

Nature, Conflict and Biodiversity Conservation in the Nanda Devi Biosphere Reserve

Keith Bosak

Department of Society and Conservation, College of Forestry and Conservation,
The University of Montana, 32 Campus Dr Missoula, MT 59812, USA

E-mail: keith.bosak@umontana.edu

Abstract

Much of the research concerning biosphere reserves has focused on problems of ecosystem management and biodiversity conservation rather than the preservation of an ecosystem in which humans play an integral part. Local people often oppose such protected areas because traditional economic and subsistence opportunities will be lost. Thus, there exists a tension between globalised conservation efforts and their unwanted local economic and cultural effects. This research uses the case of the Nanda Devi Biosphere Reserve (NDBR) in the Garhwal Himalayas of India to explore how conflicts over biosphere reserve management are grounded in competing social constructions of nature, reflected in discourse and translated into resource management ideals. This article employs multiple methods to uncover how competing conceptions of nature, manifest through discourses of nature, influence ideas of how the reserve should be managed. Local populations seek to conserve biodiversity through livelihoods while the policies that govern the NDBR seek to limit such activities, creating conflict. Helping policy makers to understand that local ideas of resource management are based in ideas of a sacred landscape experienced through communal livelihood activities may serve to create conservation policies that will accommodate local people and help to preserve biodiversity.

Keywords: biodiversity conservation, political ecology, discourse, conflict, biosphere reserves, Himalayas

INTRODUCTION AND SITE DESCRIPTION

Conflict and Biodiversity Conservation

MUCH OF THE RESEARCH concerning biosphere reserves has focused on problems of ecosystem management and biodiversity conservation rather than the preservation of an ecosystem in which humans play an integral part (Battiste 1997; Brown 2002). Unfortunately, the role of local people in the conservation process is ill-defined both in policy and practice, leading to conflicts between land managers and local people living within reserves (Kuhn 2000; Lynagh & Ulrich 2002). Often the declaration of a piece of land as a park or reserve, 'may immediately restrict access of the local community to biotic wealth traditionally harvested to meet their daily requirements' (Pandey 1995: 12). Time and again, local people oppose protected areas (PAs) because traditional economic and subsistence opportunities will be lost. Thus, a tension

exists between globalised conservation efforts and their unwanted local economic and cultural effects.

The case of the Nanda Devi Biosphere Reserve (NDBR) provides an example of one of many people/PA conflicts occurring worldwide. Well-meaning conservation initiatives such as biosphere reserves that are often organised by global agencies and articulated by national and regional governments often meet with resistance from local people living in or around these PAs. One factor implicated in this conflict is competing conceptions of nature. Conceptions of nature are manifest in discourses of nature and associated with material practices. Drawing upon ideas of the social construction of nature and political ecology, I argue that the conflict over management of the NDBR is grounded in part in differing conceptions of nature that produce competing discourses of nature and ultimately different ideas of how the NDBR should be managed. The research also highlights how well-intentioned conservation policies that are informed by

modern and Western conceptions of nature often have detrimental effects on the culture and livelihoods of people living within or around PAs.

Description of the Nanda Devi Biosphere Reserve

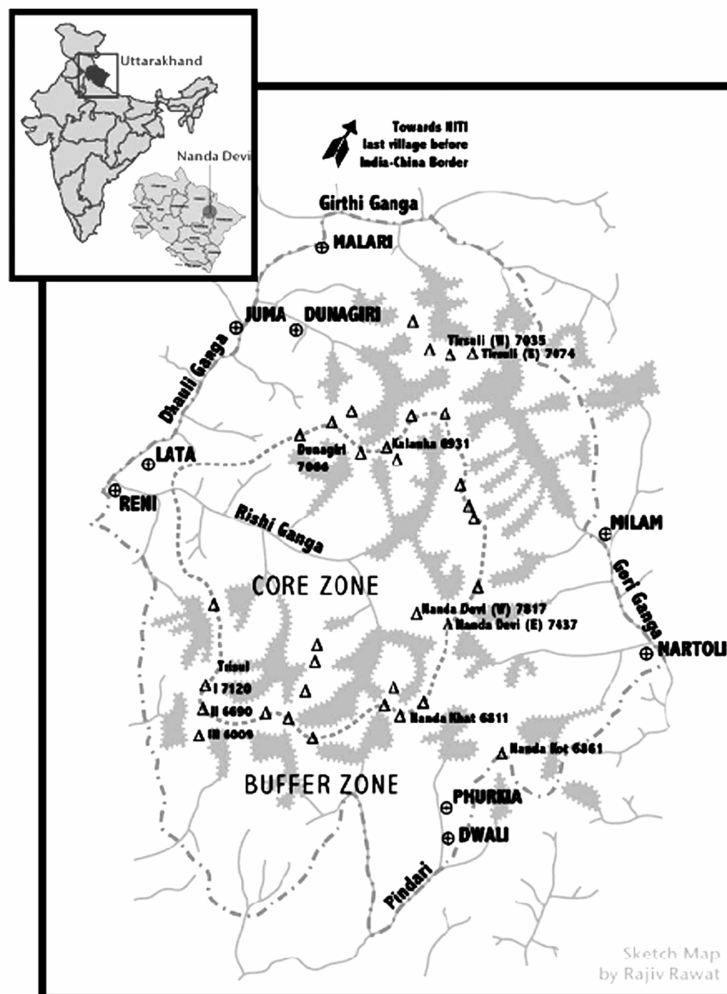
The NDBR, located in the Chamoli district of the newly created state of Uttarakhand¹ is characterised by its unique and inaccessible terrain. The centrepiece of the entire region is Nanda Devi (Figure 1). At 7,817 m above mean sea level, Nanda Devi is the second highest mountain in the Indian Himalayas. Nanda Devi forms the high-point of a vast glacial basin ringed by high peaks. The peaks that form the outer edge of what is now known as the core zone of the NDBR have glaciers that feed the Rishi Ganga river, which has cut a deep gorge in its westward flow towards the Dhauri Ganga. At its low point, the gorge is only 1,900 m above mean sea level, producing a local relief in the NDBR of almost 6,000 m. The

combination of high peaks and deep river gorges makes accessing the region a difficult endeavour. At the western end of the Rishi Gorge, the Rishi Ganga feeds into the Dhauri Ganga, which flows southward into the Alaknanda. The Dhauri Ganga river forms the Niti valley. This valley extends northward to the Tibetan Plateau via the Niti Pass.

The 1993 Nanda Devi Scientific and Ecological Expedition catalogued 620 species of plants in the NDBR, six of these being nationally threatened species. The area can be divided into three ecological zones. Mixed temperate and tropical forests occupy the lower altitudes. Bhoj forests [forests of Himalayan birch (*Betula jacquemontii*)] lie in a belt extending from Lata to Reni and to Dhibruggheta. These forests are known for their trailing lichen and understory of dwarf rhododendron (*Rhododendron yakushimanum*). Forests of fir (*Pinus spectabilis*), rhododendron (*Rhododendron campanulata* ssp. *aeruginosum*) and Himalayan birch line the Rishi Gorge (Samant 1993).

Figure 1

Sketch map of the Nanda Devi Biosphere Reserve study area



Above the Rishi Gorge, conditions become drier and the forests transition into a mixture of birch and rhododendron before finally giving way to temperate scrub. Juniper (*Juniperus recurva*) and dwarf rhododendron can be found above the tree line and juniper is especially prevalent on slopes with a southern aspect. The temperate scrub gives way to alpine grassland at an altitude of about 4,300 m. The areas in the buffer zone of the NDBR where many of the villages are located are characterised by thick forests of pine (*Pinus excelsa*, *Pinus longifolia*) and Himalayan cedar or deodar (*Cedrus deodara*) as well as stands of broad leaf forests such as species of maple, walnut (*Juglans regia*) and horse chestnut (*Aesculus hippocastanum*). Villagers rely heavily on the biodiversity of the reserve, using approximately 97 species of plants for a variety of needs including food, medicine, fodder, fuel, building materials and religious rituals (Samant 1993). These forests and alpine meadows also play host to a number of animal species some of which are threatened or endangered.

