



**Integrated Rural Planning and Development:
Johar Valley, Uttarakhand, India**

Exploration Seminar Report

University of Washington

Fall 2008

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1.0 INTRODUCTION

The first Indian Himalaya Exploration Seminar took place from August 24 through September 23, 2008, and focused on integrated rural planning and development (including public health) in the Kumaon region of Uttarakhand. The focus of the study was the Johar Valley, an area within the eastern buffer zone of the Nanda Devi Biosphere Reserve (NDBR), which is a UNESCO World Heritage Site. The Johar Valley is experiencing changes from several fronts, such as: potential hydroelectric power development on the Gori River, proposed road development, and expanded tourism related infrastructure. Additionally, the Johar Valley continues to experience a declining population and limited access to health care. These new forces promise to bring economic benefits to the communities, but at the same time threaten the cultural and ecological patterns that make the Valley unique. The exploration seminar would attempt to understand some of these intersecting issues as part of an integrated rural planning and development approach.

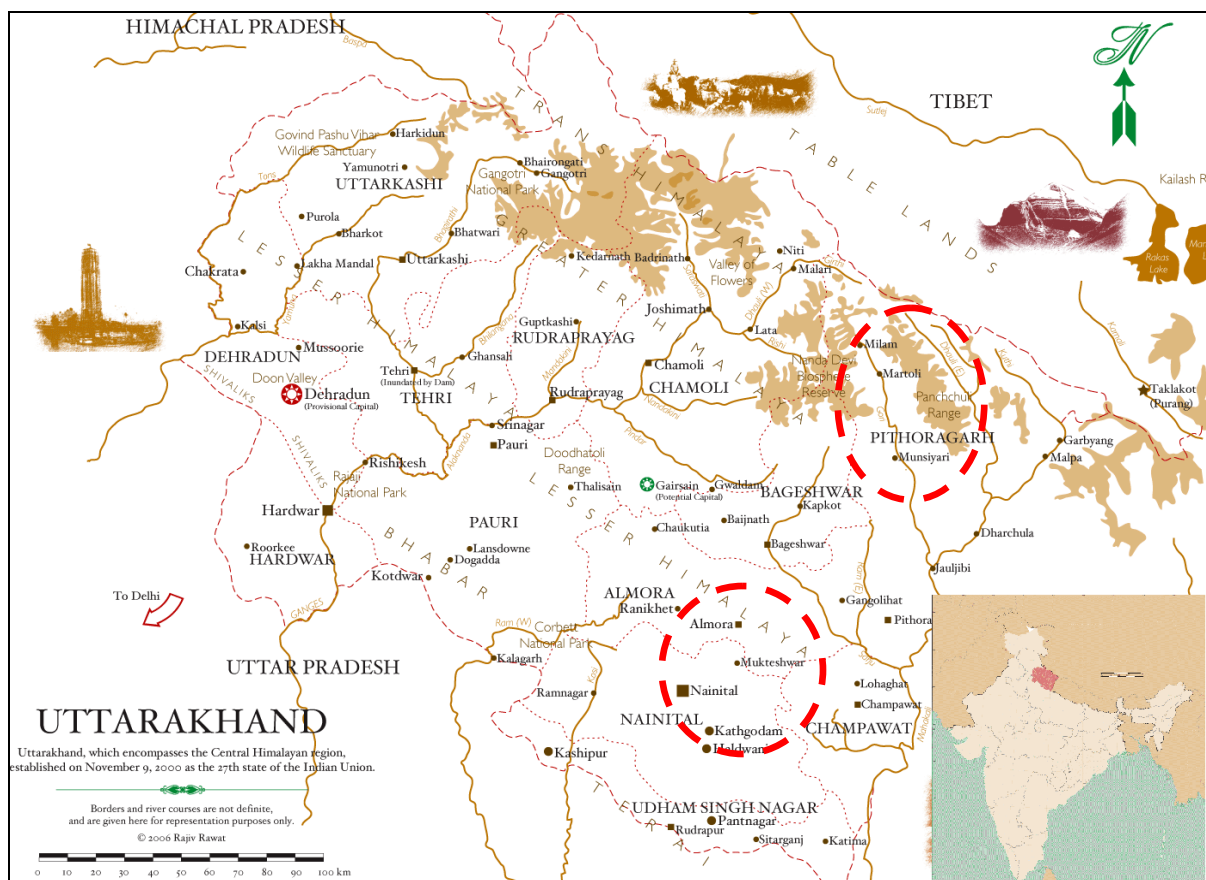


Figure 1.1: Uttarakhand State, India indicating areas of the Exploration Seminar.

The five-credit study trip, conducted between summer and autumn quarter, was offered as a University of Washington College of Arts & Sciences Exploration Seminar, a program introduced in 2003 to encourage more students to study internationally. During the month-long study abroad experience, the group gathered observations and explored the study area through the lens of:

- 1) Ecology & Environment
- 2) Built Environment
- 3) Public Health
- 4) Community Economic Development

The UW Exploration Seminar group of 14 graduate students, 6 undergraduates, 3 faculty, and 1 Teaching Assistant, supported by a staff of interpreters, trekking guide, porters, and kitchen assistants, visited six villages in the Johar Valley over a period of twelve days.

The program began with a week long stay at Sonapani (near Almora)--an eco-retreat center located on 20 acres in the Himalayan foothills, designed and operated by social entrepreneur, Ashish Arora, as a model of sustainable tourism. During this time the class became familiar with the various institutions and organizations that work on rural development issues in the region. Daylong site visits were made to Mukteshwar, Nainital, and Almora, and the group traveled on foot to the local NGOs including Aarohi and CHIRAG. Highlights from area visits are described below:

- Central Himalayan Rural Action Group (CHIRAG) is a non-profit grassroots development organization working with rural communities in the Central Himalayan state of Uttarakhand. They began in 1986 with forest management and health services related work in Ramgarh block of Nainital district, and have grown into one of the largest NGOs in Uttarakhand, with programs in over 150 villages. CHIRAG has developed a nature path as an interpretive trail to re-establish local residents' connection with the native plant species and to produce revenue for local residents who work as guides. The group experienced the trail on the way to the headquarters of the NGO in Sitla.
- Dr. Shekhar Pathak, a historian from Uttarakhand who has been a Professor of History at Kumaon University in Nainital for the past two decades, conducted a half-day workshop focusing on the geography, history and ecology of the region. Dr. Pathak has trekked across Uttarakhand with students once every ten years since 1974 to understand the condition of the people and land. He shared with the group his knowledge and insights of the area.
- The day-trip to Almora included a visit to the Panchachuli Women Weavers, the largest independent women's cooperative in the state of Uttarakhand. More than 750 women from over 32 villages in the Almora region are involved in the processing of raw materials and production of woven and knitted products. Founder Mukti Datta hosted a discussion with our group to talk about how Panchachuli has played a key role in changing the socio-economic dynamics of the local community.

While the group visited six villages in the Johar Valley, the focus remained on two villages: Milam and

Martoli. Martoli is located high above the Gori Ganga on an open plateau that affords views of Nanda Devi (7816m). Currently, its population is dwindling as more residents migrate to the plains permanently. Just four decades ago, prior to the border closure in 1962, this multi-caste village supported several hundred people. Milam, at 3450m, is the last major settlement before Tibet. Home to an outpost of the Indo-Tibetan Border Police, it has more residents than Martoli, and was once one of the most important staging posts along the trade route with Tibet. The other villages included Lilam, Bogdyar, Rilgiri, and Burphu. Additional information was gathered in Munsiyari, Sarmoli, and Rilkote.



Figure 1.2: Johar Valley, Uttarakhand State, India.

Besides the high valley villages of Milam and Martoli, the program also spent time in another village-- Sarmoli—located at the gateway of Johar Valley. Sarmoli, a small village near Munsiyari, was considered as a prototype for innovative rural development. One of the ways in which the residents of Sarmoli are participating in the growing tourism economy is by developing a community based tourism program. Several households participate in a homestay program that is administered by the Village Forest Council. A percentage of the homestay proceeds go to the Forest Council for forest related programs. The group had the opportunity to participate in the Sarmoli homestay program, and observe through personal experience how this model has balanced the needs of the market and the locals. The program, in its fourth year and has a waiting list of village families that would like to participate. However, it is committed to growing in a sustainable manner; its success is due to the work and vision of Malika Viridi, a democratic activist who was elected as the Sarpanch of the (Sarmoli - Jainti) village Forest Council (Van Panchayat). The work of the Van Panchayat, as Viridi notes, “has little glamour, and involves an everyday slog of protecting a resource for ecosystem flows, while also ensuring equitable and sustainable use through

inclusive and democratic processes.”¹ She is also the founder of a womens' collective in Munsiyari, called MAATI and is active in womens' and human rights work. In addition to meeting with the village residents, the class participated in two sessions with Viridi and her colleague, Ramnarayan K (Ram), to discuss their model of community development, which promotes democratic governance and sustainable management of natural resources with women as active participants. Ram introduced the class to the details of the hydroelectric proposals in Johar Valley, and the environmental degradation the related dam construction projects may cause.

The work was carried out in four teams (with interpreters assisting each team as needed) focusing on (1) ecology & environment with an emphasis on water resources, (2) built environment, (3) public health, and (4) community economic development. Each team developed their unique set of questions that would allow them to understand their topic areas, but within the framework of the main objectives of the class. The information was collected using a variety of methods including informal interviews, focus groups, and direct observation. The chapters in this report discuss the four areas of focus presenting initial observations and recommendations. Collectively, they provide an assessment of the Johar Valley's built and natural environment, health care, and potential for community economic development ideas as part of an integrated rural development and planning approach. This work will likely serve as a foundation for work in subsequent years in the area.

1.1 Physical Geography

Located in northern India, the Johar Valley is a remote and rural mountainous region within Pithoragarh district of the western Kumaon region in the newly formed hill state of Uttarakhand. The Pithoragarh district adjoins Tibet and Nepal, and is drained by River Kaliganga system. The Valley is accessed from the gateway village of Munsiyari along a foot trail that follows the River Goriganga, a right bank tributary of the Kaliganga system. The foot trail is the only link between the lower and upper villages in Johar Valley, and historically functioned as a trade route between Johar Valley villages and villages in Tibet. The terrain, drainage, climate, vegetation, and soils are typical of the Himalayas with rangelands as a dominant feature of the high altitude ecosystem. As described by the International Centre for Integrated Mountain Development (ICIMOD) rangelands are particularly fragile and critical ecosystems that support livestock and accommodate important watershed functions as well as provide valuable and biologically diverse resources. As they become exceedingly popular with tourists, it is even more important to manage them in sustainable ways so they continue to provide the ecosystem services.

¹ Viridi, 2007.

The Johar Valley ranges in altitude from 2290m at Munsiyari to 3872m in Milam. The topography varies from glaciated peaks to grassy plateaus and rangelands to river valleys fed by the glaciers, snowmelt and monsoon rains. The climate of the high-altitude summer villages is what Hoon describes as of “tundra” variety where mild summer season is followed by an extremely cold and snowy winter season. The winter villages, at lower altitude, enjoy a warmer and more rainy climate, and vegetation patterns follow the climatic zones in this order: “...coniferous forests in the lower levels, through birch and rhododendron woods, then scrub and alpine pastures, before giving way to bare rock and snow.” Hoon also notes that specific soil variation in this area has not been fully studied, but offers the following insights, which were confirmed with site observations:

Mountain soils in general are immature and have a thin surface layer. They are therefore very prone to erosion and loss of fertility. Deforestation, disused terraces and road building activities have encourages landslides along the mountain slopes. This has led to acute soil erosion problems in the middle Himalayas.²

The upper Johar Valley constitutes part of the eastern border of the buffer zone of the Nanda Devi Biosphere Reserve, established in India’s western Himalaya in 1988 under UNESCO’s Man and Biosphere Program to protect the area’s biological and cultural diversity. The village of Martoli is part of the buffer zone. Man-biosphere conflict is an important part of the regional dynamic, and is discussed in the next section.

1.2 Human Geography

The human geography and cultural history are closely intertwined in this area that Hoon describes as a “rugged and hostile” environment.³ Various delineations of the socio-physical boundaries of the Johar Valley exist in literature. However, for the purposes of this work Johar Valley was considered as consisting of 13 villages with a total population of roughly 500 with much of the Valley situated in the sub-alpine and alpine zones above 3000m.⁴ The Indian government uses the word Bhotiya to refer to those who have traditionally resided in the upper Himalayan valleys of the Kumaon and Garhwal Regions of the Uttarakhand State. A defining characteristic of the Bhotiya is the practice of transhumance, or migration between summer and winter villages to use grazing land and grow crops. Although transhumance is on the decline, the practice was still observed during travels to the region in the month of

²Hoon, Vineeta. Living on the Move: Bhotiyas of the Kumaon Himalaya. Livelihood and environment, 4. New Delhi: Sage Publications, 1996.

³ Hoon, 65.

⁴ Negi, Chandra Singh. “Declining Transhumance and Subtle Changes in Livelihood Patterns and Biodiversity in the Kumaon Himalaya.” Mountain Research and Development 27(2) (2007): 114.

September, which coincided with the end of the harvest and grazing season as villagers were making preparations to return to lower altitude villages for the winter. The villagers had been in the upper villages for the summer months cultivating crops and medicinal herbs (for subsistence, trade and cash). In addition there were herders who had brought their sheep to higher altitude to take advantage of the lush grazing pastures. Transhumance is generally considered good for the environment as it takes advantage of seasonal resources. Negi describes the positive cultural benefits of transhumance as better for nutritional and food security needs of the population in areas of marginal resources.

Reliance on natural resources defines the history of the human population in the Kumaon as a whole and the Johar Valley particularly. Two major influences on the physical and human geography of the area are:

- 1) establishment of the Nanda Devi Biosphere Reserve (NDBR) in 1988 as a mechanism to protect cultural and biological diversity especially in parts of the Valley that is within the buffer zone of the Biosphere; and
- 2) general rise of domestic and international tourism.

The NDBR is one of three biosphere reserves in the Indian Himalaya. Covering a total area of 2236 square kilometers, the NDBR contains a core zone of 625 square kilometers free from human habitation surrounded by a buffer zone of 1611 square kilometers that includes humanized landscape. The NDBR buffer zone is home to 19 communities (five permanent and 14 transhumant settlements) including Martoli.⁵ Maikhuri, et al, note that “conflicts between local people and protected area managers are a common problem in developing countries” and Kumaon is no exception. The residents of Johar Valley rely on forest resources for sustenance, and access restrictions imposed by biosphere designation impacts the traditional patterns of resource use (and economic mainstays) of subsistence farming, forest extraction, and livestock grazing. This and declining transhumance all point to a need for new forms of livelihood strategies that are respectful of the culture and ecology of the place. Tourism is already emerging as an important source of revenue, and tourism related infrastructure development is on the rise, however, this is happening without a coordinated plan or widespread commitment to protect the environment.

1.3 Tourism

Trade was a major part of Bhotiya livelihood until the Indo-China War of 1962 led to the closing of the borders between the two countries. The population of the region has declined markedly since that time as traditional barter trade gave way to new forms of livelihood concentrated largely in the lower villages.

⁵ UNESCO/IUCN, “Protected Areas and World Heritage.”

This shifting pattern has threatened the viability of formerly thriving village communities in the Johar Valley that had depended on trade with Tibetan villages as a main source of livelihood. Recently Bhotiya communities in the larger region, especially the Garhwal side of Uttarakhand, have been exploring alternative forms of livelihood including community-based tourism. Bosak and Schroeder, in their article titled "Biodiversity Conservation and the Struggle for the Nanda Devi Biosphere Reserve"⁶ argue that community-based ecotourism as practiced by the Bhotiyas might be a "sustainable way to provide an income for local people and to preserve local culture." The spectacular natural and cultural resources have made the Himalayas one of the most popular adventure tourism destinations in the world. However, as noted by Sanjay Nepal⁷, the impacts of mountain tourism include "overcrowding, noise pollution, garbage pollution, extraction of valuable resources (collection of firewood and rare plant specimens), pack stock grazing, fire hazards, introduction of nonnative species, and sewage outflow." Although Johar Valley has yet to see these impacts to the degree that Nepal mentions, it will not be immune from these impacts, especially if tourism is not organized and promoted within an environmental sustainability and community development framework.

The term community based tourism or eco tourism is generally used to define responsible tourism ethics. The International Ecotourism Society defines ecotourism as "responsible travel to natural areas that conserves the environment and improves the well-being of local people" and explains that ecotourism is about uniting conservation, communities, and sustainable travel. Giannecchini's definition of ecotourism expands on this idea:

A form of tourism inspired primarily by the natural history of an area, including its indigenous cultures. The ecotourist visits relatively undeveloped areas in the spirit of appreciation, participation and sensitivity. The ecotourist practices a non-consumptive use of wildlife and natural resources and contributes to the visited area through labor or financial means aimed at directly benefiting the conservation of the site and the economic well being of the local residents.⁸

All groups explored the concept of community-based tourism within the particular focus areas, as part of the integrated rural planning and development approach. It was generally agreed upon that community based tourism would play an integral role in developing effective livelihood strategies in Johar Valley.

⁶ Bosek, Keith, and Kathleen Shroeder. "Biodiversity Conservation and the Struggle for the Nanda Devi Biosphere Reserve." Focus. 48. 1 (2004): 1.

⁷ Nepal, Sanjeev. "Mountain Ecotourism and Sustainable Development: Ecology, Economics, and Ethics." Mountain Research and Development 22(2) (2002): 104.

⁸ Giannecchini, J. "Ecotourism: New Partners, New Relationships." CONSERVATION BIOLOGY -BOSTON MASSACHUSETTS-. 7. 2 (1993): 429.

Within the parameters of the four topics the teams explored ways in which this could be achieved.

1.4 Methods and Objectives

The exploration seminar group relied heavily on information gathering principals set forth in the Catholic Relief Services (CRS) Manual on Rapid Rural Assessment (RRA).⁹ In the Johar Valley, the field methods were particularly focused on participatory information gathering, triangulation and unobtrusive observations. However, a range of methods was utilized to inform the group's work.

Literature Review

Articles and previous case studies related to the Johar Valley, the Nanda Devi Biosphere Reserve, and India's environmental and political movements, ecotourism, rural community economic development, and public health in India were reviewed prior to field exploration. These articles were written by both Indian and non-Indian authors. See Appendix I for a full list of reviewed material.

Lectures and Workshops

The class participated in eight lectures/discussions with key informants from the region from the 26th of August to the 16th of September. Each lecture/discussion was focused on a particular topic, and included time for participants to discuss their specific area of research. Care was taken to note gaps in knowledge and biases that might be inherent in the approach, as well as to avoid relying solely on one key informant.

Fieldtrips and Day Hikes

As already noted, the group participated in a number of day trips prior to the fieldwork in the Johar Valley. While in the villages of the Johar, additional day hikes were made to surrounding areas. These hikes allowed the group to further explore temples, forest resources, trek routes, river drainages, and points of interest, such as the Milam Glacier.

Group Interviews

Two group interviews were held with the full group: a group interview in Martoli (included both males and females) and one in Burphu (designed to include females only). Key informants ranged from regional experts to NGO workers, village locals and visitors (domestic and international). In the group interviews held in Martoli and Burphu, participants came solely from within the village and translators were used for relaying all information between a group of interviewers and the group of villagers. The villagers were read and agreed to a consent agreement (see Appendix C) before the interview began. To establish consistency across information gathering, a pre-formed "script" of questions was asked to the villagers

⁹ Freudemberger, Karen Schoonmaker. Rapid Rural Response Appraisal and Participatory Rural Appraisal Manual. Baltimore, Md: Catholic Relief Services, 1999.

(see Appendix B). Group interview and survey design considerations included an attempt to understand the cultural group dynamics (caste and gender), individual group dynamics, minority vs. majority opinion, and communication problems inherent in translating the entire group's response through one translator. In the Burphu focus group, the group dynamics related to gender was sidestepped by excluding men from participating, effects that were difficult to minimize in the Martoli focus group.

Individual Interviews

In general, the informally surveyed population included the local people living in the study area (both practicing transhumance and settled permanently) and those visiting for the Nanda Devi Festival in Martoli. Individuals interviewed in rural villages were all adults, with a majority being above 40 years of age (approximate). At the time of the interviews, they were involved in manual trade labors including farming, sheep herding, weaving, and domestic household caretaking. These interviews were conducted in respondent's households or in communal areas of the villages, mostly in the evening when the villagers had returned from their day of work in the fields or gathering firewood (a task carried out by women primarily). Care was taken to avoid the respondent being influenced by the views of other community members. However it was unavoidable, as interviewers had to rely on an Indian interpreter and, even though this person was not from the region, their presence may have had an effect on the respondents' answers. The research team contained both male and female students who had never been introduced to the respondents prior to the interview. Access to women interviewees was primarily restricted to women researchers.

Limitations

The information presented in this report reflects limitations inherent to fieldwork of this nature. Some information and nuance is likely to have been lost during the translation and interpretation of questions and responses into Hindi, Kumaoni (local language) and English. The research groups' composition included a range of experience, gender, nationalities, and academic training. However, the majority of the members came from a western, industrialized cultural heritage. As such, an awareness of possible cultural bias during the fieldwork and reporting was considered.

1.4.2 Individual Team Data Collection Methods

While all four teams utilized direct observation, mapping/diagramming/drawing, and photo-documentation there were specific methods they used that relied on their disciplinary training and usefulness, which were used when appropriate and to supplement the general methods data collection.

Environment and Ecology (Water Resource)

Although a reconnaissance of water infrastructure of all the villages along the route was conducted, the

work primarily focused on Martoli and Milam where considerable time was spent collecting data around the topic. The research methodology used in this work included direct observation and mapping of existing water systems. Informal interviews clarified the history and current conditions of these systems, and how multiple systems came together in villages where they were noted. In addition to informal interviews, the group conducted one focus group on issues around water.

Built Environment

The built environment team relied extensively on fieldwork methods used in design research. These included observations of people using space, measurements of built forms, mapping of the village, sketches of plans/sections/details of buildings and building clusters, photo-documentations, notation of structure/construction/materiality, and rubbings of carvings. Analysis was conducted through the use of diagramming and noting of relationships of the built fabric, identification of main design/built features, description of the use of spaces and social relationships, speculation on the intention of the built forms and their relationship to the natural environment, and the use of common design elements and decoration.

In addition, the team relied on unstructured interviews with villagers in Johar during observation to obtain an understanding of the development of the villages, the built form, and how spaces were used. Outside of Johar Valley the team met with representatives of some institutions and agencies to access the specifics of tourism plan for the valley to understand the priorities set up by them. For this purpose a handful of buildings were examined in greater detail for their current adaptation or potential for the use of ecotourism.

Ultimately the team's goal was to determine the existing spatial patterns (and where possible how they intersected with social systems), vernacular architecture (including techniques) and the cultural heritage, aspect of the traditional environment.

Public Health

The public health team relied exclusively on individual interviews, group interviews, and observations in Munsiyari, Martoli, Burphu, and Milam. In Munsiyari, the team interviewed an administrator of the public hospital and a local biologist. In Martoli, the team participated in the group interview, conducted an interview with three older women, and an interview with a group of adventure tourists from West Bengal state. In Burphu, the team members participated in the focus group with thirteen women of various ages and interviewed the village pharmacist. In Milam, the team interviewed an individual who runs a homestay and grows medicinal herbs, three porters, four village women, the village midwife, and a high-ranking official of Milam's Indo-Tibetan Border Patrol (ITBP).

In addition, the public health team conducted interviews with NGOs and public and private health and social service providers in the Almora and Nainital Districts. The purpose of this was to better

understand services provided in the area and to obtain information about models that may be applicable to address the health and emergency care issues identified in the Johar Valley.

Community and Economic Development

In addition to the seminar group's general research methods, the CED team made general observations of resources and participated in focused interviews. General observations of resources included both potential and unexplored opportunities as well as existing livelihood strategies. This information was considered on a village basis as well as categorized as valley-wide resources. The CED team conducted several additional unstructured interviews utilizing the same consent statement and set of questions generated for the common group interviews/focus groups. In this manner, the same weaknesses exist in terms of translators and group dynamics. These additional interviews gathered more information on the current livelihood strategies and the interviewees' perspective on potential future economic activities.

1.4.3 Individual Team Objectives

The following introduces each of the four teams' overall objectives that are more fully presented in the chapters to follow.

Environment & Ecology (Water Resources): To provide an overview of the current water system infrastructure in selected villages as one aspect of the area's complex ecology. The team considered access to fresh water, an ecological and cultural resource that impacts (and is impacted by) both hosts and tourists. Field observations included design, materials, construction, operation, maintenance, and use of fresh water systems.

Built Environment: To understand the architecture and planning of the built environment of Johar Valley, which is unique, but in varying stages of neglect and decay. The team worked on understanding the patterns of this environment including design and vernacular techniques that went into its creation.

Public Health: To investigate perceived access to health and emergency care for residents and tourist, the availability and use of different types of healthcare, and the availability and use of emergency care and women's healthcare in the Johar Valley.

Community Economic Development: To explore sustainable livelihood strategies which contribute to community economic development in the Johar Valley. The team assessed existing conditions and attitudes, evaluated opportunities and challenges, and identified possible opportunities for future community economic development.

2.0 ENVIRONMENT AND ECOLOGY

Seminar Research Team

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2.0 ENVIRONMENT & ECOLOGY

2.1 Overview

Located in northern India adjacent to Tibet and Nepal, the Johar Valley is a remote and rural territory within the Pithoragarh district of the western Kumaon region in the newly formed hill state of Uttarakhand. The valley's major river is the Goriganga, which starts at the Milam Glacier and flows southeast, fed by other glaciers and streams from the Nanda Devi Biosphere Reserve to the east and the five Panchachuli Peaks to the west. The mountainous landscape of the Johar Valley includes river valleys and alpine meadows, with alpine glaciers in the distance. The ecological resources that led to the NDBR's designation as a World Heritage Site in 1988 include high quality forests, rare plants, and endangered mammal species such as the snow leopard and Himalayan black bear. Cultural resources are an important part of the ecology of Johar Valley, and access restrictions placed on the local population due to the World Heritage designation resulted in the Bhotiya people being unable to meet their basic needs for fuel and fodder.¹⁰

Vineeta Hoon divides Bhotiya habitat into three distinct ecological regions, and the Johar or Goriganga valley is located within the *Himadri* region, an area drained by the River Kaliganga system. She describes the river system this way:

The River Goriganga is the largest right bank tributary of the river Kaliganga. . . Numerous feeder streams which drain from small and large glaciers, meet these rivers at almost right angles, indicating fault lines and a trellis pattern of drainage in the upper courses of the rivers. These mountain streams are very important sources of clear water supply and almost all the Bhotiya villages are located close to them. The swift flowing mountain streams can generate power and the people have channeled the streams to power water mills used for milling flour.¹¹

In addition, fresh water has historically been diverted for crop irrigation and livestock. Increasing tourism increases pressure on limited water resources.

The International Ecotourism Society defines ecotourism as “responsible travel to natural areas that conserves the environment and improves the well-being of local people.”¹² The team focused on water

¹⁰ Silori, C.S. “Biosphere Reserve Management in Theory and Practice: Case of Nanda Devi Biosphere Reserve, Western Himalaya, India.” JOURNAL OF INTERNATIONAL WILDLIFE LAW AND POLICY 4.3 (2001): 205-219.

¹¹ Hoon, 1996.

¹² International Ecotourism Society, “Definitions and Principles,” www.ecotourism.org.

resources as part of the “Environment and Ecology” topic, and specifically considered the ability to access fresh water, an ecological and cultural resource that impacts (and is impacted by) both hosts and tourists. Field observations focused primarily on water system infrastructure, which is perhaps the most important component of water resources when considering the impacts of human settlement and activities on the landscape. Zurick and Karan, in *Himalaya: Life on the Edge of the World*, describe the water resources of the Himalaya as having both spiritual and practical significance and note that “the traditional irrigation systems are one of the marvels of the indigenous landscape.”¹³ The decision to focus on a small but important piece of the environment was based on several constraints (including time, group size, availability of subjects, and translator availability). Water source, conveyance, use, and disposal were considered. Similarities and differences between villages in design, materials, construction, operation, maintenance, and use of fresh water systems are described.

This report describes selected water systems in the Johar Valley, and includes observations from six villages visited over a period of twelve days in September 2008. Although a reconnaissance of water infrastructure of all the villages along the route was conducted, the work primarily focused on Martoli and Milam where considerable time was spent collecting data around the topic. The research methodology used in this work included direct observation, mapping, informal interviews, and one focus group (which included questions from all four research teams).

The water resource team recognizes that water infrastructure, especially in resource poor economies, is closely tied to political or social structures, something that the team was not entirely able to explore. This introduction is followed by findings, discussion and analysis and an explanation of patterns of water systems including recommendations. Additionally, water resource team developed a set of research questions to help orient future work in the area, included in the recommendations.

