

CREATING RESILIENT COMMUNITY IN DISASTER PRONE GEOGRAPHIES: SHOULD AAGAAS TURN FOR-PROFIT OR REMAIN NOT-FOR-PROFIT?

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AIM:

1. To discuss economic, social, and environmental resilience in communities prone to natural disasters and make the region financially sustainable.
2. To recognize the importance of environmental conservation and how it impacts the lives of the poor people in the mountain regions
3. To appreciate the challenges of addressing sustainable livelihood and poverty alleviation in hilly regions.

CASE SYNOPSIS

This case discusses Alaknanda Ghaati Shilpi Federation (AAGAAS), a non-profit organization in a small town in the Chamoli district of Uttarakhand, a state in northern India. It discusses how AAGAAS aimed at development in the region through the promotion of sustainable livelihoods aimed at creating a resilient community. The organization also set up a bio-diversity park with the stated objective of promoting bio tourism as a livelihood alternative for the local communities. However, the tragedy that took place at Uttarakhand in June 2013 challenged AAGAAS. This tragedy challenged Maithani to sustain the

organization which was already engaged in local craft promotion and many other initiatives for community development including sustainable livelihoods.

Maithani was facing a shortage of funds along with lack of skilled manpower. He wondered whether it was feasible to transform his organization into a for-profit organisation but was skeptical about the transformation in light of the recent tragedy. However, he wondered what would be a viable business model that could generate sustainable livelihood options for the poor while at the same time helping to conserve the fragile ecosystem of the region.

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CREATING RESILIENT COMMUNITY IN DISASTER PRONE GEOGRAPHIES: SHOULD AAGAAS TURN FOR-PROFIT OR REMAIN NOT-FOR-PROFIT?

It was a dark and rainy morning on June 16, 2013. Jagadamba Prasad Maithani (Maithani), chairperson and founder of Alaknanda Ghaati Shilpi Federation (AAGAAS), was in his house in Dehradun, reading the newspaper. The weather forecast for the region was heavy to very heavy rainfall over the next 48 hours. The pre-monsoon showers had started on the night of June 10, 2013, and had continued till the morning of June 11, 2013, bringing down temperatures. The rains had brought a welcome respite from the hot and humid weather conditions that had prevailed in the region for several days. However, now, after two days of incessant rains, Maithani felt restless and uneasy. Just then, his phone rang. It was Jaswant Negi (Negi), his associate, calling from the Pipalkoti office of AAGAAS, located some 250 km away from Dehradun. Negi's voice was thick with fear. And as Negi's words sank in, Maithani too stood horrified, clutching his phone. Negi told him that the torrential rains had caused flooding and widespread devastation in Kedarnath valley. With the tourist season in full swing, the situation had become all the more alarming. The people had been caught unawares in the absence of any strong weather warning by the Indian Meteorological Department (IMD). Maithani immediately switched on the television. One of the local news channels reported,

“Three persons were killed in a house collapse in Dehradun today while thousands of Char Dham pilgrims were stranded on Gangotri and Yamunotri routes, as incessant overnight showers across Uttarakhand caused landslips in Uttarkashi district and swelled rivers. The downpour has also led to the suspension of the Char Dham Yatra¹. ”²

Maithani felt the urgent need to mobilize all his resources to help those affected. However, he also felt helpless. AAGAAS had been going through a tough time in recent years in arranging for funds. To add to the problem, most of his core team members had left the organization for better opportunities elsewhere. AAGAAS was totally ill-equipped to

¹ Char Dham, meaning four abodes in Hindi, refers to the four holy places of Hindus namely Badrinath, Kedarnath, Yamunotri, and Gangotri. Char Dham Yatra refers to the journey covering these four places. All these four places are located in the state of Uttarakhand.

² <http://www.thehindu.com/todays-paper/tp-national/monsoon-storms-endanger-lives-affect-char-dham-pilgrims/article4821461.ece> (accessed on Dec 15, 2013)

deal with disasters of such magnitude. He made a few phone calls and then hopped into a shared cab to reach the disaster zone.

Five months after the disaster, official numbers put the death toll at 580. Over 5,200 people were reported missing. Around 4,200 villages were affected and 9,200 heads of cattle and livestock were lost. About 3,320 houses were destroyed and about 995 public buildings were damaged; close to 9,000 km of roads were affected; and 85 motor bridges and 140 bridge bridges were damaged. The disaster left over 70,000 tourists and 100,000 local inhabitants stranded in and around the banks of the Alaknanda and Bhagirathi rivers. They were subsequently rescued by the Indian army. (*See Exhibits I-IV*)

ABOUT UTTARAKHAND

Uttarakhand is a state in the northern part of India with Dehradun being the state capital. The state has a total geographic area of 51,125 [sq.km](#) of which 93% is mountainous and around 65% is covered by forests. The state lies almost entirely in the Himalayan region. The northern part of the state is bordered by the Himalayan range while the southern part is the Terai region that separates the mountains from the plains. The Terai region is characterized by thick forests, swamps, and grasslands. The state is a tourist destination because of its picturesque landscape made up of snow clad mountains, green valleys, rivers, and lakes. The two most prominent rivers of India, namely the Ganga and the Yamuna, originate in the mountains of Uttarakhand. The state is also a favourite destination for pilgrims. Kedarnath, Badrinath, Hemkund Sahib, Gangotri, Yamunotri, Jageshwar, Bageshwar, Rishikesh, and Haridwar are all known for their religious importance. According to 2011 data, 25 million tourists visited Uttarakhand in current tourist season which was more than twice the population of the state. It was reported that during the period January to June 20, 2013, more than 1.2 million people had visited the four towns of Kedarnath, Badrinath, Gangotri, and Yamunotri.

