

# *Biodiversity and Medicinal Plants in Nepal: Involving Untouchables in Conservation and Development*

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In this article, I consider the specific uses made of findings from anthropological research to a current biodiversity conservation project in Nepal. The project links biodiversity conservation with the marketing of high-altitude medicinal plants in the vicinity of Khaptad National Park. Drawing from ethnographic and historical data I demonstrate that employing a specific group of people — untouchables — achieves the project's key goal: to produce the greatest amount of benefit for the greatest number of people.

**Key Words:** biodiversity, medicinal plants, untouchables; Nepal

In November 1993 I was asked to consult as an anthropologist on a project in Nepal, near an area in which I have lived and done research for five years. The project will link biodiversity conservation with the marketing of high-altitude medicinal plants in the vicinity of Khaptad National Park in the Seti Zone of far western Nepal. Thinking my role would be conventional — that of a translator and interpreter of culture in a remote region of Nepal — I was surprised to return to the United States feeling conflict over influencing the course of events in a potentially significant way. When I was brought into the project, target groups had not been adequately identified. Because of my familiarity with the area and its people, my views on this issue were solicited and discussed. Soon, I found my initial protectiveness of indigenous cultural knowledge transformed into an agenda as I argued the merits of two points: first, that

the unit of biodiversity conservation and preliminary marketing activities should be the village (and a limited number, at that), rather than an entire district; and second, that untouchables, particularly women, should be involved in the project from the beginning in a fundamental way. Drawing from ethnographic and historical data collected during prior anthropological fieldwork in Thalara,<sup>1</sup> I will demonstrate that employing a specific group of people — untouchables — achieves the project's key goal: to produce the greatest amount of benefit for the greatest number of people. At the end of the paper, I will revisit the issue of anthropologists' participation in development projects.

## *The Status of Biodiversity Conservation in Nepal*

In light of the rapid destruction of biologically diverse ecosystems and arable land under cultivation throughout Nepal's farming middle hills, improved management of forest ecosystems is urgently needed (Biene *et al.* 1990; Eckholm 1976). Promoting the sustainable use of ecosystems meets the dual benefits of providing income to local people, as well as conserving and safeguarding the genetic resources housed within them (FAO 1985). It is estimated that, of the over 6,500 species of flowering plants in Nepal, 370 are endemic to Nepal and over 700 species are reported by local people to have medicinal properties (Nepal Environmental Policy and Action Plan 1993:36-37). However, due to the lack of a national program to monitor and protect Nepal's biodiversity, no systematic inventories of the biological diversity of the Khaptad National Park region, (nor of most regions of Nepal in general) exist; thus, it is unknown how many species of plants and animals are extinct or becoming extinct. Indeed, the

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establishment of national parks and protected areas, covering nearly eleven percent of the country's total land area, has been Nepal's greatest effort at protecting ecosystems and biodiversity. Best known of these are the Sagarmatha (Mt. Everest) and Royal Chitwan National Parks, both included in the U.N. World Heritage List because of their outstanding natural wealth and appeal. The preservation of Nepal's biodiversity *ex situ* is fostered in the Royal Botanical Garden and the Central Zoo as well as in a relatively small gene bank at the Agricultural Research Council. All of these programs are limited by lack of funds and other resources. Several non-governmental programs systematically compile biodiversity-related databases, but there is a need to consolidate these data.

While harvesting and marketing of medicinal and other plants has a short history in other regions of Nepal (Jumla and Dhankutta, for example), this has yet to occur in any systematic and conservationally sustainable fashion in the Khaptad region. The strategy of supporting a limited number of villages in which to develop biodiversity management and entrepreneurial activities is an appropriate one for several reasons. First, it has been recently recognized by His Majesty's Government (HMG) of Nepal that local people need to be given significant and long-term roles in the management of national parks and their buffer zones, roles from which they have been largely excluded (HMG 1993). With few exceptions, most of Nepal's national parks are patrolled by the military at great financial and political expense to the Nepalese government. Untrained in such nonmilitary duties, military personnel have experienced conflicts with local people now prevented regular access to their parks. The government of Nepal has promoted the testing of a number of new approaches to park management developed by public institutions and private NGOs. The Annapurna Conservation Area and the Makalu-Barun Conservation Projects have involved local people in project planning and management with success. Those aspects of these on-going experimental projects relevant to the present project will involve villagers at all levels of biodiversity conservation through the direction of autonomous, non-governmental planning and revenue management committees. However, the unique features of this project which, like the Annapurna project make it experimental, are the marketing of medicinal plants, the extensive employment of lower castes, and the tying of entrepreneurial activities to biodiversity conservation.

### *Project Location and Population: Village-level Conservation*

The general problem of National Parks' management has been noted by observers to the Khaptad region of far western Nepal as well. In discussions with local people about the importance of biodiversity conservation, they discuss the destructive practices by large numbers of military personnel in the region. Villagers contrast their own conservative use of Khaptad's resources with the military's indiscriminate exploitation of timber for building nonessential structures, clearing of forested areas to enhance surveillance capability, and hunting the very animals that villagers are now prevented from hunting. While the truth probably lies somewhere in the middle, the attitude of Thalara villagers toward the military on Khaptad is negative, and has been since the initiation of the Park. Their anger comes from what they perceive to be

disrespect shown to the sanctity of Khaptad Lekh, and their resentment towards the aggressive forms of control the military guardians use is mounting. In light of the hostile relationship between villagers and the military patrol, attempts to forge a cooperative approach to conservation and sustainable use of the natural treasures of Khaptad Lekh may be difficult but certainly in everyone's interest. In discussions with the Acting Secretary of Forestry, he noted the need for such cooperative efforts.