2.2 Findings

Data was gathered in six villages, starting in Lilam and ending in Milam. The villages were selected based on the trekking route and the availability of time to map, ask questions of people in the area, and employ other Rapid Rural Assessment research methods.¹⁴

¹³ Zurick, David, Pradyumna P. Karan, and Julsun Pacheco. . *Himalaya: life on the edge of the world*. Baltimore: Johns Hopkins University Press, 1999.

¹⁴ Freudenberger, 1999.

2.2.1 Village-by-Village Findings

Lilam

In Lilam, the team observed elements of the water infrastructure located in the lower portion of the village where the Indo Tibet Border Police (I.T.B.P.) and tourist facilities are located. Observation revealed the following information about Lilam’s water system:

Table 2.1: Overview of water infrastructure serving Lilam Village

Project Description	Date	Current Conditions	Additional Findings
Stream origin possibly 1 or 2 springs located on slopes either north or south of village 4 access points (3 spigots, 1 pipe) 1 full and 2 empty storage bins (black plastic);	Not obtained	All access points had active flow; spigot located next to campsite had limited flow in early morning on day of observation (September 2008).	

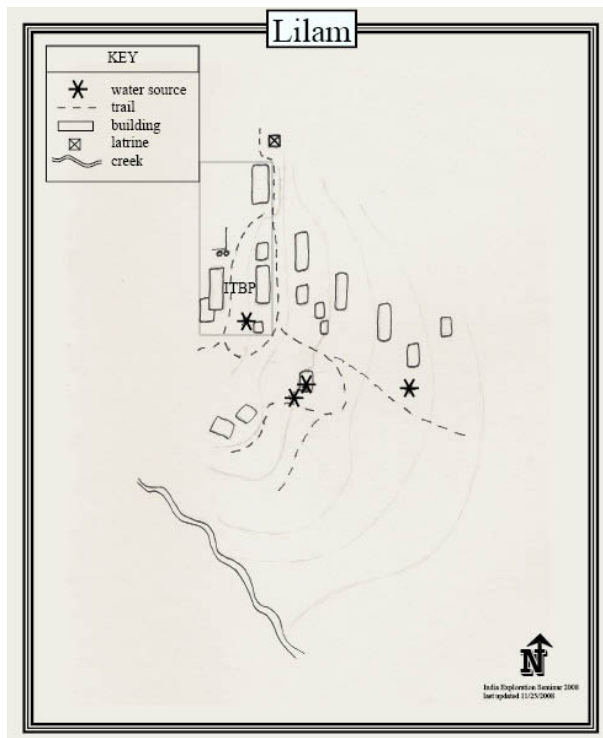


Figure 2.1: Lilam Map.

Rilgiri

Short observation during a lunch stop revealed the following information about Rilgiri’s water infrastructure:

Table 2.2: Overview of water infrastructure serving Rilgiri Village

Project Description	Date	Current Conditions	Additional Findings
2 black 1” rubber/plastic hoses from waterfall located south of village buildings 2” pipe directly out of rock wall on trail, just before reaching village	Not obtained	All access points were functional during observation (September 2008)	

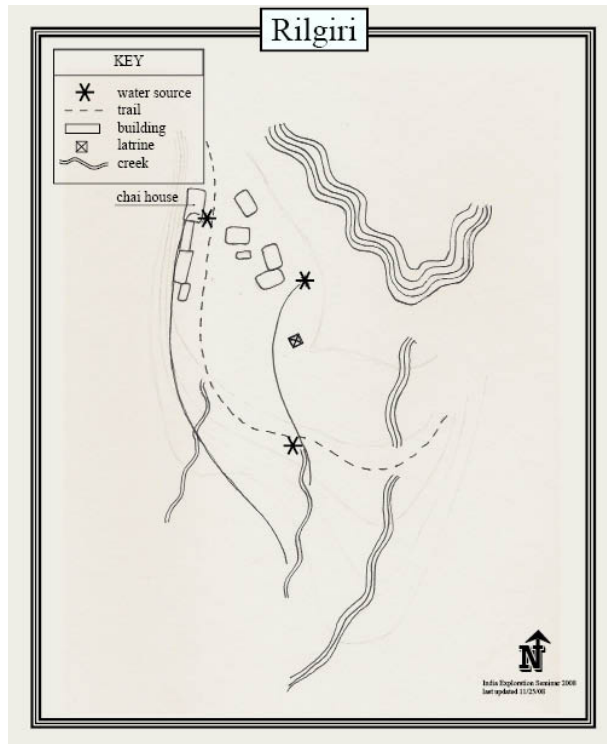


Figure 2.2: Rilgiri Map

Bogdyar

In Bogdyar, the team observed what appeared to be two water projects. However, the team was unable to conduct interviews to support these observations:

Table 2.3: Overview of water infrastructure serving Bogdyar Village

Project Description	Date	Current Conditions	Additional Findings
<p>Main water project (located south of tributary to Gori Ganga)</p> <p>Built by Munsiyari Van Panchayat and the Border Area Development Programme (BADP)</p> <p>Spring-fed source, likely on slope south of village</p> <p>1 concrete holding tank plus access point (overflow pipe)</p> <p>1-2” metal pipe from tank underground</p> <p>At least 2 spigots in village</p>	Not obtained	Active flow from overflow pipe; 2 spigots functional	The Border Area Development Programme is part of the comprehensive approach of Border management with focus on socio-economic development of border areas and to promote a sense of security amongst the people living there.
<p>Secondary project (located north of tributary to Gori Ganga)</p> <p>Unknown source</p> <p>2-3” pipe / access point</p>	Not obtained	Appeared functional; observed villagers using active flow from access pipe	

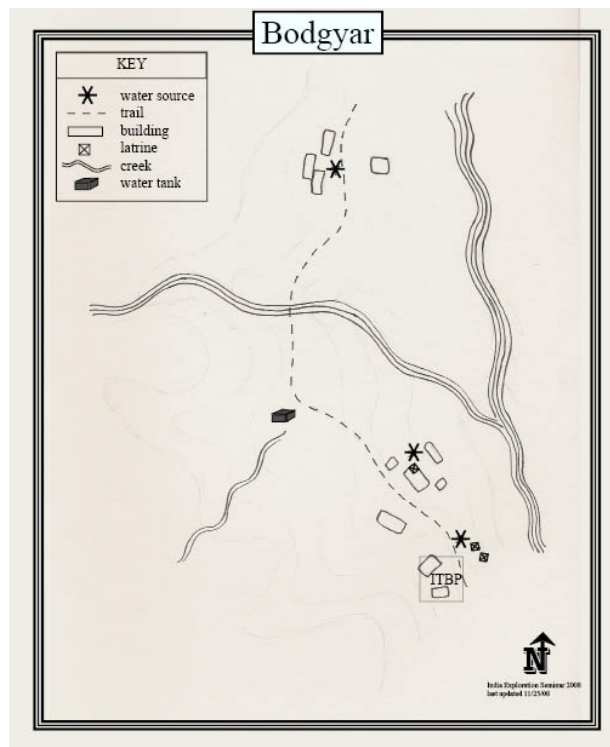


Figure 2.3: Bogdyar Map

Martoli

In Martoli, the team found evidence of three separate water projects that comprise the village's drinking water and agricultural irrigation infrastructure. Through direct observation, a focus group interview with villagers, and informal interviews with village residents including the head of the *Gram Panchayat* (village council) and the Treasurer of the Ecotourism Committee, the following information about the types, chronology and current conditions of those three projects was collected.

Table 2.4: Overview of water infrastructure serving Martoli Village

Project Description	Date	Current Conditions	Additional Findings
<p>1st Government Project</p> <p>Origin is groundwater/spring located on south-southwest slope above village</p> <p>1 concrete holding tank</p> <p>Collection points made of stone surrounded pipe source</p> <p>1-2" diameter metal pipe, that were meant to be buried approx. 1 meter underground all along the route</p> <p>6 village access points (spigots) (<i>Spigot shown in Figure 2.6</i>)</p>	1996	<p>Observed pipes above ground level; community reported breaks in pipes; system reported to not be reliable.</p> <p>3 of 6 spigots were working consistently at time of observation (September 2008).</p>	
<p>2nd Government Project</p> <p>Origin is groundwater/spring located within community forestland managed by the <i>Van Panchayat</i> (forest council), on south/southwest hillside above village.</p> <p>1 concrete holding tank (<i>Shown in Figure 2.7</i>)</p> <p>1-2" diameter metal pipe, designed to be buried approx. 1 meter underground</p>	2007 or 2008	<p>Observed pipes above ground level; community reported breaks in pipes; system reported to be not reliable.</p>	<p>Origin location within Van Panchayat land appears to provide protection to both the forest as well as the water source</p>

<i>Project Description (Martoli – Continued)</i>	<i>Date</i>	<i>Current Conditions</i>	<i>Additional Findings</i>
<p>Vineeta Hoon’s Project (Reservoir shown in Figure 2.8)</p> <p>Origin is snow-melt and/or monsoon season runoff from south-southwest hillside above village</p> <p>Concrete aqueduct conveys water to village</p> <p>It was reported that it includes a holding pond for irrigation of fields just south of village buildings,</p> <p>Project intended to include micro-hydroelectric power</p>	2005	<p>Water supply is seasonal and appears to run only during monsoon.</p> <p>Holding pond was observed to be dry (September 2008)</p> <p>Micro hydro project not currently functioning</p>	Observed trench that currently diverts water from aqueduct to Nanda Devi temple

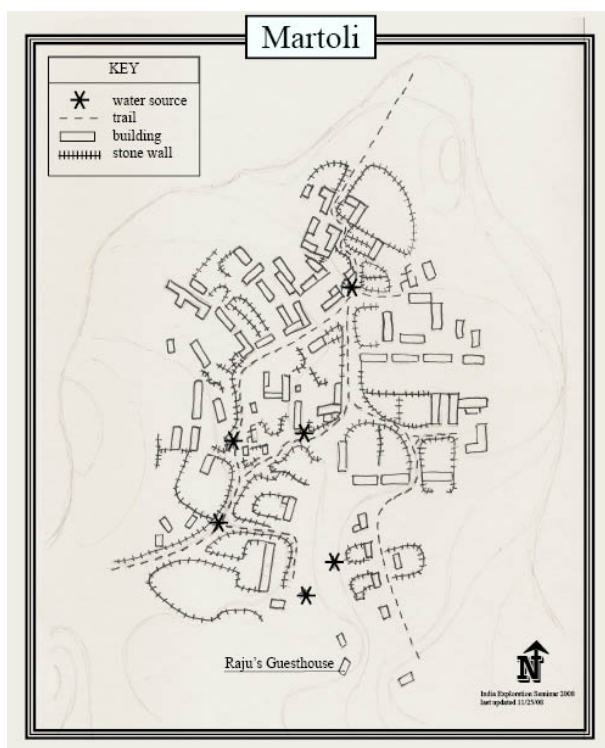


Figure 2.4: Martoli Map

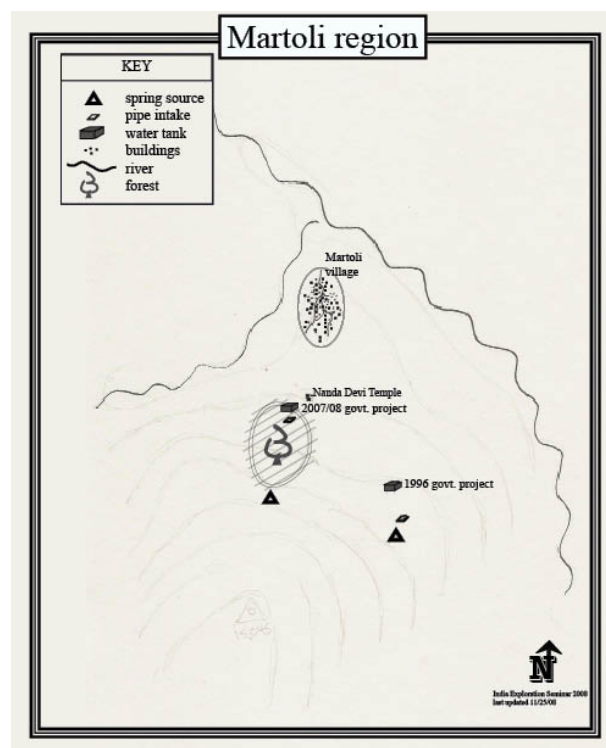


Figure 2.5: Martoli Region Map



Figure 2.6: Typical Spigot in Martoli Village

Various village members provided information about the management and maintenance of the water system. The leader of the Gram Panchayat stated that there is no money provided for maintenance of the government systems and that the community is responsible for seeking government assistance when the system breaks. A villager who brought the water resource team to the location of the first government project pointed out exposed pipes (that should be buried at least 1 meter underground) and a cracked, empty concrete holding tank. Focus group participants stated that they feel they are not able to effectively reach out to decision-makers regarding management of resources, and that they often do not hear back from “experts” who come to the village to investigate water issues. The member of the Ecotourism Committee suggested that money collected from tourism could, in the future, provide funding for ongoing maintenance or improvement of water infrastructure.



Figure 2.7: Concrete Holding Tank, Second Government Project

In addition to learning about current infrastructure, the team learned through the focus group and informal interviews that the sources and uses of water have changed over time. The Treasurer of the Ecotourism Committee said that Martoli historically (for approximately “200 – 300 years” prior to 1962) drew water from rivers and snowmelt through trenches leading into the village. There was also a water mill that was operational until several years ago, but it is currently no longer in use because there was not enough water to power it.



Figure 2.8: Reservoir from Vineeta Hoon project.

Some members of the community suggested that environmental changes might be affecting the volume and regularity of water reaching the village. When asked whether the villagers have concerns about the availability of natural resources, focus group participants stated that their biggest concern was melting glaciers and decreasing amounts of snowmelt. Participants said that they have observed these changes over the last 15 to 20 years. When asked whether any barriers to water access exist, focus group participants and the Treasurer of the Ecotourism Committee both stated that community members share water amicably.

Burphu

In Burphu, observations of elements of the water infrastructure were made and informal interviews with several villagers, including the leader of the Gram Panchayat, were conducted. There was evidence of two water projects that provide drinking and irrigation water to the village. Additionally, there was another set of projects designed to power two of three mill facilities - two are flour mills and one is a micro-hydroelectric facility - located below the slope south of the of the main village, along a major tributary to the Gori Ganga (called the “Kat Kuli River” by villagers).

Table 2.5: Overview of water infrastructure serving Burphu Village

Project Description	Date	Current Conditions	Additional Findings
<p>Government Project</p> <p>Origin is groundwater/spring from slope north of village</p> <p>2 concrete holding tanks</p> <p>1-2” metal pipe</p> <p>8 access points (spigots)</p>	1985	<p>Spigots mostly functional (exact count not taken)</p> <p>Concrete tanks cracked and empty</p> <p>System reported to break often?</p>	<p>Took 2-3 years for successful system operation</p>
<p>Secondary Project (not observed, mentioned only in interview)</p> <p>Origin is possibly slope southeast of village, across tributary (Kat Kuli River?)</p> <p>No other information obtained</p>	Not obtained	Not obtained	
<p>Micro Hydropower / Water Mills</p> <p>Series of 3 mills, one of which is also micro-hydropower facility (<i>Shown in Figure 3.10</i>)</p> <p>Origin is river flowing from Burphu Glacier (called Kat Kuli by one villager)</p> <p>Trenches divert water to and from mills</p> <p>Researcher Vineeta Hoon obtained funding for the hydropower facility</p>	Between 2005-2007	<p>2 of 3 mills are currently operational</p> <p>Hydropower facility currently not operational</p>	<p>Mills grind flour at rate of 25 kg/hour; cost to grind is 2 Rupees/kg</p> <p>Hydropower facility has capacity to power 25 bulbs</p>

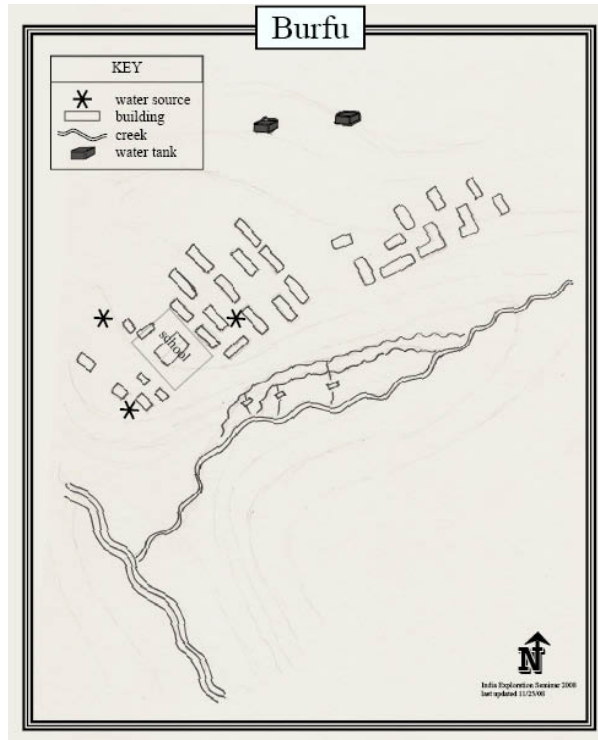


Figure 2.9: Burphu Map

Various village members provided information about the management and maintenance of the existing water supply infrastructure. The leader of the Gram Panchayat reported that prior to installation of the 1985 government system the villagers took water directly from the river. Villagers are primarily required to maintain the system themselves, or travel to Munsiyari to ask for assistance; a maintenance request from Munsiyari can take four to five months to accomplish. The leader of the Gram Panchayat also reported that a committee of the Gram Panchayat puts together an annual proposal for maintenance funding. This committee sometimes secures between 25,000 to 50,000 Rupees annually but is often denied funding altogether.

Through the interview with the leader of the Gram Panchayat the team learned that two of three flourmills are currently working. The mills were all constructed within one to three years of present and replaced prior mills that had washed away. The mills are privately owned. Researcher Vineeta Hoon obtained research funding to build the hydropower project on the mill owned by the leader of the Gram Panchayat. The hydropower facility had the capacity to power 25 bulbs when it was operational. The facility was reported to have worked only one time before it broke. The leader of the Gram Panchayat stated that it would only take “one day’s work” by several villagers to fix it. Villagers pay INR 2/kg to use the flourmills and the mills can grind up to 25 kg/hour.



Figure 2.10: Water Mills and Micro-hydro generator in Burphu

As in Martoli, Burphu residents also revealed that environmental changes such as the receding glaciers appear to be affecting the volume and regularity of water reaching the village. They however did not use the term “global warming” to describe these changes. Villagers also said temperatures in the valley have been rising and that this brings a greater number of people into the valley. They reported that increasing number of visitors or residents could potentially create a shortage of water supply in the future. The villagers interviewed in Burphu said that they do not collect fees from tourists, and that they had reservations about the ecotourism model put forth by Martoli.

Milam

In Milam, the water resource team learned about both historic and present-day water systems through direct observation and informal interviews. Interviews were conducted with village leaders, including the leader of the *Pani Panchayat* (water council), individuals scattered throughout the village, and representatives of an NGO that used to be active in the Valley, the National Tree Growers Cooperative Federation Ltd. The team found evidence of two active systems that provide water for household and irrigation uses, as well as evidence of irrigation and mill projects that are currently not operational or were never completed.

Table 2.6: Overview of water infrastructure serving Milam Village

Project Description	Date	Current Conditions	Additional Findings
<p><u>Government Project</u></p> <p>Origin is groundwater/spring from scree/rock slope (former landslide area) approx. 3 km from village</p> <p>2 concrete holding tanks</p> <p>1-2” metal pipes</p> <p>Serves several of 6 village access points (combination of government and NGO system)</p>	<p>1982, repaired in 1996</p>	<p>Functions intermittently;</p> <p>Requires villagers to shift exact source location based on available flows from scree/rock slope—</p> <p>Observed evidence of recent attempts to fix flow with sheet metal</p>	<p>Unclear how or where government system and NGO system are linked, but interviews indicate that linkage exists</p>
<p><u>NGO Project (National Tree Growers Cooperative Federation Ltd.)</u></p> <p>Origin is tributary east of Gaanka River</p> <p>Water conveyed from origin through 2” aluminum pipe suspended across Gaanka River (<i>shown in Figure 3.12</i>); ground-level pipe buried 1 meter deep</p> <p>Passes through 2 chambers, including filtration chamber</p> <p>Likely serves most of the 6 village access points (combination of government and NGO system)</p>	<p>2002</p>	<p>Flow to village currently working; irrigation to lower fields not functional</p>	<p>Pani Panchayat originated at project completion</p> <p>Exposed pipes are required to be drained and supply shut off during winter.</p>
<p><u>Canal / Mill Project</u></p> <p>Canal begins at Gori Ganga below village</p> <p>Approx. 2 ft wide, 1 ft deep channel carries water in meanders along lowest agricultural fields to water mill</p> <p>Mill is privately-owned</p> <p>Channel only used for mill, not for irrigation (due to siltation)</p>	<p>Last used in 1965 (?)</p>	<p>The canal is currently dry and is blocked by rocks at source.</p> <p>The mill is currently not operational</p>	<p>Mill reported to be up for repair next year, possibly with government assistance</p>
<p><u>Irrigation Project</u></p> <p>Project founder unclear</p> <p>4-6” metal pipes seen scattered around village and throughout Johar Valley</p>	<p>Not completed</p>	<p>Project never completed for several reasons: pipes were too large and heavy, and were delivered to wrong village (Lilam instead of Milam)</p>	

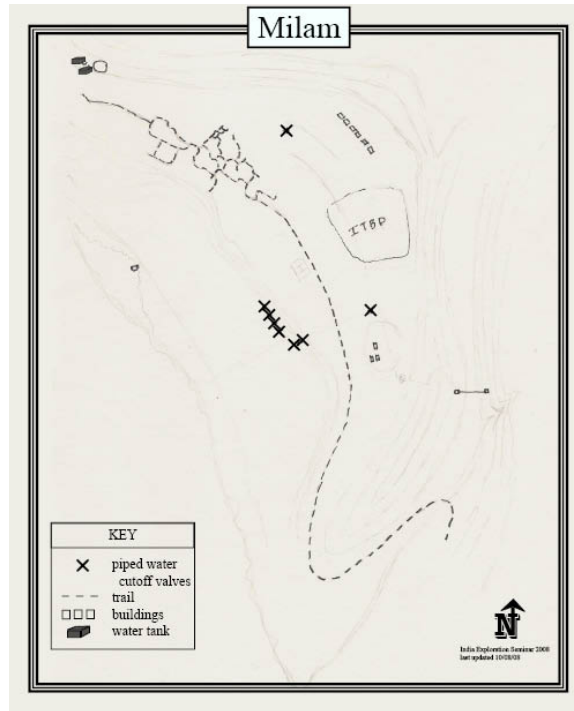


Figure 2.11: Milam Map

The two primary systems currently serving Milam village are the government system installed in 1982 and a project installed by the NGO National Tree Growers Cooperative Federation Ltd. Through interviews with villagers and during discussion in Munsiyari with a representative of the Foundation for Ecological Security (FES), it was learned that the two systems join through a valve and together provide water for both household and irrigation uses; however, it was not directly observed where or how this joining occurs. The government system installed in 1982 was apparently repaired in 1996 (and perhaps again in 2007), but continues to work inconsistently. Interviews also revealed that its location three kilometers from the village is considered a barrier to continued maintenance of this system.

The 2002 NGO system was planned for several reasons. According to the FES, water has historically been a challenge for Milam because no clean sources flow directly to the village. The only viable tributaries are located across substantial geographic features, like rivers and steep gorge. Interviews revealed that one historic water source was the *Dood Pani* (“Milk Water”) stream whose drainage is still visible across the Gori Ganga west of the village. The wooden aqueduct constructed by former Milam resident G.S. Pangti conveyed water into the village from a stream on the west bank of the Gori Ganga for only one to two seasons. Another historic water source was reputed to be 13 kilometers away but no additional information was gathered about this system.

Although it runs directly alongside the village, the Gori Ganga contains a high concentration of very fine

silt that is unsuitable for drinking and that destroys crops by leaving a thick coating of clay. The leader of the Pani Panchayat stated that the community felt the government system was unreliable because it depends upon a spring with inconsistent flow, and that prior to installing the NGO system they tested and attempted to fix the government system but ultimately chose to build the new project.

The 2002 NGO project is one (and perhaps the only) example found of a project that contains elements tailored to local conditions. The system origin is a waterfall located southeast of the village. Aluminum pipes (and other supplies, which took a total of three years to carry into Milam, all upon human backs) were at times set or buried into rock, then suspended across the Gaanka River to a ridge above the southernmost portion of Milam. Any in-ground pipes are buried to about 1 meter deep to avoid freezing. According to FES, the project was originally conceived as an irrigation project, so access points (spigots) were limited in number (six), and villagers were expected to carry or hook-up hoses to bring water to individual fields or homes. During the team's visit, the portion of the project serving the village and upland fields appeared to be working well, but the portion meant to irrigate fields below the village was not in use and apparently has never worked as planned.



Figure 2.12: FES built water pipe suspended across Gaanka River to serve Milam Village

Through observation and interviews with villagers, the team learned that Milam has a fairly unique system of managing and maintaining water infrastructure among the villages observed. The water system is managed through the Pani Panchayat that began service in 2002 concurrent with completion of the NGO project. According to the FES the NGO recommended formation of the Pani Panchayat in order to

facilitate cooperation among the villagers and to ensure that not any one person controlled the water system. During two separate interviews with the leader of the Pani Panchayat, it was learned that the Council is composed of five to six villagers, including one seat reserved for a member of the I.T.B.P. The primary responsibility of the *Pani Panchayat* is to coordinate preparation of the pipes for the winter season, which lasts approximately from November to May; prior to leaving for the winter, villagers drain water from exposed pipes to avoid freezing and cracking. The water system is restored once the villagers return. During winter the I.T.B.P. – currently the only full-time residents of Milam – resort to hauling water from rivers or melting snow while the water system is shut down. During the winter of 2003 the I.T.B.P. mistakenly opened the pipes, which resulted in the cracking and eventual replacement of nearly every pipe in the system.

The leader of the Pani Panchayat shared that the group has no annual budget, but both he and the FES representative confirmed that the committee was given a lump sum of 60,000 Rupees designated for maintenance after project completion. This sum is currently deposited in the Pani Panchayat leader's bank account, and he told the team that he is keeping this money in reserve to use for major repairs. The Pani Panchayat, therefore, does not allocate funds for ongoing maintenance. Villagers are expected – without any formal training or appropriate tools or materials – to carry out the routine activities and repairs required to keep the system running. The FES representative described three ways that Milam (and most other Johar Valley villages visited) receive projects or ongoing project maintenance: 1) make periodic requests to the government; 2) wait for periodic visits from the responsible department; or 3) become the recipient of politically-motivated projects (politicians see an opportunity to implement a project in an area that has little-to-no scrutiny as to its completion or ongoing maintenance). As with all villages explored, ongoing maintenance of water systems in Milam appears to be a persistent threat to water security.

In addition to learning about the installation and management of the 2002 NGO system through interviews, the water resource team also observed and translated two signs posted prominently at the entrance into the I.T.B.P. camp and Milam village; those signs, translated from Hindi to English, state:

“Foundation for Ecological Security Musyari has initiated this irrigation and drinking water scheme for Milam 14 Sep 2002. Mr. Kundin Singh Tolya – Block Head. Inaugurated on 14 Sept on Nandashtime [moon calendar changes each year].”

“Notice water council village Milam – villagers please note that water will be started when you arrive and shut off when everyone leaves. If you interfere with the water line in any way there will be an investigation and you will be liable.”

2.2.2 Additional Findings – Dam Projects

Through interviews with the Foundation for Ecological Security and villagers and observations throughout the valley, the team learned that several dam projects are underway. These projects are spread throughout the valley and are in the planning or early construction phases. From informal conversations with villagers and the focus group in Martoli, it was learned that little information has been made public about the projects. In the Martoli focus group, participants reported feeling unsure about how the dams will affect their lives and the village. One resident expressed concern about the environmental damage would take place from the dam projects that involve blasting holes in the valley cliffs to divert water. In talking to villagers about the dams, the construction of a road in the valley was also often raised. The government may build a road to facilitate construction of the dams, and most villagers felt optimistic that the road would improve their quality of life by allowing easier access the cities beyond the valley.

2.3 Discussion and Analysis

This section examines similarities and differences in water system challenges and responses in Martoli, Burphu, and Milam. To draw out common themes and noteworthy differences, this analysis looks at five components of water systems in the valley: system histories; water source characteristics; design, distribution, and access; maintenance; and infrastructure management.