Several species of large mammals occupy the NDBR and are perhaps the most conspicuous fauna in the reserve. Among these, the bharal or blue sheep (*Pseudois nayaur*) are the most common, grazing in large herds in the high alpine pastures. In the forests of the Rishi Gorge and the buffer zone, Himalayan tahr (*Hemitragus jemlahicus*) can be found. Musk deer (*Moschus chrysogaster*) are also found in some parts of the NDBR. These shy animals have been relentlessly poached for their musk glands. Another shy and rarely seen inhabitant of the reserve is the snow leopard (*Uncia uncia*). There is no good estimate of the numbers of snow leopards within the reserve, but locals do claim to see these animals on a frequent basis and their sign is plentiful. This area is also home to the common leopard (*Panthera pardus*) found throughout India (Lavkumar 1977, 1979). Himalayan black *Ursus thibetanus* and brown bears (*Ursus arctos*) also inhabit the forests of the NDBR. Several species of birds are also live within the NDBR. The most notable of these is the monal pheasant (*Lophophorus impeyanus*). Above the tree line, the Himalayan snow cock (*Tetraogallus himalayensis*) and the snow partridge (*Lerwa lerwa*) can be found in large numbers. Overall, 114 species of birds were catalogued in 1993 (Sankaran 1993).

Bhotiya History, Culture and Livelihoods

There are several distinct groups of Bhotiya people. These are the Jads of Uttarkashi district, the Marcha (traders) and the Tolcha (farmers) of Chamoli district and the Shaukas of Pithoragarh district (Nand & Kumar 1989). The word Bhotiya comes from the word 'Bo' which in Tibetan means Tibet. However, only the Jads are Buddhists. The Shaukas have a religion that mixes Hinduism and Buddhism. The Marcha and the Tolcha are Hindus and subscribe to the caste system. The Marcha

and the Tolcha Bhotiya inhabit the NDBR and share Rajput family names. This is due to the penetration of Rajput princes into the Garhwal Himalayas in the middle ages, in an attempt to escape the brutality of the Muslim invaders in the south. The princes' offered the local Bhotiya status as high caste citizens if they would convert to Hinduism, thus the Rajput surnames (Nand & Kumar 1989; Rawat 1989).

Given the proximity to Tibet and the pastoral history of the region, the Marchas developed a complex system of moving with their herds between the Tibetan Plateau and the lowlands of the terai region (an extension of the Gangetic plain). The cyclic movement of the herds prevented overgrazing of the landscape and the Marchas also used the goats as pack animals, trading goods such as wool and salt between the Tibetan Plateau and the terai.

In the NDBR, 17 of the 19 villages are of Bhotiya ethnicity and all 10 of the villages of the Niti valley are Bhotiya. Traditionally, 14 of the 19 villages moved between winter and summer settlements and five were stationary. Lata and Reni are the most prominent villages of the Niti valley, being situated near the confluence of the Rishi and Dhaulti Ganga rivers. The last village before the Tibetan frontier is Niti and this is the village from which the entire valley takes its name (Figure 1). Other villages of some size include Malari, Tolma, Suraitohta and Dronagiri.

Woollen products have been traditionally spun and knitted by the women in order to supplement the family income. Fields are terraced and worked by men and women. This region is capable of producing two harvests a year: a wheat, barley and millet harvest usually in May and a late summer or early fall harvest that includes local varieties of lentils and other pulses as well as kidney beans and potatoes that are sold as cash crops. Many of the villages also have multiple varieties of fruit and nut trees including apricot, pear and apple as well as walnut trees. Villagers have also historically gone into the forests and high meadows to gather medicinal plants for healing and religious purposes.

During the golden age of mountaineering on the Nanda Devi in the 1970's, the local Bhotiya population played a key role as porters and guides for expeditions. By 1977 the environmental impact of so many expeditions was being noticed. Nanda Devi had become the second most visited Himalayan peak after the Mount Everest. In September of 1982, the Nanda Devi basin (624 sq km) was named a national park (NP) and subsequently closed due to the environmental degradation suffered from the onslaught of tourists. The Bhotiya also suffered from the closure because their traditional grazing areas and community forests became off limits. The area was designated a United Nations World Heritage Site in 1988 for its unique biodiversity and renamed as the NDBR. This designation created the roughly 1,600 sq km buffer zone of the NDBR (Figure 1). In 2000, when the state of Uttara

rakhand was created from the mountainous areas of Uttar Pradesh, the NDBR came under the jurisdiction of the Forest Department of Uttarakhand. Also in 2000, the Forest Department expanded the PA to include the neighbouring Valley of Flowers NP as a secondary core zone and also expanded the buffer zone so that the entire PA now covers 5,860 sq km (UFD 2003). The designation of the additional areas was eventually approved by the United Nations Educational, Scientific and Cultural Organization (UNESCO) in 2005. This was all enacted with limited consultation of the people living in the villages located within the boundaries of the reserve.

Reaction to Conservation Policies

The designation of the Nanda Devi NP as a biosphere reserve in 1988 increased the area under conservation management considerably. The NP became the core zone of the biosphere reserve and a buffer zone was created that included village lands.

The Man and the Biosphere (MAB) guidelines leave buffer zones open to traditional subsistence livelihood activities. However, restrictions were placed on grazing in the area and this caused overgrazing and a resulting reduction in livestock numbers. With the reduced number of sheep flocks there was also a reduction in the production of woollen products. Restrictions were also placed on the gathering of fuelwood, fodder and non-timber forest products. The Bhotiyas' livelihood activities were thus threatened. The MAB policies provided for income-generating and development programmes. However, these programmes turned out to be ineffective and inappropriate for the Bhotiyas' situation. Furthermore, the Bhotiya were not interested in becoming dependant on government programmes. NP authorities and international agencies developed these policies with little involvement or input from the local people. The 'top-down' policies of the reserve and inappropriate remedies for loss of livelihood combined to turn the Bhotiya against the policies of the NDBR (Rao *et al.* 2000; Maikhuri *et al.* 2001).

In 1998, after years of going to the authorities with their grievances and getting no response, the Bhotiya decided to take matters into their own hands. Under the leadership of local activists, the Bhotiya of the Niti valley organised a forced entry into the core zone *en masse*. Villagers presented a list of demands to officials. These demands included full restoration of local rights and roles as guardians of Nanda Devi. The villagers vowed to continue to assert their rights to the core zone through forced entry and present their case anywhere it could be heard until authorities recognised their rights to the NDBR. For 3 years locals pleaded their case with little success. In 2001 a series of events would change the struggle in fundamental ways.

In the May of 2001 an expedition carried out under the auspices of the Indian Mountaineering Foundation (IMF)

and the Ministry of Environment and Forests (MoEF) gained permission from the state of Uttarakhand to enter the core zone in order to determine the feasibility of opening up the NDBR once again to tourism. At first the Bhotiya were enthusiastic about the expedition but soon they became apprehensive, thinking that the government would allow national and multinational tourism operators to take control of tourism in the NDBR, leaving the Bhotiya relegated to roles of porters and guides. This expedition initiated a second wave of activity whereby the Bhotiya sought to use the alliances they had made with social activists and environmental justice organisations to promote their own agenda of community-based ecotourism.