In delineating the parameters of the research site, we had to initially consider what the unit(s) of activity would be. There are four districts-Bajhang, Bajura, Doti, and Accham-with hundreds of villages that border the Khaptad region; but it was not feasible to include all or even half of them. The areas selected were based on proximity to, and familiarity with, the Park and its buffer zone; economic needs of local people; the community's prior involvement with the management of small-scale development projects (Peace Corps; Udhaya Himalaya; Women's Development Division); levels of literacy; established activities of local herbal healers (both upper- and lower-caste); and an herbal health post. Three primary village-clusters were chosen, including Thalara, the area with which I am most familiar. It was to Thalara that our group went in November 1993, to meet with two Nepalese botanists who had been discussing the project's feasibility with members of a second buffer-zone community.

The project community of Thalara is representative of most village clusters in the Khaptad region, including the other project villages. Thalara, with a population of just over two thousand in seven hamlets, is located in far western Nepal, and the people call themselves *gauko manchay*, "village hill people". Seven lower caste groups and three upper caste groups (discussed further below) are represented in Thalara; there are no ethnic minority groups such as Sherpas or Newars, as are found in other regions of Nepal. Of the total of 346 households in Thalara, 140 (forty percent) are lower caste and 206 (sixty percent) upper caste (Cameron 1996).

Thalara's clustered hamlets of stone, wood, and mud houses dot the sides of rolling and ever-rising hills that peak in the western Himalaya mountains, which frame the identity of these people as hill peasants-small-scale farmers who use no mechanized or capitalized means of production, have little capital for exchange purposes, and have a high population density to feed and house. From every place in Thalara one is able to see steep and narrow terraced slopes, green with fertile crops of summer rice or winter wheat, and brown in the late spring and fall between growing seasons. Connecting the hamlets are a myriad of human and animal footpaths cutting across fields and up the sides of hills, guiding people to and from their fields, their neighbors' homes, and more distant sites. Those distant sites to which the people of Thalara's hamlets travel include the bustling District Center of Chainpur eight to ten hour's walking distance away. There one finds civilian and government offices, air transport facilities, hospitals, and banks. Still other footpaths radiating from Thalara lead away from such congested activity, out of the villages, and up into the "jungal," the region that is Khaptad Lekh.

It is local people who can be credited with maintaining and preserving Khaptad's ecosystem over the centuries. Khaptad Lekh has been long recognized as a place of spiritual presences, witnessed in its beauty of lush moss-covered forests, groves of brilliant rhododendrons fed by mountain streams, and the visible

diversity of plant and animal species. Through the centuries, Khaptad Lekh has developed as a sacred pilgrimage site, and its geography is mapped with stone sculptures of deities, prayer flags, and short, dark shrines that house the spiritual energies of the region. In their annual and semi-annual pilgrimages, groups of villagers, kin and friend, infant and elderly, married and unmarried, hike steadily upwards along the trails snaking through the tangled forests, across streams, and around massive boulders covered with lichens. At the end of a long day, they reach the rolling plateau of brilliant green grasses and yellow subalpine wildflowers that is the centerpiece of the National Park and for which Khaptad Lekh is famous. As they hike, and throughout their 2-3 day stay at the top, people selectively use Khaptad's resources, and sanction against the unnecessary use of firewood or the removal of too many medicinal and edible plants. On more than one occasion, while journeying with fellow villagers from Thalara to the top of Khaptad Lekh, such native practices with the explicit goal of conservation for future generations were described to me by my companions.

At the secular level, village agriculturalists practice seasonal migration of water buffalo and cows to upland grazing stations within Khaptad. Family members stay in rough, temporary shelters for 1-2 weeks with their livestock who graze nearby; taking turns, the shepherds are replaced by other family members, but the animals remain. Users of grazing stations limit seasonal grazing of animals to between 1-3 months, thus preventing the land from being depleted through overgrazing. Hunting in Khaptad is minimal since possession of firearms is strictly prohibited by Nepalese law. Plants are collected for medicinal use by serious herbal healers of all castes in their regular practice, and amateur healers for specific family members and their ailments. However, the area's two most influential and successful healers (of upper caste) informed us that they are now prevented from regularly collecting medicinal plants because of the military presence on Khaptad.

Finally, villages are those units from which kinship-based groups of foragers are generated on an *ad hoc* basis. Such foraging may be specifically related to occupation, particularly among the lower castes. For example, before the restrictions made by the National Park, basketmakers would gather bamboo from the Khaptad region on a regular basis. Family members would join with members of other basketmaking families and spend a day or two collecting. Foraging may also be for general resources needed in the home, such as firewood, in which case kin-related women and other female friends leave in groups early in the morning, and return with their bundles towards dusk. All other uses that local people make of the Khaptad region extraction of medicinal plants, gathering of edible plant materials, collecting of firewood, and hunting are organized at the village level, within and/or between families. People enjoy their foraging expeditions into the cool, lush forests, to spend time with family and friends singing and composing songs as they gather. Thus, replication in the project of these prevailing methods of non-timber forest products extraction is a rational use made of people's knowledge of Khaptad Lekh.