Chamoli is the second largest district in the state of Uttarakhand and covers an area of 8030 [sq.km](#). The entire area is mountainous with a forest cover of 58.38%. The elevation of the district ranges from 800 to 8000 meters above sea level. The region is subject to

frequent landslides and earthquakes since Chamoli is a highly earthquake prone area. (See Exhibit VI) In the recent past, an earthquake measuring 6.8 on the Richter Scale occurred on March 29, 1999, killing 103 people and leaving several hundreds injured. Approximately, 50,000 houses were damaged and over 2,000 villages were affected. Electricity, water, and communication facilities were severely affected following the earthquake. In 2010, excessive rainfall led to floods that caused massive crop damage in the region. This led to a shortfall in the production of rabi crop, pulses and grains, and vegetables and fruits. The region also faces water problems. Water bodies were reported to be drying up as a result of large dams, deforestation, and global climate change. As of 2012, the district of Chamoli had a population of 391,605 with a population density of 49 people per [sq. km](#). Around 84.83% of the district's population lived in rural areas and 20% of them were scheduled castes and scheduled tribes (SC/ST). Over a quarter of the 32,384 below the poverty lines (BPL) families in the district were scheduled castes and scheduled tribes (SC/ST). SC/ST BPL households comprised more than one-third of Dasholi Block of Chamoli District. The district is one of the most backward in Uttarakhand. The region has numerous socio-economic problems created and aggravated by the migration of young men, subsistence agriculture, lack of market access, and unfair burden on women folk to run hearth and home. Female foeticide is also widespread. The gender ratio in the 2011 census for girl children in the 0 to 6 year age group was just 889 per 1000 boys. Rural life is predominantly labor intensive and dependent on forest and livestock. The forest provides fodder for the livestock, fuel wood for cooking, fruits, seeds, and fiber. Almost every rural family keeps livestock to meet their requirements for milk and manure. However, fodder shortage is an acute problem in these areas and it has a significant impact on the health of the livestock and on milk yield. These areas are characterized by inaccessibility, fragility, marginality, diversity, niche, and human adaptation mechanisms, often called 'mountain specificities'. (See Exhibit VII)

ABOUT AAGAAS

AAGAAS was founded in the year 2002 by Jagadamba Prasad Maithani as a voluntary nonprofit organization in the small town of Pipalkoti. Pipalkoti, located in Chamoli district, is 262 km away from the state capital of Dehradun. Pipalkoti has seen very little economic and industrial development because of its geographic remoteness, difficult terrain, and sparse population. AAGAAS started with the idea of promoting community-based tourism, biodiversity conservation, and promotion of lesser and unknown trekking routes around Pipalkoti town and adjacent areas. The locals were keen to develop and enhance their skills, knowledge, and capacities in conservation of the local environment. The objective was to create local institutions that would focus on the inclusive sustainable growth of the poor tribals and weaker sections of society through livelihood promotion. In the last 10 years, AAGAAS had initiated and completed a number of projects (*See Exhibit VIII*). AAGAAS worked in 54 gram panchayats³, 800 schools, and 4 districts in Uttarakhand. The focus areas were promotion of biotourism, local craft promotion, and livelihoods and nursery plantation.

³ Gram Panchayats are local self-governments at the village or small town level in India.

THE CAUSE

From June 14 to 17, 2013, the Indian state of Uttarakhand and adjoining areas received torrential rainfall of over 200mm within a short span of 24 hours. Over the next couple of days, the rainfall continued but with less intensity over the Alaknanda and Bhagirathi basins. This caused the Chorabari Glacier at a height of 3800 metres to melt and to the Mandakini River bursting its banks. The result was heavy floods near Gobindghat, Kedarnath, and Rudraprayag district in Uttarakhand and the adjoining state of Himachal Pradesh in India and in western Nepal. Heavy rainfall was also reported in the nearby regions of Delhi, the Indian states of Haryana and Uttar Pradesh, and in some parts of Tibet.

However, newspaper reports suggested that the scale of the disaster had been compounded by man-made factors such as rampant construction of hydro-power projects and expansion of roads.

ActionAid, a UK-based agency reported:

“The construction of more than 245 hydroelectric dam and mining projects along the 14 river valleys in the state within the last decade, has posed an enormous ecological threat. Rivers have been diverted, hills blasted and forests destroyed, causing large-scale soil erosion and landslides. Debris from the construction has raised water levels, which contributed to flash flooding when monsoon rains came early.”⁴ (See Exhibit V)

The Hindu, a leading Indian newspaper, reported:

“The human intervention in the region over the last 10 years also played a major role in intensifying the disaster. To cater to the unprecedented growth of religious tourism, a large network of new highways and road-widening schemes are cutting into the toes of delicate, fragile and marginally stable slopes that hug the highways on river edges. Highways

⁴ <http://www.actionaid.org/india/news/deadly-north-india-floods-largely-man-made-says-actionaid> (accessed on Dec 15, 2013)

— around 500 km long — on the banks of the Alaknanda and the Bhagirathi are constantly being widened at narrow stretches, leaving extremely steep conglomerates of rock and soil exposed to the vagaries of the weather. The recent spurt of construction of hotels on river edges, particularly on low over-banks prone to flooding, has further deteriorated the over-bank stability. The heavy tourist traffic adds to the destabilising process. ”⁵