2.3.1 System Histories

Water access and transport systems have evolved in a similar pattern in Martoli, Burphu, and Milam. Historically, villagers relied on dug channels or carried water directly from river sources. In Milam, for instance, women gathered water and washed clothes in a source half way between the river and the village. In the 1980s and 90s, the government installed one or more gravity-fed systems in each of the villages to transport water for household use. These systems have faced significant maintenance issues, both in the past and presently. Beginning in 2000, private parties initiated new water projects to serve various purposes, from agricultural irrigation to hydropower production. In Martoli and Milam, these systems appear to have fewer maintenance problems than the government projects. A result of this pattern is that the villages now have multiple and overlapping systems. Rather than repair, adapt, or dismantle old systems, new projects have tended to use fresh materials at new sites in order to take advantage of untapped water sources or serve different village needs. Pipes or channels from new systems connect with old projects, producing complex webs of intersecting systems. Villagers seem to lack a complete understanding of how systems interact, likely complicating their ability to diagnose and repair problems. Future water initiatives should weigh the benefit of constructing a new system with the cost of adding complexity to the overall infrastructure network.

2.3.2 Water Source Characteristics

As the government, individuals, and NGOs have worked with villages to build new water systems, they have used similar criteria in selecting water sources. No current system takes water directly from the Gori Ganga. The glacial water contains clay silt that smothers crops and is unsuitable for human consumption over the long-term; as a result, all villages are faced with the common challenge of needing to find reliable, non-silty sources for household and irrigation water.

Villages have responded similarly to this challenge. Each system takes water from tributaries outside the villages located at elevations higher than storage tanks. The sources are all groundwater – commonly referred to as springs by villagers – charged by either snowmelt or rainfall. These non-glacial tributaries are often unreliable, either changing output location or running dry for part of the year or permanently. When these fluctuations occur, villages are often spurred to build new systems. Martoli, for instance, previously relied on a spring several hundred meters west of the current one. This spring ran dry, and the village was forced to move its collection site. Similarly, the government water system in Milam takes water from a groundwater source that changes output location each year. While villagers correct for the movement every spring, this unreliable shift convinced the Tree Growers Federation NGO to tap a new source for the system installed in 2002.

The need to locate consistent, non-glacial tributaries will continue to be a shared challenge for villages in the future, particularly if climate change reduces snowmelt and rainfall levels. Villagers in Martoli and Burphu acknowledged that recent years have seen decreased snowpack, and they expressed concern about how this will impact water supply.

2.3.3 Design, Distribution, and Access

Because the government systems across all villages have similar goals – to provide water for household use – and are located in areas with similar landscapes and topography, they share the same materials and basic design. Water is collected in one to two inch steel pipes, drawn by gravity to concrete storage and/or filtration tanks, and piped to concrete spigots located in public spaces in the villages. Steel pipes are used rather than PVC pipes because steel does not break under the intense ultraviolet rays present at high altitude.¹⁵ The pipes should be buried at least one meter below ground to prevent damage from water freezing in the pipes during winter. The difficult terrain and lack of skilled labor and proper machinery has caused inconsistent adherence to this standard in all three villages. See below for a discussion of related maintenance issues.

¹⁵ An irrigation system constructed by a villager used an elevated PVC pipe in the same location as the current NGO system. The PVC pipe disintegrated after one season due to UV rays.

The systems initiated by private individuals or groups have designs and layouts that are unique in comparison to the government projects. The private systems have purposes broader and more varied than the government projects. In addition, the private projects are funded and designed by non-governmental parties that likely have greater flexibility, skill, and experience in developing innovative systems. The reservoir project in Martoli designed by Vineeta Hoon uses an open stone aqueduct and dug storage pool with the goal of providing water to the village year-round. The project may have also been intended to produce hydropower. In Burphu, private individuals created open water canals to run flourmills. One of the mills, also supported by Vineeta Hoon, has hydroelectric capacity.

The 2002 NGO system in Milam was primarily designed to provide irrigation water to the agricultural fields adjacent to and below the village. The system uses materials similar to the government projects, but follows a unique layout by placing hose access points at intervals throughout the fields, not just in the village proper. In addition, its design contains an innovation not found in government systems – villagers can access drainage points to empty the system of any water before winter. This reduces the risk of damage to pipes due to freezing. Finally, the system’s distribution network is distinct in that it provides water to the ITBP camp south of Milam. In creating the system, the NGO defined the community more broadly than designers of the government projects.

2.3.4 Maintenance

With shared climates, topographies, and construction and maintenance techniques, Martoli, Burphu, and Milam’s water systems have many of the same maintenance issues. This is particularly true among systems with similar purposes and designs. Leaks in storage tanks and pipes are present in all of the systems. Storage tanks often leak because concrete is difficult to pour properly at high elevation and in extreme temperatures. Breaks in steel pipes occur when water freezes in the pipes during winter, usually a result of the pipes being buried too close to the surface of the ground.

The unique elements of the private systems in each village bring their own set of maintenance needs. Water flowing through the aqueduct project in Martoli is constrained by cracks in the stone channels. In Burphu, the flourmill and hydro project do not work due to rust on the mill’s metal blades. Finally, the 2002 NGO system in Milam has never fulfilled its goal of providing irrigation water to the fields below the village due to technical problems with the system. Project designers have been unable to fix these problems, and this portion of the system is completely shut off. The maintenance needs require that the villages design and implement plans for managing system repairs.

2.3.5 Infrastructure Management

In general, the method of managing water systems, particularly repairs to the systems, appears haphazard and inconsistent. Maintenance issues are handled in one of three ways, although it is unclear which method is selected in which circumstance: (1) villagers fix the problem themselves; (2) a government representative visits the village and makes repairs; or (3) a village resident travels to Munsiyari to report a problem and request a government repair visit, which can take four to five months. Maintenance issues are sometimes exacerbated when villagers choose the first option. Residents who lack formal plumbing training can further complicate the system and make future overhauls more difficult. There is no evidence of training or transfer of information from government project managers to villagers.

Beyond these common methods of conducting repairs, the three villages use different committees to manage aspects of the water systems. In Martoli, the Van Panchayat oversees the forest from which the water source flows. Currently, the village Eco-Tourism Committee does not contribute toward the upkeep of the water system through fees collected from tourists. In Burphu, a committee from the Gram Panchayat petitions the government for maintenance funding. These requests have yielded up to 50,000 Rupees for repairs. In Milam, a water council of five to six village residents manages the 2002 system by shutting off and draining the pipes when residents leave in the fall and reconnecting the pipes when villagers return in the spring. The Tree Growers NGO endowed the council with 60,000 Rupees for major repairs; this fund has not yet been tapped.

2.4 Conclusions and Next Steps

2.4.1 Water Systems - General

The team's observations revealed that non-governmental project designs are generally more innovative and reliable over the long-term. Villagers do not receive training by which they can repair the systems installed by government sources. By working with various NGOs, villagers may be able to increase water security. This can be seen in the 2002 project in Milam, which (1) had one reported failure due to misuse rather than design and (2) managed to create a water council through the local village governance system to oversee finances and maintenance.

2.4.2 Management/Institutional Structures

The concept of the Pani Panchayat would not be difficult to extend to other villages in the Johar Valley. It is shaped similarly to the Van Panchayat forest resource management prevalent in the area. This familiarity with the Panchayat system by villagers would help avoid confusion. Some villages may even be capable of extending the Van Panchayat to take on Pani Panchayat responsibilities; this is already occurring in Martoli. The most recent water system in Martoli draws water out of a stream that emerges

from the ground just above the birch forest and run through it. The Van Panchayat limits harvesting and animal grazing in and around the forest, creating a possible increase in biodiversity. This microcosm of biodiversity and the related conservation benefits both water quality and quantity. Having the Van and Pani Panchayats work together might benefit both drinking water supply and ecosystem health, a model that could be replicated in other villages.

2.4.3 Opportunities for Ecotourism to Improve Water System Infrastructure

Another option for an administrative system of water system installation and maintenance could draw on the idea currently being attempted in Martoli by the Treasurer of the Ecotourism Committee. In this case a percentage of the funds raised by ecotourism are set aside for water system repairs. This model helps to create a greater relationship between the ecotourism and the local infrastructure, as funds raised by tourism are used for community development work. As stated before the village Eco-Tourism Committee has not yet contributed toward the upkeep of the water system due largely to local politics.

2.4.4 Further Questions and Next Steps

Under the broad topic of water in the Johar Valley, the research uncovered additional areas for future exploration. These include:

- Water quality: What is the level of water quality in each of the villages? Do the filtration systems in Martoli and Milam enhance water quality beyond simply removing large sediment? What role does the protected birch forest above Martoli play in protecting the water quality of that village? How does solid waste disposal (or lack thereof) impact water quality?
- Evaluation of water systems: Are the valley's water systems achieving the intended outcomes? Are funds for the water projects being spent in an effective and efficient manner?
- Management models: How could other villages adopt or modify Milam's Pani Panchayat system as a water management model? Is there potential for training villagers to adequately repair minor breaks in the system?
- Environmental changes: What historical water sources no longer exist? Why did these sources dry up? How might climate change impact future water supply?
- Tourist impacts on water: Will increased tourism overly burden the water supply and/or infrastructure? How might other villages adopt or modify Martoli's ecotourism model to help support water infrastructure?
- Dams: How, and to what extent, will the Gori Ganga river system change if the proposed dam project is installed? Are there existing viable models the villagers can use to ensure that they benefit from dam installation?

All these questions, and more, need to be answered before a thorough assessment of water systems can be conducted in the Johar Valley.

Finally, empowering villagers to manage and maintain their own water systems will likely decrease repair times, saving villagers from the inconveniences of hauling water from more distant sources. Because villagers lack the resources to cover costly (or even minimal) repairs, the fate of village water systems is left up to government and non-governmental organizations. While both types of organizations consider water projects in the area, they might consider ecotourism and the home-stay model in developing their proposals. Unfortunately, politics appears to exacerbate the problem in its attempt to solve it. This is seen with the Milam water system repair fund that sits frozen, held by the Pani Panchayat until a “big” repair in the system is needed. The dam projects in the area will likely bring roads that have the potential to provide easy access to maintenance of village water systems. Unfortunately, roads built to access a dam on the Gori Ganga River would not reach all villages. On the other hand, a road into the valley would still help upper villages by shortening walking distances. The village water systems in the Johar Valley are diverse, each filling the needs of its village based on the nearest or most reliable source. Villagers are involved in the implication and maintenance of these systems in varying degrees. Despite, or perhaps due to, shortcomings in all the water systems this study encompassed, there is potential for growth and sustainability.

3.0 BUILT ENVIRONMENT

Seminar Research Team

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3.0 BUILT ENVIRONMENT

3.1 Overview

The Johar Valley is located on the foothills of the northwestern Indian Himalayas, comprised of numerous small villages at various altitudes. In this report, the built environment team focuses on the villages of Martoli and Milam in *Malla Johar*—upper Johar, where the majority of time in the Johar Valley was spent. Occasionally reference to *Talla Johar*, which is the lower part of Johar Valley, south of Bogdyar is made.

Some of the larger villages in Malla Johar include Martoli and Milam, two villages this report will closely examine and analyze. More specifically, this section will document the current condition of the built environment and analyze what roles indigenous culture, village-scale politics, and unique natural environment play in shaping the built environment. This documentation will conclude with a preliminary evaluation of the capacity of these two villages, and the Johar Valley overall, to accommodate increased tourism and/or herb cultivation as means of economic growth.

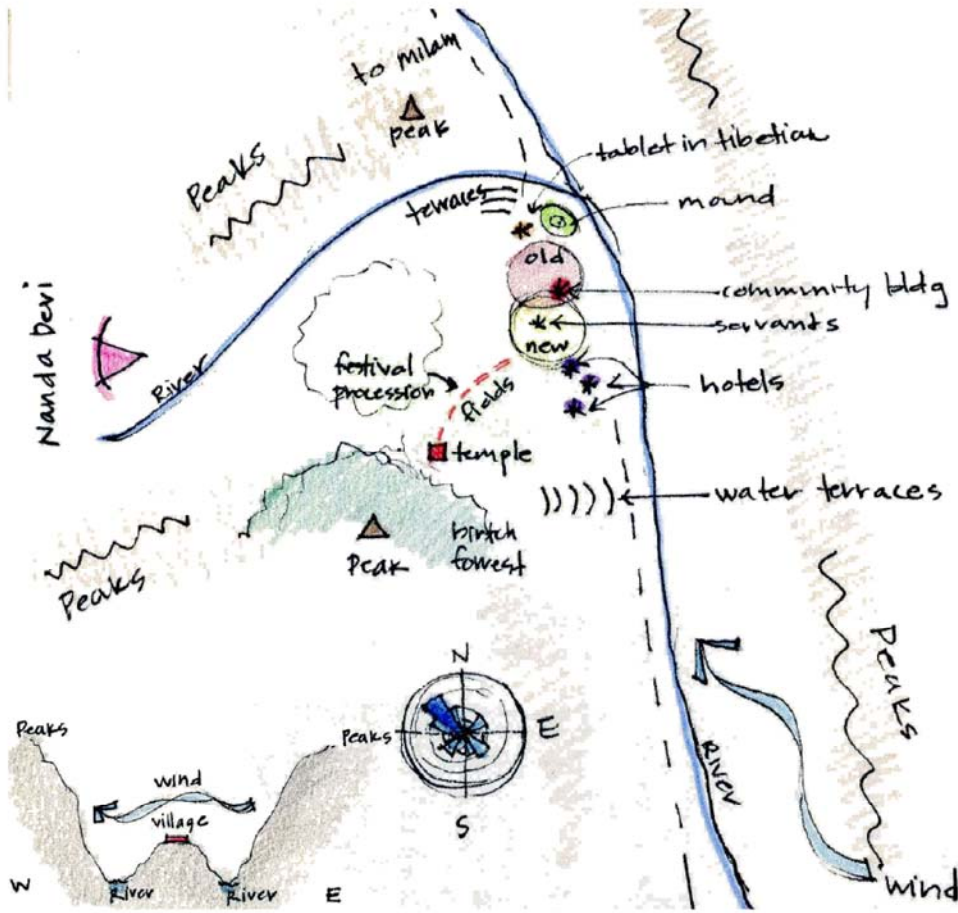
Due to the relative proximity of the two villages, they share similarities in architectural forms (building typologies), division between private and public spaces, and the functions of these spaces. Both villages have been established for centuries. As they developed over time, their limited resources restricted the construction materials of the built environment to mostly stone and minimal use of timber. The harsh climate and cultural practices in the region further influenced the layout of the villages and the architecture typologies of housing structures.

3.2 Martoli

3.2.1 Village Scale

Topography and Landscape

Martoli sits on a plateau of 16,000 feet in elevation, between the Goriganga and Lawan rivers, two of the major bodies of water in the Johar Valley. The village is highly vulnerable to harsh winds due to its elevation. Strong winds generally blow from the east, especially during the late autumn and winter months. (See Figure 3.1 Martoli Village.) Martoli's buildings are oriented in response to the direction of the wind, not adhering to Vaastu Shastra standards.



Martoli: Landscape

Old Martoli is situated to the north, New Martoli to the south. Most of the village's hotels are in New Martoli.

The village's temple is located up the mountain, within good view of Nanda Devi Peak.

The birch forest is maintained by the Van Panchayat Forest Council.

Wind generally blows east-west.



Within Old Martoli, streets are sometimes flanked by the high walls of the houses themselves, rather than by low stone fences.

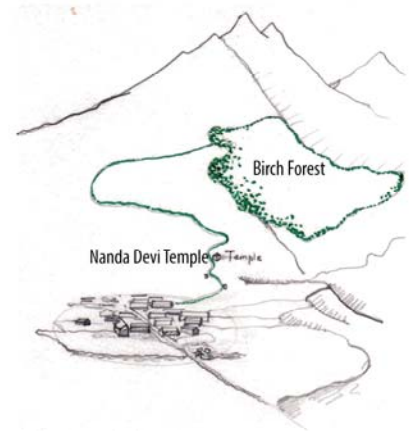


Figure 3.1: Martoli Landscape

The people of this area traditionally practice transhumance, the seasonal migration between winter and summer settlements. The harsh winters of Johar Valley are increasingly difficult for villagers, and like most villages, Martoli remains uninhabited during the autumn and winter seasons. In contrast to the varieties of agricultural crops that grow in abundance in the lower plains there is limited agriculture on the plateau where Martoli is located. The village has lost population since 1920s when economic and education opportunities in Munsiyari and the plains became available and attractive to the residents. The pattern of outmigration persisted until after 1962 when trade with Tibet was closed due to the war between India and China. Martoli has gradually lost population and today a small percentage of its original residents practice transhumance, returning to the village during the summer months.

Layout and Circulation

The settlement of Martoli is divided into two distinct parts. To the northwest lie the original settlements. To the southeast are newer developments, built sometimes after the 1920s with architectural influences from the hub town of Munsiyari. In this document, we refer to these two parts of town as Old Martoli and New Martoli. (See Figure 3.2.)

Houses in Old Martoli are often built in L-shaped housing complexes, oriented to shield the courtyards from easterly winds. Old Martoli is served by an intricate network of narrow paths with a hierarchy of public and private paths. Buildings are close together and clustered organically along the street, without clearly identifiable street blocks. Streets are flanked alternately by short walls and by the sidewalls of buildings, some towering as high as 13 feet over the street.

Historically two castes lived in separate neighborhoods in Old Martoli: Martolia, now a scheduled tribe (ST), and Harijan, a scheduled caste (SC). The Harijans were the servant caste of the Martolias and lived in a cluster of approximately 40 households at the outskirts of the original settlements. The people of the servant caste were not allowed to live in the village due to their status; they lived away from the higher caste villagers. The Harijan housing units are significantly smaller, in comparisons with larger multi-family units in the village center, and occupy an area at the edge of the village. Their neighborhood now marks the border between Old and New Martoli.

In contrast to Old Martoli, New Martoli houses are spaced further apart, and are connected by wider paths flanked by short walls. Not sheltered from any wind by neighboring buildings, they are oriented with doors and windows facing uniformly west. (See Figure 3.3.) This layout, with its wide lines of sight and straighter paths, is perhaps more legible to newcomers. Indeed, this part of town hosts more tourists with three homestay places, and ample camping space. Villagers who returned annually during the summer months constructed these new developments, mainly for personal accommodation. In recent years, tourism in the area has increased and homestays are one of the main sources of income for villagers.

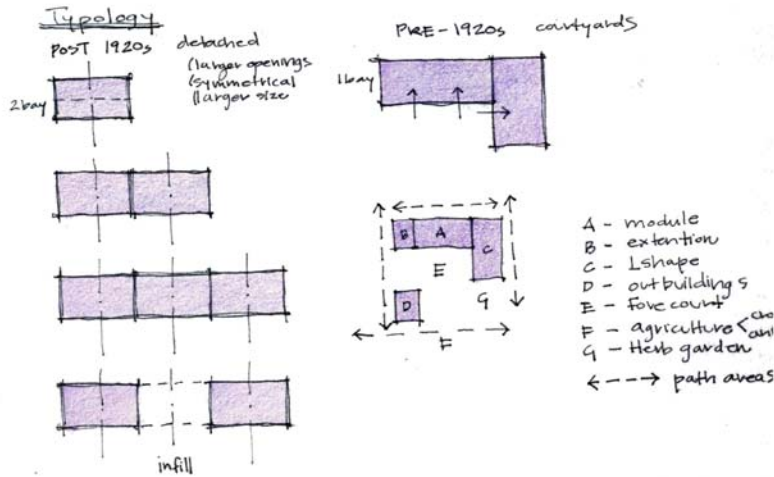


Martoli: Village Layout

- 1 Houses are often clustered around a shared courtyard.
- 2 Water spigots mark circulation nodes where people can be seen gathering.
- 3 A new community center was built in the 1990s at the site of the original community center.
- 4 Martoli's main street
- 5 KMVN Guesthouse
- 6 Martoli's "triangle"



Figure 3.2: Martoli Village Layout



Martoli: Neighborhoods and Building Layout

Left: diagrams of estimated building typologies in Martoli.

"Post 1920s" refers to houses found in New Martoli; as we were unable to find the reason for demarcating the border between New and Old Martoli at the 1920s, we have omitted the temporal distinction from our official report.

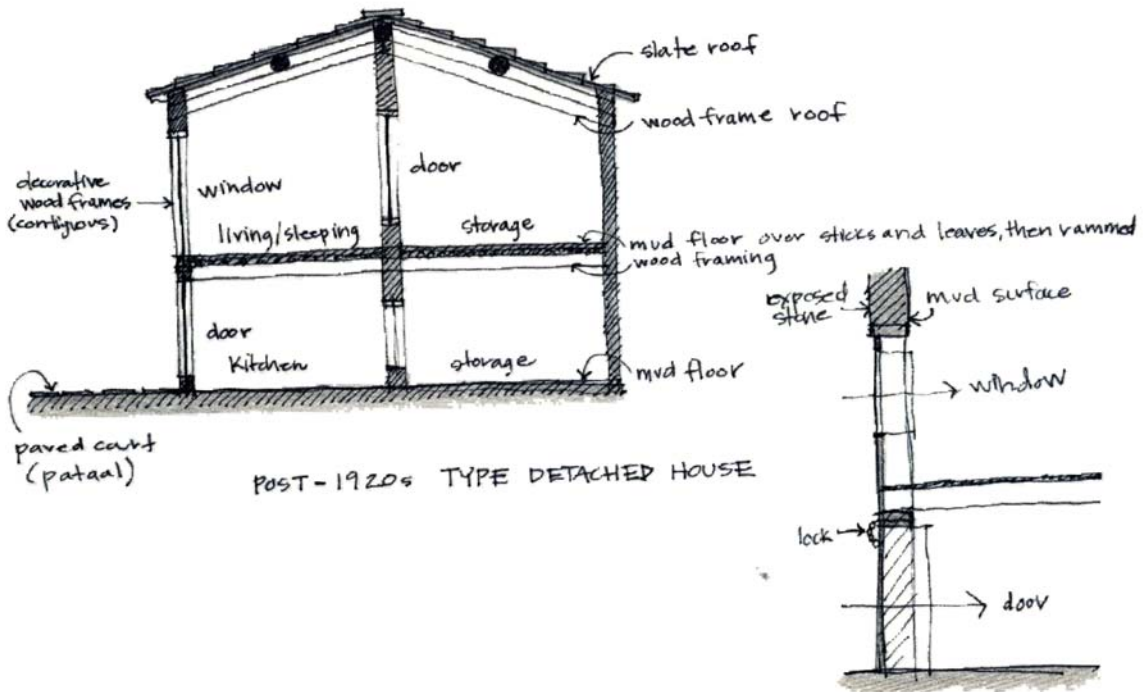
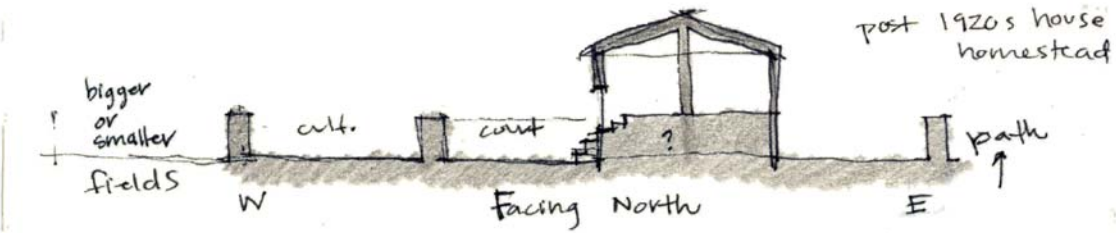


Figure 3.3: Martoli: Neighborhoods and Building Layout

Aside from the differences of private spaces between the New and Old Martoli, public spaces are still relatively uniform throughout the village. Streets and water spigots are general public spaces where villagers exchange conversation on a daily basis, and the paths widen in these areas to accommodate gathering. Notable gathering points for villagers include a cigarette store, the newly rebuilt community center, and—particularly in New Martoli¹⁶—the *angan* or the communal courtyards. (See Figure 3.4.)

3.2.2 Buildings

Traditional Construction and Layout

A traditional Malla Johar house may be described as a housing complex, which is divided into three to five housing units. Different households occupy each unit, although historically households sharing a complex belonged to the same clan. This makes it difficult to compare villagers' answers on the number of families living in a given village, as counts can be based on the number of kitchens, housing units, or housing complexes.

Building foundations are usually two feet deep and made of stone. The two-story walls, with built-in niches on the interior and wooden hooks on both sides, are constructed of coursed stone rubble and plastered inside with mud and cow dung. Some houses exhibit one-story annexes for additional storage or kitchen space. Others have timber projections on their exteriors under the roof eaves for drying and storing wood. Occasionally, buildings have stone treads that project out from the coursing (more common at end walls and at corners) creating access to the roof.

The ground floor of a house is made of rammed earth, sometimes coated with a dung plaster (*lipai*). A timber frame supports the upper floor. A layer of twigs is laid on top of the frame's joists, followed by a layer of dampha leaves, and finally three inches of mud and clay. Cow dung plaster (*lipai*) insulates and finishes the upper floor. (See Figure 3.5.)

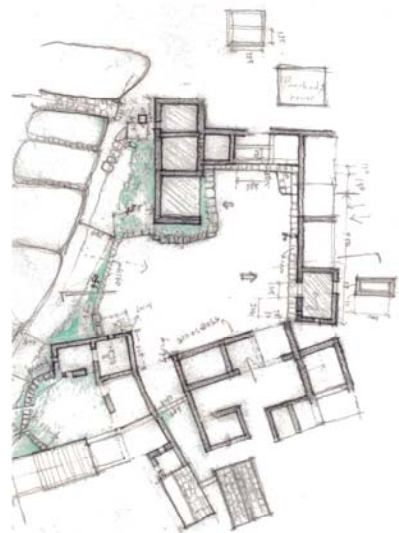
A room for the cattle, and kitchen, make up the ground floor. In older constructions, from the time when villagers wintered in Martoli, the bottom floor is sunken below ground level to help insulate the rooms from strong winter winds. Heat generated from cooking and from bovine body heat helps to warm the floors of the bedrooms above.

¹⁶ The angans are important gathering spaces in both New and Old Martoli; however, in New Martoli, the public space is more ambiguous. The angans provide a distinct sense of place that is also sheltered from the open windy areas.



Courtyards

Many courtyards have a special stone like this one on the left, with a depression carved into it. These were used as mortars for grinding seeds.



The *angan* is a communal space shared by multiple households within a complex. Once upon a time, this space had multiple entrances from the street and was almost always paved. These courtyards were used for recreation, weaving, and for drying and processing vegetables and meat.

Nowadays, many courtyards are fenced off, with the stone paving replaced by vegetable and herb gardens in lieu of terraced farming farther away..

Figure 3.4: Courtyards

Houses



The long horizontal beams of most traditional building frames are made of *raga* timber, sourced only from Bogdiyar in Talla Johar. *Raga* is longer, straighter, and more durable than locally available birch.



The ground floor of a house is made of rammed earth, sometimes coated with cow dung plaster (*lipai*).

A timber frame supports the upper floor. A layer of twigs is laid on top of the timber frame, followed by a layer of dampha leaves, and then three inches of mud and clay. *Lipai* insulates and finishes the upper floor.



The photo to the left depicts a typical structure, with a small opening on the ground floor, and a main door to the living room and bedroom above.

Windows to unused rooms are blocked with stones to minimize draft.

The photo below shows an example of elaborate doorframe carving and of the mud plastering used on the ground floor.



Figure 3.5: Houses

A wooden frame supports the slate roof in the traditional Malla Johar house. The long horizontal beams of this frame are made of raga timber, sourced only from Bogdiyar in Talla Johar. Raga is longer, straighter, and more durable than locally available birch, allowing for larger consistent spans.

The slate roof shingles are also traditionally locally sourced. Heavy snow, moisture, and freeze/thaw cycles require the roofs to need routine maintenance. Although they are very durable when properly maintained, without routine maintenance they tend to cave in on their own weight as seen in the abandoned structures in the village.

Decoratively, the roofs of houses are capped with white stones on their ridges. In both Martoli and Milam, these stones are symbolic of the Nanda Devi peak, while other villages in Johar Valley use similar stones to symbolize other peaks that are more sacred to them.

Windows and doors are much smaller in traditional constructions to shield the interiors from the harsh climate including strong and cold winds. The doors are only large enough for some person to duck through. Windows are sparse, often included as a larger assembly with the door. A few tiny windows (less than one square foot opening) are seen on end or back walls, and more towards the edge of the village.¹⁷

Raga wood, which is not only durable but also easy to carve, is used to construct traditional door and window frames. Historically, craftsmen hired from Munsiyari carved these frames into elaborate geometric forms inspired by leaves and flowers (see Figure 3.5). The oldest carved window in Malla Johar is believed to date from the 17th century in Milam Village. When villagers begin their annual exodus in September, they board up their windows to prevent theft by tourists and porters. The windows of many unused rooms are now also blocked out with stones.