### *Project Objectives, Collaborators, and Activities*

The mission of the Biodiversity Support Program (BSP) is to promote biodiversity conservation by linking it with market

activities, thus benefiting the environment and its stewards. Furthermore, the Program requires that the intellectual property rights of local people be protected, a condition conventionally unspecified or unaddressed in prior development programs (King 1992; Plotkin 1993; Posey 1990). The Program is funded by the United States Agency for International Development through a consortium of worldwide conservation agencies including the World Wildlife Fund, the Nature Conservancy, and the World Resources Institute. The preliminary investigative phase, which took us to Nepal in November 1993, involved many researchers: the Nepalese contingent included two botanists, a businessman, and two government attorneys; the Americans were a neuropsychologist, a physician, and an anthropologist. Others with whom we met for consultation, advice, and approval included a Hindu holy man (who has lived on Khaptad Lekh for decades and is largely responsible for convincing the King of Nepal to create a national park in the area), the Acting Secretary of Forestry, and local people: herbal healers from all castes, leaders, and untouchables (including leatherworkers, ironsmiths, basketweavers, and tailors).

A first objective of the project is to support and facilitate local people's involvement in the management of the buffer zone surrounding the subalpine ecosystem of Khaptad National Park in far western Nepal. Recognizing that poverty conditions prevent long-term sustainable use of ecosystems, a second objective of the project is to tie biodiversity conservation with income generation for local people. We anticipate that local herbal healers of all castes will work in conjunction with collectors, cultivators, porters, and businesspeople to market Thalara's rich ethnomedical tradition (see Cameron 1986) and Khaptad's medicinal plants to other parts of Nepal, India, and the United States. The Institute of Biodiversity of Nepal (IBN) and the Research Laboratory for Agricultural Biotechnology and Biochemistry (RLABB) are indigenous Nepalese NGOs that comprise two of the seven members of the Association of Research Institutes of Nepal (ARIN). ARIN members have been working together for four years in the areas of plant collection, plant systematics, and germplasm collection and conservation. IBN is primarily concerned with biodiversity conservation, and RLABB contributes to the project an expertise in agriculture and forestry biotechnology and biochemistry.

A third objective is to develop medicinal, insecticidal, and aromatic plants to be marketed by Himalayan Naturals, a new enterprise formed specifically for the project for local, national, and international consumers;<sup>2</sup> and to establish a taxonomic data bank and a library of natural product extracts. During the first phase of the project, three tiers of marketable plant products will be developed: 1) topical antiseptics and insect repellents; 2) herbal teas and aromatics; and, 3) pharmaceutical drugs. The first two categories of medicines and plant-based consumables will be marketed within the second year, whereas the latter category will take several years to bring to market. During the second phase of the project, chemically-dereplicated extracts will be processed by the RLABB and leased by Himalayan Naturals to international pharmaceutical companies. Abbott Laboratories in the United States has expressed a committed interest in the project, and other firms have been contracted.

A fourth objective is to initially secure partial financial investment in the project from Nepali- and American-based herbal medicine and pharmaceutical companies, to ensure their cooperation with IBN in the screening and processing of plants,

and to transfer eventually complete responsibility to IBN and Himalayan Naturals through their continued financial investment in the project. A fifth objective is to involve local people in the protection of their intellectual property rights through various legal, practical (medical and economic), and profit-sharing mechanisms.

If the project goes forward, the sustained harvesting and/or cultivation of non-timber products will involve local people in many different roles. IBN training staff will work with local trainers to initially explain the project's goals and to help develop local people's skills in the implementation of them. The expertise of lower- and upper-caste herbal healers will be needed in medicinal plant identification, collection, proper preparation, and efficacious use for local consumption.<sup>3</sup> The plants will be gathered from the buffer zone or from inside Khaptad Lekh and stored in designated collection sites throughout the region by collectors. For some plant species, cultivation and harvesting may be more efficient than gathering, and therefore harvesters and cultivators will be needed. Due to bulk, most of the plants will be semi-refined in Thalara, and then transported to buyers in Kathmandu. Security guards for harvesting sites may be necessary to guard against theft and vandalism. Finally, the project managers and biodiversity regulators will also be hired from within the community.

The perceived long term benefits are as follows: (1) sustainable biodiversity will provide economic benefits and incentives to all people in the community; (2) increased productivity of the marginal forest land will improve the sustainability of collection through technical support and common property management; (3) the value of the raw material at the local level will be increased through local quality control and increasingly sophisticated organic and aqueous extraction techniques produced in the IBN labs for international markets; and, (4) these improved technical and marketing techniques will allow for much of the initial research and development to be done in Nepal, thereby strengthening the collectors' bargaining power and marketing options, increasing profits, and resulting in yet more economic returns to the local communities.