RELIEF EFFORTS OF AAGAAS

Help Uttarakhand Project

In the aftermath of the Uttarakhand floods, AAGAAS worked with three NGOs namely Samoolam, Karm Marg, and Kadam to help the local survivors by building a phase-wise rehabilitation plan. The project “Help Uttarakhand” was especially focused on helping the villagers of Chamoli district to get their lives back to normal. The villages of Badrinath valley in the Joshimoth block namely Hanuman Chatti, Pandukeshwar, Govindghat, Bhyundar, Pulana, Lambagarh, and Pinoli / Benakuli had been identified for the first phase of relief efforts (*See Exhibit XV and XVI*). These villages had been severely affected by the floods and no attention had been given to them by the state government. The villagers’ farmlands and cattle had been washed away and the locals had barely any means of earning a livelihood. The problem was all the more acute because of the remote location of these villages and their non-accessibility due to broken roads. The first phase of the project started on July 23, 2013, with immediate relief supplies in the form of dry rations being sent from Dehradun to Pandukeshwar by road. From Pandukeshwar, supplies were sent to the villages on foot. During that time, people were still being evacuated from the towns of Bhyundar and Pulana to the Joshimath camp. The second phase of the project started on August 5, 2013. The third phase of the project involved distribution of 30 tents and 192 solar lanterns and school bag kits. The project cost was estimated to be around INR 19,52,700 (USD 3 1,282)⁶ (*See*

⁵ <http://www.thehindu.com/todays-paper/tp-opinion/down-a-slippery-slope-in-uttarakhand/article5077645.ece> (accessed on Dec 15, 2013)

⁶ USD 1 = INR 62 approx (Nov 2013)

Exhibit XVII)

AAGAAS AND PEOPLE FOR ANIMALS (PFA)-DEHRADUN

AAGAAS also worked closely with People for Animals, Dehradun (PFA) and Help Animals India to help rescue horses, donkeys, and mules that had been left stranded on the banks of the Alaknanda River. It was reported that a temporary bridge had been constructed and the injured animals had been transferred to safety.

EXISTING INITIATIVES OF AAGAAS TOWARDS CREATING SUSTAINABLE LIVELIHOODS

Maithani was able to quickly scale the relief work during the 2013 disaster because of his existing networks developed during last two decades of sustainable livelihood projects for his community. Some of the main initiatives are related to bio tourism and local craft promotion.

ESTABLISHMENT OF BIO-TOURISM PARK (BTP)

In 2004, AAGAAS along with the Society for Community Involvement in Development (SFCID) set up a bio-tourism park at Pipalkoti. The project was funded by the United Nations Development Program (UNDP). The project beneficiaries included 45 villages, 2 blocks, and 1 district. The objective was to promote bio tourism as a livelihood alternative for the local communities (*See Exhibit IX and X*).

LOCAL CRAFT PROMOTION

The district of Chamoli is home to the Rudia community. The Rudia community is known for its craftsmanship in making household items from locally available hill bamboo popularly known as ringal (*See Exhibit XI*). However, due to the diminishing market needs for bamboo products and rising competition from cheaper materials like plastic, the Rudia community was finding it difficult to earn their livelihood. AAGAAS had been working with the Uttarakhand Bamboo and Fiber Development Board (UBFDB) to revive the ringal craft and promote ringal based products. AAGAAS had also set up two cooperatives namely the Alakananda Self-reliant Cooperative and Himalayee self-

reliant cooperative for the marketing and promotion of ringal based products. In 2006, AAGAAS started organizing the annual Pipalkoti Dev Ringal Mahotsav (*See Exhibit XII*). It also initiated the Badrinath Prasad Tokari Program in cooperation with Badrinath temple. The program involved distributing prasads⁷ in ringal baskets to the pilgrims. The initiative started with 78 self-help groups (SHGs) which comprised 275 artisans of the Rudia community. These artisans were given training in bamboo products, handicrafts, and natural fiber-based products. The response was encouraging. Maithani said “*We managed to supply 45,000 baskets whereas the demand is much bigger. Each basket costs between INR 35 (56 cents) to INR 50 (81 cents) depending on the design and size.*”

In 2008, AAGAAS partnered with the Himmothan society, Dehradun, along with Sir Ratan Tata Trust (SRTT) to implement the Integrated Fodder and Livestock Development Project (IFLDP). IFLDP aimed to increase fodder production and enhance livestock based livelihood in 83 remote villages in 6 districts of Uttarakhand. AAGAAS was the project partner for the villages of Tangni and Salla Raitoli, both in the Dasholi block of Chamoli.

In 2010 AAGAAS initiated the “Himalayan Nettle Fiber” project. This was a community-based approach to sustainable harvesting of the nettle fiber and marketing of nettle-based products. The Himalayan Nettle (*Girardinia Diversifolia*) is a grass species found in the upper reaches of the Himalayas. Different pockets of Uttarakhand have traditionally used plant fibers like the nettle, the agava sisalana, and industrial hemp to make domestic products like ropes and other rope based products like slippers and lamp shades (*See Exhibit XIII*). The Bhutia community women are major participants in fiber extraction and in weaving activity. The project started with the identification of 17 villages in Dasholi and Joshimath block where nettle fiber seeds could be sown. These villages were divided into two clusters. They were then formed into Fiber User Groups (FUGs) which were of two types – resource Cluster and weaving Cluster. Nettle fiber seeds were sown in the villages of Tangani Malli, Irani, Pagana, Jhinjhi, Kuhed, and several others (*See Exhibit XIV*). A natural fiber training program was conducted for the FUGs which imparted knowledge and skills for nettle fiber processing. A degumming

⁷ Prasad in Hindi means a devotional offering made to a god, typically consisting of food that is later shared among devotees.

unit was also established as part of this project.