Harijan Constructions

Due to their social standing, the Harijans, (lower caste) had no access to *raga* wood for long structural beams, their houses are limited in size to the length of a birch beam. They therefore have a small square footprint, with only a kitchen on the ground floor and sleeping quarters above.

Harijan houses¹⁸ are comprised of a cluster of modules with proportions closer to a square than a long

¹⁷ These windows could be intended more for visibility of their surroundings, than for light or ventilation.

¹⁸ The Harijan houses have been abandoned for sometime, and were mostly no longer intact. Therefore these conclusions are speculative and limited.

rectangle (the majority of the houses), reflecting the use of limited materials with shorter structural spans. These modules consisted of a single room above a lower room, similar to other typologies, but shorter and smaller, and with heights also likely limited by material availability. There is only one very small opening into each space, and no evidence of woodwork. In some, if not all, cases the modules were attached – making use of a shared center bearing wall, and a more efficient use of resources. In addition to the nuclear family, grandparents also lived with the household in these small houses. The Harijans also had no agricultural property or garden space.

Constructions from New Martoli (late nineteenth-early twentieth century)

Buildings built in the last century reflect a change in the seasonal patterns and lifestyles of Martoli's residents. Since they are built after residents began wintering in Munsiyari, these newer houses have larger doors and windows, a reflection of both their thermal needs and the influence of the lower valley forms. New Martoli houses are also built on larger lots, with an extra bay added to the rear of the house, extending both the kitchen on the ground floor and the bedroom above.

Recent Construction

Two buildings in Martoli that are a departure from traditional typologies and methods are the government-operated Kumaon Mandal Vikas Nigam (KMVN) guesthouse, still under construction as of September 2008, and the new community center built in the 1990s. The KMVN is located in New Martoli, while the community center is at the site of the former community center in Old Martoli.

The KMVN guesthouse¹⁹ is similar in massing to the detached dwellings of New Martoli and is constructed of coursed stone, but the stones are adhered heavily with mortar. The windows and doors are significantly larger than traditional models. Their pattern and positioning are entirely foreign and face into the wind, rather than away from it as do all the other buildings of New Martoli. The building sits as on a single level on a stone plinth, without the traditional stoop that would lead to an upper level.

The community center²⁰ sits on a plinth near the highest part of the village. It is highly visible not only because of its positioning, but it is a larger scale building surfaced in white plaster, and topped with a flag. The community center is comprised of two rooms of unequal size with multiple larger doors and a variety

¹⁹ At the time of observation, this guesthouse was under construction. The final detailing, surfacing, and roof design was unknown. The possible use of the traditional angan typology in this design is not yet known. Further study of these completed designs to traditional buildings would be valuable.

²⁰ The community center is a unique typology that was not examined as a part of this research. It does appear to have a similar form to school buildings that are also newer constructions in the valley – note Milam and Burphu.

of window sizes and locations. One corner of the building is open, creating a covered porch. A small stone outbuilding sits adjacent to the larger structure, forming the edge of a small raised plaza, extending the space of the porch. Grooves and markings in the stone surface of the plaza show evidence of traditional games being played here.

3.2.3 Uses Of Space

The kitchen is primarily a women's space. They are responsible for most domestic chores including cooking and cleaning. They fetch water and firewood needed for cooking. The kitchens have very small openings for temperature regulation, and as a result the ventilation is poor. This causes thick deposits of soot on the ceilings and upper areas of the walls as well.

Agricultural chores are shared by both women and men in the *angan*, or courtyard, of each housing complex. The *angan* is communal space used for drying meat, threshing grains, and grinding seeds and herbs, as well as for playing, chatting, and weaving. The flat stone paving of many *angan* includes one special stone with a deep indentation, carved out to serve as a mortar. Here, women pound herbs and seeds with a five-foot wooden pestle. Some *angan* have a small herb patch, which is a more recent development and in some instances placed in front of the entrance to the lowered kitchen. This helps to decrease the size of the doorway and block more wind.

The boundary between a family's private space and the public street is clear, as traditional *angans* sit below street level (mostly in the older cluster construction of Old Martoli) and are further set off by low stone walls and stairs. The front doors of many houses are also oriented away from the main path, thus offering privacy to the residents.

3.2.4 Farms

Herb cultivation is an important component of life in Malla Johar. Some important herbs are *kala jira*—black cumin, which some villagers sell for INR 200 per kilogram—and *gandrani* root, which is used in cooking and also to treat stomachaches. *Jimbu* garlic chives fetch INR 200 – 300 per kilogram for the villagers and are sold in Munsiyari for INR 350/kg. *Meeta atis* is another common herb, used both in cooking and for its medicinal properties²¹.

Although the outskirts of Martoli are covered in terraced farmland, most farming now takes place directly around the houses, in the interstitial spaces that were once courtyards or vegetable plots. In front of the

²¹ See Community Economic Development section for details on herbs.

entrances to the houses themselves, these plots also help to block out some of the cold winter drafts.

As villagers begin migrating to their winter homes in September, and tourist season continues through November, herb theft by porters has become a growing problem. The villagers have attempted to counter this problem with tourism regulations; this will be covered in later sections.

3.3 Milam

3.3.1 Village

Topography and Landscape

Milam is the largest village in Johar Valley. It is surrounded on all four sides by mountains. The village sits on a lower, flatter tongue of land just above where the Goriganga and Gonkha Rivers converge. A small ridge along the eastern edge orients the village more to the west with lower fields along the Goriganga River, and upper fields near the edge of the village. The large area of lower fields were once cultivated, but are now mostly abandoned, while some of the upper fields are still in use. The predominantly easterly wind is low in intensity and does not appear to strongly influence the layout of the village or orientation of houses. (See Figure 3.6.)

Layout and Circulation

There are six neighborhoods and seven castes in Milam. The Raawat settlement is the oldest, and continues to serve as the village center. This “center” incorporates a street intersection that villagers refer to as the town square. (See Figure 3.7.)

The network of streets and public spaces in Milam is very sophisticated, incorporating a variety of routes, intersections, scales, and details – hinting at a more bustling and lively time in Milam’s past. The intersections of some of the main streets have public gathering spaces, where the space widens and seating is usually incorporated. They are enclosed by plantings and furnished with stone benches. The streets are mostly paved with stones and flanked by low walls on either side.

Milam: Landscape

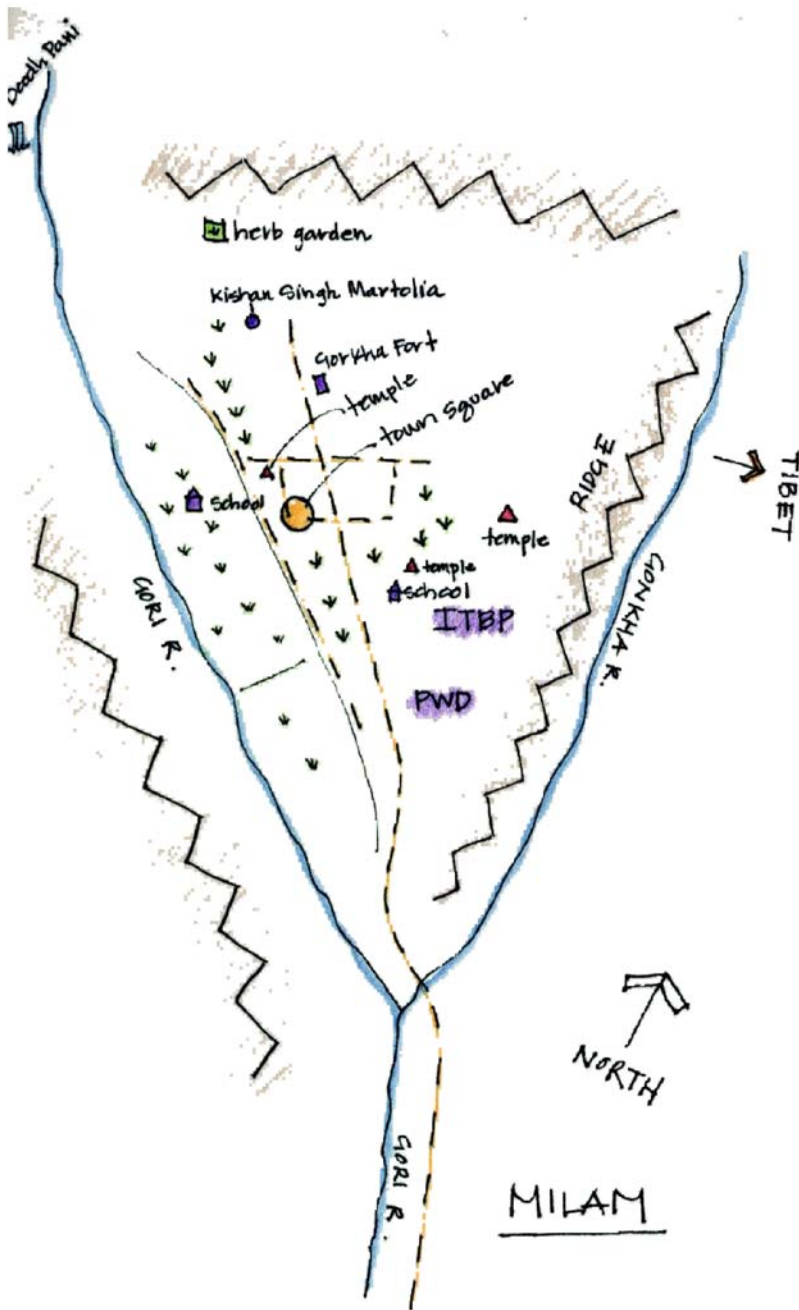
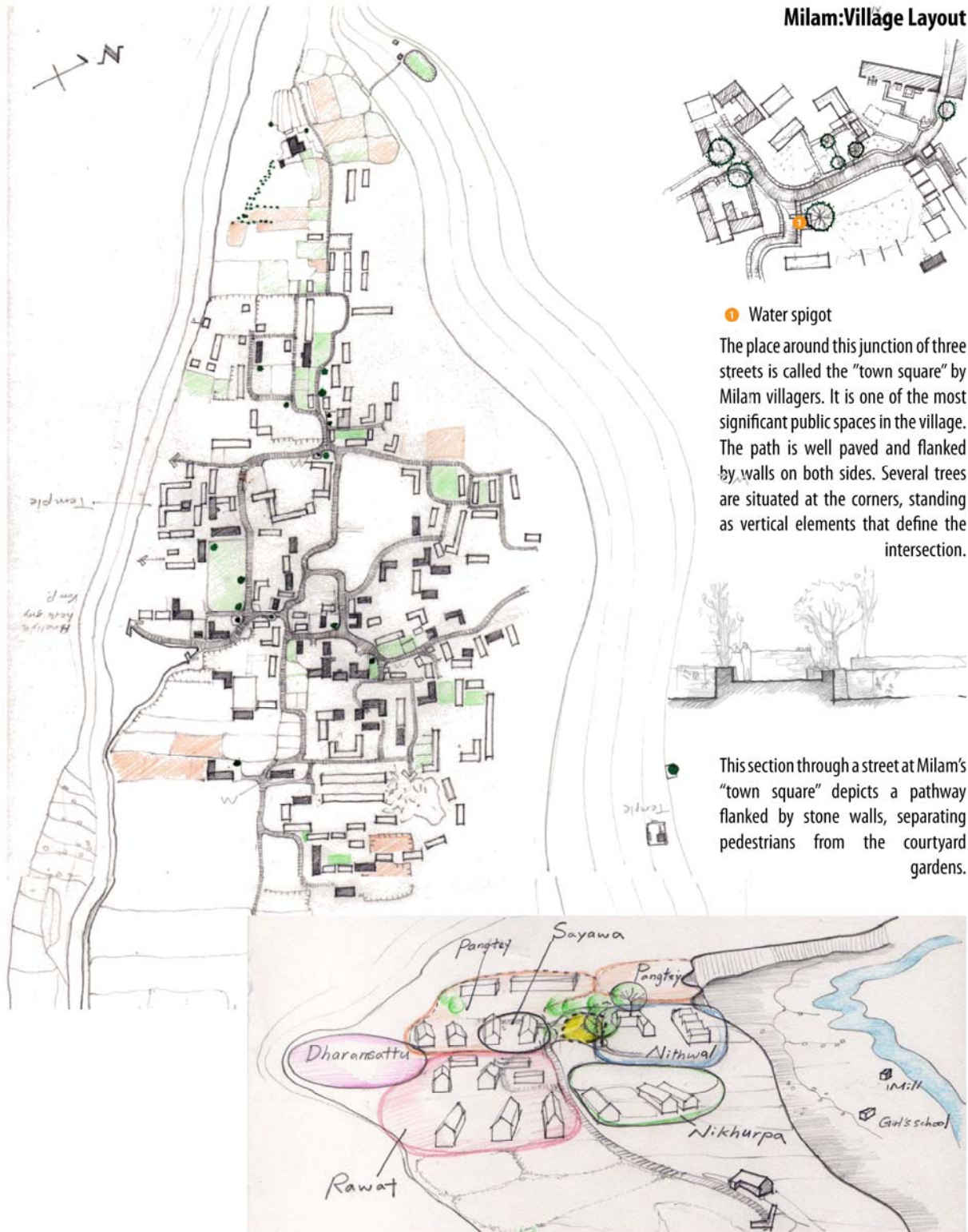


Figure 3.6: Milam Landscape



Milam:Village Layout

Water spigot

The place around this junction of three streets is called the "town square" by Milam villagers. It is one of the most significant public spaces in the village. The path is well paved and flanked by walls on both sides. Several trees are situated at the corners, standing as vertical elements that define the intersection.

This section through a street at Milam's "town square" depicts a pathway flanked by stone walls, separating pedestrians from the courtyard gardens.

Figure 3.7: Milam Village Layout

3.3.2 Buildings

Traditional Construction

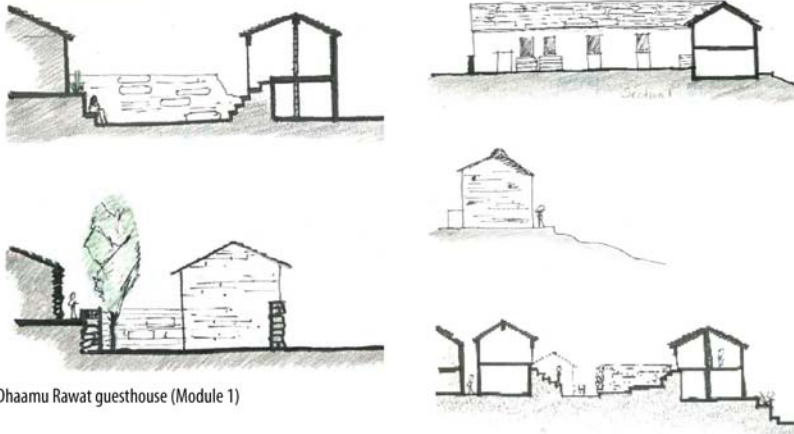
The houses in Milam are similar to those in Martoli, in scale, form, and construction. They are primarily a series of housing clusters. One notable difference is the prevalence of a white plaster on the walls of many houses in Milam. This plaster is a white mud sourced near the river, and gives a clean appearance to the walls.²² Some of the carved woodwork has been painted in Milam, unlike in Martoli.²³

Milam is the only multicaste village in Johar Valley not including the Harijans in Martoli who were there to serve the Martolias. The different castes in Milam (Raawat, Pangtey, Sayana, Nitwal, Nikhurpa, and Dharamsattu) are organized in several neighborhoods of which Raawats are the most influential. (See Figures 3.8 and 3.9.) They were the first community in Milam, and their clusters occupy the northern and central parts of the village. One building of note here is the Gorkha House, a former jail that was originally built to serve as a small fort with underground tunnels holding arms and ammunitions. The weapons are now held in Munsiyari, but the structure still holds a lot of historic relevance. The Pangtey houses tend to be oriented inward into courtyards, and are generally perpendicular to the main arterial. The Sayana houses are located between the Pangtey and Raawat neighborhoods, and tend to sit below grade. The Nitwals moved to Milam at a later stage and their neighborhood is located in the southeast quarter of the village, facing the river. The Nikhurpa cluster of houses is arranged in a more legible layout, in row houses stepping down towards the river. These houses resemble buildings in New Martoli, with larger openings and uniform orientation. Finally, the Dharamsattu households are dispersed in clusters with connected courtyards.

²² Some guesthouse owners in Milam plan to shift away from using this traditional plastering material, since tourists complain about the dust on their clothing when they brush up against the walls. Another modification that one guesthouse owner made to the traditional housing layout was to move the kitchen upstairs, to make it easier to serve guests. If buildings are restored in Milam, they might take on a different look compared to any restored buildings in Martoli, since many of the elaborately carved window frames in Milam houses were used one winter for firewood by the ITBP.

²³ Painting the woodwork has been seen in other villages, mostly in the lower valley in buildings that are occupied. This may be a more recent practice (noted in its prevalence in occupied buildings), as a means to protect the aging wood or it could be a new aesthetic fashion.

Milam: Neighborhoods and Building Layout



Dhaamu Rawat guesthouse (Module 1)

Far left: Module 1 building typology

Near left: Module 2

Module 3



Module 4

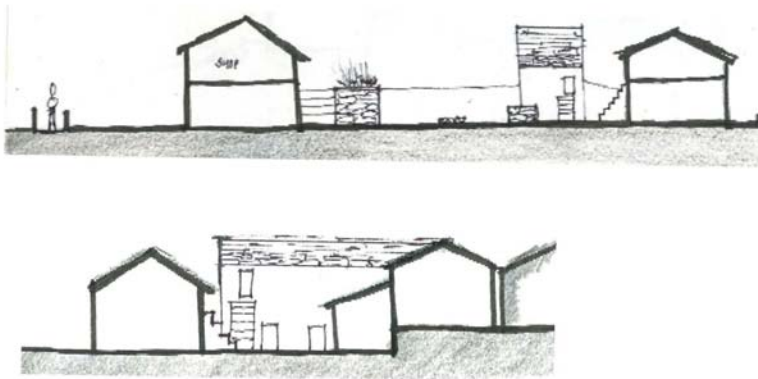
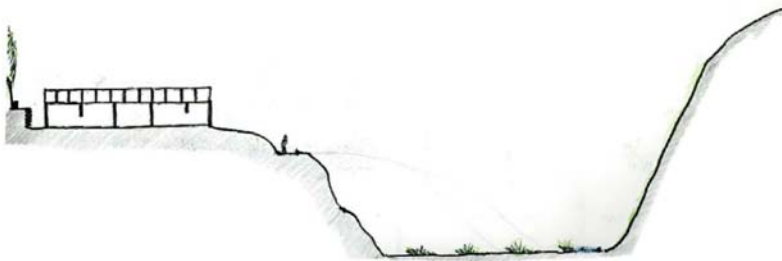


Figure 3.8: Milam Neighborhoods and Building Layout

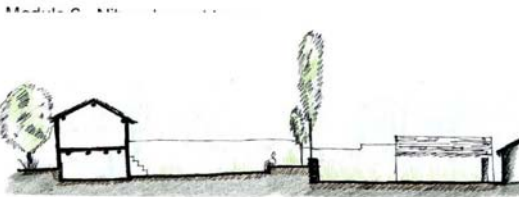
Milam: Neighborhoods and Building Layout



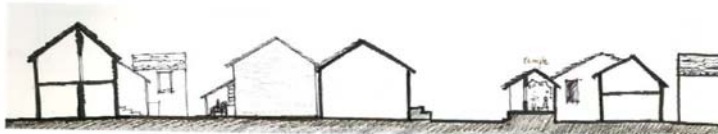
Module 5: house in Sayana neighborhood



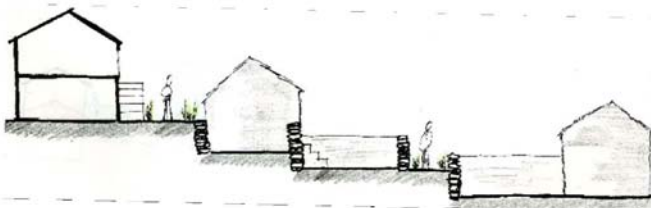
Section through Nitwaal neighborhood, showing landscape



Module 6: guesthouse in Nitwaal neighborhood



Section through Nitwaal neighborhood



Section through Nikhurpa neighborhood

Figure 3.9: Milam Neighborhoods and Building Layout

3.3.3 Farmland

Although fields by the river have been abandoned, farmland in the upper fields of Milam near the dwellings is still in use. This contrasts with Martoli, where farming at the outskirts of the village has virtually disappeared. Figure 3.10 depicts the contrast between the larger-scale farming in these former agricultural fields—with plots often shared piecemeal among multiple families after someone leaves them behind—and the small-scale gardening directly around dwellings.

3.4 Vision for the Future

3.4.1 Key Players in the Built Environment

National Hydroelectric Power Corporation and Road Construction

Although the sacred nature of the Ganga River has previously delayed hydroelectric dam construction in Johar Valley, dam construction projects are now underway. A road is expected in Johar Valley all the way through Milam, by some accounts as early as 2012. The villages along the Johar Valley are expecting increased economic opportunities as a result of this, primarily in the form of tourism, herb cultivation, and wool products.

Most villagers that the built environment team spoke with see this as a positive outcome, bringing greater possibilities of luring children back to live in the villages. Some villagers, however, voiced concerns that outsiders may largely reap the economic benefits of the new infrastructure or that the increased tourism will also increase incidences of small-scale theft and destruction in the village.

Kumaon Mandal Vikas Nigam

The state government's Uttarakhand Tourism Development Board oversees both Garhwal Mandal Vikas Nigam (GMVN) and Kumaon Mandal Vikas Nigam (KMVN), which implement the tourism board's policies in Garhwal and Kumaon, respectively. Both GMVN and KMVN run independently of state funding; they generate their own revenue through state-operated adventure tours and guesthouses.²⁴ In the city of Nainital, for example, interactions between KMVN and non-KMVN-operated guesthouses are largely limited to the collection of a luxury tax for hotels with room rates of over INR 1000 per night.²⁵

²⁴ Berry, Jeewan C. Phone interview, 5 September 2008.

²⁵ Personal interview at the Uttarakhand Tourism Development Board offices (then named the Uttaranchal Tourism Office), 30 August 2008.

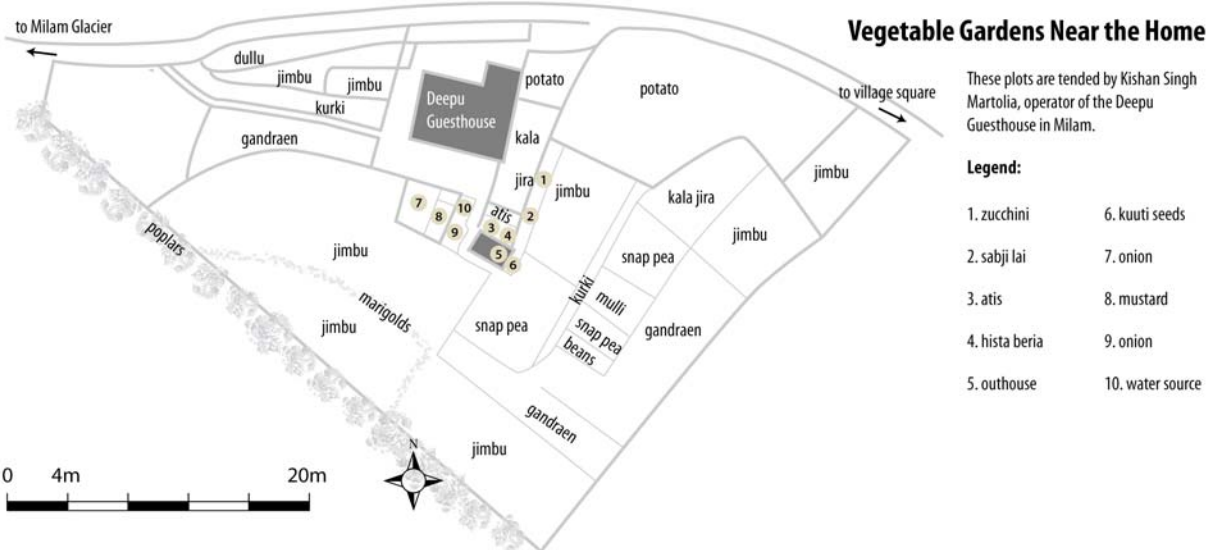
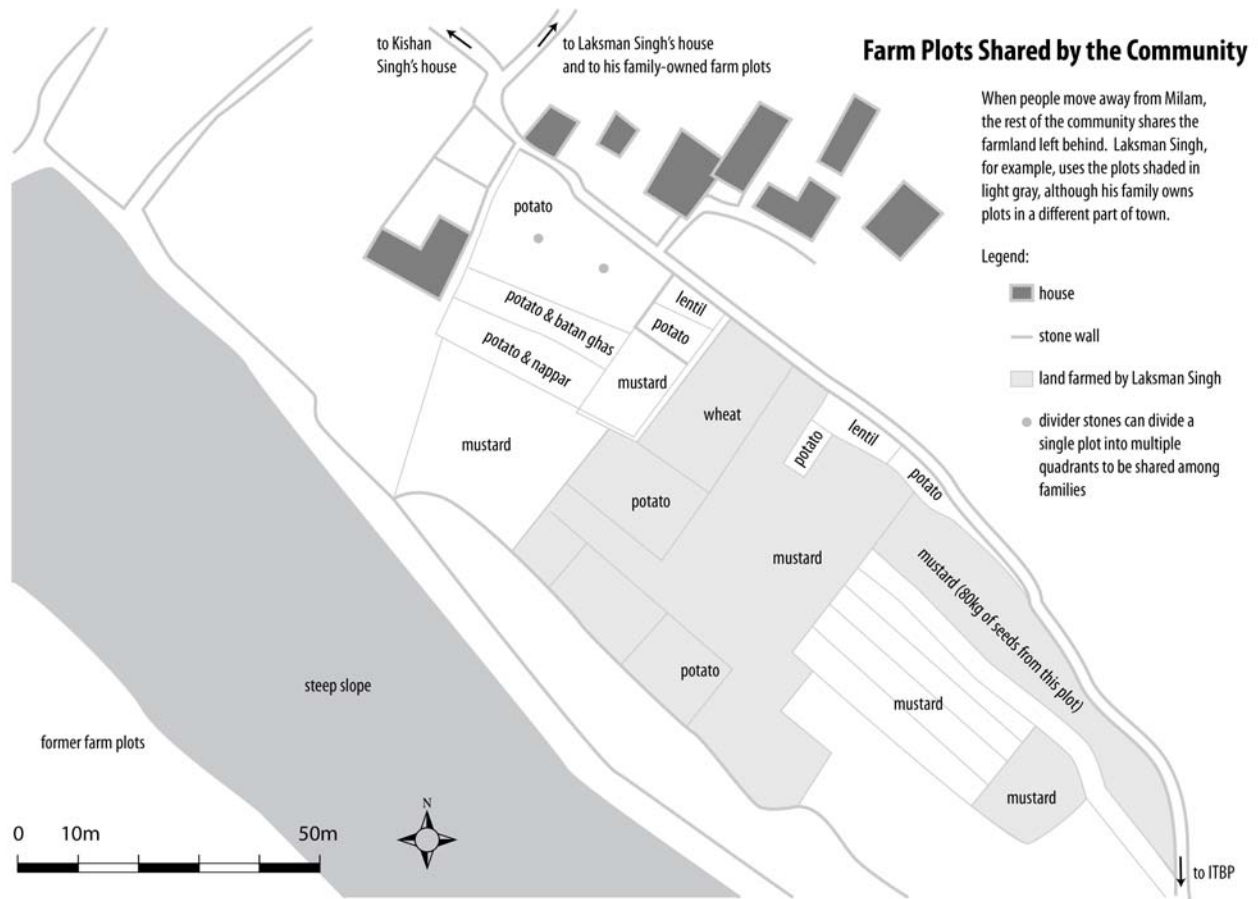


Figure 3.10: Farm Plots Shared by the Community

A recent development in KMVN's guesthouse franchise is a string of guesthouses in Johar Valley, built to accommodate the growing tourism. This includes guesthouses in both Martoli and Milam.²⁶ These guesthouses are being constructed under private agreements with individual property owners, and the villages at large do not expect to profit from these ventures.²⁷

In the district of Nainital, the Uttarakhand Tourism Development Board is developing pilot rural tourism programs in the towns of Padam Puri and Arikalas. These programs are based on guidelines set by the Government of India and by the World Tourism Organization, in recognition of the potential of village life to attract foreign tourists in particular. These programs include the development of "software"—the training of villagers in hospitality, handicrafts, and Kumaon cuisine promotion—and "hardware"—the establishment of a community center and KMVN accommodations. These accommodations will eventually be handed over to the Gram Sabha, the village's elected head.²⁸ It is still unclear how the outcome from these pilot programs would be measured, and whether the state's rural tourism program will be expanded into Johar Valley or not.