During the first phase of the project, IBN training staff will provide nonformal education to local members of Himalayan Naturals, the Village Enterprise Biodiversity Cooperative (VEBC), and the local work force in enterprise and biodiversity conservation. The focus during the first two years will be on eight plants known to be in high demand in Nepal and India for their multiple economic potential as medicinal, pesticidal, and aromatic products. IBN will train local people in identifying and carefully harvesting an increasing percentage of the focus plants each year (up to 20%) for sale as raw materials based on the monitoring data of sustainable biodiversity (described below). While providing considerably lower potential income than the more complex second phase of the project, phase one is designed to provide immediate economic return to the region's people, and thereby establish incentives to appropriately manage and sustain the region's rich biodiversity.

The marketing analysis of the raw materials has been based on the prices and demands of traders located at the roadhead towns close to the Indian border. The total value of the eight plant trade from the Khaptad region has been estimated to be Nrs 108,960 (US \$2,197) in the first year of the project. This value gradually increases in the second (US \$5,448) and third (US \$10,896) years of the project and peaks in the fourth year

(US \$21,792). The above is a very conservative estimate by the planning stage economists, who expect it to be considerably higher in reality.

Due to their bulk, most plants will be semi-refined locally for transport by porters to market sites. If Thalara's currently inoperative hydroelectric generator is repaired, this will allow IBN also to train villagers to produce slightly more sophisticated products such as simple plant extracts and local medicine in pill form. Medicinal and aromatic extracts are easier to transport in large quantities resulting in greater profits. Most local medicines are in powder form to be taken with water, an understandably unpopular procedure, whereas those sold in larger cities are in pill form. If these medicinal plants are pulverized and rotated in a large metal drum (by hand, by a foot pedal, or by electricity) with water, beads are formed which can then be administered as pills (a process common in rural Sri Lanka). This more desirable form of medicine can be made available to the local herbal healers, as well as for trade.

Once the village harvesting process has been established, collection booths in Thalara and Kalukheti (Bajhang), Khaptad (Accham), Dongri (Bajura), and Jhengrana and Baglekhi (Doti) will be maintained in the Khaptad region. In addition, warehouses will be rented in Chainpur, Silgarhi (Doti) and Nepalgunj. While most of the transport of plants will be by porters, the building of a ropeway is under consideration. There is excellent access to markets in Nepal for sale of non-timber forest products found in the Khaptad region, especially via Nepalgunj. Roadheads are the most effective place for trade of non-timber forest products. Silgardhi is an important road head catchment area in western Nepal where trading activities of all four districts of Khaptad region are centered. It is connected with major Indian border crossings including Mahendranagar, Dhangardhi and Nepalgunj. Chainpur (Bajhang district), Martadi (Bajura district), and Safay Bagar (Accham district) are the airport collection centers in the Khaptad region.

However, access to Indian and overseas markets is problematic because the supply cannot meet the demand. HPPCL, a project collaborator, is the biggest consumer of medicinal plants in Nepal and will cooperate with Nepal's other private companies such as Gorkha Ayurveda Co. and Dabur Co. The cities of Delhi, Lucknow, Kanpur, and Calcutta are the important herb trade centers in India that consume large amounts of raw materials as well as extracts, and which have business agreements with HPPCL. A project goal is to develop refining procedures that can meet Indian and other international demands.

Himalayan Naturals, working with the local VEBC, will act as an entrepreneur for promoting herbal trade during the first three years of the project. Thereafter, the VEBC will have sufficient experience to become a subsidiary of Himalayan Naturals or an independent enterprise to deal directly with HPPCL and other distributors with IBN in an advisory and biodiversity monitoring role.

During the second phase of the project, arrangements for long term biodiversity prospecting will begin. Due to the high demand by the drug industry for natural product extracts, Himalayan Naturals and IBN will work to develop natural products supply capability with assistance from RLBB in Kathmandu, Nepal and Abbott Laboratories in the U.S. Our initial focus is to develop coded data banks of chemically-dereplicated extracts from healer-identified and randomly

collected plants for lease or sale to Abbott and other pharmaceutical and related industries. Samples will be collected in the field by trained parobotanists and taxonomists living in the buffer zone of Khaptad National Park, and then transported to Kathmandu by van from a roadhead on a weekly basis for identification verification, voucher preparation and coding, and sample extraction and processing. Using an approach standardized and quality controlled by RLABB, facilities and technology at RLABB for plant biochemical procedures will be aided by training and equipment agreements with Abbott Laboratories. With additional training of parataxonomists by entomologists and microbiologists/mycologists at ARIN's other institutes in Nepal, exploration and processing of insects and microbes will begin in the second and third years.

Extract samples will be produced, packaged, and shipped by Himalayan Naturals to interested pharmaceutical companies for screening, in exchange for remuneration up-front. Samples will be sent in coded form, and each company will have limited exclusivity for a period of 6 months to screen. After 6 months, Abbott and other companies will be charged an additional fee per sample retained to maintain exclusivity — called "exclusivity payments". Initially Abbott and later other labs and companies will have complete ownership of any lead drug compounds discovered through this screening program, and will have full responsibility for filing and maintaining patents on these compounds and derivatives.