The Bhotiya succeeded in mobilising the alliances they had formed and involved Jaanadhar, a forest rights organisation operating throughout Uttarakhand. Activists at Jaanadhar coalesced a group of grassroots non-governmental organisations into the Alliance for Development. This group helped to start the Vanaadhikar initiative to unite similar groups fighting oppressive policies in PAs, realising that the Bhotiya were but one of many groups struggling against the policies of PAs. The stir created by the Alliance for Development led the state government, the MoEF and the NP authorities to realise that the IMF proposal to open the NDBR to tourism was problematic. Two IMF endorsed international expeditions to the NDBR were cancelled by the Uttarakhand government. By the fall of 2001, the Bhotiya had organised a workshop to formalise their proposal for community-based ecotourism in the NDBR. Local leaders drew from a loose network of supporters from the United States of America, Canada and India. In this way, the local Bhotiya were able to mobilise various scholars, academics and donor agencies across the world on their behalf. This network was able to procure funding for the workshop that was held in the fall of 2001. During this workshop, the local people, their elected representatives and various social activists met and drew inspiration from local history and international conventions to draft the Nanda Devi Biodiversity Conservation and Ecotourism Declaration (Appendix 1). This declaration outlined the ideals for a community-based tourism industry free of exploitation of the environment and the people of the area, and serves as a set of guiding principles on how to manage the reserve through ecotourism. Today, the Bhotiya are still struggling to implement their ecotourism declaration.

The current conflict within the NDBR is partly grounded in different ideas among policy makers and local Bhotiya about how protected resources should be managed. These differences are themselves grounded in competing conceptions of nature and reflected in discourses of nature that influence material outcomes such as livelihood activities and conservation policies. Understanding how different stakeholder groups conceptualise nature, and being able to trace how these conceptualisa-

tions translate into resource management ideals, provides important insight into the sources of conflict between local people, resource managers and policy makers.

DISCOURSE, POLITICAL ECOLOGY AND THE SOCIAL CONSTRUCTION OF NATURE

“If you have people and no forests, that is a problem but if there are only forests and no people to call them forests, then those forests too have no meaning” (Dhan Singh Rana quoted in Rego 2003). This quote implies a complex conceptualisation of nature and suggests a dialectic thinking about the relationship between people and nature where the two are not necessarily conceptualised as opposite or distinct but rather, mutually constitutive (Peterson 2004). Thus, the purpose of this review is to provide a theoretical foundation for understanding conceptualisations of nature, and to implicate politics and power in discursive and material conflicts over natural resources. In order to accomplish this, I draw from social constructivist and political ecological ideas of nature as a discursive concept that is socially constructed.

Although the assertion that nature is socially constructed is criticised as denying the reality of the ‘natural’ world, many social constructivists argue that the categories of reality often ascribed to nature are arbitrary and serve certain political interests. Specifically, scientific expertise adds credibility to claims about nature and allows one arbitrary classification to prevail over others, leading to the assertion that current ‘truths’ in science are bound to change with changing political and social conditions. This is in opposition to the realist position that truth is fixed, and physical phenomena (such as nature) have certain essences or essential qualities that differentiate them from other phenomena (Sayer 1997). The argument for an essential nature is based in the Cartesian dualism that nature is a pre-social category and only when humans interact with nature is it brought into the symbolic order. However, nature is viewed as existing prior to humans and is therefore independent of power relations (Castree 2001; Dingler 2005).

The realist critique of the social construction of nature as a constructivist project focuses on three problems. First, asserting that nature is socially constructed denies the material existence of nature. Second, constructivism leads to relativism because it is no longer possible to decide between the validity of competing constructions. The third problem with constructivism is that discourse would create what it constructs (Demeritt 2002; Dingler 2005). For political ecologists these critiques are not entirely accurate as most are not what Robbins (2004) classifies as ‘hard’ or radical constructivists. He describes this type of constructivism as: ‘Insisting that it is social context alone that conditions and determines our concepts for understanding the world, and so creates the world, at least effectively, in the process’ (Robbins 2004: 114).

Again, this type of constructivism is criticised as relativistic because it argues that science cannot be used to determine which claims about nature are real.

Most political ecologists shy away from this type of constructivism in favour of a ‘softer’ form, whereby ‘the objective world is real and independent of our categorisation but filtered through subjective conceptual systems and scientific methods that are socially conditioned’ (Robbins 2004: 114). Hacking (1999) describes this form of constructivism as a philosophical critique that ‘is concerned with situating human knowledge socially or alternatively with advancing an understanding of reality or specific entities as socially produced, rather than as simply given with fixed ontological properties’ (Demeritt 2002: 771). Often this type of constructivism is associated with post-modernism and anti-essentialism. Post-modern constructivist accounts of nature are based in discourse theory and also what Dingler (2005) calls non-essentialism.

Political ecologists focusing on discourse are concerned with how a conception of nature, expressed through discourses of nature, influence material practices such as resource management decisions (Neumann 1992; Escobar 1998; Proctor 1998). In a conservation context, the protection of nature is necessarily a social question, in which nature can be seen as externalised or internalised. When nature is externalised or separate from humans, emphasis is placed on humans as the defender or protector of nature and scientific knowledge is paramount. This often leads to ‘top-down’ conservation policies that privilege scientific knowledge over local experience (Willem-Braun 1997). Many times the disconnect between humans and nature leads to top-down policy prescriptions and alternate, local and populist discourses. Local people are often portrayed as both villains and victims in the discourses of global environmental management, caught in a downward spiral of poverty and environmental degradation, whereas scientists are portrayed as the heroes, providing knowledge and policy prescriptions that will alleviate poverty and reverse environmental degradation (Adger *et al.* 2001). In contrast, when nature is internalised or considered part of the human experience, the knowledge of locals is paramount and the emphasis is on people as representatives of nature (Escobar 1999). Another aspect of discursive approaches in political ecology is the deconstruction of modern essentialist notions of nature. For academics such as Escobar (1998) terms like biodiversity are discursive constructs that act to cement a new nature-society relationship emerging from within the context of science, culture and economics (Escobar 1998, 1999). These propositions are based on social relations, wherein some are empowered and others are not.

While discursive political ecology can be useful in deconstructing and uncovering the power relations involved in creating hegemonic discourses of nature, such anti-essential stances are also contradictory, particularly be-

cause it is often necessary to employ essentialist descriptions for strategic purposes as is done with the creation of categories. Therefore, critics of anti-essentialism argue that some degree of essentialism is unavoidable (Sayer 1997). A discursive concept of nature implies that discourse itself created the material reality of nature; a reality that did not exist prior to its discursive construction. In this case, a discourse would actually create what it constructs. This also implies that material reality could be transformed by re-formulating or re-interpreting discourse.

However, Dingler (2005) states that the accusations of idealism are misguided, but do point to a theoretical challenge of how to explain the interrelation between humans and nature. He argues that proponents of a discursive concept of nature do not assert that nature (in a non-discursive sense) is created through language. Rather, material reality is only experienced through discourse. Therefore nature only becomes meaningful through discourse. This leads Dingler (2005) to conclude that humans cannot express the characteristics of non-discursive nature since naming necessarily leads to discursive conceptualisations and once nature is named it becomes part of the realm of discourse and thus politics. The theoretical challenge is how to explain this relation between a material nature and discourses of nature without reproducing the Cartesian dualism. Dingler (2005) points to the Actor Network Theory as one arena where these dualisms are beginning to be broken down. In addition, Whatmore (2002) in her book *Hybrid geographies* also calls for the breakdown of the nature-culture binary. Both argue that by bringing into the fold, non-human actors, the binary of humans and environment can be broken down (Law & Hassard 1999). However, it becomes difficult and problematic to even explain nature when it is not put in opposition to humans or seen as outside the realm of human activity.

