

Perspective, part of a Special Feature on [The Science and Practice of Ecology and Society](#)
**Revolt and Remember: How the Shimshal Nature Trust Develops and
Sustains Social-Ecological Resilience in Northern Pakistan**

*Mehjabeen Abidi-Habib*¹ and *Anna Lawrence*²

ABSTRACT. The Shimshal Nature Trust is an indigenous institution rooted in a thriving and dynamic culture that links the local ecology and society. It has deployed identity, traditional knowledge, science, and institutional innovation to adapt to outside challenges without destroying local commons management. This paper reviews scholarly debate on natural resource management and uses resilience theory to examine this complex adaptive system. Two disturbances to Shimshal resilience prompted by a national park and a new road are traced. Shimshali responses include social processes of learning, knowledge systems, and renewal. Ways in which adaptive renewal cycles involve Revolt, a short, fast reaction, and Remember, a larger, slower cascade, are put in perspective. Simple and powerful qualities that guide change are highlighted. We conclude that the Shimshal Nature Trust creates a resilient interface between the outside and inside worlds. Government, donors, and academics can participate in contextualized action-learning cycles that result in more informed and negotiated contributions to local institutions for commons management.

Key Words: *Pakistan; indigenous institution; local commons management; ecological resilience; complex adaptive systems; social learning; renewal; national park; new road; community participation*

INTRODUCTION

Far away, in Pakistan's Upper Hunza, there is a valley called Shimshal, where we listen to a tale traditionally sung to the ibex hunter after the kill.

Ibex child to mother: *Ma, look! Seems to me a hunter's coming...*

Mother (nonchalant): *No, my child, that is just a shepherd.*

Child (alarmed): *But, Ma, that is a hunter with a rifle!*

Mother: *Merely a shepherd's staff...*

Child (agitated): *Ma, he's getting his rifle ready to load!!*

Mother (subdued): *No, no, he's turning a rope to light the flint for a campfire.*

The hunter takes aim, fires, and wounds the mother ibex...

Child (in horror): *Your mouth... it's bleeding, Ma!*

Mother: *Child, this is just the sunscreen paste I applied; don't worry.*

Child (lamenting): *Ma, now what will become of me?*

Mother (prostrate): *You see those ibex over there? You must go and live in the middle of their protective circle.*

Child (in despair): *If the ibex hit and shun me, what will become of me?*

Mother (belabored breathing): *Now... you must learn how it is to be an orphan in this world...*

(W. Davies 2004; Farmanullah of Shimshal, personal communication)

By alluding to the order of nature, the storyteller reminds us of the universal tenet that Creation is one whole interconnected expression, woven with the qualities of rigor and compassion, and that we are part of this order.

In these remote central Karakoram Mountains (Fig. 1), the Shimshal Nature Trust (SNT), an indigenous institution, puts this world view into practice. Its stewardship of nature is a fundamental departure from convention. Instead of separating the management of people and nature into discrete

entities as do other NGOs and government agencies, the SNT unifies local culture and ecology to build resilience for Shimshal.

Opened to the world less than three years ago by a 53-km road that provides access, although only by jeep, to the Karakoram Highway, Shimshal is a collection of some 200 households who speak Wakhi, an East Iranian language (Mock 1997). At 3500 m, the community commands territories the size of Switzerland that include majestic glaciers, nine peaks more than 7000 m high, some 36 pasturelands, forests, and endangered mammals such as the snow leopard, blue sheep, and ibex.

Shimshali life forms part of the Ismaili Muslim diaspora and is economically and symbolically intertwined with all of its landscape ecology (Butz 1996). Until recently it was one of the few communities extant in Pakistan that are self-sufficient in terms of food. As transhumant pastoralists, the villagers spend five months every year away from their valley homes, camping on elevated pastures as livestock graze on wild grasses. Known as the Pamir, a perma-ice bog of Tibetan steppe flora, this is the realm of Shimshali women, who are the primary graziers (Abidi 1987). Rural life in the area, which holds the largest herds of yaks in upper Hunza, is punctuated by socio-religious festivals that renew collective memory, pass down traditional knowledge, celebrate new achievements, and look to the future.

Here there is hope that, in the face of the unprecedented pace of modernity, rural landscapes and lives will continue to adapt without the destruction of their unique identity and provenance (Figs. 2 and 3).

BACKGROUND

In this story of the evolution of an indigenous institution for nature stewardship, we start with a wider debate about the management of the commons, one that often appears to be divided between those seeking universal rules, with a tendency toward rational choice and bureaucracy, and those arguing for the importance of context (Cleaver 2000, Agrawal 2001). We then focus on resilience theory, which gives us a lens that is both broad and incisive, to understand the linked social-ecological system and its response to the change that is happening even in a place like Shimshal.