Van Panchayat

Each village has its own elected Van Panchayat, or Forest Council. They have been boosted greatly by a recent grant from the state for INR 500,000 per village, over five years, to maintain their forests and water supplies and to plant new trees. For comparison, since Martoli's Van Panchayat was founded in 1975, it has only generated INR 150,000 on its own in sheep and property taxes. Using these state funds, villages have planted new seedlings, and some have erected walls to protect seedlings from livestock. The hope is that the villages will eventually be self-reliant with timber production.

Gram Panchayat

Due to low population numbers, one Gram Panchayat (Village Council) governs all seven villages west of the Goriganga River in Malla Johar: Laspa, Rhilkhot, Martoli, Luang, Mapa, Gangar, and Bachu. Another governs Kilanch, Tola, Burphu, Bilju, and Milam, which lie east of the Goriganga.

Each village must therefore share the annual INR 200,000 (approx. \$4000) in state funding for Gram Panchayats with the other villages in the jurisdiction. This leaves Martoli, for instance, with a little less than INR 28,600 (approx. \$600 per annum) in government support. Even then, the Gram Panchayat must

²⁶ KMVN brochure.

²⁷ Pankti, Durga Singh. Personal Interview, 13 September 2008.

²⁸ Berry, Jeewan C. Phone interview, 5 September 2008.

still petition the District Magistrate for any changes to the built environment that it would like to make—for example, renovating a community center—using this money.²⁹ This potentially removes from the village governments a sense of direct control over their built environment when in fact they could have a greater role in determining and implementing historic preservation guidelines. This would help maintain a cohesive village identity as it adapts to the changing economy that new development might bring.

Village Ecotourism Committees

Recently, the Uttarakhand Tourism Development Board requested that all twelve villages in Malla Johar prepare for an increasing tourist base by developing strategic plans to maintain a healthy environment that will continue to support their agricultural and nomadic livelihoods. Although the tourism development board requested that all twelve villages in Malla Johar form ecotourism committees, only one is known to exist at time of writing: Martoli's Ecotourism Samiti. This committee's charter establishes some ground rules aimed at addressing tourism-related changes to the community and environment. Committee members agreed to enforce a INR 15 – 25 overnight fee for tourists, while also enacting a flat fine of INR 1000 for environmental damage—from litter to the removal of stones from a stone wall, to theft from herb gardens. Revenue from these fees will first go into registering the committee as an organization, and then into building western-style public toilets. To date, however, the committee has not yet enforced the environmental fine, and has enforced the overnight fee only inconsistently. Enforcement is difficult. Not only is it near impossible to trace theft to a specific party, but also the current guesthouse operators are not politically allied with the ecotourism committee, making even tourist registration difficult to enforce.³⁰ Until there is more collaboration among all stakeholders in tourism development in Martoli, the committee will likely have insufficient political power to enforce rules.

An atmosphere of disagreement and strong wills dominate many other efforts towards collaboration in tourism development throughout Malla Johar. In Milam, for example, competition among guesthouses makes it impossible for guesthouses to even advertise, as billboards and signs disappear overnight.³¹

Landowners

Nearly all landowners in Malla Johar belong to scheduled Bhotiya tribes. As such, their land can never be sold to a non-Bhotiya outsider. An outsider who wishes to develop a guesthouse or other facility in Malla Johar must partner with a property owner there, as KMVN has done in Martoli.

²⁹ Pankti, Durga Singh. Personal Interview, 13 September 2008.

³⁰ Pankti, Durga Singh. Personal Interview, 13 September 2008.

³¹ Martolia, Kishan Singh. Personal Interview, 18 September 2008.

Malla Johar is a complex web of properties and ownership. Individual families hold fifty of the 150 hectares of land in Martoli; the rest is publicly owned and managed by the Van Panchayat. Many individual family plots, however, have been abandoned for multiple generations, with hundreds of relatives now laying claim to the same piece of land. This makes it difficult for any individual family member to modify a house, as he must first receive the approval of all relatives with a claim to the house.

Since many houses require heavy restoration before they can be livable again, most abandoned houses will likely remain that way unless more legal support is provided for individuals who would like to renovate or restore jointly owned property.

3.4.2 Economic Development and Historic Preservation

The future of Malla Johar's built form will depend on the realities of responding to the changing economic demands of a valley that may soon see a road for motor vehicles. It could be expected that there will be an increased capacity to bring to market the herbs that are cultivated in the valley, as well as a busier tourist industry.

The built environment team mapped some farmlands as a base for calculating the capacity of available land for specific herbal crops (see Figure 10), however the results are not conclusive, as more work is needed to formulate recommendations for Malla Johar's agricultural economy. The new developments in Johar Valley should also be carefully weighed against their potentially negative impacts. The natural and built environment of the area is extremely fragile, and new development should be sensitive of the unique natural, cultural, and historic resources of the valley. An important next step would be to outline appropriate development goals and guidelines that are sensitive to these resources. Historic preservation can be an important tool to help maintain or reverse the decay of the unique structures in the valley, but also serve as an economic catalyst for community based cultural tourism.

In determining the appropriate direction for the built environment in response to growing tourism, the built environment team assessed (1) the expectations of tourists to Johar Valley, and (2) the ability of the villages to meet those expectations.

Tourist Expectations

A group of trekkers from West Bengal spoke of Himanchal Pradesh as a good model for mountain tourism, with its wide selection of both modern and primitive facilities. Tourism in Himanchal Pradesh is advanced through two organizations: a state-owned tourism development authority, and the state-facilitated Himalaya Tourism Development Corporation. If the Johar Valley region takes cues from Himanchal Pradesh for tourism development, more modern facilities in the future can be expected.

Meanwhile, the town of Sarmoli, near the base of Johar Valley, has a homestay program that aims to improve the livelihoods of existing residents. This program has chosen to forgo a diversified portfolio of lodging options, emphasizing instead those that are reflective of local building traditions and livelihoods. As a base for excursions into Johar Valley, Sarmoli may set a tone for tourists' expectations of Johar Valley that is quite different from the Himanchal Pradesh model.

Tourist expectations of Johar will also certainly be heavily influenced by KMVN's branding of their guesthouse program in the valley. More work is needed to determine whether KMVN plans a rural tourism program similar to those being launched in Nainital, or instead wants to develop something to add to its current portfolio of adventure mountaineering, skiing, and kayaking that is already scattered throughout the Kumaon region.

Villager Response

How villagers have already begun modifying the built environment in response to tourism is another indicator of tourist expectations. The most palpable village-level response to increased tourism is the construction of public toilets. Burphu already has public toilets, while installation of new western style toilets is the first target of the revenues expected by Martoli's Ecotourism Samiti. Burphu's next priorities include improving the hiking trail to Burphu Glacier and addressing litter in order to maintain the cleanliness of village spaces.³²

Individual guesthouse owners have also modified their individual dwellings in order to attract tourists. Dhamu Rhawat of Milam moved his kitchen upstairs; streamlining the cooking process and protecting his guests from smoke. He has also plastered his walls in white mud to make them appear cleaner.³³ Another guesthouse owner in Milam, Kishan Singh Martolia, has landscaped his front courtyard with some decorative flowers, and stated that his future renovation priorities are to: (1) install a more reliable water source, (2) create a tin-roofed lean-to in front of the house for sitting outside in the rain, and (3) modernize the bathroom. The most common request from his guests, meanwhile, is a chimney for the smoke from the kitchen.³⁴ These all indicate high-priority modifications on traditional homes if the volume of tourism increases.

3.4.3 Conflicts and Recommendations

Martolia's comments are indicative of a clear conflict between tourist expectations and the ability of the

³² Personal interview, Gram Sabha (Van Panchayat chief) of Burphu village. 15 September 2008.

³³ Personal interview, Dhamu Rhawat. 17 September 2008.

³⁴ Personal interview, Kishan Singh Martolia. 17 September 2008.

village today to fulfill those expectations. Knowing that his guests prefer slate roofs, for example, Martolia would like to maintain them, but it is economically infeasible to do so, as the regulations around stone quarrying make slate expensive and hard to obtain. Alternatively tin has emerged as a popular roofing material that is affordable and easy to transport; its popularity can be expected to increase when paved roads make it easier to transport.

If traditional construction were part of tourists' expectations of Johar Valley, it would benefit the valley's economy for lawmakers to modify such laws that make historic preservation difficult. Another action that the state government can take to encourage traditional construction in Johar Valley is to assist village Van Panchayats in maintaining their timber forests, or means to procure structurally important *raga* wood, which can be sourced only lower in the valley in Talla Johar and which now, due to scarcity, fetches a prohibitively high price.³⁵

The government might also subsidize villagers to maintain the roofs of other peoples' houses that have been abandoned. Since roofs cave quickly without routine maintenance, and since abandoned houses can cost INR 150,000 to restore,³⁶ it may be cost-effective to maintain existing structures in anticipation of future demand.

In order to determine how much investment in historic preservation is worthwhile, the Uttarakhand Tourism Development Board or KMVN should promptly conduct studies to detail the expectations and hopes of the targeted tourist population in Johar Valley. These findings should then shape design guidelines and development regulations for villages, and shape new tourist infrastructure likely to come to the Valley with the development of the road. It is important to recognize that accommodations can echo traditional construction while still catering to modern needs. As Laurie Baker's work in India has demonstrated, traditional materials (mud, brick, and stone) can be used effectively in new construction using environmentally efficient manufacturing technologies.³⁷ With a conscious effort to respond to the local climate and need using time-tested local techniques the new architecture in Johar Valley can embody what Baker calls an "honesty and truth in the choice of materials and the method of using them."³⁸

³⁵ Pankti, Durga Singh. Personal Interview, 13 September 2008.

³⁶ Personal interview with an unnamed Burphu villager who restored his house after ten years in Munsiyari, 15 September 2008.

³⁷ Bhatia, Gautam. Laurie Baker: Life, Work, Writings. New York: Penguin Books, 2003. p. 242.

³⁸ Bhatia, 248.

4.0 PUBLIC HEALTH

Seminar Team

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4.0 PUBLIC HEALTH

4.1 Overview

The public health section of this study focuses on three topics: (1) access to health care, (2) the availability and use of different types of health care, including Ayurvedic, allopathic, and homeopathic care, and (3) the availability and use of emergency care and women's health care in the Johar Valley.

Questions that address these foci are presented in Appendix B. Specific issues addressed in these questions include:

- (1) availability of health care in the Johar Valley, including the proximity of villagers to these health care facilities, specifically in terms of women's health and emergency care;
- (2) public, private and Non-Governmental Organizational (NGO) health care structure in the Valley, involving some reference to this structure's relationship to (a) the neighboring districts, (b) the state system in Uttarakhand, and (c) the national health care system;
- (3) perceived health care needs among villagers; and
- (4) villagers' current preferences for allopathic or Ayurvedic medicines.

Where relevant, questions about specific public health issues such as indoor air quality, prevalence of specific diseases, health education, and sewage treatment were included. Because one of the primary research questions of this study focused on the viability of ecotourism in the Valley, the public health team also attempted to assess the availability of health care for tourists in the region. Finally, the team conducted a preliminary exploration of medicinal herbs grown and used in the area (see Appendix D).

The methodology used in this study was based on interviews, focus groups, and observations. The public health team conducted research in the following villages of the Johar Valley: Munsiyari, Martoli, Burphu, and Milam. In Munsiyari, an administrator of the public hospital and a local biologist were interviewed. In Martoli, the public health team participated in a focus group with approximately fourteen villagers, an interview with three older women, and an interview with a group of adventure tourists from West Bengal State. In Burphu, a focus group with thirteen women of various ages and an interview with the village pharmacist were conducted. In Milam, interviews were conducted with an individual who runs a homestay and grows medicinal herbs, three porters, four village women, the village midwife, and a high-ranking official of the Indo-Tibetan Border Police Force's (ITBP) Milam station. In addition, interviews were held with NGOs and public and private health and social service providers in the Almora and Nainital Districts. The purpose of this was to better understand services provided in the area and to obtain information about models that may be applicable to address the health and emergency care issues identified in the Johar Valley.

The public health team primary findings in this study indicate an overall lack of access to medical care and health education in the Johar Valley, particularly with respect to female practitioners and emergency care. In locations where there were medical practitioners, there appeared to be considerable limitations to the quality of care provided and an apparent absence of any form of evaluative measures for quality of care. Although there appeared to be a public health care structure and many health care policies, the actual delivery of health care by the public system seemed far more limited than the stated policies.

4.2 Findings

4.2.1 Structure of Medical Care Services

The public health care structure in India is characterized by state level administration. Public services in the state of Uttarakhand involve a hospital in Nainital, a clinic in Almora, medical services at ITBP posts, and pharmacists and midwives posted in rural villages. Private services in the region include the Dena Hospital, which is located about eleven kilometers outside of Almora. Non-Governmental Organization (NGO) services include clinics and health camps run by Aarohi and the Central Himalayan Rural Action Group (known as “CHIRAG”).

National Level: Delhi

The national level requirement states that the minimum level of training for any health care provider posted in the Valley must be at least that of a pharmacist. The National Rural Health Mission sets forth the national goals for public health in rural areas like the Johar Valley. The following are national level programs and/or mandates:

Indo-Tibetan Border Police Force (ITBP) – The ITBP has a strong presence in the Johar Valley, with posts located in Milam, Bogdyar, Lilam, Rilkote, and Munsiyari. The border patrol is required to provide medical care, services, and medications free of charge to inhabitants of the Valley. The medications available from the ITBP are primarily basic treatments for inflammation, pain, fever, and mild infection. The ITBP also runs medical health camps once every two to three months. These camps provide basic health care and diagnostic services for inhabitants of the Valley. If a health problem cannot be addressed at the camp, the individual is referred to Munsiyari and is transported there by stretcher. The ITBP’s budget is two lac (10 lac = 1,000,000 Rupees), which is roughly equivalent to \$5,000 United States Dollars (USD). The ITBP also helps to maintain the trail system in the Valley, as the trails are the main means of transport and certainly must be navigable in the case of an emergency.

Border Area Development Program (BADP) – An ITBP official indicated that the BADP is responsible for the development of the region near the Indo-Tibetan border and for the welfare of the

people living in this area. This program aims to develop the infrastructure of remote border areas and to enhance security for local populations living in “sensitive border areas.” It applies to all of the states with international borders and is a way of enhancing India’s security via a “demographic buffer.” The program emphasizes a participatory approach and the use of surveys to assess the needs of local populations in these areas. The BADP’s intended outcome is to develop the border areas to the same level as the rest of the country. The program is centrally funded and emphasizes state-level administration, although programs can be carried out by a variety of institutions and groups such as the state government, the central government, central paramilitary forces, volunteer agencies, and district or traditional councils.³⁹

National Rural Health Mission (NRHM) – This was mentioned on a few occasions during interviews. It is a national program that was established to address the poor state of the health care system in rural areas. The overarching goals of the NRHM are to improve the quality of health care and to increase access to health care, especially for underserved populations such as rural inhabitants and women. The NRHM addresses a wide variety of health care issues and aims to increase district level administration of health care programs, while also emphasizing community involvement. Uttarakhand is one of the 18 states listed as a priority of the NRHM. In addition to increased spending on health care, some unique aspects of the NRHM are that it calls for a female health activist for each village and focuses on strengthening the health care system that is already present in order to meet the Indian Public Health Standard. Overall, the NRHM plans to increase funding for health care and to direct this funding to programs specific for rural areas.⁴⁰

State Level: Uttarakhand (Capital: Dehra Dun)

Much of India’s health care structure is administered through state level policies and mandates. The state is given direction by the national government regarding certain health care service requirements, but the majority of services (clinics, practitioners, emergency services) are driven by state level decision-making. The following are known provisions in the State of Uttarakhand:

Community Health Center (CHC) - The State of Uttarakhand administers mandates to the CHC. Under the Indian Public Health Standard (IPHS), a CHC is a hospital that includes 30 beds and forms part of the secondary healthcare structure in India. The function and authority of each CHC involves providing

³⁹ “Border Area Development Programme (BADP): Revised Guidelines.” Ministry of Home Affairs & Department of Border Management, 2008. [http://planning.bih.nic.in/news/Chap.-5\(1\)&20BADP_Guidelines.pdf.pdf](http://planning.bih.nic.in/news/Chap.-5(1)&20BADP_Guidelines.pdf.pdf)

⁴⁰ “National Rural Health Mission (2005-2012): Mission Document.” www.nposonline.net/pdf/policies/Document_on_National_Rural_Mission.pdf.

secondary healthcare structure in India. The function and authority of each CHC involves providing specialist care and referral care for patients from the primary health centers (PHCs) under it.⁴¹ The CHC is responsible for placing midwives in villages, and the villagers' petitions for changes or additional services in any particular area of the Valley must be administered through the CHC. There is a CHC located in Munsiyari, as well as three others in the district of Pithoragarh.⁴² In the time from 2007 through 2012, the State of Uttarakhand plans to establish 35 new CHCs. The theme of this five-year plan is "health for all".⁴³

Ambulance Service – In June 2008, a program was initiated to make eight ambulances available for emergencies in the state of Uttarakhand. It is now being reported that additional ambulances have been added to the fleet.⁴⁴ The ambulances can be accessed by dialing "108" from any local telephone. Drivers, who are not medically trained, are dispatched and an estimate is given to the caller regarding how long (how many hours, days) it will take for the ambulance to arrive. There are also some private ambulances in the state, such as at Aarohi.

Auxiliary Nurse Midwife (ANM) – ANMs are a category of female health care provider for India's rural population. They provide many types of care, including reproductive care, immunizations, infectious disease care, and sanitation. ANMs have 1.5 years of training and their placement location is determined by the CHC.⁴⁵ There are policies indicating that an ANM should be placed in the Johar Valley but the one ANM who was placed there has left her post and has not been replaced.

District Level: Pithoragarh

The District Magistrate (DM) is located in Pithoragarh, which is the capital of Pithoragarh District. In addition to monitoring Border Area Development Programs, the following elements of the Johar Valley's health care structure are directed by district level management, although it should be noted that this list is not complete given that we did not visit Pithoragarh and more research in the area is necessary.

⁴¹ "Indian Public Health Standard." National Rural Health Mission. <http://mohfw.nic.in/nrhm/iphs.htm>.

⁴² "Community Health Centre." Department of Medical Health & Family Welfare. National Informatics Centre. <http://gov.ua.nic.in/health/chc.html>.

⁴³ "Uttarakhand Health & Population Policy." Department of Medical Health & Family Welfare. National Informatics Centre. <http://gov.ua.nic.in/health/health%20policy.html>.

⁴⁴ Saini, Ravindra. "Emergency health initiative in Uttarakhand." eUttaranchal. 23 Sept. 2008. WorldPress. <http://www.euttaranchal.com/news/2008/09/emergency-health-initiative-in-uttarakhand/>.

⁴⁵ Mavalankar, Dileep, and Kranti S. Vora. "The Changing Role of Auxiliary Nurse Midwife (ANM) in India: Implications for Maternal and Child Health (MCH)." Indian Institute of Management. <http://www.iimahd.ernet.in/publications/data/2008-03-01Mavalankar.pdf>.

Pharmacist – There is currently one pharmacist posted in the Johar Valley, in the village of Burphu. During an interview conducted with the pharmacist, he stated that he chose to practice in Burphu after being given the choice between Burphu and another village. He has been located in the village for a few years and he brings medications with him from Munsiyari, typically enough to last for one month at a time. Should he require more medications, he sends a porter to Munsiyari to retrieve additional supplies. He appeared to be the only medical practitioner in the Valley and he does not provide exams or diagnostic services—only medications.



Figure 4.1: Location of pharmacist in Burphu

District Hospital – There is a district female hospital and a district male hospital located in Pithoragarh.⁴⁶ Although the team did not visit the district hospitals, the hospitals are reported to have many services, including surgery, psychiatry, dental, pediatric, ICU, burn ward, anesthetics, gynecology, antenatal care, abortion services, emergency care, immunizations, investigative procedures, and specialist services such as neurology and cardiology, among many others.⁴⁷

4.2.2 Women's Health

The availability of health care services for women has been identified as an area of neglect in previous studies of the public health system in rural India.⁴⁸ In order to address this issue, the public health team research in each village focused on the specific questions of whether a trained female medical practitioner

⁴⁶ "Hospital." Department of Medical Health & Family Welfare. National Informatics Centre. <http://gov.ua.nic.in/health/hospitals.html>.

⁴⁷ "Facilities Available At Various Centres." Department of Medical Health & Family Welfare. National Informatics Centre. <http://gov.ua.nic.in/health/health%20facilities.html>.

⁴⁸ Dalal, Ajit K. *Integrating Traditional Services within Primary Healthcare*

or midwife was present in the village and if women received pre- and post-natal care. In addition, we explored the availability of training programs for local midwives. The importance of access to a female medical practitioner cannot be underestimated in a culture in which issues of pregnancy are rarely discussed in the presence of men and it is considered inappropriate for a male practitioner to physically examine a woman. The findings regarding women's health are presented in a village-by-village structure that includes the town of Pithoragarh and the following villages: Munsiyari, Martoli, Burphu, and Milam.

Although the public health team did not visit Pithoragarh, its role in women's health care for the Johar Valley was learned from interviews with an administrator of the Munsiyari hospital. Pregnant women with complications that cannot be treated at the hospital in Munsiyari are sent to the district hospital in Pithoragarh for more advanced treatment. In addition, there is a midwife training program in Pithoragarh that provides certification for local women who can then perform deliveries in their villages.

While childbirth emergencies are referred to Pithoragarh for care, the majority of women who live in the Johar Valley use the public hospital in Munsiyari for deliveries. The pharmacist in Burphu encourages women to locate to Munsiyari during the sixth or seventh month of their pregnancy. The Munsiyari hospital has a women's clinic and employs two female allopathic doctors out of a total of four allopathic doctors; these doctors are the only qualified female medical practitioners in the Johar Valley.

There is no medical practitioner located in Martoli and through interviews the team learned that local inhabitants do not perceive a trained midwife as necessary. Observations and interviews also indicated that the women who live in Martoli are older than childbearing age. In Burphu, however, where there were women of childbearing age, a trained midwife was absent. Interviews with the pharmacist indicated that it is government policy for a midwife to be posted in the village and that one was technically posted there, although she had relocated to Munsiyari. This pharmacist also stated that there was a practicing dai (a lay person with experience handling childbirth, but little, if any, training), but our conversation with the Burphu women's focus group indicated that there is presently no such person in the village. The team learned that some women who had remained in Burphu to deliver their children had died in childbirth.

The women's focus group in Burphu voiced concerns regarding the absence of a nearby female practitioner and they indicated reluctance to discuss their health concerns with the male pharmacist in the village. They also stated that the pharmacist does not provide immunizations for children in Burphu, such that those who do not receive immunization in Munsiyari remain unvaccinated or have incomplete immunizations.

Although the ITBP in Milam provides some health care services for villagers, it does not employ a female

medical practitioner. Women would not allow themselves to be examined or share their reproductive health concerns with a male practitioner, so women only use the ITBP for coughs or pain medication. The team also spoke with a practicing midwife in Milam who claimed to have performed fifty to sixty deliveries over a period of about thirty years. She completed an official training program seven years prior to this study and was provided with a medical supply kit to be used during deliveries. Although she noted having been guaranteed compensation at 100 Rupees per month upon receiving her training, she claimed that she had only received this payment for one year. Apart from this compensation, she reported that some patients pay varying amounts for her services. Two older women in Milam gave birth to their children without assistance and did not receive post-natal care until their children fell ill and required medical attention. This, however, occurred decades ago, is unusual, and does not always have a positive outcome as indicated by the maternal childbirth deaths known to occur in the villages.

4.2.3 Types of Medical Care

India is historically known for its use of traditional Ayurvedic medical treatments, so an integral focus of our research was to determine the current level of (1) use and (2) knowledge concerning Ayurvedic versus allopathic treatments.⁴⁹ To do this, the public health team asked questions of villagers and health care providers regarding the type of care they provided and the types of pharmaceuticals they used. Villagers were also asked about the type of health care they preferred and the types of medications they used. The inquiries regarding Ayurvedic care included an exploration of the types of medicinal herbs grown in the villages and the extent to which medicinal herbs were used.

Ayurvedic Care

Ayurvedic medicine is a centuries-old traditional medicine practice that is native to India and is characterized by the use of medicinal herbs, massage, exercise, and Yoga as preventative and curative treatments for health-related ailments. Central to Ayurveda are beliefs about (1) the body's three substances (called *Dosas*), (2) universe forming elements, and (3) the balancing of the body's metabolic system with good digestion and proper excretion, considered the precursor to vitality, or health.

Historically, Ayurveda has been the principle type of medical treatment in the Johar Valley. The majority of individuals interviewed indicated a preference for herbal treatments over allopathic care for common ailments, specifically headaches, stomachaches, and fevers. Herbal treatments are often 'the first line' of treatment, but when they are ineffective they are typically followed by allopathic medicines and treatments. The public health team found the use of herbs to be more common among older generations

⁴⁹ *ibid.*

of villagers, a finding confirmed by several groups, including the ITBP, porters, and village women. Herbs often take time to improve health, and people have become used to, and like, the quick effects of “modern” drugs. As a result, the younger generations seem to prefer allopathic medical treatment over Ayurveda’s herbal remedies.

The pharmacist in Burphu confirmed that many villagers use medicinal herbs, noting the lack of comprehensive and expert knowledge and awareness about the proper use of the herbs—something the pharmacist felt was needed in the Valley. The pharmacist also mentioned that there had been an Ayurvedic doctor located in Burphu, but this doctor left the Johar Valley sometime during the 1990s.

The women’s focus group in Burphu reported traveling to Munsiyari to obtain herbal medicine, yet this did not appear to be a common practice throughout the Valley. In Milam, most villagers maintained their own herb gardens, in addition to a communal herb garden that has been somewhat abandoned. One villager in Milam stated that ‘everyone’ in the community knows how to grow and use their own herbs. There is a practicing Ayurvedic doctor at the Munsiyari hospital, but in a conversation with a medical administrator at the hospital it was evident that he felt that the people of the Johar Valley could provide for themselves with respect to herbal remedies and treatments. See Appendix D for a list of medicinal herbs that are grown and used in the Valley.



Figure 4.2: Herbs used for cooking and medicine in Martoli

Allopathic Care

Allopathic medicine, also known as “Western Medicine,” is characterized by its scientific basis and use of technology for health-related interventions. It generally involves the use of medications that specifically counteract the patient’s condition or symptoms, such as treating a bacterial disease with an antibiotic.

All of the practitioners in the Valley, including the ITBP medics, the pharmacist in Burphu, and the Munsiyari medical staff, provided allopathic treatment and medicines. The team found that in emergency

situations, people immediately turn to allopathy. There are four allopathic doctors, one Ayurvedic doctor, and one homeopathic doctor posted at the Munsiyari hospital and patients are given a choice as to what type of treatment they prefer. The ITBP administrator noted that herbal medicines take a longer time to work than allopathic medicines. In our conversations with local porters from Munsiyari and the women's focus group in Burphu, majority stated a preference for, and greater trust in, allopathic treatment over herbal remedies. At the Nainital Hospital, the Chief Medical Officer said that they offered all types of care and that people generally chose Ayurvedic care for chronic or less serious concerns and allopathic care for acute illnesses and injuries.



Figure 4.3: Nainital Hospital

4.2.4 Emergency and Urgent Care for Locals

There is a lack of any kind of emergency or urgent care in the Johar Valley, other than in Munsiyari. This deficiency in trauma care systems is consistent with previous studies in rural India.⁵⁰ The public health team considered emergency and urgent care to include those conditions for which a high level of medical attention is necessary, both in terms of the level of care and the urgency with which it is needed. These include chronic respiratory conditions, heart attacks, childbirth complications, trauma (head injuries, severe bone injuries), high fever, and pneumonia, among others.

In every village, it was found that emergency cases are transported to Munsiyari for care due to the absence of nearby emergency or urgent care services. This transport involves the use of a stretcher or a pony, requiring ten to twelve people and taking two or three days. If a patient requires more treatment than is available in Munsiyari, the patient is transported to Pithoragarh. Patients that cannot be treated there are moved to Delhi for urgent and emergency care. If the patient is not transported to Munsiyari, there are supposedly ITBP-trained paramedics at every ITBP post in the Valley. These paramedics, however, are ITBP staff and appear to only receive a few months of training.