Thus, deconstructing the nature-society binary becomes an ambitious project for theoretical and empirical investigation. However, I argue that this binary is a product of modern (Western) thought about nature rather than an essential feature and that the discussion should then focus on dialectic conceptualisations of nature from the perspective that nature (in a non-discursive sense) is not merely a discursive construction but our human conceptions of nature are based in discourse. In this case, 'nature' becomes a discursive construct because we as humans cannot talk of our conceptions without language and non-discursive nature cannot speak for itself (in a human sense). Focusing on how nature is conceptualised (via a human-environmental dialectic), and then explained through discourse uncovers the relation between material (non-discursive) nature and discourses of nature that enter the political realm when power laden decisions on how to order the material world produce conflict.

BHOTIYA CONCEPTIONS OF NATURE

Because of the complexity of the conflict in the NDBR, multiple data sources were used (texts, interviews, a survey and a photographic activity) to elicit Bhotiya conceptions of nature. These data were analysed using multiple methods, including discourse analysis, interpretation of survey results and interviews as well as the interpretation of a photographic activity undertaken by research participants. The goal was not to find a single truth behind the conflict in the NDBR, but rather to offer a careful interpretation of how the local Bhotiya believe they have been affected by the policies governing the NDBR, that is grounded in analysis of how differences in conceptions of nature held by the Bhotiya and those formulating policy have helped to fuel the conflict in how the reserve should be managed.

A survey provides a basic measure of how villagers feel they have been affected by the policies of the NDBR while maintaining anonymity. Villagers were surveyed in the villages of Reni, Lata, Suraitohta, Tolma, Phagti, Paing, Suki and Juwagwar. Each village contains 10–100 households. One person in each household was surveyed with the goal being to survey as many households as possible within the study area. The household level was chosen to avoid overlap in responses of individuals to questions. The survey was written in English and translated into either Hindi or Garhwali depending on the language proficiency of the participant. Research assistants were hired in Dehradun where it was possible to find students who speak English, Hindi and Garhwali. Results are reported for the entire study area. Surveys were not analysed statistically. Rather they were used to provide a measure of the context within which this conflict is taking place. In this case, the perceptions of the changes in livelihoods and culture that the policies of the NDBR have had on the Bhotiya are important issues. How the Bhotiya perceive their lives to have been changed directly influences how they react to the policies governing the biosphere reserve.

Surveys and accompanying interviews were conducted in eight villages within the NDBR. It was necessary to try to survey members of the household who were old enough to remember the NDBR being open to mountaineering and trekking so that they would be able to give a comparative perspective on livelihood and cultural activities before and after the closure in 1982. In addition to age, participants were chosen based on their availability to spend 45 minutes answering questions. Extensive notes were taken along with the surveys when respondents gave detailed answers with relevant information. Only six of the 30 respondents were women. This was mainly due to the heavy workload many women have with regard to agricultural and household responsibilities. Because there are only two villages within the buffer zone containing scheduled caste or untouchable households, only two of

the respondents represented this group. All respondents were over 18 years of age and their average age was 46 years.

Survey results show that 76.7 percent of the households cited farming as their primary source of income. No households cited herding. Only 23.3 percent of households cited farming as the primary source of income before the closure of NDBR. Thirty percent of households were herders before the closure and 40 percent of households were engaged in the service industry (portering, weaving, guiding and day labour). This first set of results suggests that livelihood activities have changed since the closure. When the high alpine meadows of the core zone were open to the Bhotiya, grazing of sheep and goats was part of the livelihood strategy. After the closure, most households either sold or slaughtered their sheep and goats. It is significant to note that only seven households cited farming as their primary source of income before the closure. Most households were engaged in a combination of herding and service jobs. Farming still occurred, but was maintained at the subsistence level. Every respondent said that the households within their villages have either the same or less farmland than before the closure. This indicates that even though there has been a shift in livelihood activities away from herding and service labour, the amount of land which people have to farm has not increased. With an increase in agricultural activity and no appreciable increase in agricultural land, agricultural intensity necessarily increases. Villages farm the same land they did before the closure, but now the land is used not only for subsistence but also for income-generating agricultural activities. These livelihood changes have also led to lower standards of living within the villages of the NDBR.

All of the households surveyed said it was at least slightly harder to earn an income since the closure and 23.3 percent of the households said it is now impossible to earn an income; 93.3 percent of households said that living standards were lower since the closure and 6.7 percent of households said they were the same. Since income-generating activities are now primarily tied to agriculture, those with the most and/or most productive land have the best opportunity to earn an income from their land. Those households with marginal land and/or small tracts of land have much less potential to earn an income from their agricultural activities. The results show that in all of the villages surveyed, households thought it was harder to earn an income now than before the closure.

The survey also addresses the religious impacts of the closure. Of the 30 surveyed, 63.3 percent of households said their religious rituals have changed since the closure. Upon further questioning, villagers relayed that they were able to go to the alpine meadows and perform *pujas* to their goddess Nanda Devi. Now this is not allowed in the core zone. Such rituals are seen as an important part of

livelihood and cultural activities such as harvests and fertility.

In the final section of the survey that references the conflict over the NDBR and the Bhotiyas' active involvement in the resistance the results were one-sided. Every household surveyed opposed the closure. This is probably not the case for every household within the buffer zone; some households in the area have profited since the closure. It is significant that among those households surveyed there was overwhelming opposition to the closure. When asked, 73.3 percent of the households surveyed said they were involved in some way in the struggle against the policies of the NDBR. While the level of involvement varied by household (some only attended meetings occasionally while others were leaders in the protest against the closure) many households had at least participated in the movement to regain resource rights. This is important because it illustrates that the local opposition of the closure is not only expressed in principle but is also based in action.

The survey results show that there have been changes in livelihood activities as well as cultural activities since the closure of the core zone. The changes in livelihood activities have made it harder for households to earn an income and some households now find it impossible to earn a living, barely surviving through subsistence agriculture. Agricultural production has intensified while the amount of land for agriculture has remained relatively stable. This has led to an increase in the intensity of agriculture and a shift towards growing crops to sell in the marketplace. Opposition to the policies of the NDBR was observed to be widespread as was involvement in the struggle against the policies of the NDBR. The Bhotiya living in the eight villages surveyed perceive the closure of the core zone to be detrimental to their livelihoods and culture and therefore they oppose these policies vigorously.

Semi-structured interviews and a photographic activity were implemented as a means to uncover commonalities in the Bhotiya villagers' conceptions of nature. This project was carried out simultaneously with the surveys, and survey participants were also interviewed if they were willing and could spare the time. The interview script asked questions about how participants conceptualise nature and to provide a description of the same. Among the topics were humans' places in nature and human impacts on nature. In total, 28 of the 30 survey participants were willing to be interviewed or take part in the photographic assignment. Of these, 18 were interviewed directly and 10 were asked to participate in the photographic assignment. Participants were asked to take pictures of nature with a disposable camera. Ten villagers from eight villages (seven men and three women) were given cameras with 27 exposures each, totalling 270 exposures. Villagers helped to select the participants for the photographic activity and participants were selected

based on their interest to participate and their ability to operate the cameras. The goal was to record visually what they (the Bhotiya) think of as 'nature.' Translated from English, the word for nature in Hindi that was used was *prakriti*, which means the natural world.

Photographic techniques such as the activity noted above originated in the field of visual anthropology. Although this sub-discipline of anthropology is not widely practiced, it is being embraced more by younger academics. Visual anthropology is concerned more with visual representations made by researchers and does not directly address the visual representations in a participatory study such as this (Prins 1997; Wright 1998; Pink 2001). Still, the themes of visual anthropology are applicable to anyone creating visual representations. One of the main themes of visual anthropology is the idea that visual perceptions play a part in non-linguistic and/or pre-linguistic cognition (Loizos 2001). Another theme addressed in visual anthropology is the role that visual symbols play in constructing a social order. Structures such as houses and temples as well as ritual objects and styles of dress all depend on visual information. A third theme is that of visual representation. This theme addresses questions of how well photography, art or film has portrayed the phenomena under study. In this case, the concern is with how well the photographs taken by villagers 'represent' their conceptions of nature.