Some case studies link community resource management to policy and state relations with donors (Blaikie 2006). This approach can lead to the treatment of culture as a static resource, a concern that makes anthropologists highlight the risks of intervention and reductionist assumptions (Johnson 2004), and call for greater legitimacy and cultural authenticity from historically specific cases (Black and Watson 2006).

However, a recent wide-ranging review of participatory forest management detects a move from an external focus on creating the conditions for commons management to a more adaptive, context-based, and emergent approach to common property (Lawrence 2007). Important contributions to the question of context have highlighted the significance of culture: how values and beliefs shape acceptable and workable institutions and, above all, dynamic evolution (Mosse 1997). As Cleaver (2000:380) concludes, "Rather than being consciously and rationally crafted, [collective action] institutions evolve through multiple processes involving both conscious and unconscious acts, unintended consequences and a large amount of borrowing of acceptable patterns of interaction from sanctioned social relationships."

One problem is the frequent conflation of traditional and modern, evolved and designed, and customary property and common property (Blaikie 2006, Wagner and Talakai 2007). A focus on dynamics and the embedded approach that allows for complexity (Cleaver 2000:361) takes us beyond this dichotomy and into the realms of resilience (Folke 2006). Sustainable change is about working with the interfaces between people and nature, indigenous and state (Cleaver 2000, Blaikie 2006). Whatever the origins of a common property institution, some cases, notably of Himalayan Gaddi pastoralists, highlight the indigenous ability to creatively reinterpret external interventions (Axelby 2007:35).

It is cases like this that lead us to refer to the emerging work on resilience theory, a centerpiece of the theoretical perspective we reflect through the case of the Shimshal Nature Trust (SNT).

Using the newest work on resilience (Janssen et al. 2006), we view this indigenous institution as one of the keystones of a linked social-ecological system and examine its response to the unexpected changes that happen at the interface between society and ecology.

Fig. 1. Map showing the location of Shimshal in the northern areas of Pakistan (Source: Ali 2003).



The linked social-ecological system as used in resilience theory is one in which resources cannot be treated as discrete entities in isolation from the rest of the ecological and social system (Berkes et al. 1998). World views and ethics concerning the environment are integral to traditional environmental knowledge, which is continually evolving. Emphasis is placed on the linkages and feedback controls within which local institutions operate.

Networked local institutions and locally devised systems based on science and tradition support effective commons management. The importance of the social science of resource management is underlined through people-oriented rather than

resource-oriented management regimes (Berkes et al. 1998).

Although Shimshal exhibits the signs of a linked social-ecological system, our main area of interest is SNT's response to major disturbances to the system. As Folke (2006:259) points out, "...resilience is not only about being persistent or robust to disturbance. It is also about the opportunities that disturbance opens up in terms of recombination of evolved structures, renewal of the system and new emergence."

We borrow the concept of "Revolt and Remember" (Resilience Alliance 2007) as part of the adaptive

Fig. 2. Shimshal valley in summer (Photo: Shimshal Nature Trust).



cycle of a resilient system. In a period of Revolt, a disturbance occurs whose every step triggers a cascade of events that move the disturbance to a larger and slower level in the social-ecological system. This period is marked by social learning and institutional innovation. Remember is a cross-scale connection important in times of change, renewal, and reorganization. It is associated with social memory, knowledge-system integration, and visioning (Folke 2006).

Whereas Revolt is a fast reaction to a disturbance, Remember is a larger recollection of accumulated experience and preparation for the future.

Simultaneous and complementary, we see both these phenomena happening at the social and institutional level in Shimshal.

The following section focuses on two disturbances to the social-ecological system of Shimshal: the declaration of a National Park and the completion of a road (Fig. 4). Using the Revolt and Remember concepts, we trace the local responses to the tensions caused by these disturbances and in doing so highlight the genesis of the SNT as a keystone institution. The simple and powerful rules*** guiding adaptive change that can be learned from this case are reviewed at the end.

Fig. 3. Shimshal valley in winter (Photo: Shimshal Nature Trust).



THE CASE STUDY

In this section, we examine how the social-ecological resilience of the Shimshali manifests itself in a complex adaptive system. The first part describes two major disturbances: the first was unexpected, whereas the second was both welcome and anticipated. In the second part we discuss the responses to these disturbances, which called forth a complex array of system attributes and drew on components of social learning, knowledge systems, and renewal, thus setting in motion the adaptive renewal cycles of Revolt and Remember. The section ends with our distillation of the principles that guide adaptive change.