The issue of intellectual property rights (IPRs) in Nepal (where within the past three years there has been a shift from a monarchy to a democratic government) must be carefully considered. Existing legislation relating to the protection of IPRs of indigenous knowledge and equitable profit sharing of patented compounds is currently general and may not be very effective. Even terms like "trade secret" have not been well defined. The IPR issue is ever present. For example, the U.S. planning team, consisting of an anthropologist, physician, and psychophysiologist obtained detailed and valuable video-taped information on important plants from local healers. We are reluctant to share this information as requested from some U.S. pharmaceutical firms until the issue of local and national IPRs is addressed. Concern over these matters, especially as it relates to indigenous knowledge in biodiversity projects and the sharing of by local villagers was discussed with then Secretary of Forestry, Dr. Dipendra Purish Dhakal.

### *Why Untouchables? Poverty, Caste, and the History of Land and Labor Relations in Thalara*

Promoting the idea of untouchables as entrepreneurs makes sense when we consider the history of Thalara's political economy and contemporary political ecology. In an area such as Hindu Nepal, such broad processes inevitably involve practices of caste hierarchy. Caste ranking in Thalara is similar (though not identical) to that found in India and in the rest of Nepal, and is based on relative ritual purity ascribed at birth.<sup>4</sup> The lower caste groups are linked through their ritual impurity relative to those above them. Although there are many arguments within caste theory about what makes the low castes 'low,' locally they are labelled *nachunay* caste, "not touchable people;" *saano jaati*, "small caste;" and *talo jaati*, "low caste." The historical and contemporary experience of those people

called "low" and "small" is one of oppression, poverty, and relative powerlessness.

In addition to their untouchable status in relation to those of high caste, there is ranking among the low caste groups themselves. The upper ranked and intermarrying groups among the lower castes include the following artisans and specialized laborers: basket weavers, goldsmiths, ironsmiths, masons, and former guards for the local king. These artisans, some of whom are also marginal farmers, do not touch persons of caste rank lower than themselves. The second tier of lower castes include leatherworkers and tailors, who do not intermarry but are of equivalent status. At the bottom of the caste hierarchy is a single group of potters, musicians, and female prostitutes, who are untouchable to all other groups above them. The highest ranked and most ritually pure group in the Nepalese caste system are the Brahmins, followed by the Thakuri and Chhetri castes.

The question I was asked to answer was this: based on my research on intercaste labor transformations in Thalara, which groups of local people would be best suited to fill project jobs? Answering this requires consideration of many political, economic, and social factors, not the least of which is how coveted any form of employment is by local people. Families can benefit tremendously from even a single member being employed in a stable, income-earning job. The sources of cash income in Thalara are few, but its uses are unlimited—purchase of land and farm animals, proper weddings for daughters and sons, lending to others at high interest rates, food and clothing for family members, prestigious feasting of guests, medicine, travel for religious and health reasons, and education for (usually) sons. Most upper caste families have been able to engage partially in one or many of these subsistence and prestige-bearing activities. Untouchable families have not. Indeed, the history of their low status has been built on exclusion from such activities (Cameron 1995).

For several reasons, my answer to the question posed above was "the untouchables". Because the project requires the greatest amount of benefit to go to the greatest number of people, employing untouchables can best achieve this objective, as I will demonstrate below. Employing untouchables can potentially diminish their economic dependence on upper castes, thus indirectly benefitting upper castes as well. It is unlikely that project people would have been able to identify these most deserving and employable persons. Local politics are such that leaders have their own agenda in development matters to satisfy the most powerful local groups — the high-caste elites.

In Thalara today, as in the past, land ownership closely parallels caste hierarchy; the poorest families in the area are the untouchables. They own little to no agricultural land, and conventionally depend on rented land to farm. Based on research conducted in Thalara in 1988/89 on fifty upper and lower caste households, upper caste families were found to own 82 percent of all registered land. The remaining 18 percent is owned by low caste families such as tailors, ironsmiths, basketmakers and leatherworkers. The average size of the high caste family farm is 9.01 ropani, more than 4.5 times larger than the average lower caste family farm, at 1.95 ropani (Cameron 1996).

In addition to becoming agricultural and non-agricultural wage laborers, the main means whereby low caste families meet subsistence deficits and shelter themselves against poverty and hunger is through land tenancy, the most common form called *maatya*. *Maatya* land is given as collateral on a loan and may

be used for the duration of the loan; in addition to the cash loan, labor may also be promised. The money lent in exchange for *maatya* land is earned primarily by men of low caste who regularly travel to India for employment purposes. Exchanges of agricultural and nonagricultural labor are made by women in the low caste renting family. *Maatya* land is a critical addition to the farming resources of the lower caste family. By adding modest amounts of rented land to their meager parcels of owned land, the size of the lower caste farm nearly doubles from approximately two ropani to four ropani. In almost all cases, rented land moved low caste families into a higher landholding category such that low caste people worked 32 percent of the total land farmed by the population, while 68 percent was farmed by high caste families (Cameron 1995). Clearly, lower caste subsistence critically depends on rented land. However, the uncertainty of supply of rentable land limits lower caste families' reliance on this unstable economic resource. Each monsoon season sees erosion of topsoil and the fragmenting loss of whole plots of arable farmland. Thus, landless groups like Thalara's untouchables must be assisted in locating alternate nonagricultural subsistence activities to diminish their dependency on renting land from upper castes. Controlled harvesting and marketing of subalpine medicinal plants is a feasible employment alternative with great future potential.