Building on these themes, Wang *et al.* (1996) developed a research technique called 'photovoice.' This technique was first used with Chinese village women in order to empower them to influence policy makers using photography. The women were given cameras and asked to use them to portray their lives and health needs in what is called a 'photo novella.' This methodology is underpinned by feminist theory and as participatory action research; the goal was to increase the empowerment of the women who participate in the study. In their discussions of the limitations of photovoice, Wang *et al.* (1996) treat photography as unproblematic when used by women to represent their daily lives. No discussion is given regarding the political decisions women must have encountered when deciding what to represent and what to leave out of their photo novellas. Noting this, the photographic activity used in the research in the NDBR acknowledges that the photographs themselves can be problematic because villagers' decisions on what to include or what not to include in their photographs are based on many other factors which are not directly linked to their conceptions of nature (Nakamura 2008). This issue was addressed by using semi-structured interviews as the main source of data and using the photographic activity as a supplement. In addition, participants were asked about their decision-making process in the follow-up interviews upon their return of the cameras. Participants were asked what they took pictures of and why, and also what they did not take pictures of and why. Given these limitations and recent critiques

of photographic methods, it was difficult to ascribe meaning to the photographs themselves.

The photographic activity did prove useful as a supplement to the interviews and provided a way for villagers to participate in the study and begin to think about their conceptions of nature. Several participants took pictures of their households and family members first and it was expected that participants would take photographs for posterity. However, one participant said this is how they prioritise the natural environment. After that, the results varied. Some people primarily photographed the surrounding landscape while others focused on livelihood activities. In total, 162 photographs were processed, of which 146 were useable. The other 16 photographs were not useable because they were either too dark or were taken with a finger over the lens. Four of the cameras were not returned. Although it is impossible from the photographs alone to gain a useful understanding of the participants' conceptions of nature, the activity did yield some interesting results. After careful inspection of the photographs, some patterns began to emerge and it was possible to roughly categorise them into seven groups.

The formulation of the categories was based on the rules of content analysis, which emphasised a need to be exhaustive and inclusive (Weber 1990). First, the photographs were sorted into piles with similar content and then categories were established. The categories were households, human landscape, non-human landscape, livelihood activities, mixed subjects, flora and fauna, and domestic animals. Any pictures taken of people not working were categorised as households. Photographs of houses and villages were included in the human landscape along with photographs of other human-made structures such as paddocks, fencing and walls. The non-human landscape photographs were categorised as such only if the subject matter was explicitly and exclusively a landscape without human activity. Many were photographs of snow covered peaks. Photographs categorised as livelihood activities included working people and agricultural products. The category of mixed subjects was necessary because many of the photographs included both the human and non-human landscape as well as livelihood activities. Flora and fauna were also included as a category because participants took photographs of both wildlife and plants. These photographs included nesting birds, deodar trees and medicinal herbs. The last category was domestic animals. This category was dominated by photographs of cows, the most common domestic animal in this region.

Several themes emerged from the photographs and coincided with responses from the interviews. First, participants often included communal livelihood activities such as planting or harvesting of crops in their photographs of nature. In addition participants also included their families and the built environment in pictures of the landscape. These results suggest that the Bhotiya identify

with the natural environment on a day-to-day basis through their communities and livelihood activities. Furthermore, it also suggests that the Bhotiya view themselves as participants in natural processes. Second, the inclusion of wild and domestic plants and animals, and natural and human landscapes, suggests that the Bhotiya view nature with some complexity as a phenomenon that is both external to and included within their daily lives and rituals.

The interviews with survey participants not involved in the photographic activity and follow-up interviews from the photographic activity, yielded significant and in-depth information that reinforced the themes found in the photographic activity. Nature for the Bhotiya is an inseparable part of their existence. Therefore, their lives and livelihoods are intertwined in the physical landscape. The Bhotiya are agro/pastoralists, some of whom still practice transhumance even though it is at best a marginal livelihood activity in the region. They are Hindu but their folk beliefs are not entirely based on mainstream Hinduism. Bhotiya have a distinct cosmology and their creation myth has a strong influence on how the Bhotiya view nature. For Bhotiyas, it is Bhumiya, the god of earth, who looks after their crops, multiplies and regenerates their seeds and helps in sustaining life. Bhotiyas offer the first grains of the yearly harvest to Bhumiya. This is generally a token amount of wheat or millet. Their entire Bari meetings (their indigenous management system) are conducted on the occasion of Bhumiya Pujan (the ritual to offer summer harvest). The Bhotiya also worship the mountain Nanda Devi as the physical incarnation of the goddess Parvati. The village of Lata is home to the Nanda Devi temple and the cult of Nanda Devi is widespread in the Garhwal. The infusion of spirituality and religion with livelihoods and landscape reinforces the belief that people are participants in natural and supernatural processes.

This relationship with nature is a reciprocal one based on the Bhotiyas' physical connection with their environment. Pragmatically, the Bhotiya realise that it is in their best interest to care for the physical environment around them so that in turn the environment will provide for them in the form of resources. A male interviewee from the village of Bhalagaon explained that humans can either help or harm nature, but that it is in their best interest to help nature because then nature will also help humans. For him, environmental services are free and a gift from the divine. As such, he and his family use these services keeping in mind the balance between use and abuse of the environment. He stated that if he overgrazes in the pastures, they will not be as productive the next year. He also said that he will only take what medicinal herbs he needs from the forest so that he and others will have some for future needs. Although the Bhotiya view of nature is infused with religion, it is also pragmatic and based on what conservationists now refer to as environmental services.

The interview with N.R. (interviewee wished to remain anonymous) of Paing, a remote village nestled high above the Rishi Ganga, gives a woman's perspective on nature. Her perspective is similar to that of the men interviewed, but is also unique in some ways. When asked what she took pictures of first, she said that she took pictures of family and their daily activities, noting that these photographs reflect "how we work and what we want". She explained that for the Bhotiya, livelihood and nature are the same because they are dependent on nature for so many things. She then added "In nature there is beauty; if there is no nature, there is no beauty". This suggests an aesthetic appreciation for the landscape as well as a complex view of nature. She declared that humans are a part of nature and that humans are not harmful to nature because so many human activities promote the conservation of nature. She chose to photograph many collective activities such as planting and harvesting crops. Several of these photographs were staged but the point was the same, that collective action is essential to the Bhotiya way of life and it provides a social structure, formalised in institutions, that assures (in most cases) use of the environment that cultivates biodiversity for the benefit of the community.

The Bhotiya have a complex perspective on nature and one which cannot be fully understood by people who are not directly dependent on their local landscape for physical and cultural survival. However, the interviews and photographic activity do provide a glimpse into the ways in which the Bhotiya have conceptualised nature and placed themselves within this conceptualisation. The Bhotiya have a dialectical view of nature that places humans somewhere between the natural landscape and the gods, whose domain also consists of the natural landscape. The Bhotiya situate themselves within nature, recognising that nature has no meaning without humans and humans cannot survive without nature. This suggests a dialectical view of nature where material nature exists, but humans give it meaning while nature provides services and is the source of spiritual beliefs. In the Bhotiya conception of nature, the landscape is the provider of subsistence and wealth and as such must be cared for. In addition, the landscape has a spiritual significance and any abuse will result in harsh penalties. Religious and livelihood activities cannot be separated as they provide the conduit by which the Bhotiya interact with the landscape around them. Therefore, the Bhotiya ideas of how the reserve should be managed revolve around what they deem as 'appropriate' livelihood activities and are based in a dialectic view of human/environment relationships.