Two disturbances to Shimshali resilience

The unexpected national park

Established in 1975, the Khunjerab National Park in northern Pakistan is an IUCN Category II park promulgated through a national ordinance. After recommendations by George Schaller, it was established to protect endangered ungulate species in a spectacular landscape and showcase modern nature conservation (Knudsen 1999). The park boundaries included parts of Shimshal's 2700 km² of traditional commons and those of eight other villages. This was an unexpected surprise. In the 1970s, little consultation on park restrictions and local use regimes took place. By the 1990s, this had become the center of a national controversy between the government and local communities.

Fig. 4. The jeep track to Shimshal forks off from the Karakorum Highway (Photo: M. Abidi-Habib).



Initially, the category II park classification meant that all human intervention within park boundaries was to be excluded, including livestock grazing and hunting. Of those involved, Shimshal is the only community that has not agreed to abide by park regulations and accepted monetary compensation; the reasons the Shimshali give for this is the large size of their territory, and the “economic and symbolic [cultural] dependence of Shimshali society” (SNT 1998). The Shimshalis continued their transhumant life-style in their traditional commons while usufruct controversy continued over contextually inappropriate regulations (Knudsen 1999; Fig. 5). Subsequent negotiations have taken

into account local rights and modified park zones (Abidi-Habib 2002). The roots of the SNT itself lie in this challenge to Shimshal’s landscape and interconnected way of life as shown below.

The impossible road

Legendary for their robustness, until recently the Shimshalis had to undertake a perilous three-day trek to leave their valley. A regional harbinger of development, the Aga Khan Rural Support Program (AKRSP) got involved in building infrastructure in the northern areas of Pakistan in the early 1980s. At that time, Shimshal began to lobby for a connecting

Fig. 5. A Shimshal Nature Trust sign announcing that Shimshal is a Community Conserved Area. Note the ibex at left and blue sheep at right, author standing at left (Photo: M. Abidi-Habib).



road to the Karakoram Highway, citing the extreme hazards posed by their isolation to their communal health, social relations, and economy. Government estimates declared such a task technically unfeasible and uneconomical, and the relocation of all of Shimshal to lands beside the highway was the recommended solution (Khan 1987).

The construction of an otherwise impossible road was begun by Shimshal's own men, who took advantage of the AKRSP's technical and financial aid. The result, 53 km long with eight bridges across hair-raising ravines, finally embarrassed the

government into constructing the middle stretches (Fig. 6). A generation of able-bodied men contributed to the construction of this road, and two lost their lives in the process. Annually, the road festival commemorates this landmark in local history (Muzaffar-ud-Din of Shimshal, *personal communication*).

Since 2005, a daily jeep service has linked Shimshal to Upper Hunza. Although it brings connection and relative ease, it also brings fear and uncertainty (Davis 2004). Higher education in cities takes children away from annual pasture migrations, the

Fig. 6. A wooden suspension bridge on the road to Shimshal (Photo: M. Abidi-Habib).



increasing numbers of professional trekkers introduce exotic values and ready cash, and the community's traditional relationship with nature is threatened (I. Ali, *unpublished manuscript*).

The Shimshali response: social processes and Revolt and Remember adaptive cycles

Social processes: learning, knowledge systems, and renewal

Renewed social learning—past and future, scientific and traditional—is a hallmark of Shimshal. Despite its isolation, it has a 110-yr history of scholarly focus that attracted the interest of British Empire linguists and geographers. An international group of ecologists and anthropologists works there now and produces world-class research and publications.

However, Shimshali society is not a passive research subject. Learning across a century, scholar after scholar is carefully vetted by local leaders in terms of intention, antecedents, and competence (Butz 1995, Knudsen 1999). An instance is cited in which a researcher was sent back from Shimshal to rethink his approach (Farmanullah of Shimshal, *personal communication*).

Social processes come to light in the example of research that was carried out on the subject of rural happiness, which brought a Japanese graduate student from Nihon University in 1987. Discussions with this researcher highlighted the local view that they have nothing but rural poverty, which prompted the establishment of a joint environmental education program with Japan. Aimed at comparing two extreme models of human development, Tokyo and Shimshal, the program enabled students and teachers to exchange visits to discover where social balance and happiness lay. The long, slow process focuses on annual research in documenting village life, “a mirror to ourselves” as they call it in Shimshal (Muzaffar-ud-Din of Shimshal, *personal communication*; Fig. 7).