Figure 4.4: Man transported to health clinic at Aarohi

Although the team was told that a helicopter landing pad (helipad) is located at every ITBP post, it was only confirmed from observations in Bogdiyar and Milam. Air Force helicopter evacuation can be accessed through the ITBP in emergency situations, although no information was obtained of any villagers being evacuated in this fashion. Given the proximity to the Tibetan border, private helicopters are not allowed in the Johar Valley. The ITBP officer reported one account of a recent tourist who was evacuated in a helicopter due to a broken leg. This process took four to five days due to some delay on behalf of the tourist's group leader, although the ITBP commander claimed that helicopter services could be accessed in as little as one to two days, and in 4-5 hours for emergency situations.

⁵⁰ Johsipura, M.K.; H.S. Shah; P.R. Patel; P.A. Divatia; P.M. Desai. *Trauma care systems in India*

There are eight public ambulances in the state of Uttarakhand (see Structure of Medical Care Services, above). None of these ambulances are posted in Munsiyari. The administrator in the public hospital in Munsiyari stated that if an ambulance is unavailable to transport a patient, villagers collect donations to hire a car for transporting the patient to Pithoragarh.

4.2.5 Emergency and Urgent Care for the Tourist Population

One focus of the study was to assess the potential for ecotourism in the Johar Valley, leading to collection of information about emergency care for the tourist population. There were very few tourists in the Valley in the month of September, which limited the amount of interviews we could conduct. In general, the public health team found that tourists carry medicines and are able to provide for their own basic medical care. This was confirmed through interviews with the group of adventure tourists from West Bengal State and the homestay operator in Milam. It was also made evident from the villagers' frequent requests for basic medications from our large group. Overall, tourist health is not a main concern in the Valley primarily because of the absence of basic services for local inhabitants—which is of primary concern. From the team's own experience and through an interview with an ITBP officer in Milam, the ITBP emphasized its ability to provide health care for tourists if necessary. Air Force evacuation via helicopter, as described above, may also be available for tourists if they know to contact the ITBP and if they have insurance or cash to cover the cost. The length of time it would take to obtain an Air Force helicopter for evaluation is not clear.

4.2.6 Beliefs and Attitudes

Although the public health team did not initially intend to focus on the Johar Valley inhabitants' *beliefs* about health care, this interest emerged over the course of the research. The team found that the attitudes of villagers regarding illness and their perceptions of health care needs were often heavily influenced by religion. In Martoli, the general consensus of the focus group was that villagers rarely become ill because they are protected by the goddess Nanda Devi, who they rely on to maintain their health. The similarly named nearby mountain peak is the incarnation of this goddess. At least one interview in every village indicated that villagers in the Johar Valley are healthy people for whom sickness is a rare event. This belief was maintained despite evidence to the contrary, e.g., high rates of tuberculosis and respiratory illnesses, as well as villagers' consistent requests for more health care and medications such as pain killers.



Figure 4.5: Temple in Martoli with a view of the Nanda Devi peak in the distance

Another attitude that emerged was that some of the health care leaders in the cities around the Johar Valley seemed to believe that the villagers in the Valley are healthy because they live a healthy and active life in the outdoors. This attitude seemed to indicate that villagers do not need much health care and can just care for themselves, using herbs, as they have for many years. This misguided belief, which was overtly stated, serves as a barrier and perhaps a justification for the public health care system not providing better services for the villagers.

Finally, practitioners in public settings seemed to believe that health education consists of nothing more than providing information to patients and then letting them make their own choices. Health promotion, persuasion and social marketing – techniques commonly used in the United States – did not seem to be used at all. The NGOs appeared to make more efforts to persuade people to follow certain healthy behaviors, but the techniques used still appeared very basic and mostly involved conveying information.

4.3 ANALYSIS

4.3.1 Health Care Structure and Policies but Few Practitioners or Services

A central issue in the public health findings was that health care structure and policies exist, but there are few practitioners and health care services provided to residents of the Johar Valley. For example, the government mandates that a midwife be posted in Burphu, but a midwife was not actually present in this village. Government policy states that there must be a trained medical practitioner in each village, but we

found that there were no qualified doctors in the Johar Valley north of the largest town, Munsiyari. In a similar vein, the pharmacist in Burphu stated that there was a trained dai in Burphu, but women in the community said that those services were not available; and supposedly there are health camps provided on a regular basis but none was reported to have been provided in the recent years. Perhaps the aforementioned beliefs provide some justification for poor implementation of health care services in the Valley despite a well-defined health care structure and related policies.

The public health team identified three main categories of public health emphasis in the Johar Valley: (1) Public Health Concerns, (2) Access and Availability of Health Care, and (3) Quality of Care.

4.3.2 Public Health Concerns

The following issues were not a primary focus of the research but are relevant and important to include.

Issue One: Indoor Air Quality. The team observed that most cooking is conducted indoors on the ground floor and that wood is the main source of fuel. This practice creates large amounts of indoor smoke. Based on knowledge of the health risks resulting from secondhand smoke, the team identified these cooking practices to be a major contributor to respiratory problems among villagers.

Issue Two: Water Quality. The research group that focused on water resources addressed the issue of water quality. It is important to note that the public health team never saw any sewage system and that the quality of the water in the area needs to be monitored and protected, which is not currently happening. If more tourists start to come to this area, concern about water quality will be of increased importance.

Issue Three: Alcoholism. Alcoholism was raised as a common problem among men, and the team observed many intoxicated individuals. Prevention and treatment of alcoholism are not viewed as a public health concern. Broad-based health education about this issue does not exist.

4.3.3 Access and Availability Issues

Issue One: No female practitioner is posted or practices in the Valley, except for in Munsiyari, and most villages have very limited access to infant and childhood immunizations. This indicates that women and children's health are not addressed sufficiently in the Johar Valley.

Issue Two: There is no access to a qualified doctor in the Johar Valley, other than in Munsiyari. This presents a challenge to villagers, especially during emergency situations. The presence of a pharmacist and ITBP trained paramedics does not eliminate the need for a medically trained doctor in the Valley.

Issue Three: North of Munsiyari, there is no road access in the Johar Valley; instead, a foot trail runs the length of the Valley and is the only means of accessing villages. Travel required to access medical care is therefore made difficult and long (two or three rushed days to reach Munsiyari from the uppermost village, Milam), and is a barrier to the quality and consistency of care. This also presents barriers to the potential for the growth of tourism in the region.

Issue Four: The public health team did not discover any health education programs in the Valley, the lack of which presents problems in terms of villagers' access to health-related information. Information to which villagers are lacking access includes (1) the proper use of Ayurvedic medicines, (2) general health care information, and (3) preventative care techniques.

4.3.4 Quality of Care Issues

Issue One: *Training*. The level, or extent, of training received by all 'medically trained' personnel north of Munsiyari in the Johar Valley seemed insufficient. For example, the short training program for ITBP paramedics may not be sufficient to qualify these paramedics to meet the needs of the area.

Issue Two: *Quality of Care Evaluation*. There are no evaluations of health care services in the area. There are not any established outcome measures and no personnel who are accountable for meeting any stated objectives.

Issue Three: *Preventative Health Care*. The types of care provided are more symptomatic, responding to common conditions such as headaches and mild digestive problems, rather than focusing on preventative measures. Preventative care is not provided.

4.4 Recommendations and Future Steps

4.4.1 Availability of Practitioners

The overarching issue identified through this research is the lack of qualified medical care in the Johar Valley. The presence of ITBP trained medical personnel and a pharmacist provides some medical relief to the residents of the Johar Valley, however there is insufficient capacity to handle emergency medical situations and to address female health concerns. The public health team recognizes the difficulties in encouraging doctors to locate in this valley, due to the harsh environment and insufficient infrastructure, however the following programs and recommendations provide potential solutions to these challenges. Many of the following programs have been effective in similar remote environments and have ultimately benefited local populations and tourists alike. These programs deserve further investigation.

- **India Rural Internship Requirement:** A rural posting for medical students in India is one of the recommendations made by a task force under the National Rural Health Mission (NRHM) to address the shortage of doctors in villages and it is to become compulsory in 2009.⁵¹ With this structured requirement, villages in the Johar Valley could be potential locations for placement.
- **Doctors Without Borders:** Doctors Without Borders is an international humanitarian organization primarily focused on providing medical relief to over 60 countries worldwide. Typically, these are countries facing crises and are unable to receive basic medical care. In 2007, Doctors without Borders had volunteers stationed in the states of Kashmir, Manipur, Assam, Chhattisgarh and Bihar.⁵² The Johar Valley may be an ideal location for Doctors Without Borders to extend its reach.
- **Wilderness Medicine:** Wilderness Medicine is an emerging medical field in the United States. The medical focus and knowledge inherent of Wilderness Medicine may be directly relevant to the needs of the Johar Valley. Creating partnership programs with Wilderness Medicine schools in the United States (fellowship programs currently exist at Stanford and the University of Utah) to encourage medical residents/doctors to practice in the Johar Valley could respond to many of the health concerns of villagers as well as encourage mountaineering and adventure tourism in the Valley. Similarly, the National Outdoor Leadership School (NOLS) conducts Wilderness Medicine courses and training in remote regions as a component of their outdoor education focus. Establishing a course in the Johar Valley could be a unique opportunity for students and could also provide medical relief to the villagers.
- **Partnership with the University of Washington Medical and Nursing Schools:** Physicians, nurses, nurse practitioners and physician assistants are all trained at the University of Washington. It may be possible to develop ongoing partnerships with these schools to provide rural experience for the practitioners and to provide additional services for the local population.

4.4.2 Local Medical Training and Public Health Education

During the public health team's research, visits to various NGOs focusing on the health care needs of villagers in the Almora District were made. The team identified similar health care needs of villagers in the Johar Valley (Pithoragarh District) as in the Almora District, however currently no NGOs or private organizations are reaching out to these populations. The following recommendations provide potential models and training programs that could increase the medical capabilities and capacity of the Johar Valley, while also creating livelihood opportunities for residents.

⁵¹ Sinha, Kounteya. "From '09, 1-year rural stint a must for MBBS students." The Times of India. 25 July 2008. http://timesofindia.indiatimes.com/india/from_09_1-year_rural_stint_a_must_for_mbbs_students/articleshow/3276540.cms.

⁵² "Doctors Without Borders." MSF. www.doctorswithoutborders.org.

Aarohi

Aarohi is a NGO based in Satoli (Almora District) that was founded in 1992. As a service-based organization, it performs outreach to local villages and medical training for village women. The training is a three-year program enabling women in these villages to become proficient in basic medical care with an emphasis on midwifery training. A NGO or other privately funded organization that provides similar health services would be of benefit to the people living in the Johar Valley, particularly the women and children.



Figure 4.6: Medical supplies in the hospital at Aarohi

Aarohi is also involved in health education. It has recognized the importance of educating villagers about preventative measures as a solution to the most common health concerns. For instance, one of its focus areas is increasing awareness about sanitation issues. Elevating awareness and providing proper education can potentially improve the health status of villagers in significant ways. Based on the public health team's findings in the Johar Valley, the team would recommend educating residents on topics such as proper sanitation, women's health, preventative health care, waste management, and the connection between wood smoke and respiratory conditions.

Panchachuli

Panchachuli is another model that has applicability to the villages of the Johar Valley through its medical training of local villagers and through the provision of medical care by physicians and other health care practitioners. These practitioners travel to villages in a van equipped with technology for conducting blood tests, ultrasounds and other "high-tech" medical care. The Dena Hospital in Almora provides possibly the highest quality of medical service in the region and may be interested in expanding its services to the Munsiyari area. This hospital treats more than 100 patients per day and employs a gynecologist, a surgeon, and an Ayurvedic doctor on a full-time schedule.⁵³

⁵³ "Dena Hospital." Panchachuli U.S.A. <http://panchachuliusa.org/e0222.html>.

Wilderness First Responder/First Aid Training

The Wilderness First Responder (WFR) course is a certificate program enabling participants to respond to medical emergencies in remote locations, a minimum of two hours away from definitive care. This is an 80-hour intensive course focused on handling medical situations that may be relevant in a wilderness setting, such as trauma, spinal injuries, first aid, CPR, and allergic reactions. Specific organizations, such as *Wilderness Medical Associates* and *Crested Butte Outdoors*, have conducted WFR training courses for local trekking guides in remote mountain regions like Nepal. Given the remoteness of the Johar Valley and the trekking opportunities there, providing WFR training for local guides could facilitate tourism, increase medical capabilities of local villagers, and create local livelihood opportunities.

International Partnerships to Supply Medical Equipment

There is an evident lack of medical equipment, medications, and proper equipment to allow for basic preventative health measures – specifically water filters and smokeless/backcountry cook stoves. Grants to obtain this equipment should be pursued as well as exploring contributions by NGOs and other volunteers.

4.4.3 Quality of Medical Care and Public Health Services

It appears that there are issues related to the quality of care provided in the Johar Valley, however it is not possible to provide an objective evaluation of the quality of care until goals and measurable objectives are established. Both intermediate measures—e.g., (1) number of people served and outcome measures, and (2) decrease in the incidence of new TB cases—need to be established in coordination with the community and the health care providers. Expertise in health planning and evaluation could be provided by graduate students and professionals from international university settings, working with the providers and villagers in the Valley.

4.5 Conclusion

The public health team's findings indicate that the moderate level of health care services provided in the Johar Valley is insufficient to meet the real (as opposed to the perceived) need for such services. Further research is needed to fully detail the demand for health care and to determine those areas of priority emphasis. The information provided in the recommendations section is intended to offer concrete suggestions for ways to expand the health care infrastructure in the Johar Valley and shall not be considered an exhaustive list of options. It has been the team's aim to create a resource serving as a guide to further study and research in the Valley, such that the level, access, and availability of services, the quality of care, and the overall public health system can better serve and accommodate the culture and lifestyle of Johar Valley inhabitants.

5.0 COMMUNITY ECONOMIC DEVELOPMENT

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5.0 COMMUNITY ECONOMIC DEVELOPMENT

5.1 Overview

The Johar Valley experienced significant economic disruption after the closure of the trade route to Tibet in 1962. Before 1962, trade with Tibet was the main occupation of the residents in the Johar Valley; this closure caused a major disruption in the traditional transhumance lifestyle and resulted in the partial abandonment of upper villages in the Johar Valley. Those traditionally involved in the trade industry moved to the lower valley, to other places in Uttarakhand State, and beyond to the plains. For the small percentage of people who continue to return to the upper Valley during the four to five month summer season, agriculture and wild herb gathering are the major means of livelihood.

In 1988, The Nanda Devi Biosphere Reserve, which includes portions of the upper Johar Valley, was created to protect the area's natural resources and limit resource extraction. With the restrictions on tourism in the core areas of the Reserve, the buffer zone surrounding it (which includes the upper valley village of Martoli) experienced excessive tourism and natural resource depletion. The creation of the Reserve further imposed restrictions on indigenous use of natural resources, which exacerbated declines in population due to the loss of tourism and trade economic activities.⁵⁴ Johar Valley has seen increasing tourism, but is limited due to its rugged terrain and remoteness. The traditional transhumance pattern of the Valley inhabitants is maintained by a small fraction, approximately 4%, of the valley population since 1962. This small minority is aging and is not being replaced by a younger generation. These limitations will be described and discussed later in this section.

5.1.1 Community Economic Development

The community economic development (CED) team research focused on identifying current and potential sustainable livelihood promotion strategies that contribute to economic development in the Johar Valley. Community economic development is a particular approach that combines traditional economic development (markets, resources, space) with community development (society/culture, rules/institutions, and decision making) perspectives into an interdisciplinary, holistic approach.⁵⁵ These six elements are

⁵⁴ Silori, Chandra. "Perception of local people towards conservation of forest resources in Nanda Devi Biosphere Reserve, Northwestern Himalaya, India." *Biodiversity and Conservation*, 16. 1 (2007): 211-222.

⁵⁵ Shaffer, R., S. Deller, and D. Marcouille. "Rethinking Community Economic Development." *ECONOMIC DEVELOPMENT QUARTERLY*, 20.1 (2006): 59-74.

represented below in a reproduction of the “Star of Community Economic Development”.⁵⁶

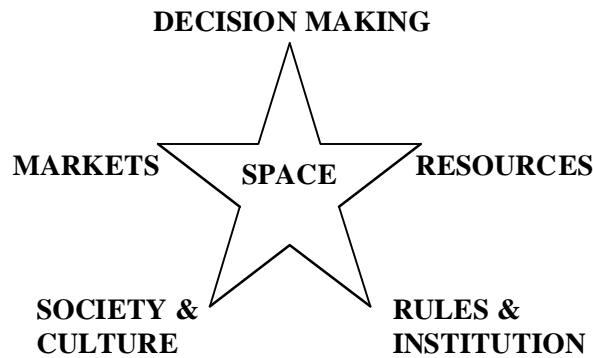


Figure 5.1: Star of Community Economic Development.

The six elements interact at different degrees depending upon the individual community situation. Community can be defined by spatial (municipality) relationship, by interest/grouping (not necessarily spatially related) and/or as “a logical decision-making unit”. Thus the definition of community includes “spatial and non-spatial dimensions” based upon “the ability to make and implement decisions”. Other key elements of effective community economic development are:

- The community’s ability to make and implement informed decisions;
- An emphasis on non-monetized wealth as well as monetized (income) creation;
- An increase in the community’s ability to absorb change and make adjustments as economic resilience increases;
- Community economic development is on-going and not a one-time event;
- The community’s ability to mobilize economic capital (investment) and social capital (capacity building) over a long period in an entrepreneurial approach.

5.1.2 Tourism and Sustainable Development

Tourism has been and continues to be viewed as an economic development tool for developing economies. The World Tourism Organization reports that international tourist arrivals tripled from a recorded 222 million in 1975 to 760 million in 2004; and world tourism receipts from US\$ 102 billion in 1980 to US\$ 523 billion in 2003.⁵⁷ For example, developing countries utilize tourism development to address economic needs through generation of foreign exchange and employment generation purposes.

⁵⁶ *ibid*

⁵⁷ World Tourism Organization. Tourism and Poverty Alleviation: Recommendations for Action. World Tourism Organization, Madrid, Spain (2004).

Domestic tourism is also growing in many countries. In 2008, the Asian Development Bank (ADB) noted that in India the international tourist arrivals had grown to 4.4 million with foreign exchange earnings estimated at \$6.7 million, while domestic tourism demand increased to an estimated 432 million. Overall the tourism sector contributed approximately 6% of GDP and employed 51.1 million persons directly and indirectly.⁵⁸ Tourism can take many forms, from large enclave development (mass tourism) to smaller community based (niche tourism) activities such as ecotourism. Within the emerging conversation of sustainable development, the positive and negative impacts of tourism development are also debated. Fundamental to the debate is the national, regional and local policy environment that is used to guide tourism development.

Sustainable tourism, along with sustainable development, has developed a cachet that may be more in name than is represented by the on-the-ground implementation. Issues of “green washing” and degrees of sustainable, eco-friendly development are all factors to be considered in the evaluation of tourism development. The World Tourism Organization definition is:

Sustainable tourism development meets the needs of present tourists and host regions while protecting and enhancing opportunities for the future. It is envisaged as leading to management of all resources in such a way that economic, social and aesthetic needs can be fulfilled while maintaining cultural integrity, essential ecological processes, biological diversity and life support systems.⁵⁹

More specific ecotourism principles have been developed and were utilized as guiding principles for the CED team in the Johar Valley. The International Ecotourism Society (TIES)⁶⁰ defines ecotourism as "responsible travel to natural areas that conserves the environment and improves the well-being of local people" and adopt the following six ecotourism principles:

- 1) Minimize impact.
- 2) Build environmental and cultural awareness and respect.
- 3) Provide positive experiences for both visitors and hosts.
- 4) Provide direct financial benefits for conservation.
- 5) Provide financial benefits and empowerment for local people.
- 6) Raise sensitivity to host countries' political, environmental, and social climate.

⁵⁸ Asian Development Bank. “Asian Development Bank & India: 2008 Fact Sheet”. Asian Development Bank (2008). www.adb.org/india

⁵⁹ Economic and Social Commission for Asia and the Pacific, United Nations Publications. “Poverty Alleviation Through Sustainable Tourism Development”. United Nations, New York (2003).

⁶⁰ The International Ecotourism Society: www.ecotourism.org/

5.1.3 Tourism in Uttarakhand State

Tourism in Uttarakhand includes a mix of domestic and foreign/international tourists.⁶¹ The holy shrines receive millions of pilgrims from throughout India. In particular, the shrines of Badrinath and Kedarnath account for 1.82% of the total tourist traffic in India. Badrinath is more accessible via road thus receives higher visitor trips; Kedarnath requires 14 kms trek. The mountains and glaciers attract adventure tourists for high altitude treks, skiing and white water rafting. Tourists in Uttarakhand can generally be characterized in three categories:

- Pilgrims/Religious tourists – generally seek budget lodging, lower food prices, and relatively easier and cheaper means of transport.
- Pleasure Tourists/Holidaymakers – generally have more sophisticated requirements, willing to pay more for quality accommodation and food.
- Special Interest Groups/Adventure and Nature lovers – choices in lodging and food prices vary. These groups and individuals are activity oriented; for example, trekking, skiing, etc.

The following chart indicates the overall tourism statistics for 2006-2007 as recorded by Uttarakhand State.⁶² Of particular interest is the greater number of domestic than international tourist recorded.

Table 5.1: Uttarakhand Tourism statistics 2006-2007.

Tourism: 2006-2007			
(A) Infrastructure	Number	(B) Tourist Arrival	No. Lakh
1. Main Tourist Places	214	1. In Tourist Places (Including Pilgrims)	222.60
2. Developed Tourist Places	124	(i) Indian Tourist	221.54
3. Tourist Rest Houses	174	(ii) Foreign Tourist	1.06
4. Raien Basera (Night Shelters)	32		
5. No. of Beds in T.R.H.	6,764	2. In Important National Parks	199,043
6. No. of Beds in Raien Basera	1,610	(i) Indian Tourist	183,481
7. No. of Hotels & paying guest Houses (as on 31-12-2007)	2,312	(ii) Foreign Tourist	15,562
8.No. of Dhramshala (as on 31-12-2007)	802		

⁶¹Jain, A., and Nagarwalla, D. J.. “Why Conserve forests? – A baseline study to assess people’s perceptions, attitudes and practices for increasing people’s involvement in conservation”. Study Conducted for Appropriate Technology, India (ATI). (2004).

⁶² Uttarakhand At a Glance: www.ua.nic.in

In general, the lack of infrastructure development, such as roads and transportation, accommodation and communication facilities are a limiting factor to overall tourism growth. The Asian Development Bank (ADB) and the Indian Government recently announced a loan for infrastructure improvement in a number of Indian States, including Uttarakhand. A primary stated purpose is to support the Government's national tourism goals by addressing one of the significant factors impeding growth: inadequate infrastructure. As stated in the ADB's "India: Preparing the Inclusive Tourism Infrastructure Development Project" report,⁶³ parallel to infrastructure development, efforts need to focus also on:

- Improving the institutional framework to ensure coordinated actions and converge the resources of agencies towards common goals of tourism development;
- Ensuring the sustainability of tourism infrastructure, services on assets created and enhancing conservation and management of heritage sites for environmentally and culturally sustainable tourism;
- Regulating the tourism industry to achieve better standards;
- Marketing the priority circuits as single destinations;
- Building the capacity of sector institutions and filling the gaps in skilled human resources in the sector; and
- Mitigating the potential adverse affects of tourism in host communities and vulnerable groups.

An additional issue affecting tourism in Uttarakhand is that visits are concentrated on six summer months during which the current infrastructure is overwhelmed but then underutilized in the non-peak months. The lack of accommodations means that a major part of expenditures is lost for the community. Especially lacking are accommodations for higher-income domestic and international visitors. Another gap identified is the lack of local arts and crafts development to capture tourist spending, locally.

When the local population in Uttarakhand was asked their perception towards development options/alternative employment schemes in the buffer zone of Nanda Devi Biosphere Reserve, the following were the top five affirmative responses⁶⁴ (in order):

- Alternative employment programs: Handicraft Activities (100%)
- Alternative employment programs: Tourism (95%)
- Improvement in agriculture sector: Cultivation of medicinal herb for more economic returns (90%)

⁶³ Asian Development Bank. "India: Preparing the Inclusive Tourism Infrastructure Development Project." Asian Development Bank: Technical Assistance Report. (2007). www.adb.org/india

⁶⁴ Silori, C. S., 2001.

- Improvement in income from non-timber forest products (NTFP): Allow collection (90%)
- Improvement in livestock productivity (85%)

The next highest response at 75% was better marketing facility for improvement in the agriculture sector. The lowest activities of interest in alternate employment programs were Sericulture, Mushroom Cultivation, and Fibre work.

5.1.4 Ecotourism in the Johar Valley

These themes for tourism development in India and the State of Uttarakhand provide the broader context in which to consider the current conditions and the opportunities for development in the Johar Valley. Although strategies to increase sustainable livelihoods for village residents extend beyond ecotourism, and at present ecotourism accounts for a relatively small portion of supplemental income for residents of the Valley, the focus of this work remains on ecotourism as it is seen as a most promising avenue for sustainable community development, and seems particularly well-suited to the valley given the richness of cultural and natural resources in the area. Also, given limited time and resources, focusing on one specific area made sense.

Similarly, although each village along the valley has its own particular challenges, this document looks mainly at overarching threats and opportunities that can apply to either the entire valley or to multiple locations within it. Within ecotourism the team focused on the following:

- Existing conditions (tourism related infrastructure)
- Attitudes about tourism (and related economic activities)
- Opportunities and challenges related to ecotourism.

5.2 Observations of the Johar Valley: Current Conditions

Interview questions addressed issues regarding scale, desirability, and characteristics of tourism related economic development and livelihood promotion to understand residents' attitudes and concerns. Most interviews took place in Martoli, Burphu, and Milam. Observations by the CED team were made during scheduled discussions with village members and officials, through informal interactions with people in villages, and during time on the trail. Interview responses and observations fell into four overarching themes: tourism infrastructure, agriculture & commerce, road & dam projects, and cultural heritage. All of these themes related to ecotourism in some way: agriculture & commerce were discussed as a means to support tourism; cultural heritage was seen as a draw for ecotourists and also as something to be preserved through tourist activities; and road and dam projects were seen as potential threats to- or opportunities for-increasing tourist activity.

During interviews and informal conversations, most villagers stated that they have had a positive experience with tourism and would like to see it increase. The money that is received from tourism supplements the income villagers make from agricultural activities as well as medicinal herb gathering. The vast majority of village residents interviewed view tourism as a promising potential for growth and economic opportunities, and see it as a way to draw youth back to the valley. However, some villagers, including those who support tourism, expressed a fear that an increased number of tourists might have a negative impact on local culture and the natural environment in the Valley. The construction of the planned road up the valley was viewed by many residents as a way for tourists to access it more easily; however, some villagers also expressed that it may bring in a different type of tourism which would be harmful to the valley's cultural and environmental assets.

5.2.1 Current Infrastructure and Programming

Due to the remoteness of the valley and the ruggedness of the terrain, tourism to the valley is somewhat limited, with approximately 200 visitors that entering the valley each year. Land access to the Valley is through a trail that originates in Munsiyari. The Uttarakhand Public Works Department (UPWD) maintains the trail. UPWD is the agency responsible for maintaining and expanding infrastructure in Uttarakhand. Because of the extreme weather in the valley, especially at higher elevations, the erosion of the trail is a frequent occurrence. This is particularly a concern during the monsoon season. However, the UPWD responds rapidly when the trail becomes washed out, and it is generally safe and remains in good condition. Despite the logistical challenges of access, tourists are drawn to the area for the natural features, biodiversity, spiritual quest, and cultural heritage. Much of the tourism is adventure related,

comprising expeditions to the different glaciers (Burphu, Pindari, and Milam), as well as to the Nanda Devi East Base Camp. Opportunities exist along the trek to view diverse flora and fauna as well as mountain peaks, waterfalls, lush tropical vegetation and sparse mountain landscapes.



Figure 5.2: Milam Glacier, September 2008.

A range of accommodation options exists in the valley. Both the ITBP and the PWD offer accommodations; prices and size of accommodations vary by village. The Kumaon Mandal Vikas Nigam (KMVN) operates a guesthouse in Munsiyari, and is expanding operations throughout the valley. Guesthouses are currently under construction in Lilam, Rilkote, Bogdiyar, and Martoli. These new projects do not adhere to traditional architectural style, although they are similar in materials and scale. Villagers stated that KMVN did not work with the local community van panchayats, but rather the individual property owner, to develop these properties. In addition to these projects, individuals and small groups of village residents currently operate small lodges throughout the valley.