It must be noted that these results largely reflect the ideals of older generations. Many younger people, particularly boys are leaving for the cities in search of work and when they return, many have changed their views on nature. In discussions with several generations of a single family, the father and mother still held animist beliefs about the landscape while the adult son had abandoned

such beliefs. Also, exposure to other conceptualisations of nature, whether through tourism or the involvement of social activists and environmentalists from outside the region, may be influencing conceptualisations of nature for the Bhotiya. Such changes could be reflected in shifting discourses of nature and potentially lead to shifts in ideas of how local resources are managed. Thus, these results only reflect a moment in time in reference to conceptions of nature for both the Bhotiya and for those who set conservation policy for the NDBR.

Discourse and Management Ideals

The Bhotiya have translated their conceptions of nature through discourse into a set of management ideals reflecting a livelihood approach to conservation that is based in a dialectical view and ideas of social construction. The Nanda Devi Biodiversity and Ecotourism Declaration was ratified by the Bhotiya living within the NDBR in August of 2001. The title of the document reflects the connection between livelihoods and conservation, with ecotourism being the primary economic activity. The declaration promotes equity, pledges to involve women at all levels of decision-making, gives preference to the economically disadvantaged, and ensures that tourism positively impacts biodiversity and communities. These management ideals reflect the Bhotiya conception of nature as intertwined with community and livelihood. It is significant that the Bhotiya have found similar ideals represented by the mainstream environmental movement. In point 11 the document states:

Acknowledging the spirit of Agenda 21 of the Earth Summit, Rio 1992, the Manila Declaration on the Social Impact of Tourism 1997 and the International Year of the Mountains and Ecotourism, 2002, we will strive for biodiversity conservation and an equitable economic development within the framework of the Constitution of the Republic of India (The Nanda Devi Biodiversity Conservation and Ecotourism Declaration, point 11).

Although it may seem contradictory for the Bhotiya to acknowledge the importance of the ideals set by the mainstream environmental movement, it is not. The people of NDBR agree in principle to Agenda 21 and the Manila Declaration. What they are challenging is the implementation of these agendas through dominant economic and political structures that reflect a view of nature as externalised. The Bhotiya are promoting biodiversity conservation through ecotourism as a livelihood option that reflects their view that humans are a part of nature. The policies of the NDBR are guided by the same documents, but the management outcome is one that restricts livelihood activities such as grazing of animals and collection of medicinal herbs as both are viewed as harmful

to biodiversity conservation. In the next section I highlight the conceptions of nature embedded within the policies of the NDBR and link them to the management policies of the NDBR that limit livelihood activities.

CONCEPTIONS OF NATURE AND CONSERVATION POLICY IN THE NANDA DEVI BIOSPHERE RESERVE

The NDBR represents materially, the convergence of global conservation ideology and discourse. While this discourse appears superficially to be consistent with the Bhotiya views of a reciprocal relationship with nature that people need to be included within, policy actions have sought to separate the Bhotiya from the core zone betraying a much more Western assumption about the relationship between people and nature. Instead of working towards sustainable development, this action reflects a global history of Western and modern ideas of nature being painted onto the landscape through the separation of lands for production and nature consumption.

The NDBR is a World Heritage Site for its unique biodiversity, and the UNESCO policy dictates that a core and buffer zone be delineated, with the core zone being off limits to humans. The core and buffer model is commonly found in the UNESCO administered biosphere reserves. This model represents an attempt at reconciliation between conservation (core zone) and development (buffer zone) that is a mainstay of sustainable development discourse. The core and buffer model reflects the idea that humans are necessarily harmful to the environment. Otherwise there would be no reason to keep local populations from practicing livelihood activities in the name of biodiversity conservation. At the federal level, the Government of India closed what was then the Nanda Devi NP to all humans in 1982. This area later became the core zone of the reserve. In 1996, the Supreme Court of India placed restrictions on the collection of medicinal herbs in PAs. Such policies are a manifestation of the conceptions of nature that drive the discourses of conservation and development and through policy, produce the material landscapes of biosphere reserves.

Discourse and Practice

The documents interpreted in this section are only a small sample of the vast amount of text produced by UNESCO (1972), UNCED (1992) and the World Bank (1999) referring to the environment and development. I chose to focus on a few key documents at the global scale and then supplement those documents with other key documents at various other scales from the national and the local levels. In deciding which documents to include, I looked specifically for texts created through collaboration between UNESCO and the World Bank as they represent the integration, at the global scale, of conservation and

development. In addition to this, key documents pertaining to the creation of the World Heritage Centre (WHC) and the MAB programmes, documents from the World-wide Fund for Nature in India and documents from the Forest Department of Uttarakhand were also interpreted. The aim here is to illustrate the common thread of modern conceptions of nature through time and across scales. First, I will provide a discussion of modern and Western conceptions of nature and link these with sustainable development discourse and practice. Second, I will trace the discourse of sustainable development in order to point out the disconnect between discourse that seeks to reconcile conservation and development, and policy recommendations that explicitly reflect modern and Western conceptions of nature.

Modernity, Nature and Sustainable Development

The policies that govern the NDBR reflect certain modern and Western conceptions of nature. Escobar (1999) notes that the concept of nature has changed throughout history and that the modern epoch that we inhabit has given its own meaning to nature. 'That nature came to be thought of as separate from people and increasingly produced through labor, for instance is related to the view of man brought about by capitalism and modernity' (Escobar 1999: 1). Escobar (1999: 4) also notes that nature is a 'specifically modern category.' The concept of nature as we understand it, is lacking in many non-modern societies. Escobar explains that the capitalist concept of nature has its roots in post-renaissance Europe and has been fully realised through today's global capitalism. There are several key components of modernity that have allowed humans to conceptualise nature in this way. They are: a linear perspective (that allows one to be removed from history and nature), objectification of landscape and women, and panopticism (Foucault 1979). Escobar (1999) defines this as capitalist nature, where resources have been ordered for human use. Capitalist modernity requires rational ways to manage resources based on the scientific knowledge of experts. This has led to what Foucault (1991) described as governmentality, a process where increasing portions of everyday life are appropriated and controlled by apparatuses of the state. As Escobar (1999: 6) notes: '[t]his process has reached the natural order from scientific forestry and plantation agriculture to the managerialism of sustainable development.' This quote reflects upon how capitalist nature produces governmentality through policies that are based in scientific knowledge and culminate in the implementation of sustainable development initiatives.

UNESCO has adopted a sustainable development perspective in its conservation efforts, hoping to balance conservation with development. Speaking at a conference on Organising Knowledge for Environmentally and Socially Sustainable Development in 1998, Tariq Hussein, a

senior advisor at the World Bank referenced 'A warning to mankind' in which 1600 scientists declared:

Human beings and the natural world are on a collision course. Human activities inflict harsh and often irreversible damage on the environment and on critical resources. If not checked, many of our current practices put at risk the future that we wish for human society and the plant and animal kingdoms, and may so alter the living that it will be unable to sustain life in the manner that we know (Serageldin et al. 1998: 1).

Hussein's comments reflect the tenets of sustainable development that the United Nations and UNESCO follow. These tenets were established in the Brundtland report also known as Our Common Future published in 1987. This report is significant because it outlines what has basically become a sustainable development paradigm by which global conservation efforts such as the MAB and the WHC can be linked with global development efforts. Linking conservation with development through ideas of sustainable development has had implications across the globe particularly with regards to resource management decisions. One reason sustainable development has become so popular is because it has been able, through the use of a few key concepts, to reconcile economic development with environmental conservation (at least conceptually). While unfettered capitalism leaves no room in its logic for environmental concern (McManus 1996), sustainable development ideology seeks to reconcile economic development and the environment. Within capitalism, nature is treated as a commodity, broken apart and treated not as a whole, but as a discrete set of resources (Smith 1984).