In this program, middle-school students scientifically monitored key local variables such as weather patterns, domestic life, agro-pastoral cycles, tourism, history, and folklore. The results of more than a decade of introspective research by children yielded self-knowledge of a relationship with nature that makes Shimshalis proud: “...we have a harmony

that others don't have” (Davies 2004). Now, instead of reciting homogenized nursery rhymes with irrelevant metaphors, school children sing Wakhi songs celebrating their unique landscape. When psychologists analyze the pictograms drawn by Shimshali children depicting their homeland, they comment on the children's highly integrated perception of self, home, and nature (M. Abidi-Habib, *unpublished data*; Figs. 8 and 9).

As the children who took part in this program came of age, they became some of the founders of the Shimshal Nature Trust (Muzzafar-ud-Din of Shimshal, *personal communication*). The reflective process they passed through gave rise to renewed social learning that we believe influenced the resilience of the system as a whole.

Revolt as an adaptive cycle

In social-ecological systems, Revolt is often signaled by an institutional innovation whose effects cascade to larger cross-scales of social processes (Resilience Alliance 2007). We show how the genesis of the Shimshal Nature Trust (SNT) set in motion a Revolt cycle in response to the national park disturbance.

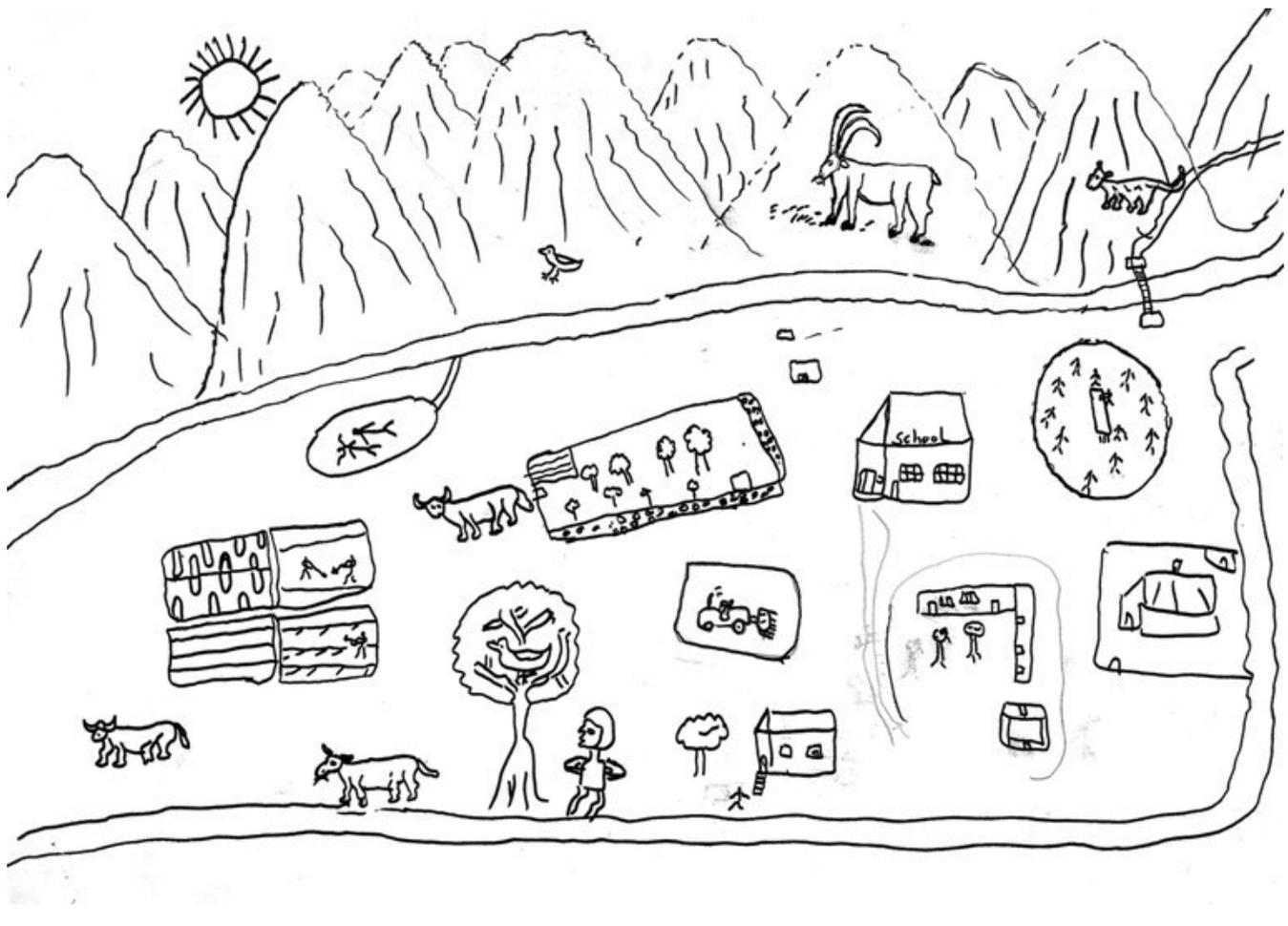
In the precolonial era, South Asian communities voiced their opposition by gaining the attention of state officials through collective rallies and protest notes (Guha 1999). In 1994, that was the way the Shimshalis chose to resist the establishment of the Khunjerab National Park. However, in the modern setting, they soon realized that all their protests had accomplished was to give them a negative image. They decided instead to found a new institution, the SNT, with a view to a “more intellectual and formalized engagement” with the state (Muzzafar-ud-Din of Shimshal, *personal communication*). They established the entire common lands as a “Waqf,” the property of a not-for-profit foundation that is inalienable under Islamic law. As such, the SNT holds the common territories of Shimshal in legal trust: a small and fast Revolt against national park paradigms.