A second form of intercaste dependency that could be potentially moderated, to everyone's advantage, is the local patron-client system. Integrated into the agricultural economy of Thalara (and many Hindu and multiethnic communities throughout Nepal) is a traditional patronage system called the *riti-bhagya* system. The *riti bhagya* system of the past and the present binds low caste families to high caste families through economic need and Hindu religious ideology (Cameron 1995). In exchange for low caste products and services, high caste landowner patrons — called *riti* — regularly provide harvest shares — called *khala* — and are expected to meet many other subsistence needs of their low caste landless dependents — called *bhagya*. *Khala* payments from landholding *riti* families to low caste *bhagya* families serve as the economic and moral backbone of the patron-client relationship because they establish the right of each family to ask for services, food, or cash advances from the other in times of need. Thus, the *riti-bhagya* system developed as a South Asian form of feudal economy in which landholding and labor relations followed caste lines. Its Indian equivalent is the familiar *jajmani* system (Raheja 1988).

However, over the past five decades, changes in population, land availability, distribution, and registration, and commodity competition have shifted the balance of the patron-client relationship in favor of the patron over the client. These changes have left lower caste families disenfranchised and dependent on upper-caste landowners. The most dire of these changes is land scarcity. From the advent of nationalist unification of Nepal in the mid-1950s, the material base of traditional intercaste and land tenure relations has eroded due to a severe shortage in arable land. There are three main causes of land scarcity: 1) the population of Nepal has more than doubled from eight to nearly twenty million people since unification; 2) intensive agricultural production, annual monsoon rains, and natural disasters such as earthquakes have caused steady and pernicious erosion of the Himalayan foothills;<sup>5</sup> and, 3) land reform has not successfully transferred land from those with plenty to those with none (Regmi 1978; Seddon 1987; Seddon *et al.* 1979).

These contemporary changes occur at the end of a long history of upper-caste control over farm land through formal registration. Brahmin, Thakuri, and later other upper-caste families, have amassed some of the largest land properties in the area. One important structural change to have occurred in the last century of relations of landownership in Thalara is the reinforcement of upper-caste patrilineal control over land by written documentation. The history of land appropriation by upper-caste patrilineal disenfranchised low caste families who did not press their own claims to informally-held land, and the prohibition against female inheritance of land became inscribed into the quasi-legal code of the area. Women who were informally able to inherit land in the past became formally barred from doing so.<sup>6</sup>

### *The Emergence of Lower-Caste Female Laborers*

Today, upper caste patrons are less able to provide for lower caste dependents than in the past. Untouchable families are in a daily struggle for survival as they seek temporary agricultural and nonagricultural work with meager payment. Untouchables, particularly women, have emerged as the first group of free laborers in Thalara, as the indigenous economy gradually shifts from complete subsistence to increasingly capitalized agricultural production and mass-produced commodities (Cameron 1995). Over the past century, women of low caste have experienced significant changes in the kinds of work they perform, the groups for whom they work, and the types and quantities of remuneration they receive. The history of low caste women's labor has been a gradual replacement of primarily artisan-related production with a variety of paid agricultural and nonagricultural work. The negative consequences of becoming free laborers in the agricultural economy include the breakdown of secure intercaste patron-client relationships, and their replacement by informal and daily wage labor in the context of increasing poverty.

Thus, untouchable women are available to work in the project without creating conflict with other labor responsibilities. Unlike upper caste women, who must farm their husbands' land, lower caste women have a variety of work experiences. They may work on their own small family plots, assist upper caste patrons in agricultural and nonagricultural work for in-kind wages, produce commodities specific to their caste alongside husbands and sons, or fulfill labor reciprocity (called *parma*) for kin and friends. For much of this work they receive in-kind and cash payments, a practice prohibited for women of upper caste. But in spite of these many work roles, lower caste women do not spend as much time in productive work as their upper caste counterparts, primarily because of the lack of such work, and in turn, they spend more time than women of upper caste in reproductive and leisure activities. Though they search, work is not to be found on a regular basis. The vast majority of women are not literate and are never considered for the rare "professional" job that presents itself in Thalara. And because of their untouchable status, operating a tea-shop, restaurant, or store is fruitless because their clients would be few. Thus, women of lower caste are an ideal group to focus on in the project because they are available and willing to work.



## *Monitoring Biodiversity: Plant Extraction and the Environment*

In the planning phase of the project, eight focus plants were researched and then chosen with the aid of villagers and healers to provide immediate economic return and incentive for future sustainable biodiversity enterprises. The latter involves undertaking the region's first extensive taxonomic survey of plants, insects and microbes, to determine the sustainable biodiversity of some of these for the establishment of a data extract bank for more complex and valuable, long-term future enterprises. The criteria considered when choosing the focus plants, and to be continued in the complete survey were: (a) life cycle characteristics; (b) type of resource (plant, insect, microbe); (c) density and abundance; (d) size-class distribution of populations at different sites in Khaptad region; and, (e) immediate and future medical and other use prospects. While most of the plants in this phase will be harvested from the wild, some will be planted in experimental plots to assess their systematic cultivation and harvest potential.