Eventually, (as in the case of the NDBR) local people's daily lives are affected by this discourse, which is translated into action through various policy apparatuses. Two seemingly contradictory discourses emerge. One discourse directly reflects the view that humans and human actions are necessarily harmful to the environment. The second discourse attempts to reconcile the contradictions inherent in the sustainable development paradigm by acknowledging the benefits of 'traditional' and 'indigenous' knowledge. The contradiction becomes evident when management schemes and policy prescriptions are discussed. Both discourses are evident at all scales from the global to the local. At the global scale, parallel discourses stemming from the sustainable development paradigm that reflects an attempt at reconciliation between conservation and economic development. One discourse acknowledges the benefits of traditional knowledge while the managerial discourse focuses on top-down and scientific approaches.

Locally, the Uttarakhand Forest Department administers the policy set forth by UNESCO with regards to the NDBR and also creates its own policy regarding forest

management. The UNESCO policy of keeping local residents out of the core zone is a reflection of the modern view that human activities are necessarily harmful to the environment and some areas must be left completely out of the reach of resource use. However, the practice of separating people from nature and disposing locals of lands they historically used has been veiled by a discourse that attempts to reconcile environmental conservation with economic development. This reconciliation can also be seen in the discourse of the local resource managers. While the rhetoric is that of reconciliation, the management outcomes reflect a modern view of nature that continues to create separate spheres for people and nature on the landscape. According to A.K. Banerjee, the District Forestry Officer in charge of Nanda Devi at the time: "Nanda Devi Biosphere Reserve is for the area's people and the effort is that the community here will be taken into account while drawing up schemes and when they become better off, the environment here will automatically flourish" (Rego 2003). This statement to the people of the NDBR reflects a discourse of reconciliation. Involvement of local people in the management of PAs has recently become popular and the management plans of the NDBR do try to involve local people but not in critical management decisions. The second part of the District Forestry Officer's statement reflects the often repeated view that economic development is integral to environmental conservation.

In writing the Periodic Report of Nanda Devi National Park, Uttarakhand, India, the Chief Wildlife Warden, Uttarakhand Forest Department (UFD 2002) also elucidates ideas of local involvement in wildlife protection and ecotourism in an attempt to show the success of the management plan of the NDBR that has been funded through UNESCO and the World Bank. The report suggests that the Bhotiya need to be taught by experts how to use resources sustainably. Specifically, economic development is taken under the umbrella of the global environmental management discourse and converted to material practice through the appropriation of funds for local grassroots development initiatives, designed by NP officials and World Bank representatives. In this case, and in many others involving biodiversity conservation, the managerial tone influenced by modern conceptions of nature, leading to the idea that external policy prescriptions can solve environmental problems, dominates the discourse and shapes the material landscape.

CONCLUSION

The case of the NDBR is one example of many people/PA conflicts occurring across the globe. Programmes such as the MAB and the WHC, that sought to reconcile conservation with development, fashioned policies at the global level that were articulated downward affecting local populations in the NDBR. The villagers perceive the

closure of the core zone to have affected their material wealth as well as caused unwanted changes in livelihood strategies. As a result, many Bhotiya oppose policies of the NDBR and have actively resisted and contested such policies. This research illuminates one factor in this conflict—competing conceptions of nature that manifest through discourse and material practices. The struggle for control of the resources in the reserve is waged in part, through discourses of nature. The dominant global discourse attempts to reconcile conservation with development and recognise indigenous knowledge. However, this discourse breaks down when policy prescriptions and material outcomes such as the closure of the core zone reflect a modern view of nature that presents humans and their livelihood activities as detrimental to biodiversity, reproducing the Cartesian dualism. At the same time, local people assert their rights to manage the resources of the NDBR according to their dialectic view highlighting the exchange between humans and nature. Both sides have assigned a cultural significance to the NDBR. For resource managers and policy makers, the reserve is significant for its unique biodiversity and must be conserved. For the Bhotiya, the area is significant as a sacred landscape and source of their livelihoods and culture. Local conceptions of nature such as those of the Bhotiya can be difficult to understand from a Western perspective as the Bhotiya conceptualise nature dialectically. This lack of understanding produces well-intentioned policies that often create conflict. In this case, helping policy makers to understand that Bhotiya ideas of resource management are based in ideas of exchange with a sacred landscape that they identify with through communal livelihoods and other daily activities may serve to create conservation policies that will accommodate local people and help to preserve biodiversity. However, policy makers must be willing to accept and try to understand multiple conceptions of nature and empower local people with resource management schemes that reflect those local conceptions of nature.

Acknowledgements

I thank the people of the Niti valley for their generous hospitality and for taking the time to participate in this research process. I would also like to thank Laurie Yung for her suggestions on the first draft of this paper as well as the anonymous reviewers and the editor for their useful comments. This research was supported with funding from a National Science Foundation Doctoral Dissertation Research Improvement grant (NSF 042669) and from an American Alpine Club research grant.

Note

1. The state of Uttaranchal was formed in November 2000 and was renamed as Uttarakhand in January 2007. The name Uttarakhand is used throughout this article.