The SNT, which was founded in 1997, uses a broad definition of environment that includes “socio-cultural and ecological components in relationship with each other” (I. Ali, *unpublished manuscript*). It is a representational institution to which all local households belong and whose elected officers hold their positions for a year. With the help of a

Fig. 7. Shimshali men gather for collective deliberations and share a yak-butter meal (Photo: Shimshal Nature Trust).



Fig. 8. A drawing by Mehmood Tahir, a fifth-grade student at the D. J. Middle School in Shimshal, showing a bird's-eye view of his home. Psychologists at Government College University Lahore have remarked on his highly integrated perception of self, home, and nature. Note the fauna, which include snow leopard, ibex, partridge, and domestic yak.



Canadian scholar who hosts its Web site, the SNT laid out its mandate, vision, management, and governance for all to see even before it had road access (Shimshal Nature Trust 1998).

At the 5th World Parks Congress at South Africa in 2003, the SNT was the only community-based Pakistani organization to represent itself. Its aim is to “comprehensively improve the quality of life in a culturally and environmentally sensitive way, while retaining indigenous control over [Shimshal’s] environment” (Shimshal Nature Trust 1998). As they cascade into broader aspects of society and ecology, SNT’s programs include nature stewardship, a

certified trophy hunt, environmental education, village development, Shimshali culture, a tourism and mountaineering school, and women’s development. Their most recent plan is to develop a 25-yr vision for the SNT, an exercise for which they have allotted a year for deliberations, and introduce larger and slower intergenerational renewal cycles.

Remember as an adaptive cycle

In times of reorganization and change, resilient systems rely on remembrance as a cross-scale connection (Resilience Alliance 2007). By

Fig. 9. A drawing by Noorina Sultana, a fifth-grade student at D. J. Middle School in Shimshal. Note the variation in feminine perception showing the centrality of school and domestic life.



integrating multiple institutions into the realms of ecosystem management and social and religious affairs, the SNT draws across time and scale to enable adaptive change. Some 13 local institutions work together to support the work of the SNT. It reports to the supreme local body for social and religious affairs, the Ismaili Council, and depends on many people to carry out its necessary functions, rather than on a single charismatic local leader.

Possible influences from the road are considered not at the individual, but at the institutional, level. With a cultural premium on education, agro-pastoral systems are under threat. The mothers of departing schoolchildren have used the SNT platform to prepare the community to hire specialized shepherds for the summer migration that previously took women and children away from the village (M. Abidi-Habib, *unpublished data*). The web of local institutions that governs collective life and the inter-relationships among them are well understood. The diagram below shows an institutional map drawn with SNT members illustrating how a Himalayan ibex is converted from an environmental endowment into a facility for the community through the trophy hunt program. The institutions involved range from the global to the local (Fig. 10). Under a parliamentary act, 75% of the fees for hunting licenses go to the community and the rest to the government. In this case, the SNT is the repository for these funds, the use of which is regulated by the trust by-laws. Recently the profits from the trophy hunt were used to finance a household water supply and a school construction project in Shimshal.

Shimshal owes spiritual allegiance as an Ismaili community to its leader and adheres to the Shia Imami Ismaili “tariqah” or persuasion of Islam that emerged in the 8th century. Guided by the Aga Khan, the global diaspora has established social and economic development institutions all over the world (Nelson 2000). Historically, the Ismailis have made significant contributions to civilization in general, and to the cultural, intellectual, and religious life of Muslims in particular (IIS 2007). Remembrance of accumulated experience, history, and self-organization comes naturally to this community, known for its ethos of self-reliance in response to change over centuries (Fig.11).