The proper mode and season of harvesting will be determined by periodic monitoring of the regeneration and growth of the wild species. Biomonitoring, under the direction of IBN scientists and locally trained persons, will include systematic regional mapping, harvest assessments, and harvest adjustments. Harvesting by local people will be done only in designated areas. Other potential harvest areas having high potential for sustainable biodiversity will be mapped with the help of Global Positioning System readings. Harvest assessments, used to gauge the ecological impact of resource harvest, will be done annually by establishing permanent experimental quadrants at the harvest sites. Annual regeneration of the herbaceous plant species and production of fruit and bark from the trees will be monitored. The parameters used to measure the harvest assessments will be (a) periodical observation on overall vigor of the plant appearance, noting any insect pests or fungal pathogens and yellow wound or damage; (b) noting whether seedlings in the vicinity are being damaged by collectors; and, (c) selection of indicator species to monitor the ecological viability of the region. Indicator (keystones) species show that their presence is crucial to maintaining the organization and diversity of the ecological communities. These need to be identified because their removal could either increase or decrease species diversity and affect optimum ecological balance in a region.

In the first year of the project, only 2% of the total potential population of NTFPs will be harvested. The quantity of harvest will be increased to 5% and 20% in the second and third years of the project, respectively. Based on the results, the percentage of harvest will be increased to a maximum of 40% in the following years. As a basis for harvest adjustments, sustainability will be measured on the basis of seedling and sampling densities recorded in the experimental regeneration survey quadrants and verified during next regeneration survey for the plant species wherever the whole plant is harvested. In case of bark and fruits collection, maximum harvest quantity and diameter at breast height will be taken into consideration. The predictive parameters which form the basis of future harvest strategies are as follows: *Optimal utilization*: densities remain above the threshold value and no major problems are detected

in the harvest assessments; *Over-utilization*: seedling and sampling densities fail to stabilize, or drop even lower, during the next five year period; and, *Under-utilization*: the population has actually increased its level of seedling establishment in response to harvesting.

In addition to the systematic and detailed semiannual biomonitoring described above, IBN will train local villagers at each site to undertake less formal, but weekly biomonitoring at the project sites.

A key part of the project that needs further clarification is the regulation of persons extracting non-timber forest products from the Park buffer zone. Unregulated removal of plant resources is a problem that the Nepalese government faces already. Since the late 1980s, people living in the Khaptad National Park buffer zone have had access to the Park for a fixed period each year for harvesting forest materials, including bamboo and plants used to make clothing fibers and paper, gathering medicinal and edible plants, and grazing cattle in the specified areas. Secretary Dr. Dipendra P. Dhakal, Ministry of Forest and Soil Conservation informed us that a new act is forthcoming regarding the management of the buffer zone whereby "users groups" such as Himalayan Naturals, with a proper plan of operation and subject to regular monitoring, will have the right to regularly use the forest resources in the buffer zone. This new plan has largely taken shape during discussions with the government regarding IBN's concern for maintaining biodiversity in the region; the unique collaborations that have emerged from this proposal involve both the international assemblage of project personnel as well as these important avenues of partnership with the Nepalese government.

Concurrently, because Nepalese laws on Intellectual Property Rights (IPRs) and patents are not clear and sufficient at present, any such agreements with local and foreign companies interested in biological resources in Khaptad such as Himalayan Naturals will have to be developed. Videotaped interviews with three of the villages' most highly regarded healers about their traditional use of medicinal plants, as well as their relation to and potential for western clinical practices provided detailed clinical information on approximately 45 plants, several of which were felt to be of considerable significance. For example, one was an insecticide, which unlike those products containing Deet, is so non-toxic that it was also used internally to combat diarrhea; another plant was used to reduce the risk of spontaneous abortion during pregnancy. The use of many of the plants were independently verified by the different healers interviewed by our group, as well as those interviewed by the Nepalese team. We are reluctant to share this information as requested from some U.S. pharmaceutical firms until the issue of local and national IPRs is addressed. Concern over these matters, especially as it relates to indigenous knowledge in biodiversity projects, has resulted in an important side benefit of the project; attorneys from Nepal and the U.S., with expertise and sensitivity to the rights of indigenous people and BCN's goals, will be the first to work with the government on these matters in the Khaptad region.

### *Lower Castes and Development*

A unique feature of this project, one discussed with and supported by local people, is to focus on people of lower caste.

Involving these exceptionally poor but uniquely trainable and employable people as parobotanists, plant gatherers and harvesters, biomonitors, and marketers will benefit the greatest number of people. Although people of lower caste have little direct experience in development projects beyond portering, they have other extensive work experiences that, combined with the training they would receive in the biodiversity project, make them ideal candidates for project participation. For generations, women and men of lower caste have negotiated work contracts with other upper caste landowners, either in traditional patron-client exchanges, or in daily wage labor. They themselves, as well as upper caste local leaders, recognize their abilities in these areas.

Biodiversity conservation and the collection and marketing of medicinal plants is a project suited to the needs of lower caste people. Up until now, the majority of rural development projects which produce direct economic benefits (this excludes health care projects) have focused on improving agricultural productivity through the introduction of stronger seed varieties, or the building of cement irrigation canals. But untouchables farm only minimally, and when they do, it is on land they have rented from upper castes. When untouchables have been involved in development projects, it is usually as porters of building materials, and not as planners, managers, or marketers.