CHALLENGES

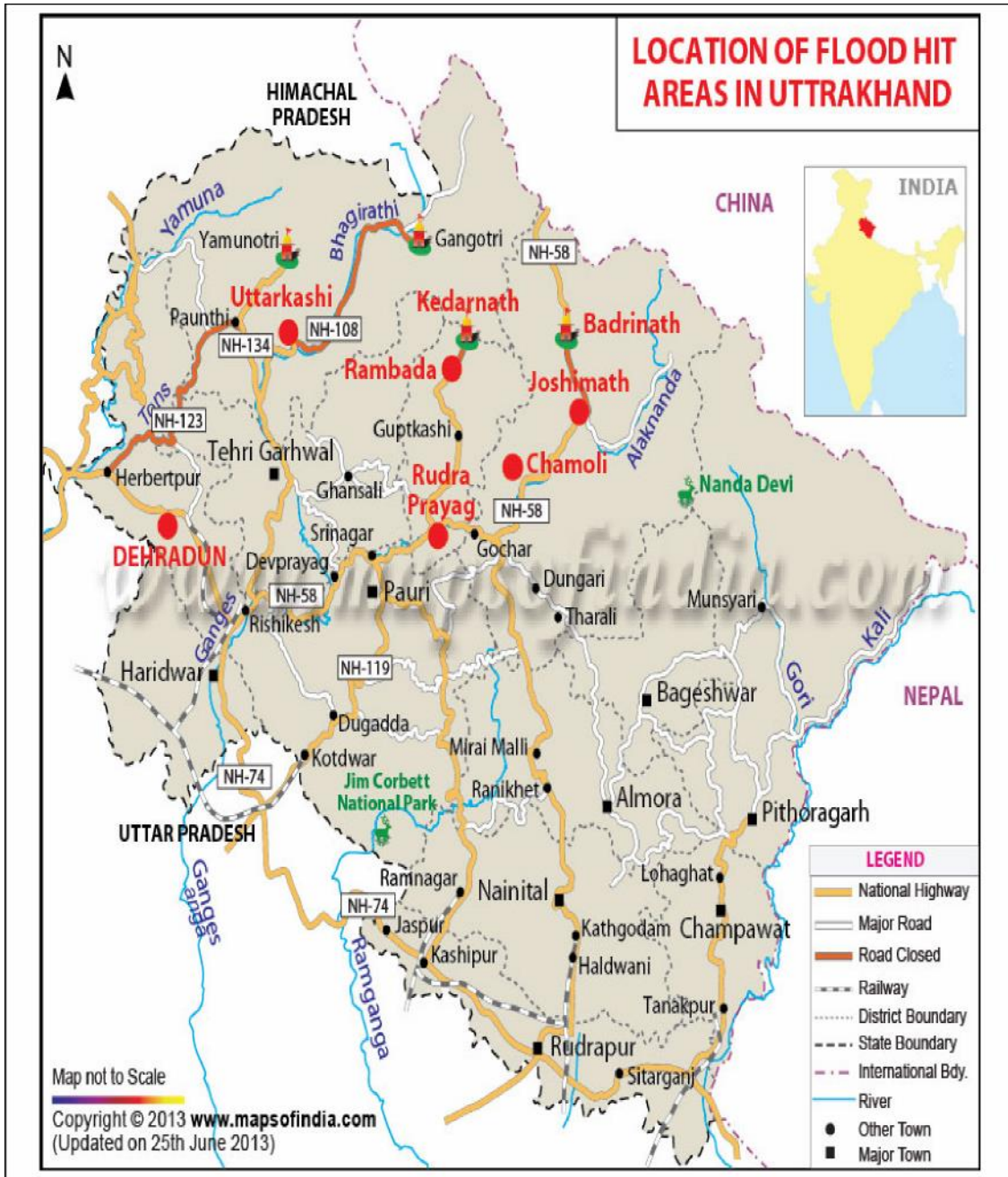
Maithani was deeply concerned about the sustainability of his organization. AAGAAS was heavily dependent on the grants received from funding agencies like the Uttarakhand Bamboo Forest Development Board (UBFDB), Sir Ratan Tata Trust (SRTT), Himmothan Society, Earth Charter International, National Institute of Animal Welfare, and Department of Animal Health. It was becoming increasingly difficult for Maithani to generate funds. And the funds generated by AAGAAS were not sufficient to sustain its operations. (*See Exhibit XVIII and XIX*). Maithani thought of transforming his organization into a for-profit organization based on sound business principles like any other commercial venture.

However, he wondered what would be a viable business model that could generate sustainable livelihood options for the poor while at the same time helping to conserve the fragile ecosystem of the region. His thinking has been affected by the fact that the region has been wrecked by natural disasters including earthquakes for centuries (*See exhibit XX and XXI*). How would this new business contribute toward creating a more resilient community in this disaster –prone region? Would it solve his problem of retaining skilled individuals? What about capital and the return on capital? Did it make good business sense to start something new in the backdrop of the recent disaster?