Figure 5.3: Guestroom at Hotel in Burphu

Camping is another popular option for accommodation in the valley. There are no designated campsites in the valley; rather, camping is allowed almost anywhere and no fees are required. An exception is in Martoli, where an ecotourism fee applies. Also, camping is prohibited in some areas near the ITBP base in Milam. While non-western style restrooms are available in most ITBP lodging and PWD lodging, restroom facilities are limited throughout the valley. There are no western toilets north of Munsiyari. Drinking water infrastructure as well as facilities for showering and bathing is limited. Finally, homestay opportunities, in which travelers share homes with host families and experience a uniquely intimate view of Johar life, exist in all villages along the trek. The most notable community tourism program is in Sarmoli, which is clearly in alignment with many of the six principles of ecotourism as a framework.

Active members of the Sarmoli village forest council participate in a community based tourism program that provides homestays to travelers. This arrangement directly benefits local conservation by requiring conservation efforts in order to participate as a homestay host. Also, seven percent of each homestay fee goes to the village forest council to support its conservation activities. The program strives to provide positive, comfortable experiences for visitors by requiring a number of standard western amenities including a clean and sanitary bathroom, hot water for bathing, and separate sleeping room for guests. Also, participating host families must be trained in sanitary food preparation, cooking and storage.

Participation in homestays begin with an introduction to the program where guests learn about the community's goals of the program, as well as its relationship to conservation efforts in the forest council. This is followed by a welcome by the host family including a tour of the home. All of this information sharing helps to build cultural awareness and respect. Finally, the program provides direct financial benefits and empowerment for local community members, especially women, who take a lead in the program by greeting guests, educating them about their family's livelihood and lifestyle, and by cooking.

These homestays generate significant income for a typical Sarmoli household, around INR 350 (to be increased to INR 500 in 2009) per person per night. (See Appendix F: Johar Valley Supplemental Income Activities Chart for a comparison of estimated income by line of business.) The program has been extremely popular with both the visitors and homestay hosts. Since its inception with 13 participating households, the program has, by 2008, increased to 25 participating households with 10 more on a waiting list. The homestay program enjoys continual use by travelers throughout the summer months. Other homestays exist in villages throughout the valley, but are not organized under a formal program as in Sarmoli. However, many residents of other villages see Sarmoli's homestay program as an example to emulate in their own village.

5.2.2 Agriculture & Current Livelihood Strategies

Village residents of the Johar Valley consider agriculture to be their main livelihood. The agricultural economy of the valley consists of subsistence and export (market) farming, as well as tending of livestock and harvesting of herbs for export (market) sale.

Crops are typically contained within plots and fields adjacent to village residents' homes. Historically agriculture was more expansive such as in villages like Milam where large tracts of land along the river were cultivated for a variety of pulses and grains including potatoes, mustard, buckwheat, uoa, lentils, and millet.⁶⁵ Currently the plots around the residences are used for growing herbs, vegetables and grains as well. In Milam, due to the presence of the largest year-round ITBP camp in the valley, villagers grow vegetables (cabbage, peas, beans, carrots, squash, spinach, and radish) and cooking herbs in abundance to use for bartering with the ITBP for medicines and supplies such as cooking oil, etc.

Farming for market sale includes the cultivation of herbs, some grains and potatoes. In some cases, the farming is done within the ruins of former structures where stone fences have been constructed, as a technique to keep the grazing animals out. Two herbs repeatedly were cited as market commodities:

⁶⁵ Field Observations and Negi, 2007.

jimbu and *thoya*. *Jimbu* is a garlic chive that is an integral part of the valley cuisine and best grows above 10,000 feet. *Thoya*, also known as black cumin, is used in a number of traditional dishes. Both of these herbs are typically sold in small quantities directly out of farmers' homes. The primary vegetable for market sale that was mentioned was potato, which villagers feel are the best in the region. Many people stated they would like to have better infrastructure to facilitate selling their goods in other markets, outside of, and further away from, the valley.⁶⁶

Livestock grazing is practiced throughout the valley, although at rates significantly lower since 1962. Largely because the loss of trade with Tibet, demand for livestock and agriculture products as well as other professions linked to trade and agriculture including wool crafting and freight shepherding has dropped considerably.⁶⁷ This trend, combined with much stricter regulations around grazing in the buffer zones of NDBS since 1987, have led to a sharp decline in livestock population. The sheep population in particular has dwindled from an estimated 15,949 in 1987 to 2,814 at present, and sheep generally now supplement other forms of income for villagers rather than being a primary source.⁶⁸ Still, a 300 head sheep herd can bring in 30,000-50,000 Rupees each year, a notable supplement to other forms of income. Beyond sheep and goats, pack animals such as mules are present in the valley.



Figure 5.4: Sheep and goats herded along the trail.

In addition to cultivated herbs, many valley residents engage in medicinal herb foraging for income. Medicinal herbs are generally sold directly to the buyer representing pharmaceutical companies or wholesalers in Munsiyari who export to a regional, national or international market. *Yar tsa gumbu* (a

⁶⁶ Interviews and informal conversations.

⁶⁷ Ibid.

⁶⁸ Ibid.

mushroom which grows on a caterpillar and is processed and marketed as an aphrodisiac in Asia) is the most commonly sought species. At present, the harvesting of *Yar Tsa Gumbu* as an alternative livelihood is more attractive to many of the valley's younger generation than agriculture, because of its ability to draw a high price with a relatively short investment of time.

The current price per kilogram of *yar tsa gumbu* is quite high, but the government is in the process of limiting the amount to INR 50,000/kg. There are many challenges in finding the species. Villagers stated that the young and fit typically collect the species because the collection period is limited and the high altitude environments where it is obtained can be severe. Despite the difficult harvesting, the potential for large sum of money (cash) for a relatively shorter investment of time is a strong attraction than more traditional forms of agriculture and herb cultivation. However, in some cases, the high price and relative scarcity of the commodity has led to mild unrest among competing foragers.

With the exception of *yar tsa gumbo*, medicinal herb gathering has not, in recent times, contributed significantly to the local economy; partially because of the dwindling of trade with Tibet (and loss of a market as the population has become depleted) but also because of a loss of indigenous knowledge regarding the uses of various herbs. Cultivation of medicinal herbs has not caught on either, largely because it is extremely difficult (and impossible in many cases) to emulate subtle growing requirements necessary to produce top-quality herbs. Also, the growing period for medicinal herbs is quite long, up to three years, which discourages farmers from planting herbs instead of other crops with shorter cultivation periods. Other barriers to the cultivation and more robust gathering of medicinal herbs include a high risk of a crop failing under cultivation, frequently low yields, lack of technology and financial support for necessary storage and transportation; lack of resources to build fences; and the absence of buy-back arrangements for crops. Poaching of cultivated herbs, after growers leave for the winter season, is also a problem.⁶⁹

Beyond agriculture and foraging activities, residents of each village also engage in value-added commerce such as the sale of woolen products or prepared and/ or packaged food manufactured elsewhere and imported into the valley. The villages of Milam and Burphu each contain stores where local residents and visitors can find basic essentials including cooking oil, batteries, biscuits (cookies), chocolate, tobacco, etc. Woolen goods (including hand knitted caps, blankets, scarves and sweaters), and cooking herbs, are typically sold out of homes and are somewhat limited in supply.

⁶⁹ Ibid.



Figure 5.5: Store in Burphu.

While some of these products are crafted in the valley, many are also brought from other regions for sale to local community members and tourists. Woolen products vary in price depending on the type of wool, craftsmanship and size, and typically range from INR 70-550. Further down the valley, in Munsiyari, carpets and larger woolen items are sold for as much as 2000 to INR 5000.



Figure 5.6: Martoli woman selling woolen scarf.

5.2.3 Road & Dam Projects

At present, the Gori Ganga is an untamed river. However, the Uttarakhand government is actively promoting hydroelectric power projects and tourism as a main economic development priority. According to key informants⁷⁰ and interviews of Johar Valley residents, the CED team discovered that there are currently five dam projects and a service road planned to be constructed over the next ten years through the Johar Valley from Munsiyari to Milam.

Because of the features present in the Johar Valley and the suitability of hydroelectric power, various private companies have begun to explore and even initiate some dam projects in the area along the Gori River. The existing ITBP facilities, such as the helicopter landing-pad, are being utilized for the survey and to transport heavy machinery and materials to the valley. There has been soil testing which has caused minor landslides in some locations due to the erosion the procedure induces.

The projects planned are large scale, utilizing a method called “run of the river.” This method of producing hydroelectric power is considered by some authorities to be less harmful to the physical environment. This system diverts water from the river through a series of pipes drilled through mountains harnessing the power, and then dumping the water back in the river further downstream. Although this system appears to be less invasive, critics claim that it would result in the drying of the riverbeds (with less than 8% of the original flow) where the water is diverted into the piping system. Also, because the valley is seismically sensitive, opponents to the dam projects worry that tunneling into mountains could cause increased geological instability or even instability to the projects themselves.

In order to support the various dam projects in remote areas, road projects connecting the villages have been proposed; however, because of the proximity of the area to the border with China, the road must have a prioritized military use. Officially, the road is being proposed to service the military in the area, but many believe that the road is being built to service the dam projects. The proposed road would stretch the entire length of the valley, from Munsiyari to Milam. Although the road would primarily service the dams, village residents would likely have access to it, as well as tourists and the general public, with certain restrictions and permits.

Villagers that we interviewed are aware that dams and a road are being built in the area, but are unaware of the specific impacts it will have on them. They nearly unanimously predicted, however, that the proposed projects would inevitably change the landscape and impact their daily lives. Some concerns they expressed is that the road may push the porters and mule porters out of employment as there will be little

⁷⁰ Presentation and group discussion with Ram, 3 September 2008.

need for them to transport village supplies, building materials, and tourist suppliers. Others see the road as benefiting the local economy by bringing tourists and facilitating transportation of agricultural produce.

When and if the road is built, the value of land would inevitably increase, as increased access to arable or other high-value lands would create more demand. Presently, however, land ownership is restricted to scheduled tribes of the area and enforced by law. Much of the land in Milam and Martoli especially has multiple claimants, which means that any given property may have dozens, if not hundreds of owners. This complex ownership system has, until the present, prevented outside ownership of the land and even internal investment. However, increased demand as the result of road construction may catalyze more formal attempts, by governmental authorities, to survey, inventory and assign plots based on ancestral claims in villages throughout the valley. It is difficult to predict what implications a land inventory would have on economic development in the valley; however, it is possible that a more formal land inventory could make development much easier in the valley and that land could see a large rise in value as demand for new development rises.

5.2.4 Culture and Heritage

The Johar Valley is home to a rich, warm, historic mountain culture. At present, many opportunities to experience this culture exist in the valley. At the gateway to the Johar Valley, the homestay program in Sarmoli, in particular, allows tourists a chance to experience Kumaoni culture firsthand. This program is in line with almost all of the six principles of eco-tourism. By sharing a home with a village resident, tourists have opportunities to build cultural awareness and respect, and the experience can be positive for both the visitor and the host.



Figure 5.7: Sarmoli homestay hostess Parvati Diaz and her weaving

The Valley provides ample opportunities for respectful cultural engagement. Some of these opportunities during the UW team's visit took the form of group discussions about medicinal and culinary herbs or

wool products. Residents of the valley invited the team to participate at the Nanda Devi festival, an annual gathering in Martoli, to offer thanks and prayer to the Nanda Devi—the patron goddess of the valley communities. Participating in these activities was enriching for visitors and made the experience in the Johar Valley unique. These types of cultural exchanges are good foundations for similar, perhaps slightly more formally organized ecotourism activities.

While these activities provide a sense of richness to the travel experience in the Johar, there is also a sense that the valley has experienced a decline following the ending of a more robust economy and culture that centered on trade with Tibet. This decline is evident in listening to village residents share stories of childhoods spent in Milam, which contrast with the many vacant homes of present day Milam and Martoli. Indeed, residents worry that if a road (or another major infrastructure project or industry) does not come to the valley, the transhumance-practicing population may die out completely.

The low rock constructed houses and buildings provide a distinct visual experience throughout the village. While many structures in the villages are no longer occupied and are visibly in a state of disrepair, the built environment does add to the overall experience of the Johar Valley. Villagers do struggle to maintain the homes due to the extreme weather conditions (especially true at higher elevations with significant snow fall)



Figure 5.8: Nanda Devi Temple with Nanda Devi peak in background, Martoli.



Figure 5.9: Deserted structures in Martoli.

and the declining availability of traditional building materials and knowledge.⁷¹ Non-traditional building styles and materials, especially metal roof materials, while economical and practical choices do detract from the overall experience of the village architecture.

5.3 Analysis/Synthesis

As a first step to organize the interview and observational findings, the CED group conducted a Strength, Weakness, Opportunity and Threat (SWOT) analysis. This section provides a summary of the more significant threats to future development as well as a presentation of the possible opportunities. The SWOT analysis was informed by ecotourism principles and the following key strategies⁷² for implementing community economic development principles:

- Using existing resources differently - utilizing innovation and technology within existing business or economic frame to do more;
- Increase the flow of INR into the community, especially important for communities with natural amenities to move beyond extractive industries towards recreation/retirement migration;
- Increasing the recirculation of INR in the community, reduce leakages out of local economy;
- Increasing the amount of resources available (increase land, labor, and/or capital) in the target community vs. another location;
- Effective and efficient process for how to make decisions, to define and implement strategies;
- Changing (reinterpreting) the rules to benefit the community.

Additionally, the following seven mountain tourism principles outlined by Nepal⁷³ capture the CED and ecotourism approach and are particularly applicable to the mountainous Johar Valley setting:

1. Make eco-tourism more sustainable,
2. Reduce dependency and increase diversity,
3. Restructure and reform existing governmental and non-governmental institutions,
4. Advance gender equity,
5. Foster local economies,
6. Provide access to training, communications and funding, and
7. Promote peace, safety and security.

⁷¹ Interviews and informal conversations.

⁷² Shaffer, 2006.

⁷³ Nepal, 2002.

These seven mountain tourism principles offered practical, applicable suggestions about how community development goals can be accomplished, specifically in a mountain context.

Finally, the SWOT process was tailored to emphasize economic activities that would be complementary and supplemental to current livelihood strategies of those living in the Johar Valley. The current ecotourism, agriculture, and other livelihood strategies provide an economic activity base upon which the proposals for other community economic development opportunities can be built.

5.3.1 Threats and Opportunities

Although there are many opportunities for sustainable community economic development, there are also many threats and challenges that exist throughout the valley and beyond that may limit or threaten sustainable development. One threat mentioned by nearly every village resident interviewed is the continuing population decline, and the concern that eventually there could be the complete abandonment, particularly in the northernmost villages of Martoli and Milam. Though most residents see the construction of a road as a potential remedy to this threat, they also acknowledge that the road will bring a separate set of threats, which are discussed more fully later in this section.

Regardless of whether a road will be constructed in the Valley, increasing ecotourism activity is a promising strategy to bring in more jobs and counter the current trends of population decline. Investments by communities and government agencies in infrastructure such as sanitation, waste management, and restroom facilities will make travel in the valley more attractive and comfortable to a wider cross-section of visitors. At the same time, the Johar Valley can be promoted internationally as an ecotourism destination.

Without much improvement over what is currently offered in the valley, existing ecotourism activities can be marketed internationally and domestically to niche groups such as universities, outdoor recreation groups and environmental advocacy groups. Another related strategy is for ecotourism organizations to foster and maintain connections with groups that have visited the valley and have both had pleasurable experiences and been good guests. As these connections are forged and mature, the valley can begin to draw from ecotourism “nodes” internationally, both for returning trips and to expand the base of people returning to the Johar. The University of Washington can be a node for future student trips, which could expand out into the greater Puget Sound mountaineering and outdoor community.

Marketing specifically to niche groups and maintaining connections with key visitor groups also address another threat perceived by village residents, which is that increased tourist activities may bring a different type of visitor. More specifically, residents fear losing control over their lifestyles due to

infringement by insensitive or intrusive guests who may not share values compatible with the local community. They also worry that crime and pollution may become problems under this scenario. Targeting specific types of travelers is a good way to avoid these types of complications.

Another tourism-related concern expressed by valley residents is that increases in tourist-based economic activity and livelihood, especially if driven by outside investors and operators, will not benefit the local community financially. To counter this threat and create more opportunities in the Valley, the community can invest in human capital and training- for example, porter and guide development, leadership and small business management training, internet literacy, and hospitality training. If people in the valley have sufficient capacity to offer the same type and quality of services as competitors from outside the valley, their chances of succeeding in ecotourism-focused activities are much higher. In addition to capacity building, linkages can be created between existing valley occupations. For example, if trekking companies can coordinate with

local agricultural providers to purchase food, ecotourism activities can act as new markets for local farmers. Also, existing knowledge of herbs and woolen goods, for example, can be strong components of a strong ecotourism economy. When combined with other activities such as treks (including expeditions) and homestays, visitors may be interested in participating in classes and seminars on topics such as cooking and weaving.



Figure 5.10: A woman in Darkot demonstrates spinning techniques.

A final tourism-related threat identified by the group is that the valley may become too dependent on tourism without sufficient diversification of the local economy. To address this, Valley residents can utilize international linkages to establish niche markets for specialty products such as woolen goods, heirloom seeds, and medicinal herbs. If packaged and marketed effectively, these value-added products could bring more money into the local economy.

While many of these threats can be addressed through resources already present in the Valley (or at least

with minimal added resources), major threats to ecotourism in the Johar Valley are, at least at the moment, beyond the exclusive reach of local influence. The most immediate and obvious threat stemming from outside influence is the impending dam and road project. While many local residents view the road as beneficial, due to the potential of increased access to health care and better mobility in the valley, some residents acknowledge that it may harm villages in the valley. The dam projects will most likely bring in large numbers of outside workers, who could overwhelm valley resources in terms of consumption and waste. It is possible that labor provided by a transient workforce, especially from Nepal, would be cheaper than local populations so the dam projects would not likely supplement livelihoods of the residents of the valley.

Beyond economic threats related to dam and road projects, there would also be major changes in the landscape and physical features of the valley. While the “run-of-the-river” method is widely considered to be more ecologically sensitive than more traditional dam-reservoir systems, this method is not free of potential to cause ecological damage. Also, because the Valley experiences seismic activity, dam construction could cause additional instability resulting in landslides. Another side effect of a road could be an effort to survey land and assign ownership (in contrast to the complicated ancestral land ownership in place now). Because many valley residents do not have sole ownership of homes they inhabit, and might not be assigned ownership, a surveying project could disrupt existing village communities significantly. Compounding all of these threats is the fact that van panchayats have little decision-making authority with regards to these matters. These governing bodies are also factionalized in exercising influence over one particular village, but no effective valley wide authority is in place coordinate.

5.3.2 Prioritizing Opportunities

The SWOT process generated a list of opportunities for future economic growth. As a final level of organization, this list of opportunities was grouped into near-, mid- and long- term opportunities. Near term opportunities were defined as those able to utilize existing resources for implementation. Mid term opportunities are those opportunities that will likely require additional research, resource and community decision(s) in order to implement. Long-term opportunities are those that may require the most change and resources from the current conditions observed in the Johar Valley. These long-term opportunities can build upon successful implementation of near- and mid- term opportunities. While both mid- and long term opportunity lists require additional research that is beyond the scope of the CED team, the complete Johar Valley Opportunity Matrix is included in Appendix E for reference.

The following presents the full list of near term opportunities developed from the SWOT process and informed by CED and ecotourism principles. One of the proposed opportunities is further explored in an

implementation scenario that also incorporates related mid- and long-term opportunities.

Near Term Opportunities

The following chart of near- term opportunities emphasize the potential for the current ecotourism and livelihood strategies to be built upon, while also identifying possible challenges.

Table 5.2: Near Term Opportunities.

NEAR TERM OPPORTUNITY	DESCRIPTION	CHALLENGES
Enhance Existing Ecotourism	Market to niche international and domestic groups, ex. Universities, Outdoor Groups	Organizing Information, Making Connections
Align Existing Livelihood Strategies with Ecotourism	Strengthen connections between producers and both hotel and tour operators, ex. Agriculture, woolen products, merchant goods	Organizing Information, Making Connections
Expand Livelihood Strategies	Create new markets for products, ex. Agriculture, woolen products, merchant goods	Organizing Information, Making Connections
Utilize Built Environment	Rehabilitate building stock and infrastructure rather than building new, ex. homestays, and residential hotels.	Lack of Funding, Preservation and Design Guidelines, Enforcement, Ancestral Ownership
Capture Merchant Sales	Expand goods and work with merchants on advertising, ex. Signage	Language Barriers, Predictability of Supply/Demand
Expand Homestays	Work with existing infrastructure and families to initiate a homestay program, ex. Sarmoli homestay model	Organizing Entity, Start-up costs
Explore Cultural Heritage Programs	Utilize indigenous knowledge for cultural exchange, ex. Village tours, medicinal herb talks, weaving and cooking classes	Organizing Entity, Coordination between villagers and tourists
Capitalize on KMVN investment(s)	Work with KMVN on creating linkages between guesthouses and village ecotourism opportunities	Competition between KMVN Guesthouses and Village run accommodations
Invest in Guide/Porter (Human) Development	Augment local knowledge with certification, ex. EMT, English Language and Mountaineering Training	Funding, Timing of Courses, Explaining Long-term Benefit to Guides, Increasing Recognition for Certified Guides
Coordinate Learning Exchange with Niti Valley Ecotourism	Use knowledge gained in the Niti Valley and apply useful sections to Johar, ex. Nanda Devi Biodiversity Conservation and Ecotourism Declaration	Organizing Entity, Logistic Challenges

To develop a sense of the geographic layout of some of the resources already present in the valley, as well as some opportunities that could be realized in the near term, opportunities are presented on a map of the Johar Valley. Please refer to Appendix A– Johar Valley Assets Map.

5.3.3 Implementation Scenario: Coordinate Learning Exchange/Niti Valley Ecotourism

The near term opportunity, coordinate learning exchange with Niti Valley Ecotourism, was selected for further discussion because it exemplifies the principles of CED, and if implemented, may provide the Johar Valley residence with tools to address current threats while still developing other ecotourism and livelihood strategies for the future. It is possible that mid- and long- term opportunities, identified below, would be furthered as well.

Table 5.3: Implementation Scenario Opportunities.

OPPORTUNITY	DESCRIPTION	CHALLENGES
NEAR TERM		
Coordinate Learning Exchange with Niti Valley Ecotourism	Use knowledge gained in the Niti Valley and apply useful sections to Johar, ex. Nanda Devi Biodiversity Conservation and Ecotourism Declaration	Organizing Entity, Logistic Challenges
MID TERM		
Identify and Build Capacity of community institutions	Utilize new and existing institutions in individual villages and the entire valley to carry out needed projects, ex. Ecotourism boards, Forest Councils, Johar Valley Development Authority (potential), KMVN	Valley Wide Coordination, Inter-village Coordination, Sustainable Capacity Development
Human Capital Development	Provide training opportunities for locals in a variety of areas, ex. Medicinal herbs, sustainable harvesting techniques, leadership training	Funding, Organizing Entity, Local Interest, Programs
LONG TERM		
Implement Community Based Visioning & Planning process	Establish local organizations to facilitate the planning process. Work on a cohesive plan for the entire valley.	Local Participation, Outreach to all Stakeholders, Organizing Entity, Coordination among entire valley, Transhumance

Background: Niti Valley and Nanda Devi Declaration

The Niti Valley, located on the western side of Nanda Devi, can offer a useful model for citizen involvement and empowerment for the people of the Johar Valley (eastern side of Nanda Devi). Although the issues facing the two valleys are somewhat different, the relatively similar village governance structure as well as similar culture of the people make for strategies somewhat transferable between the two valleys. Also, the Niti Valley has played a prominent role in the discourse surrounding management and protection of the Nanda Devi Biosphere Reserve, which also includes part of the Johar Valley.

The Niti Valley has a history of a very strong grassroots movement stemming from the birth of the *Chipko* movement. Throughout the valley's development, stakeholders have chosen to let institutional structure evolve from grassroots rather than setting out a top-down institutional plan. This model would be appropriate for Johar Valley leaders to follow, as much of what is to be accomplished relies on the inclusion of local stakeholders for vision and direction.

Within the Niti Valley, the village of Lata worked in close conjunction with a number of NGO's, including the network "Alliance for Development" as a key stakeholder to develop a definition of equity and rights of local community in relation to the emerging tourism industry- the Nanda Devi Declaration (14th October 2001).⁷⁴ Lata then organized a workshop on community-based conservation, ecotourism, developed a plan for community-based tourism.

These two actions- the Nanda Devi Declaration and follow up community workshops- would also be an appropriate, and critical, model for the beginnings of a community-based planning process, or at least statement of a shared vision, in the Johar Valley. It could serve as the starting point for a reference or authority for how development could occur in the valley, as well as define the nature of tourism that residents would like to see.

In order to share the experiences of ecotourism development in the Niti Valley with people in the Johar Valley, existing organizations could collaborate in order to bring leaders to the Johar (either in Munsiyari or other villages in the Valley) to share institutional and individual learning. This exchange could be a great way to unite existing leaders and institutions. It could also be a fruitful way to identify new leaders and activists in the community that can be starting points in a valley-wide network.

⁷⁴ Singh, T. V. and S. Singh. "On Bringing People and Park Together through Ecotourism: The Nanda Devi National Park, India." ASIA PACIFIC JOURNAL OF TOURISM RESEARCH. 9. 1 (2004).

Mid Term Opportunity: Identify and Build Capacity of Community Institutions

Using a Niti Valley/ Lata exchange as a starting point, community members can start to forge connections between existing institutions such as area ecotourism boards, Forest Councils, village van panchayats, the KVMN, and the Uttarakhand Tourism Authority, an agency focused on tourism development in the state that has recently expanded its activities to the Johar Valley. At the same time, community members can expand their network to the other side of the mountains by maintaining connections with leadership in the Nita Valley. The community could also promote itself through posting on the “Mountain Forum” (www.mountainforum.org) and also making its presence known on the Alliance for Development website devoted to Nanda Devi, (www.nandadevi.prayaga.org).

Raising awareness about mountain communities on the western side of Nanda Devi, particularly with regards to the road/ dam issue, may guide Johar Valley communities to define and request/require some benefits from these impending developments. Forging connections on the Internet and elsewhere could also help identify possible funding sources for citizen and local institution-led organizational development projects. In addition to enhancing connections between other mountain groups, it is also important for Johar Valley villages to position themselves within the state governance structure, and other higher-level authorities, so that central leadership can better understand the hopes, struggles and challenges of the people in the valley.

Mid Term Opportunity: Human Capital Development

While forging connections between key groups in the valley is a critical strategy, it is equally important to cultivate and encourage a strong grassroots community. A strong grassroots presence can add legitimacy and authority to organizations that remain true to the vision of local stakeholders.

General human capital development projects are an important first step in this path. These projects could include training in Internet usage and marketing as well as English language study, which could assist local residents to better participate and negotiate in the tourist economy. EMT training and mountaineering/ guiding education would build capacity for more advanced and varied adventure travel. Finally, villages could reclaim indigenous knowledge in medicinal herb gathering and architectural heritage by training a next generation to be experts in these topics.

All of these training opportunities build general capacity on the individual and village level, giving village members more skills and opportunities for equitable work. Second, they provide an opportunity for organizers to identify key leaders that would benefit through more specific leadership training. Another option could be to implement some elements of community organizing into all trainings, so that each person has an opportunity to begin to understand the principles of community empowerment and

leadership and can form a basis for further leadership in the community.

As the community becomes more organized, it can begin to voice its vision and priorities, specifically in relation to the nature of change in the valley that will be brought about by the proposed construction of a dam and road system. If the community is organized and can articulate a common vision for development well before these changes begin to take shape, it may be able to exercise more authority in decision making with regards to land use.



Figure 5.11: (l to r) Raju, Vinod, Ganesh, and Yashwant - Members of the Guiding Staff - 2008 UW Exploration Seminar

Long Term Opportunity: Implement Community Based Visioning & Planning Process

Long term, grassroots community empowerment and institutional capacity building could lead to a citizen-initiated planning process that could help develop a tourism vision and/ or plan for the entire Johar Valley. Community leaders could decide on the size and scope of planning efforts as well as whether to handle the process through an existing organization or institution or whether to establish a regional planning authority. Either way, it is imperative that such a plan reflects local stakeholders' visions for the Valley. Also, for the plan to have any regulatory weight, it is critical that the planning process have the support of the state. In addition to local stakeholders including village ecotourism committee, forest councils, and the KVMN, relevant state and national institutions, such as the Uttarakhand Tourism Authority, the central energy department, and the ITBP, need to be involved as stakeholders. Also it may be beneficial to include international agencies and NGOs who have shown interest in the region, such as UNESCO and World Wildlife Fund, should also be included in the process.