The political ecology of lower caste families' use of the environment is linked to the broader processes that structure the social and physical environments in which they act (Peluso 1991). The history of such intercaste labor and landholding relations described above come to structure the prevailing (though now curtailed) ways in which untouchables have come to use the resources of Khaptad. These practices can serve to increase their potential as project personnel. The informal uses made of Khaptad resources by Thalara's lower caste families are varied, and include planting small plots of high-altitude crops such as millet and wheat on land in the buffer zone; collecting raw materials necessary for caste-specific artisan production, such as bamboo, naturally-occurring chemicals for tanning leathers and gold- and silver-smithing, and raw materials for crafting tools for themselves or upper-caste patrons; foraging for firewood and fodder for animals; and gathering of edible and medicinal plants. Thus, low-caste people's long-term claims to the resources in and around Khaptad has developed their knowledge on the best ways to forge an extractive and conservationist relationship to the forests.

Although there is a strong advocacy for the employment of lower castes, upper caste people are involved in all stages of the project. Because they are the powerholders in the communities, upper caste groups were consulted on who they thought would be best suited for the project and its goals. They supported the idea of putting lower castes in central roles in the project because it would reduce their dependency on the upper castes. An important role of upper castes will be their involvement in the Village Enterprise and Biodiversity Cooperative, a group that villagers suggested establishing for the project, with representatives from all groups (different castes, park officials, etc.). The VEBC will address local conservation needs, employment opportunities, community profit-sharing, training needs, dispute resolution, and link local people to IBN, BCN, as well as educational and legal processes that may occur outside the project area. Formation of the VEBC

also follows recent guidelines by the government of Nepal to use autonomous, non-governmental committees for decision-making on revenue sharing and returns back to the community.

### *Conclusion: Anthropological Understanding and Development*

In this era of postmodern anthropology — when ideas such as “ethnographic authority”, “representation”, “social structure”, “cultural coherence”, “authenticity”, and “intervention” bear the sin of the politically incorrect ancestral gaze — even the most positionally aware of anthropologists finds herself in conflicted spaces between observer and participant. With the decentering of anthropology's research “objects”, the traditionally uneasy marriage between anthropology and applied development is further challenged.

How can anthropologists best advocate for marginalized groups like the lower castes of Nepal? While the questions of who shall represent ‘others’, and how, are valid ones (and certainly the perspectives are infinite), I believe the more pressing issue is who is *not* given the right to speak in the first place — both in anthropological theory, and in local level politics. The anthropology of South Asia is written mostly from the perspective of men from the upper castes. Consequently, even anthropological data may not be the most culturally or socially sensitive or accurate. It should also not be assumed that local level politics are more democratic than national or academic ones; the politics of exclusion reach into gender, ethnic, class, caste, and household domains. Anthropological understanding of political and cultural history can only enhance the processes by which local peoples are not completely exploited of their indigenous resources — plants, animals, and knowledge alike. Anthropological advocacy of marginal groups and less powerful peoples is not about overthrowing local social and political structures; rather, it is about forging cooperative relationships with the development community.

### NOTES

<sup>1</sup>The data were collected during fieldwork conducted in far western Nepal during 1988/89. The research was funded by the Fulbright Foundation, Sigma Xi Scientific Honor Society, the Women in International Development Section of the U.S. Agency for International Development, and the Center for Advanced Studies in International Development at Michigan State University.

<sup>2</sup>Himalayan Naturals relationship to IBN is modeled after that between Shaman Pharmaceuticals and its non-profit Healing Forest Conservancy in the United States.

<sup>3</sup>Methods to protect, guarantee, honor, and reimburse the intellectual property rights of local people is a required component of the project, rightly so. Our decision to tie local ethnobiomedical knowledge to a technology practical in the administering of health care in Thalara led to the idea of donating foot-driven “pill machines” (whose prototype is found throughout Sri Lanka) that compress powdered plants into lozenges. This will meet people's most-voiced dissatisfaction with their herbal medical system, namely the difficulty in swallowing “so much powder” (Cameron 1986). Such pragmatic approaches to what is a well-recognized thorny legal issue have been tried with success by Shaman Pharmaceuticals (King 1992; Posey 1990).

<sup>4</sup>There are two main differences between caste structure in Nepal and India: 1) Nepal's Legal Code incorporates all Nepalese citizens



into the caste system, Hindus and non-Hindus alike (whereas in India many non-Hindu ethnic groups are not incorporated into the caste system); and, 2) Nepalese ethnic groups, designated as *matwali* ("liquor drinking") in the caste system, occupy the third level of the caste hierarchy and are considered pure or touchable. This same level in the Indian system is designated as the impure *vaisya* sanskrit category, and these persons are Hindu. See Hofer [1979] for a detailed description of the Nepalese caste system.

<sup>5</sup>Of the fifty families in the research population, fifteen lower caste families (52 percent of total low-caste families with owned or rented land) and thirteen high-caste (62 percent of the total with land) claimed to have lost land in the past decade due to annual monsoon erosion and two destructive earthquakes. Although upper castes generally lose the most land in natural disasters, those lower caste families with land are not close behind. The loss of land due to erosion throughout Nepal's farming foothills contributes to a wry national joke that Nepal's largest export to India, soil, is free.

<sup>6</sup>For a complete discussion of the impact of land reform, and the distribution of the deceased king's land, on landholding relations in Bhalara see Cameron (1993).

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