QUESTIONS FOR CLASS EXERCISE

1. What challenges does the rural population of Chamoli face? What are the challenges and opportunities for social enterprises in this environment?
2. How can structural changes in the economy, society, and environment offer opportunities to the local communities in the region?
3. Critically analyze Maithani's community development initiatives. Do you think these initiatives can help in sustaining local communities? Why (not)?
4. Do you think Maithani's efforts at transforming AAGAAS into a for-profit organization could help it make the local communities more resilient to natural disasters? What else needs to be done?
5. How should Maithani respond to the challenges of fund crunch, non-availability of skilled manpower, and retaining manpower? Do you think AAGAAS should be made a for-profit organization to overcome these organizational issues?

Exhibit VI



Source: www.mapsofindia.com

Exhibit VI



Source: AAGAAS

Exhibit III



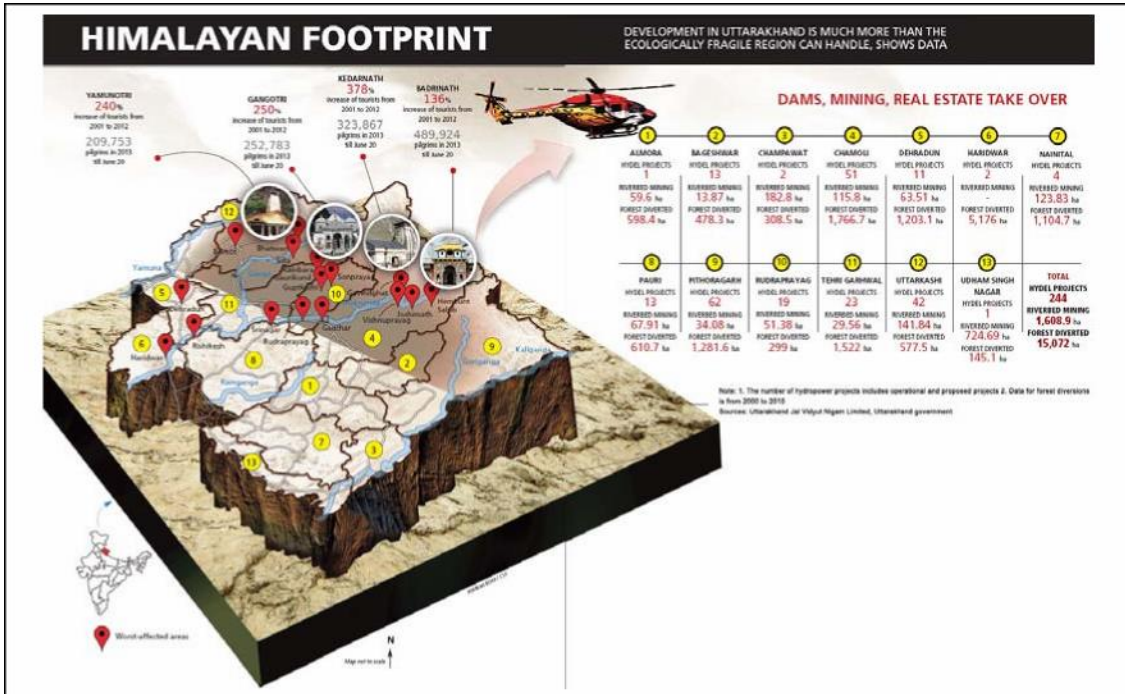
Source: AAGAAS

Exhibit VI



Source: AAGAAS

Exhibit V



Source: www.downtoearth.org.in

Exhibit VI



Source: www.dmmc.uk.gov.in

Exhibit VII

Mountain Specificities

The important conditions characterizing mountain areas which, for operational purposes, separate mountain habitats from other areas are called here 'mountain specificities'. The six important mountain specificities (some of which might be shared by other areas such as deserts in the plains) are considered here. The first four, namely, inaccessibility, fragility, marginality, and diversity or heterogeneity, may be called first order specificities. Natural suitability or 'niche' (including man-made ones) for some activities or products in which mountains have comparative advantages over the plains and 'human adaptation mechanisms' in mountain habitats are second order specificities. The latter are different from the former in the sense that they are responses or adaptations to first order specificities. Nevertheless, they are specific to mountains (Jodha 1989a). Before describing the major mountain 'specificities', it should be noted that these characteristics are not only interrelated in several ways but within the mountains they show considerable variability. For instance, all locations in mountain areas are not equally inaccessible, fragile, or marginal. Neither do human adaptation mechanisms have uniform patterns in all mountain habitats. With full recognition of such realities we may briefly introduce the mountain specificities.

Inaccessibility

Due to slope, altitude, overall terrain conditions, and periodical seasonal hazards (e.g., landslides, snow, storms) inaccessibility is the most known feature of mountain areas (Price 1981, Allan 1986, and Hewitt 1988). Its concrete manifestations are isolation, distance, poor communication, and limited mobility. Besides the dominant physical dimension, it has sociocultural and economic dimensions (Jodha 1989a).

Fragility

Mountain areas, due to altitude and steep slopes in association with geologic, edaphic, and biotic factors that limit the former's capacity to withstand even a small degree of dis-

Contd...

Contd...

turbance, are known for their fragility (DESFIL 1988). Their vulnerability to irreversible damages, due to overuse or rapid changes, extends to physical land surface, vegetative resources, and even the delicate economic life-support systems of mountain communities. Consequently, when mountain resources and environment start deteriorating due to any disturbance, it happens at a fast rate. In most cases, the damage is irreversible or reversible only over a long period (Eckholm 1975 and Hewitt 1988).