Qualities that favor adaptive change

As a complex adaptive system, Shimshal has some general attributes that fit well with hypotheses about resilience theory. According to Folke (2006), external disturbance causes change that can more easily be dealt with by societies and institutions that exhibit the following characteristics, with specific illustrations from our case study.

Unity and integration

As an umbrella institution for the community, the SNT recognizes the interconnectedness of local society, the landscape, and ecology as inseparable. This theme is central to the beliefs and practices of Shimshalis.

Learning and adaptation

The genesis of the SNT shows a break from traditional confrontation of state authority to a self-assertive consolidation of traditional knowledge and legal status. The coming of the road into Shimshal is recognized as a disturbance to society and ecology for which adaptation is envisaged through institutional rather than individual reaction.

Inner strength

A strong sense of sovereignty was engendered through the Revolt against the national park and the assertion of traditional rights through the SNT.

Renewal

Local festivals that commemorate major events in social and religious life renew collective memory and prepare for the future. One such is the festival celebrating the road construction.

Self-sufficiency

Self-sufficiency in the community was demonstrated by the construction of the road through self-help.

Connection within and outside of the community

Striking examples of internal connections are the communal investment in the children’s context-specific education and the central role that women play in the agro-pastoral system. Outside the community, Shimshali engagement with academic

Fig. 10. An institutional map drawn together with members of the Shimshal Nature Trust (SNT) that shows how a Himalayan ibex is turned from an environmental endowment into a facility for the community through the trophy hunt program. The institutions, which range from global to local in nature, include the Convention on Biodiversity, the World Wildlife Fund, the Ismaili Council, and the SNT.

