2013) *Global Economic Prospects: Less Volatile but Slower Growth*, Volume 7. The World Bank: Washington DC
- Xu, J., Grumbine, R. E., Shrestha, A., Eriksson, M., Yang, X., Wang, Y. U. N., & Wilkes, A. (2009) The melting Himalayas: cascading effects of climate change on water, biodiversity, and livelihoods. *Conservation Biology*, 23(3), 520-530
- Yadav, NP (2012) 'Forest law enforcement as an underlying driver of forest governance in Nepal.' [www.forestrynepal.org](http://www.forestrynepal.org) , published in January 30, 2012
- Yao, Y (2009) 'Village elections and redistribution of political power and collective property' *The China Quarterly*, 197: 126-144

Yi, S; Muhammad, I (2010) 'From pastoral economy to rangeland economy: Capturing the multi-functionalities of rangeland resources.' In Kreutzmann, H; Yang, Y; Richter, J (eds) *Pastoralism and Rangeland Management on the Tibetan Plateau in the Context of Climate and Global Change*, Regional workshop in Lhasa, PR China, 21–25 October. Bonn: GIZ and BMZ, pp 66–96

Zhao-Li, Yan (2009) 'Co-management of rangelands resources in the Hindu Kush-Himalayan Region: Involving Farmers in Policy processes', in Scoones, I. and Thompson, J. (editors), *Farmer First Revisited: Innovation for Agricultural Research and Development*, London: Practical Action Publishing



# 9. Appendix – Author Biographies

## Lead Authors

**Arun Agrawal** is a professor at the School of Natural Resources and Environment at the University of Michigan. He works on natural resource governance and international development in the Himalayas, and has authored several books including *Environmentality: Technologies of Government and the Making of Subjects* (2005, Duke University Press) and *Greener Pastures: Markets, State, and Community among a Migrant Pastoralist People*. His research has appeared in *Science*, *PNAS*, *Global Environmental Change*, *Conservation Biology*, *World Development*, and *Development and Change*, among other journals. He is editor-in-chief of the journal *World Development*.

**Ritu Verma** is an adjunct professor and founder/coordinator of the Wenner Gren Institutional Development Grant at the College of Language and Culture Studies, Royal Government of Bhutan; Senior Researcher and Strategic Advisor at the Tarayana Centre for Social Research and Development; Director of Out of the Box Research and Action, and a member of the international expert working group for the Royal Government's New Development Paradigm. She works on the anthropology of development and natural resource governance in the Buddhist Himalayas and east and southern Africa, and has authored several books including *Beyond the Bio-Physical: Knowledge, Culture and Power in Agriculture and Natural Resource Management* (2010, Springer) and *Gender, Land and Livelihoods: Through Farmers' Eyes* (2001, IDRC). Her work has appeared in the *Journal of Peasant Studies*, *Journal of Political Ecology*, *Druk Journal*, *Feminist Economics*, and *MRD*, among other journals.

## Text Box Authors

**Kamal Aryal** is a natural resource management analyst at ICIMOD. He holds an MSc in biodiversity from the Swedish University of Agricultural Sciences. He has 12 years of work experience in community-based natural resource management and biodiversity conservation, and has published a number of papers.

**Birendra Bajracharya** is currently the acting regional programme manager of the Mountain Environment Regional Information System (MENRIS) at ICIMOD. He holds an MSc in geo-informatics and has worked on decision support systems, GIS and remote sensing applications in the field of natural resources, biodiversity, conservation planning, and protected area management.

**Muhammad Ismail** from Pakistan joined ICIMOD as a researcher for the ecosystem services theme in 2005 and has been working in natural resource management and development since 1999. Currently, he is leading a team of multidisciplinary professionals working on rangelands, climate change science, the economic valuation of ecosystem services, biodiversity, and the promotion of the transboundary landscapes transects of the Karakoram-Pamir landscape.

**Srijana Joshi**, as an Ecosystem specialist within Ecosystem Service Thematic Area at ICIMOD. She holds a PhD on evolutionary ecology of invasive plants from University of Tuebingen, Germany and a Master Degree in Ecology from Tribhuvan University. She is a plant ecologist with over eight years of experience in the field of Ecology. She joined ICIMOD in 2011 and was involved in conducting action research program for promoting sustainable ecosystem services for rangeland areas in Hindu Kush Himalayan region.

**Seema Karki** is a research associate at ICIMOD. Enlisted under the dean's list for her MSc on natural resources, she is currently leading action research on REDD+, biodiversity, and climate change issues to form the basis for upscaling/downscaling climate change models to develop resilience strategies. She has published papers on biodiversity and REDD+.

**Manohara Khadka**, a gender specialist at ICIMOD, has a PhD from the International Institute of Social studies and an MSc in natural resources management from the Norwegian University of Life Sciences. For the past 18 years, she has been engaged extensively in the programmatic, policy, and research aspects of forestry, water resources, and agricultural development with a focus on gender, social inclusion, and institutional change processes.

**Rajan Kotru** is the regional programme manager for Transboundary Landscapes at ICIMOD. He has a PhD from the Ludwig-Maximilians University, Germany. For over 25 years, he has been conceptualizing and steering policy- and practice-level research and development cooperation projects in watershed management, forestry and livelihoods, local governance, monitoring and impact evaluation, and institutional building.

**Hari Krishna Nibanupudi** is a senior disaster risk reduction specialist at ICIMOD. He has over 18 years of experience in disaster diplomacy, governance, leadership development, and institutional building. He is a certified trainer on water diplomacy from Tufts University and is a recipient of the Mary Fran Myers Award (2013) for his contributions to disaster risk reduction.

**Wu Ning** is the theme leader for ecosystem services at ICIMOD. He is an expert on alpine rangeland and wetland ecology. He is a professor at the Chengdu Institute of Biology, CAS and has published over 150 peer-reviewed articles in international academic journals, on various topics about environmental change and ecosystem management in HKH region.

**Karma Phuntsho** is a natural resource policy specialist at ICIMOD. He has an MSc in forestry from the then Indian Forest College, Dehra Dhun, and an MSc in earth resources from Colorado State University. He has worked for the Royal Government of Bhutan for over two and a half decades, and has managerial and developmental experience in community-based natural resource management, integrated conservation and development, conservation finance, protected area management, and development management related to agriculture, livestock and forestry.

**Shahriar Wahid** is a water management expert and has conducted research on transboundary water issues, climate change impact on hydrology, and land degradation in Asia. He enjoys experimenting with various interdisciplinary techniques to decipher complex water-food-energy nexuses. As an enthusiastic scholar, he has extensively published in many journals and books.







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