Marginality

A 'marginal' entity (in any context) is the one that counts the least in the 'mainstream' situation. This may apply to physical and biological resources or conditions as well as to people and their sustenance systems. The basic factors contributing to such a status of any area or community are remoteness and physical isolation, fragile and low-productivity resources, and several man-made handicaps which prevent participation in the 'mainstream' patterns of activities (Blaikie and Brookfield 1987, Chambers 1987 and Lipton 1983). The mountain regions, being marginal areas in most cases as against prime areas, share the above attributes of marginal entities and suffer the consequences of such status in different ways (Jodha 1989a and 1989b). Several entities acquire marginal status when they are linked to dominant entities on unequal terms. In several cases mountain areas too pass through this process.

Diversity or Heterogeneity

In mountain areas, one finds immense variations among and within ecozones, even within short distances. This extreme degree of heterogeneity, in the mountains, is a function of interactions of different factors such as elevation, altitude, geologic and edaphic conditions, steepness and orientation of slopes, wind and precipitation, mountain mass, and relief of terrain (Troll 1988). The biological adaptations and socioeconomic responses to the above diversities also acquire a measure of heterogeneity of their own (Price 1981 and Jochim 1981). The diversity or 'heterogeneity' phenomenon applies to all mountain characteristics discussed here. Diversity acts as a positive attribute for the interlinked activity patterns and should serve as the true basis for assessing mountain areas' carrying capacity.

'Niche' or Comparative Advantage

Owing to their specific environmental and resource-related features, mountains provide a 'niche' for specific activities or products. At the operational level, mountains may have comparative advantages over the plains in these activities. Examples may include a specific valley serving as the habitat for special medicinal plants; mountains acting as a source of unique products (e.g., some fruits, flowers); and mountains serving as the best known sources of hydropower production. In practice, however, 'niche' or comparative advantages may remain dormant unless circumstances are created to harness them. However, mountains, owing to their heterogeneity, have several, often narrow but specific 'niches' which are used by local communities in the course of their diversified activities (Whiteman 1988 and Brush 1988). Proper harnessing of 'niche' can support sustainability while their reckless exploitation can result in elimination of 'niche'.

Source: *Mountain Perspective and Sustainability: A Framework for Development Strategies* by N.S. Jodha, Oxford and IBH Company Publishing Ltd(1992)

Exhibit XVII

S. No	Name of the project	No of Families	Period	Business Generated (Lakhs)	Market
1	Organic Pulses	38	2008-2012	INR 4.8	Metros- including Delhi, Jaipur, Ludhiana and Dehradun
2	Ecotourism	60	2004-07	INR 1.2	School, Colleges, Pilgrim Season
3	Local Craft promotion	85	2004-Going on	INR 8.4	Metros- including Delhi, Jaipur, Ludhiana, and Dehradun and at Sale points at 'yatra' route
4	Micro Insurance	112	2009-2012	INR 0.54	
5	Fruit and Vegetable cultivation	24	2004-going on	INR 3.5	Local and tourist.
6	Afforestation and biodiversity conservation	180	2009-2012	INR 4.5	Locals
7	Natural Fiber	ST-Gen-	2010-going on	INR 4.2	Deharadun – Yarn Supply

Exhibit IX



Source: www.cbd.int

Exhibit XVII



Source: AAGAAS

Exhibit XI



Source: AAGAAS

Exhibit XII



Source: AAGAAS

Exhibit XVII



Source: AAGAAS

Exhibit XIV

Details of Angaas Fiber Users Group List 2010

Sl.N.	Name of FUG	Village Name	No. of Member	Monthly Saving	Account No.	SBI's Name	Running/ Defunct	Date of Formation	Current Balance
1.	लक्ष्मी ऊन एव प्राकृतिक रे ा उत्पादन	Vijay Nagar (Pursari)	8	50.00	31015396960	Chamoli	Running	7.1.10	2400.00
2.	दुर्गा ऊन एव प्राकृतिक रे ा उत्पादन	Vijay Nagar (Pursari)	9	50.00	31015317501	Chamoli	Running	7.1.10	2575.00
3.	िखर ऊन एव प्राकृतिक रे ा उत्पादन	Kauriya	7	30.00	31086687672	Pipalkoti	Running	9-3-10	1130.00
4.	बासगा ऊन एव प्राकृतिक रे ा उत्पादन	Baajpur (Golim)	5	50.00	31036118717	Chamoli	Running	1-2-10	1500.00
5.	एकता ऊन एव प्राकृतिक रे ा उत्पादन	Baajpur (Golim)	6	50.00	31041488567	Chamoli	Running	1-2-10	1700.00
6.	इन्द्रमती ऊन एव प्राकृतिक रे ा उत्पादन	Kuhed	6	50.00	31035585998	Chamoli	Running	9-2-10	1700.00
7.	सरस्वती ऊन एव प्राकृतिक रे ा उत्पादन	Amarpur (Gadora)	8	50.00	31080394630	Pipalkoti	Running	4-3-10	1700.00
8.	गरुड मगा प्राकृतिक रे ा उत्पादन	Jalgwad (Pakhi)	6	50.00	31046716678	Pipalkoti	Running	4-1-10	1700.00
9.	राज राजे वरी प्राकृतिक रे ा उत्पादन	Tangani Malli	6	50.00	31133235851	Helang	Running	15-4-10	1100.00
10.	जय मा दुर्गा प्राकृतिक रे ा उत्पादन	Tangani Malli	5	50.00	31133685765	Helang	Running	15-4-10	1100.00
11.	दुर्गाकुंडी प्राकृतिक रे ा उत्पादन	Irani	8	50.00	31149606433	Chamoli	Running	28-4-10	1300.00
12.	सगलपुरी प्राकृतिक रे ा उत्पादन	Pagana	9	30.00		Chamoli	Running	18-5-10	
13.	सप्तकुंडी प्राकृतिक रे ा उत्पादन	Jhinjhi	8	50.00					