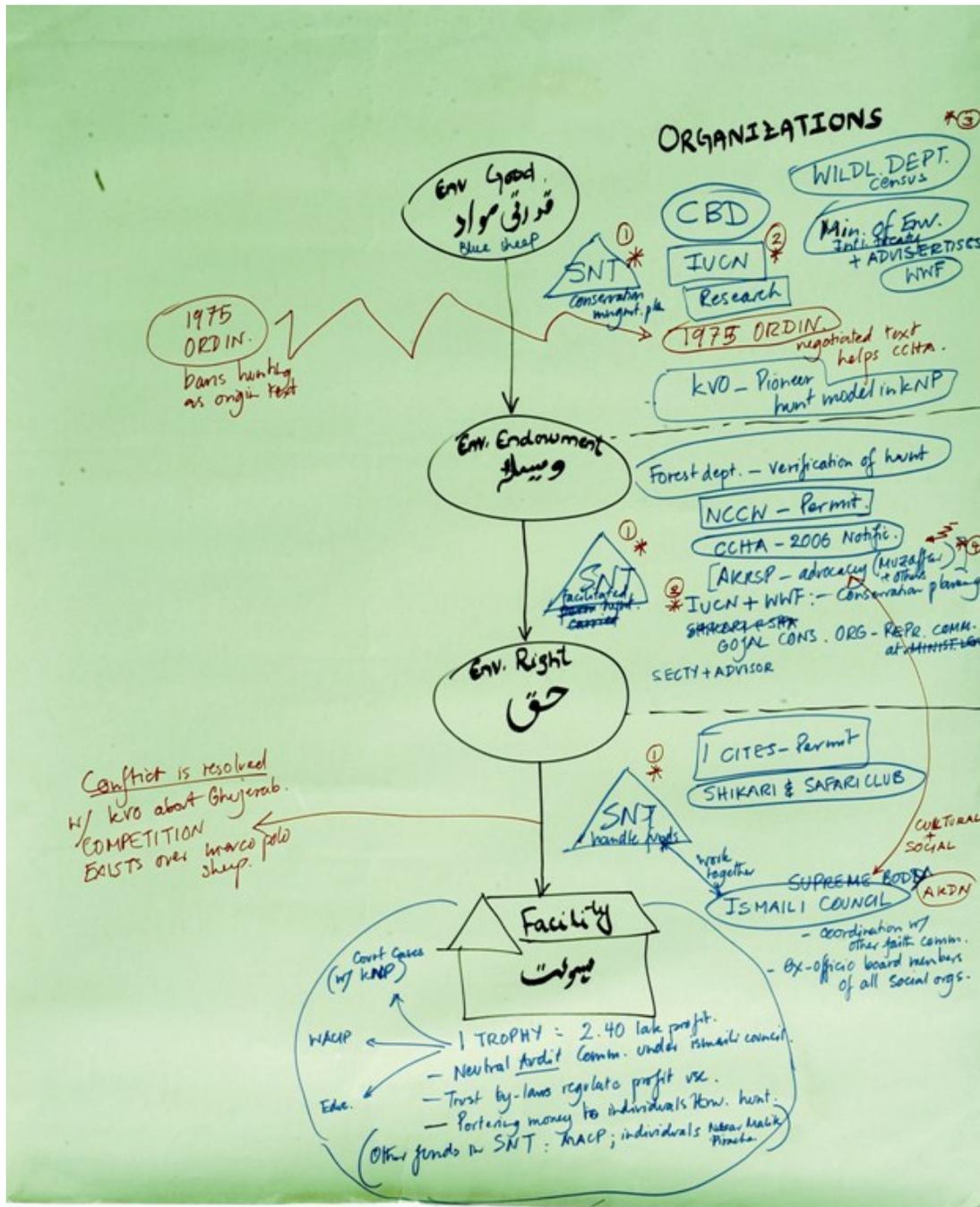


Fig. 11. Shimshali women gather for a sociable research session. Note the presence of three generations (Photo: M. Abidi-Habib).



Fig. 12. A co-educational classroom in Shimshal. Children's education is context-specific to the society and nature of the area (Photo: M Abidi-Habib).



research processes and outcomes is exceptional. The bonds with the Ismaili diaspora and the evolution of ethical practices are also noteworthy.

CONCLUSIONS

The Shimshal Nature Trust (SNT) has created a resilient interface between an outside and an inside world. However, this by no means implies that Shimshal is in equilibrium state that enables it to perpetually solve problems. It is far from a passive research model. In an immediate sense, our academic work is a perturbation of a dynamic real-time system. As we go to press, people influencing environmental governance in Pakistan review this work. From outside, they glance through a window into the SNT's inner cultural and historical landscape, which links society and ecology. Here our participation in scholarship is one part of the loop; our other aspiration is to engender more insightful state and donor behavior. In this instance, we hope to mediate better understanding among a subset of decision makers who can shape the future of local commons management.

The macrocosm of commons and adaptive change is a struggle whose dynamic interfaces are articulated through collective efforts such as the Millennium Ecosystem Assessment. Among important uncertainties hindering decision making is the weak understanding of the link that joins ecological and social processes to models for cultural and other supporting ecosystem services (Millennium Ecosystem Assessment 2005).

We believe that the SNT offers a case of some significance to the study of community resource management. Although it is firmly rooted in the indigeneity of the Shimshali people, their culture is clearly demonstrated to be a thriving and dynamic one that works actively and positively at the interface with visiting cultures and opportunities with the state, as well as through its own learning cycles (Fig. 12).

Although the local responses to change in Shimshal described above were not led by the state or by donors, these responses have occasionally been influenced by the state's failure to effectively partner with local institutions. Fortuitously, unexpected and sensitive individual researchers have also facilitated internal responses to outside challenges. What then can governments and donors learn from this?

Beyond the tensions often cited between statistically robust meta-studies (Agrawal 2001) of common property resources and unique historically and contextually specific studies, there is a role for outsiders through the process of action-learning cycles, but the motive and shape has to come from within. This study itself is an interaction at the interface between the SNT, academics, and donors, and it represents a further cycle of learning from which more informed and respectful interactions are unfolding. Likely outcomes include a broader, more mutually acceptable spectrum of negotiated collaboration between community, state, and intermediaries.

Theory is beginning to cast light on adaptive renewal cycles and resilient systems. It emphasizes that disturbance is part of development and that periods of gradual change and periods of rapid transition coexist and complement each other (Folke 2006). It reconsiders approaches to conventional natural resource management and offers self-organization and resilience as ways of understanding complexity, change, and uncertainty in nature and society (Janssen et al. 2006).

Responses to this article can be read online at:
<http://www.ecologyandsociety.org/vol12/iss2/art35/responses/>

Acknowledgments:

We thank ARKSP and WWF in Gilgit for enabling field work. Dr Amin Khan and Government College University Lahore are thanked for the guidance and grant toward Mehjabeen's Ph.D. research in Shimshal; the Charles Wallace Fellowship 2005 at Oxford University helped her literature review, and Anna's valuable advisory role at Oxford was facilitated through the Environmental Change Institute. Both authors express gratitude for the inspiring ways of Shimshali people and to the Resilience Alliance for recognizing this through the Ecology and Society Award of which this article is a part. The Shimshal Nature Trust also wishes us to convey their compliments.