REFERENCES

- Adger, N., T. Benjaminsen, K. Brown and H. Svarstad. 2001. Advancing a political ecology of global environmental discourses. *Development and Change* 32: 681–732.
- Batisse, M. 1997. Biosphere reserves: A challenge for biodiversity conservation and regional development. *Environment* 6(14): 6–21.
- Brown, J. 2002. The integration of man and the biosphere. *The Georgetown International Law Review* 14(74): 741–767.
- Castree, N. 2001. Socializing nature: Theory, practice and politics. In: *Social nature: Theory, practice and politics* (eds. Castree, N. and B. Braun). Pp. 1–21. Oxford: Blackwell.
- Demeritt, D. 2002. What is the 'social construction of nature'? A typology and sympathetic critique. *Progress in Human Geography* 26(6): 767–790.
- Dingler, J. 2005. The discursive nature of nature: Towards a post-modern concept of nature. *Journal of Environmental Policy and Planning* 7(3): 209–225.
- Escobar, A. 1998. Whose knowledge, whose nature? Biodiversity, conservation and the political ecology of social movements. *Journal of Political Ecology* 5: 53–82.
- Escobar, A. 1999. After nature: Steps to an anti-essentialist political ecology. *Current Anthropology* 40: 1–30.
- Foucault, M. 1979. *Discipline and punish*. New York: Vintage Books.
- Foucault, M. 1991. Governmentality. In: *The Foucault effect* (eds. Burchell, G., C. Gordon and P. Miller). Pp. 87–104. Chicago: University of Chicago Press.
- Hacking, I. 1999. *The social construction of what?* Cambridge: Harvard University Press.
- Kuhn, M. 2000. Biosphere reserves as planning models for sustainable regional development: Schorfheide-Chorin, Germany. *Journal of Environmental Planning and Management* 43(6): 897–904.
- Lavkumar, K. 1977. Report on the preliminary survey of the Nanda Devi Basin. Worldwide Fund for Nature-India, Bombay, India. Unpublished.
- Lavkumar, K. 1979. Nanda Devi Sanctuary-A naturalist's report. *The Himalayan Journal* 35: 191–209.
- Law, J. and J. Hassard. 1999. *Actor network theory and after*. Oxford: Blackwell.
- Loizos, P. 2001. Visual anthropology. In: *International encyclopedia of social and behavioral sciences* (eds. Smelser, N. and P. Baltes). Pp. 16246–16250. New York: Elsevier.
- Lynagh, F. and P. Urich. 2002. A critical review of buffer zone theory and practice: A Philippine case study. *Society and Natural Resources* 15: 129–145.
- Maikhuri, R.K., S. Nautiyal, K.S. Rao and K.G. Saxena. 2001. Conservation policy-People conflicts: A case study from Nanda Devi Biosphere Reserve, India. *Forest Policy and Economics* 2: 355–365.
- McManus, P. 1996. Contested terrains: Politics, stories and discourses of sustainability. *Environmental Politics* 5(1):48–73.
- Nakamura, K. 2008. A case against giving informants cameras and coming back weeks later. *Anthropology News* February: 20.
- Nand, N. and K. Kumar. 1989. *The holy Himalaya: A geographical interpretation of the Garhwal*. New Delhi: Daya Publishing House.
- Neumann, R. 1992. Political ecology of wildlife conservation in the Mt. Meru area of northeast Tanzania. *Land Degradation and Society* 3: 85–98.
- Pandey, D. 1995. Introduction: Parks protection people. *Seminar* 426: 12–14.
- Peterson, R. 2004. Central African voices on the human-environment relationship. In: *This sacred earth: Religion, nature, environment* (ed. R. Gottlieb). Pp. 168–174. New York: Routledge.
- Pink, S. 2001. More visualizing, more methodologies: On video, reflexivity and qualitative research. *Sociological Review* 49(4): 586–599.
- Prins, H. 1997. The paradox of primitivism: Native rights and the problem of imagery in cultural survival films. *Visual Anthropology* 9(3): 243–266.
- Proctor, J. 1998. The social construction of nature: Relativist accusations, pragmatist and critical realist responses. *Annals of the Association of American Geographers* 88: 352–376.
- Rao, K.S., S. Nautiyal, R.K. Maikhuri and K.G. Saxena. 2000. Management conflicts in the Nanda Devi Biosphere Reserve, India. *Mountain Research and Development* 20(4): 320–323.
- Rawat, A.S. 1989. *History of the Garhwal, 1358-1947: An erstwhile kingdom in the Himalayas*. New Delhi: Indus Publishing.
- Rego, C. 2003. Invocations to the Mountain Goddess: A UNESCO Documentary. UNESCO, New Delhi, India.
- Robbins, P. 2004. *Political ecology: A critical introduction*. Oxford: Blackwell.
- Samant, S.S. 1993. Diversity and status of plants in Nanda Devi Biosphere Reserve. Scientific and ecological expedition Nanda Devi 2 May to 22 July 1993. Corps of Engineers (Army), Wildlife Institute of India, Salim Ali Centre for Ornithology and Natural History, World Wide Fund for Nature India, G.B. Pant Institute of Himalayan Environment and Development, and Botanical Survey of India.
- Sankaran, R. 1993. An ornithological survey of Nanda Devi National Park. Scientific and ecological expedition Nanda Devi 2 May to 22 July 1993. Corps of Engineers (Army), Wildlife Institute of India, Salim Ali Centre for Ornithology and Natural History, World Wide Fund for Nature India, G.B. Pant Institute of Himalayan Environment and Development, and Botanical Survey of India.
- Sayer, A. 1997. Essentialism, social constructionism and beyond. *The Sociological Review* 45(3): 453–487.
- Serageldin, I., T. Husain, J. Martin-Brown, G. Lopez Ospina and J. Damalian (eds.) 1998. Organizing knowledge for environmentally and socially sustainable development. Proceedings of the Fifth annual meeting of World Bank Conference on Environmentally and Socially Sustainable Development World Bank, Washington, DC, USA.
- Smith, N. 1984. *Uneven development: Nature, capital and the production of space*. Oxford: Basil Blackwell Inc.
- UFD (Uttarakhand Forest Department). 2002. Periodic report of Nanda Devi National Park, Uttarakhand, India, December, 2002. Periodic Reporting Exercise on the Application of the World Heritage Convention, UNESCO, New Delhi, India.
- UFD (Uttarakhand Forest Department). 2003. Nanda Devi Biosphere Reserve, Uttarakhand. Uttaranchal Forest Department, Dehradun, India.
- UNCED (United Nations Conference on Environment and Development). 1992. Convention on Biological Diversity. UNCED, Rio de Janeiro, Brazil.
- UNESCO (United Nations Educational Scientific and Cultural Organization). 1972. Convention Concerning the Protection of the World Cultural and Natural Heritage. UNESCO, Paris.
- Wang, C., M. Burris and X. Ping. 1996. Chinese village women as visual anthropologists: A participatory approach to reaching policy makers. *Social Science and Medicine* 42: 1391–1400.
- Weber, R. 1990. *Basic content analysis*. California: Sage Publications.
- Whatmore, S. 2002. *Hybrid geographies*. London: Sage Publications.
- Willems-Braun, B. 1997. Buried epistemologies: The politics of nature in (post) colonial British Columbia. *Annals of the Association of American Geographers* 87: 3–31.
- World Bank. 1999. Culture in sustainable development: Investing in cultural and natural endowments World Bank, Washington, DC, USA.
- Wright, C. 1998. The third subject: Perspectives on visual anthropology. *Anthropology Today* 14(4): 16–22.

Appendix 1

The Nanda Devi Biodiversity Conservation and Ecotourism Declaration
Gram Sabha Lata, Chamoli, Uttarakhand

14 October 2001

Today, on 14 October 2001, in the courtyard of the temple of our revered Nanda Devi, we the people's representatives, social workers and citizens of the Niti valley, after profound deliberations on biodiversity conservation and tourism, while confirming our commitment to community-based management processes, dedicate ourselves to the following:

1. That we, in accordance with the resolutions adopted by the World Tourism Organisation's Manila Declaration 1997 on the Social Impact of Tourism will lay the foundation for community-based tourism development in our region.
2. That in our region we will develop a tourism industry free from monopolies and will ensure equity in the tourism business.
3. With the cessation of all forms of exploitation like the exploitation of porters and child labour in the tourism industry, we will ensure a positive impact of tourism on the biodiversity of our region and the enhancement of the quality of life of the local community.
4. That in any tourism related enterprise we will give preference to our unemployed youth and underprivileged families, we will also ensure equal opportunities for disabled persons with special provisions to avail such opportunities.
5. That we will ensure the involvement and consent of the women of our region at all levels of decision-making while developing and implementing conservation and tourism plans.
6. While developing appropriate institutions for the management of community-based conservation and ecotourism in our area, we will ensure that tourism will have no negative impact on the biodiversity and culture of our region, and that any anti-social or anti-national activities will have no scope to operate in our region.
7. We will regulate and ensure quality services and safety for tourists, and by developing our own marketing network will eliminate the middlemen and endeavour to reduce the travel costs of the tourist.
8. While developing the tourism infrastructure in our region we will take care of the special needs of senior citizens and disabled persons.
9. As proud citizens of the land of the Chipko movement we in the name of Gaura Devi will establish a centre for socio-culture and biodiversity, for the conservation and propagation of our unique culture.
10. We will ensure the exchange and sharing of experiences with communities of other regions to develop ecotourism in accordance with the Manila Declaration of 1997 in those regions.
11. Acknowledging the spirit of Agenda 21 of the Earth Summit, Rio 1992, the Manila Declaration on the Social Impact of Tourism 1997 and the International Year of the Mountains and Ecotourism, 2002, we will strive for biodiversity conservation and an equitable economic development within the framework of the Constitution of the Republic of India.
12. Today on 14 October 2001, in front of our revered Nanda Devi, and drawing inspiration from Chipko's radiant history we dedicate ourselves to the transformation of our region into a global centre for peace, prosperity and biodiversity conservation.

Supervising editor: Pamela McElwee

Received 4 March 2008. Revised 10 September 2008. Accepted 18 September 2008.