Source: AAGAAS

Exhibit XVII



Source: AAGAAS

Exhibit XVI

	Villages	No of Families Severely Affected
1	Pulana / Bhyundar	99
2	Pinoli/Benakuli	15
3	Govind Ghat	25
4	Lambarh	24
5	Pandukeshwar	120

Source: AAGAAS

Exhibit XVII

S.No.	Items Needed	Qty	Price	Amount
1	Heavy Duty Tents (Life- 2 Years)	55	15,000	825,000
2	Blankets	1,200	200	240,000
3	Tirpal (Plastic Covering) and polysheet 10x 12	200	400	80,000
4	Raincoats	250	300	75,000
5	Torches- LED	300	100	30,000
6	Batteries	600	12	7,200
7	Candles	2,000	3	6,000
8	Lighters	300	15	4,500
9	Solar lantern with mobile charger (discounted)	300	1,450	435,000
10	First Aid Kit (generic medicines – low cost)	20	7000	1,40,000
11	Logistics cost			10,000
12	Transportation cost from Delhi to Dehradun to Baldaur village			100000

Source: AAGAAS

Exhibit XVIII

Convergence of fund from MGNREGA (2011-12)

Gram Panchayat	Area (ha.)	Labour component (Rs.)	Material component (Rs.)	Total Cost (Rs.)	Employment generated (person days)	Total Job Card Holder involved (Nos)		
						Men	Women	Total
किसली	2	59500	25500	85000.00	595	15	16	31
गढ़ौरा	2	59500	25500	85000.00	595	0	17	17
नौरा	2	59500	25500	85000.00	595	22	40	62
दिगाती	2	59500	25500	85000.00	595	7	17	24
बनरु	2	59500	25500	85000.00	595	9	6	15
पाखनी	3	86452	40450	127000.00	864	8	4	12
दुमपी मल्ली	3	86452	40450	127000.00	864	5	17	22
योग	16	470404	208400	679000	4703	66	117	183

Source: AAGAAS

Exhibit XIX
Convergence of Funds from Other Sources in 2011-12

SN	Activities	Unit/ no	Name of source	Funds from other sources (Rs.)	Community contribution (Rs.)		
					Labour (Rs.)	Cash (Rs.)	Total
1	Nursery raising	2	0	0	2800	0	2800
2	Forage crop cultivation	9	अगाज फीडरे ल एब कृषि विभाग	अगाज 227 एब कृषि विभाग 70 = 297	400	0	400
3	Pre-planting works on common lands	0	0	0	0	0	0
4	Grass planting on common land	0	0	0	5150	0	5150
5	Fodder tree planting on common land	0	0	0	10250	0	10250
6	Fodder planting on private land	0	0	0	3200	0	3200
7	Purchase of planting material	0	मन्रेगा	195100	0	0	0
8	Soil & water con. measures	0	0	0	0	0	0
9	Intercultural operations	0	0	0	17100	0	17100
10	Capacity building	0	0	0	0	0	0
11	Formation & strengthening of CBOs	0	0	0	455	0	455
12	Fodder Preservation and Better Feeding Practices	0	कृषि विभाग	15750	0	13600	13600
13	Renewable energy / Biogas	0	0	0	0	0	0
14	Livestock camps	0	0	0	0	0	0
15	Animal Insurance	112	ULDB	17753.05	0	13535	13535
16	Livestock Health and Breed Improvement	0	0	0	0	0	0
17	Livestock based micro-enterprises	0	0	00	0	0	0
18	Micro Finance	0	0	0	0	0	0
19	Honorarium / travel Expenses of extension worker	0	0	0	0	0	0
20	Stationary/ Documentation / Communication	0	0	0	0	0	0
21	Others	0	00	0	0	0	0
22		0	0	0	0	0	0
Total		123	0	228900.05	39355	27135	66490

Source: AAGAAS

Exhibit XX
Major Disasters in Uttarakhand Region over Last 200 Years

Year	Disaster	Location	Remarks
1816	Landslide	Pauri	
1842	Landslide	Joshimath	
1868	Landslides	Chamoli	73 people death
1880	Landslide	Nainital	151 death
1898	Landslides	Nainital	29 death
1945	Catastrophe	Madmaheswar	4 death
1951	Flood	Satpuli	Agriculture land damaged
1967	Flood	Nanak Sagar	35 villages affected
1970	Flood	Balakuchi and Kanauriya	70 death and 35 house damaged in the flood
1971	Flood	Dhaarchula	12 death
1976	Landslides	Kapkot(bagar village)	11 people death and 45 animal death
1977	Flood and Landslide	Sisna (Tavaghaat)	16 family destroy