LITERATURE CITED

- Abidi, M.** 1987. *Pastures and livestock development in Gojal*. AKRSP Report No. 5. Aga Khan Rural Support Program/IUCN, Aga Khan Foundation, Gilgit, Pakistan.
- Abidi-Habib, M., editor.** 2002. *Green pioneers, stories from the grassroots*. UNDP/City Press, Karachi, Pakistan.
- Agrawal, A.** 2001. Common property institutions and sustainable governance of resources. *World Development* 29:1649-1672.
- Axelby, R.** 2007. It takes two hands to clap: how Gaddi shepherds in the Indian Himalayas negotiate access to grazing. *Journal of Agrarian Change* 7:35-75.
- Berkes, F., C. Folke, and J. Colding.** 1998. *Linking social and ecological systems; management practices and social mechanisms for building resilience*. Cambridge University Press, Cambridge, UK.
- Black, R., and E. Watson.** 2006. Local community, legitimacy, and cultural authenticity in post conflict natural resource management: Ethiopia and Mozambique. *Environment and Planning D: Society and Space* 24:263-282
- Blaikie, P.** 2006. Is small really beautiful? Community-based natural resource management in Malawi and Botswana. *World Development* 34:1942-1957.
- Butz, D.** 1995. Legitimizing porter regulation in an indigenous mountain community in northern Pakistan. *Environment and Planning* 13:381-414
- Butz, D.** 1996. Sustaining indigenous communities: symbolic and instrumental dimensions of pastoral resource use in Shimshal, northern Pakistan. *Canadian Geographer* 40: 36-53.
- Cleaver, F.** 2000. Moral ecological rationality, institutions and the management of common property resources. *Development and Change* 31:361-383.
- Davies, W., editor.** 2004. *Voices from the mountain, oral testimonies from Shimshal, the Karakoram, Pakistan*. Panos Institute, London, UK.
- Folke, C.** 2006. Resilience: the emergence of a perspective for social-ecological systems analyses. *Global Environmental Change* 16:253-267.
- Guha, R.** 1989. *The unquiet woods: ecological change and peasant resistance in the Himalaya*. Oxford University Press, New Delhi, India.
- Institute of Ismaili Studies (IIS).** 2007. *The Ismaili community history*. Available online at: <http://www.iis.ac.uk>. NEED MORE PRECISE ONLINE ADDRESS
- Janssen, M., and E. Ostrom.** 2006. Resilience, vulnerability and adaptation: a cross-cutting theme of the International Human Dimensions Programme on Global Environmental Change. *Global Environmental Change* 16:237-239.
- Johnson, C.** 2004. Uncommon ground: the poverty of history in common property discourse. *Development and Change* 35:407-433.
- Khan, S. S.** 1987. *Compiled minutes of management meeting*. Aga Khan Rural Support Program, Gilgit, Pakistan.
- Knudsen, A.** 1999. Conservation and controversy in the Karakoram: Khunjerab National Park, Pakistan. *Journal of Political Ecology* 56:1-28.
- Lawrence, A.** 2007. *Beyond the second generation: towards adaptiveness in participatory forest management*. Perspectives in Agriculture, Veterinary Science, Nutrition and Natural Resources, No. 028. Environmental Change Institute, Oxford University Centre for the Environment, Oxford, UK.
- Millennium Ecosystem Assessment (MA).** 2005. *Millennium Ecosystem Assessment: ecosystems and human well-being—synthesis*. Island Press, Washington, D.C., USA.
- Mock, J.** 1997. *The discursive construction of reality in the Wakhi community of northern Pakistan*. Dissertation. South and Southeast Asian Studies, University of California, Berkeley, California, USA.
- Mosse, D.** 1997. The symbolic making of a common property resource: history, ecology and locality in a tank-irrigated landscape in South India. *Development and Change* 28:467-504.

Nelson, S. R. 2000. *The Aga Khan Rural Support Programme: an alternative model for rural development*. Thesis. Columbia University, New York, New York, USA.

Resilience Alliance. 2007. *Assessing resilience in social-ecological systems—a workbook for scientists*. Available online at: <http://www.resalliance.org/3871.php>.

Shimshal Nature Trust. 1998. *Shimshal Nature Trust (SNT); fifteen year vision & management plan*. Available online at: <http://www.brocku.ca/geography/people/dbutz/shimshal.html>.

Wagner, J., and M. Talakai. 2007. Customs, commons, property, and ecology: case studies from Oceania. *Human Organization* **66**:1-10.