5.4 Gaps and Next Steps

The goals of the 2008 exploration seminar, broadly speaking, were to get a general sense of what conditions on the ground look like in the Johar Valley and to make recommendations about first steps for ecotourism development. In working towards these two goals, many steps for further research were identified. First, further information regarding major actors and functions of community affairs in the Johar Valley is needed. Although the CED group achieved a basic understanding of these dynamics, more nuanced understanding is essential. Specifically, more research needs to be done on the role of KMVN in ecotourism expansion in the valley. As a governmental agency with a focus on tourism that is beginning to focus effort and attention on the Johar Valley, the KMVN will be a very important player in the direction of future development. Also, more research about the proposed road and dam projects should be undertaken. Since this issue is the most pressing from both a time and impact perspective, learning more about it should be a top priority for future research. Finally, comparable tourism development case studies in Himachal Pradesh and the Garhwal region of Uttarakhand need to be researched and evaluated for insights. Exploring these cases or other successful ecotourism efforts, would create a useful benchmark with which to evaluate programs and opportunities in the Johar Valley.

6.0 REFLECTONS

Next Steps for Future Work

Google Maps now has fairly detailed satellite image of Milam; a copy of this could be obtained for the field work in order to make land surveys accurate to scale. That, in turn, will enable future teams to accurately assess the availability and productivity of farmland in the Johar villages.

The Community Economic Development team has copied Kishan Singh Martolia's guestbook log in Milam. Future work could supplement this information with official tourist logs in order to document the seasonal tourism patterns in Johar Valley. Two sources to consult are Burphu's tourist log and ITBP records. The latter can be retrieved in Munsiyari.

Future work could also investigate the priorities of state-level tourism initiatives, run by KMVN and by the Uttarakhand Tourism Development Board. Do they plan to expand their pilot rural tourism program? How much power do they intend to yield to local Gram Panchayats in governing the direction of tourism development? The state's vision and priorities require further exploration.

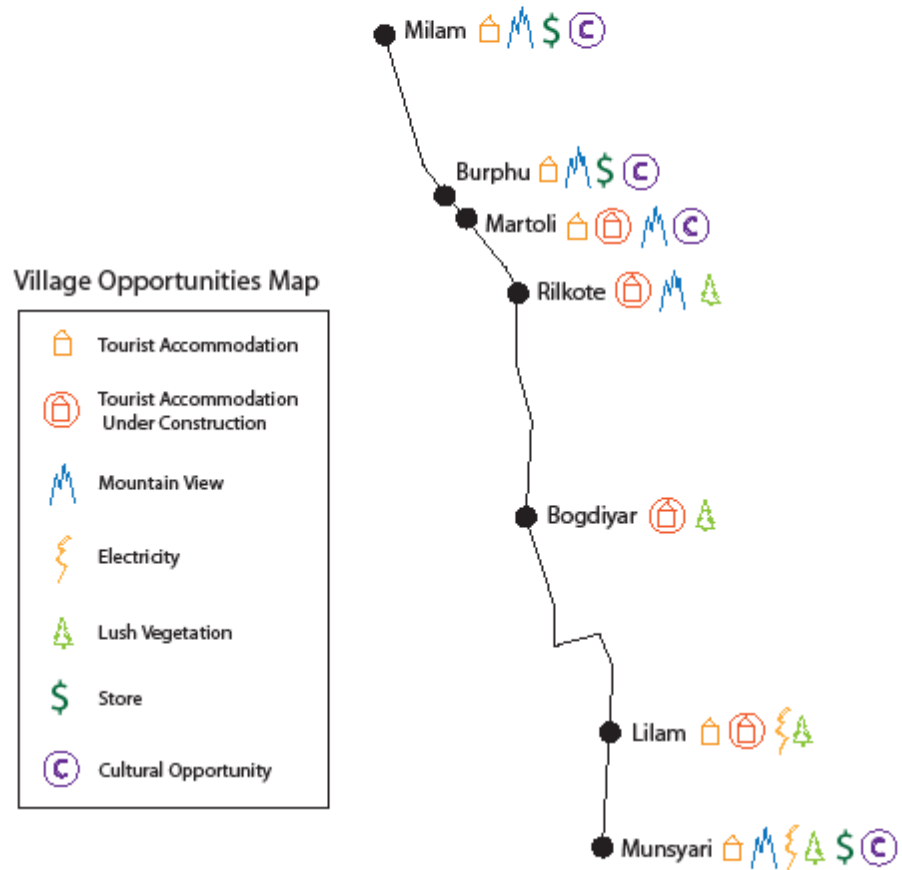
A really challenging, yet extremely valuable, pursuit would be the study and creation of sustainable development guidelines for natural, cultural, and historic built resources in the context of current and pending Johar Valley development. Involving all the stakeholders in the decisions on the future of the Valley is crucial. This work has only started the process of better understanding Johar Valley.



Figure 6.1: 2008 UW Exploration Seminar and local participants, Sonapani, India.

APPENDIX

Appendix A: Johar Valley Assets Map



Appendix B: Focus Questions for the Johar Valley

Environment and Ecology

1. What is your water source?
2. Are there any barriers to accessing your water source?
3. Are you aware of any dam projects in the valley? If so, what do you think of them?
4. Are there problems in the region related to natural resources other than water?

Built Environment

1. What are the traditions in the built environment, and how can lessons be taken from this and applied to new developments?
2. How is the built environment changing based on tourism?
 - a. What is the perception of tourism businessmen of what tourists want?
 - b. What is the feedback of tourists on the environment that they see? What do they like/don't like?
 - c. What are the priorities of tourism operators in the built environment?
3. Who has the power in defining the built environment?
 - a. What's the relationship among government (local and district-level), tourism operators, and other villagers?
 - b. What's the relationship within groups, i.e. among all hotel operators and owners?
 - c. What is the role of KMVN in Johar Valley tourism? How can tourists take part in shaping the built environment?

Public Health

1. What is the availability of health care in the Johar Valley, including the proximity to health care facilities, specifically in terms of women's health and emergency care?
2. What are the public, private and Non-Governmental Organizational (NGO) health care structure in the Valley? And relationship to (a) the neighboring districts, (b) the state system in Uttarakhand, and (c) the national health care system?
3. What are the health care needs among villagers?
4. What is the villagers' current preferences for allopathic or Ayurvedic medicines?

Community Economic Development

1. What is the desirability of tourism? What are the benefits and/or concerns? What has been your experience?
2. What is the interest in changing economic livelihood? – community, -family/individual?
3. What other things do you do (economic livelihood)? For example, herb gathering, farming, etc?

Appendix C: Informed Consent Statement

Informed Consent Statement

Hello. We are students from the University of Washington in the United States. We are visiting the Johar Valley to learn about the Kumaon region and its villages. We are particularly interested in understanding your thoughts about ecotourism and health care.

We would like to ask you a few questions about these topics. You can choose whether or not you want to answer our questions. It is fine if you choose not to answer them. By answering our questions you will help us to learn what types of tourism, if any, would be of direct benefit to the community and how to promote good health care for those who live in the Johar Valley and those who visit it.

Do you have any questions for us? Would you like to answer our questions? (If no: Thank you). (If yes: would you like to do that now or at another time? When would you like to talk?)

Appendix D: Herbal Medicines in the Johar Valley

1. Gandrani/Angelicaglanca

- *Medicinal Type:* root
- *Treats:* cough, asthma, gastric problems.
- *Treatment Method:* Chew, w/ lukewarm water
- *Growing/Harvesting Conditions:* grows at 9-14,000 ft., in moist places, approximately one meter in height. Plant in April-May. Distance between crop rows is three feet. Harvest August-September.
- *Market Value:* INR 300/kg.

2. Sweet Athis/ Gangre

- *Medicinal Type:* root
- *Treats:* lack of strength
- *Treatment Method:* eaten (unconfirmed) – stated as “good tasting”
- *Growing/Harvesting Conditions:* unknown
- *Market Value:* unknown

3. Athis

- *Medicinal Type:* root
- *Treats:* gastric/digestive problems, fever, internal cuts, loose motions (diarrhea); good for hair
- *Treatment Method:* chew and take with lukewarm water
- *Growing/Harvesting Conditions:* grows at 11-12,000 ft in altitude. Plant grows to one foot tall.
- *Market Value:* INR 800/kg.

4. Salam Panja

- *Medicinal Type:* root
- *Treats:* gastric problems, blood clotting problems, promotes general “good health”; also gives “manpower” and increases sperm count
- *Treatment Method:* soak roots in water overnight, use in the morning.
- *Growing/Harvesting Conditions:* harvested root looks like a hand (panja: hand)
- *Market Value:* unknown

5. Coot (Saussurealappa)

- *Medicinal Type:* root—both bitter and sweet version
- *Treats:* cuts, burns
- *Treatment Method:* rub directly onto wound/skin

- *Growing/Harvesting Conditions:* plant in April, harvest in October. Takes three years to grow. Grows to one meter tall. One plant yields 5-7 kg of coot. One acre of land yields one quintal of coot.
- *Market Value:* unknown

6. Kutki

- *Medicinal Type:* unknown
- *Treats:* constipation, malaria, fever, joint pain, urinary problems
- *Treatment Method:* unknown
- *Growing/Harvesting Conditions:* plant in April, harvest in October. One acre yields five quintal.
- *Market Value:* unknown

7. Dolu

- *Medicinal Type:* leaf
- *Treats:* jaundice, internal injuries
- *Treatment Method:* boil and drink the water; also used to color wool
- *Growing/Harvesting Conditions:* when harvested, it is a broad leaf one to two feet tall. Plant in April, harvest in August. "Takes three years."
- *Market Value:* unknown

8. Thaiya

- *Medicinal Type:* used to make scented oil (unclear which portion of the plant is used)
- *Treats:* stomach ache, fever, itching.
- *Treatment Method:* unknown
- *Growing/Harvesting Conditions:* also black cummin (unclear)
- *Market Value:* unknown

9. Magi

- *Medicinal Type:* unknown
- *Treats:* jaundice, repels insects
- *Treatment Method:* good scent (not clear what this meant)
- *Growing/Harvesting Conditions:* One acre yields three quintal.
- *Market Value:* unknown

10. Chiviata

- *Medicinal Type:* unknown
- *Treats:* cleansing (blood purifying), digestion, used to make safi
- *Treatment Method:* unknown
- *Growing/Harvesting Conditions:* 1 acre yields 5 quintal. Takes one year to grow.
- *Market Value:* unknown

Appendix E: Johar Valley Opportunity Matrix

Johar Valley – Opportunity Matrix – Community Economic Development Team		
NEAR TERM	DESCRIPTION	CHALLENGES
1) Enhance Existing Ecotourism	Market to niche international and domestic groups, ex. Universities, Outdoor Groups	Organizing Information, Making Connections
2) Align Existing Livelihood Strategies with Ecotourism	Strengthen connections between producers and both hotel and tour operators, ex. Agriculture, woolen products, merchant goods	Organizing Information, Making Connections
3) Expand Livelihood Strategies	Create new markets for products, ex. Agriculture, woolen products, merchant goods	Organizing Information, Making Connections
4) Utilize Built Environment	Rehabilitate building stock and infrastructure rather than building new, ex. Homestays, hotels, residences	Lack of Funding, Preservation and Design Guidelines, Enforcement, Ancestral Ownership
5) Capture Merchant Sales	Expand goods and work with merchants on advertising, ex. Signage	Language Barriers, Predictability of Supply/Demand
6) Expand Homestays	Work with existing infrastructure and families to initiate a homestay program, ex. Sarmoli homestay model	Organizing Entity, Start-up Costs
7) Explore Cultural Heritage Programs	Utilize indigenous knowledge for cultural exchange, ex. Village tours, medicinal herb talks, weaving and cooking classes	Organizing Entity, Coordination between villagers and tourists
8) Capitalize on KMVN investment(s)	Work with KMVN on creating linkages between guesthouses and village ecotourism opportunities	Competition between KMVN Guesthouses and Village run accommodations
9) Invest in Guide/Porter (Human) Development	Augment local knowledge with certification, ex. EMT, English Language and Mountaineering Training	Funding, Timing of Courses, Explaining Long-term Benefit to Guides, Increasing Recognition for Certified Guides
10) Coordinate Learning Exchange with Niti Valley Ecotourism	Use knowledge gained in the Niti Valley and apply useful sections to Johar, ex. Nanda Devi Biodiversity Conservation and Ecotourism Declaration	Organizing Entity, Logistic Challenges
MID TERM	DESCRIPTION	CHALLENGES
1) Identify Munsiyari as Gateway to Johar Valley	Work with institutions to market the valley, ex. Website and brochure creation	Recognizing organizing institutions, funding

2) Expand Agricultural Markets	Work with local farmers on marketing and packaging as well as increasing amount of cultivated land, ex. Heirloom seeds, medicinal and non-medicinal herbs	Supply/Demand, Recognizing Markets, Logistics
3) Expand Non-Agriculture Economic Opportunities	Partnering between trek operators and local producers, as well as expand markets abroad, ex. Advertising, web presence	Coordination, Supple/Demand, Recognizing Markets, Training of Internet Sales
4) Invest in Infrastructure Improvements	Work with villages to identify and implement infrastructure improvement projects ex. Waste management, sanitation, restroom facilities	Funding, Planning, Organizing Entity, Valley Wide Implementation and Phasing, Natural Resource Limitations
5) Identify and Build Capacity of community institutions	Utilize new and existing institutions in individual villages and the entire valley to carry out needed projects, ex. Ecotourism boards, Forest Councils, Johar Valley Development Authority (potential), KMVN	Valley Wide Coordination, Inter-village Coordination, Sustainable Capacity Development
6) Explore Mitigation for Dam(s) and Road	Understand opportunities for valley inhabitants for employment (construction and operation) as well as possible mitigation through a valley fund to address needs	Lack of Local Voice, Exclusion from Process, Unknown requirements for local employment and precedence, Uncertainty of plans
7) Human Capital Development	Provide training opportunities for locals in a variety of areas, ex. Medicinal herbs, sustainable harvesting techniques, leadership training	Funding, Organizing Entity, Local Interest, Programs
LONG TERM	DESCRIPTION	CHALLENGES
1) Develop Heritage Trail Route to Tibet	Reopen historic trade routes to Tibet and market them as Heritage Routes	Border Security, International Government Cooperation, Organizing Entity, Trail Condition
2) Create and Implement Environmental Regulations	Identify potential threats to the environment and create regulations to mitigate them. Work with new and existing institutions to create an overall policy for Johar Valley	Organizing Entity, Enforcement of Regulations, Buy-in From the Valley, Minimal Infrastructure to Correlate with Regulations
3) Identify and Secure Funding for Infrastructure and Other Improvements	Identify potential sources for funding and projects to be completed, ex. NGOs, Local, Regional, National and International Organizations	Organizing Entity, Convincing Funders on Importance of Investment in the Valley, Coordination within Villages and the Entire Valley
4) Expand Length of Seasonality	Look into the feasibility and opportunities to expand the tourism season to extend beyond the current four months	Severe Weather Conditions, Village Transhumance, Lack of Infrastructure and Funding, Need to Upgrade/Create Facilities

5) Retention and repopulation of villages	Work on strategies that will bring villagers back to their ancestral lands, especially focusing on youth programs, ex. University Partnerships with Internship/Training placements in the valley, providing facilities such as schools and doctors, incentives for youth to return	Fostering Relationships with Universities, Institution Building, Providing Motivation for Youth
6) Implement Community Based Visioning & Planning process	Establish local organizations to facilitate the planning process. Work on a cohesive plan for the entire valley.	Local Participation, Outreach to all Stakeholders, Organizing Entity, Coordination among entire valley, Transhumance

Appendix F: Johar Valley Supplemental Income Activities Chart

Supplemental Income Activities Chart – Community Economic Development Team			
Activities	Unit Price	Yearly Yield	Notes
Homestays	INR350/person/night	35,000 Rs/year	Assuming 100 people per season (4 month season)
<i>Jimbu & Thaya</i> Export	INR 200-300/kg		Depending on whether sold locally or outside of village farther down the valley. Milam as a village produced 2000 kg of <i>jimbu</i> .
Sheep Herding		INR 30-50,000 /year	300 head herd
<i>Yar Tsa Gumba</i> Export	INR 80-90,000/kg	~ INR16-18,000	Only harvested by young able-bodied males during a limited collection season. Average annual yield is 200 g per person. Government is in the process of limiting the price to 50,000 Rs/kg
Woolen Products	INR 70-550 /product		Depending on size and quality of product.
Porter Work	INR 300 /day		Animals required for porter work.
Guide Work	INR 500 /day		Training required for guide work
KMVN Guest Houses	INR 900 /room/night		Meant as a gauge for understanding the homestay pricing.
Potato Export	INR 300 /kg		Not an in demand product outside of the sustenance farming market.
Grains Export	INR 200 /kg		
General Stores			No information other than that they exist in villages throughout the region.

Appendix G: Johar Valley SWOT Analysis

SWOT Analysis – Johar Valley: Community Economic Development Team

Valley-wide SWOT

Strengths/Assets

Natural features
Supply of water (abundance)
Distinct culture and history
Friendly people
Indigenous knowledge
Ancestral ties to place
Ease of navigation
Well-defined trail system
Off beaten track
ITBP and permit process
Agriculture
Tourist accommodations
Uniqueness of food
Nanda Devi spiritual importance

Cultural crafts
NGO philosophy/work
Inherent government interest
Ecotourism committee
Built environment distinctness
Scheduled tribes land can't be sold
Laws concerning selling property
Security: peaceful border
Biodiversity
Trade route heritage
Trekking companies

Weaknesses

Remoteness
Village populations on the decline
Variation between villages
Seasonality
Tourist infrastructure for international visitors
Lack of standards
Ancestral land ownership
Water availability and quality
ITBP
Sewer and garbage infrastructure
Start-up opportunities
Absence of communication infrastructure
Lack of emergency care

Undefined permitting requirements
Border closure
Weather
Lack of environmental regulations
Lack of planning
Lack of a village voice
Way finding
Lack of training
Alcoholism
Marketing
Language barrier
Lack of education

Opportunities

Road
Marketing
Advertising
Dam projects: financial leverage & mitigation
Dam projects: employment
ITBP, capacity
Building resources and restoration
Biosphere, UNESCO institutions
Local level institutions
Expansion of homestay model
Cultural opportunities for learning
Training for guides/porters: EMT, mountaineering,
Training for guides/porters: English language

Supplies for trekkers
Munsiyari as gateway
Milam as destination
Agriculture: heirloom seeds, increase diversity
Agriculture: herbs, organic
Microfinance
Awareness
Participatory planning process
Tourist quotas
Retention and return of villagers
Seasonality expansion
Opening of trade routes
Expanding mountaineering opportunities
KMVN guesthouses

Threats/Challenges

Road: scale/speed of growth, cheaper labor
Dam: increase in workers
Dam: loss of agricultural lands
Dam: environmental degradation, land instability
Climate change
Tourism with no local economic benefit
Degradation of integrity of the traditional architecture
Border security
Out-migration
Tourist attitudes

“Too many” tourists
Uncontrolled access
Ancestral ownership, reaching agreement
Lack of infrastructure
Loss of cultural heritage
Ability of community to manage changes
Diverging and haphazard development with no plan
Population displacement
Wealth inequity
Dependence on tourism as economic means

Village Specific Assets

Sarmoli

Homestay model
NGOs
Proximity to Munsiyari
Ecotourism principles
View of Panchachuli Range
Accessibility
General infrastructure
Permanent settlement
Learning opportunities, cooking, woolen goods
Ability to leverage assets
Educated leaders committed to community

Lilam

Permanent settlement
KMVN guesthouse under construction
ITBP post

Bogdyar

Existing hotel
Chai stop
KMVN guesthouse under construction
ITBP post

Rilkote

Temporary helipad
KMVN guesthouse under construction
ITBP post
Chai stop

Martoli

Nanda Devi east base camp
Temple
Conserved forest
Ecotourism Committee
Three hotels
Cultural tours

Burphu

Valley Seat
People of various ages
Government rations center
Glacier access
Temple
Vitality
Institutions such as school, doctor, post office

Milam

Glacier
Largest village
ITBP located there for 12 months/year
Unique urban infrastructure
History
Challenges, water, no cameras
Terminus
Homestay potential
Agriculture

Appendix H: Johar Valley Interview Summaries

MARTOLI

Herb Talk

During the course of this talk it was stated that a number of herbs were grown in the area. Income potential for some of the herbs was also given.

- *Thoya* (Black Cumin)
 - INR 200/kg, INR 250-300/kg in Munsiyari
- *Jimbu* (Garlic Chive)
 - INR 200/kg, INR 250-300/kg in Munsiyari
- *Lal Jadi* (Red Herb)
- *Meetha Atees* (Sweet Root)
- *Chirayat*
- *Gandraini* (Root)

Munna Hotel Interview

There were two people that were part of this interview, the hotel operator and the Gram Panchayat.

The hotel operator has lived in Martoli for about eight years. His hotel is the oldest in the village and was started in 1982 by his father. Before the hotel opened the family lived off agricultural production; mainly herbs, and they continues to farm in conjunction with hotel operation.

The owner noticed that there has been an increase in tourists in the last five to six years. His relationship with tourists is good and he welcomes more. He recognizes that his facilities are few and stated he can provide more as his income increases. There was an instance when his hotel was full, and the overflow was accommodated by housing people in the community hall for the night. He stated that there are more foreigners than domestic travelers that stay at the hotel and that most inquire in Munsiyari about accommodations in Johar Valley.

The owner stated that his family is currently in Munsiyari. He stated that a school would be a necessity if his family were to come to live further in the valley with him. In addition, winter conditions were too severe to live in Martoli year round. When asked about the road, he stated that it would be nice if it only went to Bogdyar, so only the “pure” tourists would continue to Martoli.

The Gram Panchayat, who is the head of the Eco Tourism Committee, talked about their future plans with funds which were: garbage collection and burn, constructing restroom facilities, and improving water supply. He also commented on the KMVN project and stated that it was for the “rich people.” The project will provide good facilities, but KMVN only interacted with the property owner, and not the village, on the development of the project.

He also stated that conditions are hard. There is not enough food and that people are only there to graze their cattle and herds. They are not currently receiving any assistance or funding from the government. He stated that basic infrastructure, such as electricity and roads are needed most.

Hotel Interview 2 (Lxman Restaurant on sign)

The owner started the hotel five to six years ago. It was originally elsewhere in the village, but relocated because he was evicted from his original location. His residence is elsewhere in the village, and he rents the space where the hotel is located for INR 800 a season. Before starting the hotel he farmed, which he continues to do. His main residence is in Munsiyari.

He has from 15-20 guests per season. As he gets older continuing the hotel operation has become more difficult. He cannot cook for more than 10-15 people at one time.

Martoli Group Interview

A group interview took place at the Nanda Devi Temple and included sixteen male and female community members. The youngest was 40 and the oldest was 70.

The community does not see tourism as a major contributor to their livelihood (compared to agriculture). They felt water was not a big issue, but have noticed the amount has been decreasing because of global warming. Their main concerns for the area are the receding glaciers, and for the region to remain (ecologically) intact. There has been little change to the economy in the past five years, however, they are excited about the growing tourism, and would like to see more of it as a supplement to agriculture. They have not had any negative experience with tourists to date. The village felt that the ITBP created barriers with paperwork, making travel difficult for tourists.

They felt the road would make a positive difference in their lives. The village would be able to sell their agricultural products, mainly potatoes, and make a greater profit. They are aware the dam is being built, but are unsure of its consequences. They assume there will be environmental impacts, but are confused about the outcome. When asked about work opportunities from dam construction, they felt the majority of workers would come from outside the valley where labor is cheaper.

When asked about *yar tsa gumbu* they stated that it is only profitable for the young and fit. There has been a benefit from it, but not for the whole community.

Eco Tourism Committee Head

The Eco Tourism Committee was founded on May 15, 2006 by Uttarakhand Tourism. It originally included twelve villages, but only Martoli is active. The Committee identified five places of interest to Eco Tourists throughout the valley, based on natural beauty.

The committee must raise INR 5,000 as startup costs to be recognized by the government. The committee has collected INR 2,000 to date from the 2008 season fees. The money that the committee raises would be used to build tourist infrastructure around the village. The current fees are:

- 25 Rupees for international tourist
- 20 Rupees for domestic tourists
- 15 for domestic student tourists

Additional fees can be levied by private operators, but they do not go towards the Eco Tourism Committee. Since the committee is in its infancy it does not have the capacity to increase taxes on tourists to add to the fund. He stated that the cost of one western toilet costs INR 15,000.

Bigfoot Expedition Interview

The interview consisted of three men who are adventure tourists from Calcutta. They were last in the Kumoan region in 2003. Since their last visit there has been an increase and improvement in lodging and better communication along the trek. There was only one hotel in Martoli in 1995. The number of people in the villages has gone down, but tourism has increased. They would not like to see any changes in Martoli; they feel the facilities are adequate. They did not see the need for adding restroom facilities.

During their trek they prefer to stay in homestays or in tents to give locals a source of income. They reduced their travel footprint by burning their trash and reducing their plastic use. They also train students in Calcutta on how to reduce their footprint when trekking.

The group thought the road would take a long time to construct and don't think it will happen in their lifetime. They also don't think it will make it all the way to Milam. They felt that the road would help the local people, but also view it as a source of corruption. The people in Martoli are "innocent" and the land is clean, but they feel that will change with the construction of the road. Using Nepal as an example, they said they get paid well, but the growth has taken away from the overall experience of place. They did not expect to stay in a five-star hotel in the mountains.

They used Himachal Pradesh as a good model of successful Eco Tourism.. They stated they don't like to deal with the ITBP because no cameras are allowed past Milam, but otherwise feel the ITBP is helpful.

BURPHU

Villager Interview 1

The villager stated that some people are returning to the village. Their main livelihoods are agriculture (potatoes, mustard, and grains) and grazing goats and sheep. He stated that Burphu is the main center for the valley, which includes the Government ration store, veterinary office, PWD office, pharmacist, post office, hotels, school and a pharmacist. The village consists of 24-25 families with around 100 people. There are 24 kids.

He stated that most tourists tent camp and don't necessarily stop in Burphu. His reasons were that Martoli is more popular because of Nanda Devi.

Villager Interview 2

The man stated that the village receives tourists well. They find out about the accommodations available through word of mouth or when they enter the village. He stated that there are 5-6 families that are prepared for homestays. The village plans to look at Eco Tourism in the future. Most tourists that stop buy things from the stores and woolen textiles/carpets, or come to see the woodcarvings in the village and the glacier.. He stated that the village does have restroom facilities that were supposedly funded through the government.

MILAM

Interview with farmers

There are 25 households in Milam with 1-3 members each. Water is the largest issue to ensure keeping yields up, which have been declining in the last ten years. They feel the water problems may be attributed to "climate change." The village grows nine crops, vegetables and medicinal herbs. Vegetables are grown primarily for personal use, but also to barter with ITBP for canned milk or kerosene oil. The farmers stated they send their agricultural products down on mules and sell direct to the market. The seeds have been in the family for generations and are heirloom seeds. They stated that a road will create better access and increase tourism, but there may also be outside beneficiaries. One farmer said he was familiar with the Sarmoli homestay model, and it would be good for Milam as well. The farmers also stated that eco tourism would be more attractive to youth, and that agricultural work during the summer is also attractive.

Storekeeper Interview

He stated that the store opened in 1997. They sell products to everyone including locals, tourists, and the ITBP. Tourists find out about the store by word of mouth. The store is a part of the house. They sell based

on demand. Goods are brought in from Munsiyari on ponies at the beginning of the season and are replenished based on demand. They also farm and sell their agricultural products from the store. If available they also sell woolen goods that they make in Munsiyari. The storekeeper stated that there is a problem with goods expiring. They are satisfied with the amount of business they get. He feels tourism is good and enjoys the interactions with tourists. During the winter he grazes sheep.

Milam Agricultural Products

- *Lie* (mustard)
- Potatoes
- *Ogle* (*papar*)
- *Uoa*
- Wheat
- Lentils
- *Jimbu*
- Black Cumin
- Addth
- Vegetables (cabbage, peas, beans, carrots, squash, daikan, spinach)

Appendix I: Exploration Seminar Reading List

PREPATORY COURSE READING LIST

(e-reserve file name in parenthesis)

Session 1B: April 18, 2008

Chapter 3 in Rai, H. C. (1998). Hill Tourism: Planning and Development. New Delhi, Kanishka Publishers. (hill_tourism_chp3.pdf)

Chapter 2 in Hoon, V. (1996). Living on the Move: Bhotiyas of the Kumaon Himalaya. New Delhi; Thousand Oaks, Calif., Sage Publications. (hoon.living_on_the_move.ch2.pdf)

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