Year	Disaster	Location	Remarks
1977	Landslide	Tavaghaat	25 Army jawan, 44 people and 80 domestic animal death and 161 family affected
1978	Landslide	Baagirath	25 death and above 100 domestic animals flow
1978		Tharali	6 death
1978		Almora	2 death
1978		Kapkot(bagar village)	2 death and animals
1979	Landslide	Mandakani valley (Kaontha villages)	50 death
1980	Landslide	Uttarakashi	45 death
1983	Flood	Kapkot (karmi)	37 death
1984	Catastrophe	Kapkot (Jagthana)	9 death
1985		Tharali	9 death
1990		Chamoli (Lolti-banuali)	15 death
1990	Landslides	Neelkanth Rishikesh	Above 100 death
1991	Catastrophe	Chamoli (devarkhadera, Gangol gaon, Haat, Paaduli, Kaunj, peepalghaati, and Gopeshwar	29 death +28 domestic animals
1996	Cloud Burst	Pithauragarh	19 death
1998	Landslide	Ukhimath	69 death + 400 domestic animals
1998	Landslide	Malpa (Pithauragrah)	160 Kailash tourist, 59 porter, 5 guide of Kumaun Mandal Vikas Nigam, 19 labour of GREF, 8 Jawan of ITBP, 4 jawan of UK Police, 4 labour of PWD, 01 saint, 46 farmer, and 32 Nepali death
1998	Catastrophe	Malpa (Pithauragrah)	40 death
2001	Cloud Burst	Phata (Chamoli)	21 death
2001	Hailstorm	Gauna	7 death
2002		Khetgaon	5 death

Year	Disaster	Location	Remarks
2002	Landslide/ Debris	Budhakedar	28 death
2002		Bhatwari-dunda	5 death
2003		Gadoli (Pauri)	4 death
2004	Hailstorm	Lohaarkhet	9 death
2004		Baldaura (Joshimath)	8 death
2004	Landslide	Vishnuprayag	16 death
2004	Landslide	Laambagarh	7 death and 9 missing
2004	Landslide	Uttarakashi	6 death
2004	Flood	Pithauragarh	01 death
2004	Tunnel Flooding	Tehri	29 death
2004	Flood	Udamsingh Nagar	9 death
2005	Hailstorm	Gobindghat	11 death
2005	Cloud Burst	Rudraparayag	9 death
2005	Rains	Uttarakhand different places	6 death
2007	Catastrophe		1
2007	Cloud Burst	Devpuri (Gairdsain)	8 death
2007	Landslide	Bageshwar	2 child death
2007	Heavy rain	5 death	
2007	Cloud Burst	Pauri	2 death
2007	Landslide	Dharchula	15 death
2008	Heavy rain	Uttarakhand different places	6 death
2008	Glacier	Ghanghriya	6 tourist
2009	Cloud Burst	Munsyari	43 death
2010	Rains	Thalisain	2 student
2010	Heavy rain	Kumaun	3 death
2010	Rains	Almora	3 death
2010	Heavy rain	Uttarakhand different places	5 death

Year	Disaster	Location	Remarks
2010	Landslide	Bageshwar (Sumadh Gaon)	18 students
2010	Heavy rain	Uttarakhand different places	85 death
2010	Heavy rain	Uttarakhand different places	5 death
2010	Heavy rain and cloud burst	Almora	36 death
2010	Heavy rain	Uttarakhand different places	50 death and 36 missing
2010	Heavy rain	Rudki and tehri	4 child death
2011	Heavy rain	Kumanun (baur river)	5 death
2011	Cloud burst	Dhanaulti	5 death
2011	Heavy rain	Uttarakhand different places	10 death

Various Websites and Publications

Exhibit XXI
Major Earthquakes in Uttarakhand Region

Year	Richter Scale	Epicentre
1803	6	Uttarakashi
1803	9	Badrinath
1816	7	Gangotri
1831	5	Lohaghaat
1832	6	Lohaghaat
1833	6	Lohaghaat
1835	7	Lohaghaat
1843	5	Chamoli
1851	5	Nainital
1869	6	Nainital
1871	6	Landaur
1916	7.5	Dharchula-Bajaang

Year	Richter Scale	Epicentre
1935	6	Dharchula-Bajaang
1937	8	Dehradun
1943	5	Chamoli
1945	6.5	Almora
1958	7.5	Bajaang-Dharchula
1961	5.7	Bajaang-Dharchula
1964	5.8	Bajaang-Dharchula
1964	5.3	Bajaang-Dharchula
1966	6	Bajaang-Dharchula
1966	6.3	Kapkot-Dharchula
1966	5.7	Bharat-Nepal border
1968	7	Dharchula-Bajaang
1979	5.7	Bharat-Nepal border
1980	6.5	Dharcula
1991	6.6	Uttarakashi
1999	6.8	Chamoli
2005	4.8	Whole Uttarakhand
2005	3.8	Dehradun/Haridwar
2005	5.2	Chamoli/Joshimath
2006	5	Uttarakhand -China border
2007	5	Whole Uttarakhand
2007	3.5	Mori Ranwayi Ghaati
2009	4.7	Bhatwari- uttarakashi
2010	5.1	Pithauragarh

Various Websites and Publications

Suggested Readings:

1. Mountain Perspective and Sustainability: A Framework for Developmental Strategies by N.S. Jodha.
2. Growth, Poverty Alleviation and Sustainable Resource Management in Mountain Areas of South Asia, Proceedings of the International Conference, Jan 31-Feb 4, Kathmandu, Nepal
3. C.K. Prahalad and S.L. Hart, The fortune at the bottom of the pyramid, Strategy and Business, 2002.
4. How to Change the World: Social Entrepreneurship and the Power of New Ideas, David Bornstein, Oxford University Press, 2007

