LIVELIHOOD TRANSITIONS IN HILAUGAD WATERSHED

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I. INTRODUCTION

The Hilaugad watershed, a sub-catchment of the larger Lastargad basin, lies on the west bank of the Mandakini river which rises from the nearby snow covered peaks of the high Himalayas.[2] It is spread across an area of 78.77 sq. km (7877 ha) from a lower elevation of about 900m to an altitude of about 2600m. It lies on the eastern side of the mountain ridge that divides the Mandakini valley in the east from the Bhilangana river valley in the west. A major motor road from the town of Tilwara on the banks of the Mandakini to Ghansali town on the banks of the Bhilangana runs through the watershed.

Reserved forests cover 51 per cent (4000 ha) of the total watershed area. They lie along the upper northern and western part of the watershed (See Fig.1). The remaining area (3877 ha) contains 27 villages. Its cultivable area is 2128 ha of which just over half (1072 ha) is presently cultivated and the remaining (1056 ha) is left fallow. It has a total population of 11780, the density being 150 persons/km^2 . There are 1228 women per 1000 men in the watershed. Scheduled Castes (SCs) make up 9.5 per cent of the total population.

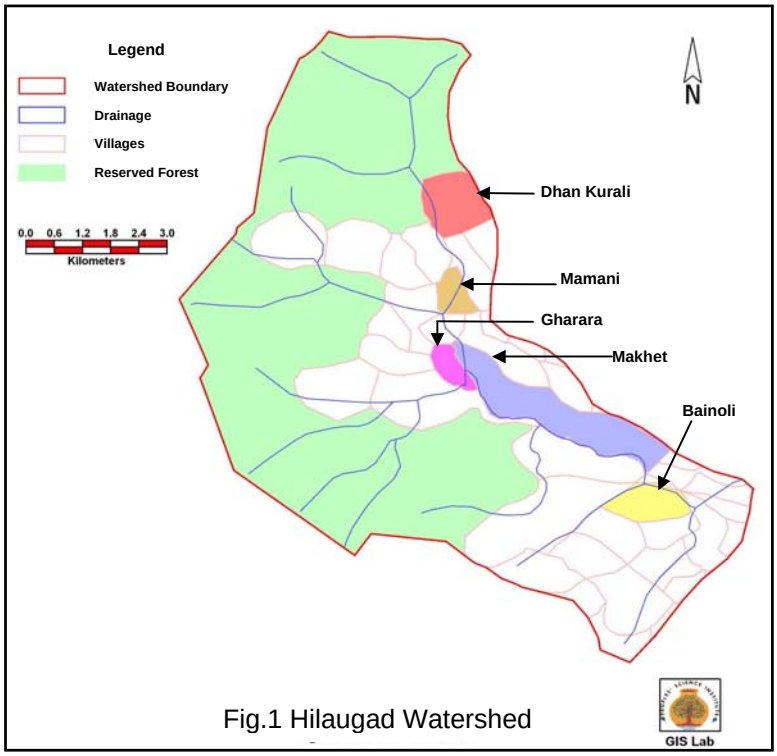

Fig.1 Hilaugad Watershed

For the purposes of this study five villages were selected in the upper, middle and lower reaches of the watershed. These are Dhan Kurali and Mamani (upper reach), Gharara and Makhet (middle reach) and Bainoli in the lower reach (See Fig.1). In 2005-06 People's Science Institute (PSI) and Centre for Development Initiative (CDI), a local voluntary organization, carried out participatory research with the five selected communities as part of the CP-23 project. The data generated has been used to study the local resource use patterns, livelihoods and the institutional framework for resource management. This paper presents the results of the livelihoods assessment.

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[2] *Gad* is the local term for the main stream that drains a mountain valley and feeds into a river. Lower order streams that feed a *gad* are called *gaderas*.

II. METHODOLOGY

In each selected village the research began with a series of village meetings where the project background and purpose were explained to the villagers. Discussions with the elderly residents were used to prepare a timeline with particular reference to the availability and use of natural resources. Transect walks were undertaken to understand the geography and land use patterns. This was followed by extensive participatory social mapping and wealth ranking exercises. In all the villages more than 60 per cent of the families were present during these exercises.

The wealth ranking exercise was followed by a 50 per cent households questionnaire-based sample survey to gather data on household incomes, expenditures, resource consumption and migration patterns.

Resource mapping was done to understand the land use and cropping patterns, the extent and types of forests, product flows from them, water availability and access. Trend analyses of resource availability were done. Biomass productivities of the forests and fields were measured. The daily routines and mobility of men and women were determined. Chapati (Venn) diagrams and discussions were used to develop an understanding of the functionality, accessibility and importance of local institutions.

III. LIVELIHOOD ASSETS

Livelihood opportunities and constraints can be comprehensively understood by analyzing the conditions of human, natural, social, physical and financial assets in the region.

Human Assets

The five selected villages are home to 368 households with a total population of 1989 persons. Women marginally outnumber men due to the outmigration of men in search of employment. (This issue is discussed later in a separate section.) The average household size varies from five to six persons. Demographic details, the caste structure and literacy levels for each village are given in Table 1. Other Backward Castes (OBC) and Rajputs are the dominant castes in the selected villages. Dhan Kurali and Makhet are single caste villages. SCs live essentially in only one village, Gharara.

In general the total literacy levels tend to increase as one goes down the valley. Literacy levels in Gharara do not follow this trend. This is perhaps a reflection of the fact that 50 per cent of the households in the village are SC families. Young male adults in these villages are likely to be educated at least upto the twelfth standard, whereas young female adults are likely to be educated at least upto the eighth standard. One generation ago the corresponding figures would be the eighth standard for men and fifth for the women. Increasing education levels are enabling the younger generation to look for livelihood opportunities away from the villages and off the farms. There is almost a 20 per cent literacy differential between the men and the women in four villages reflecting a clear gender bias in education. Bainoli, however, is an exception to this trend. The overall literacy level in Bainoli is very high and the gender differential is only 5 per cent.

Table 1: Demography, Caste & Literacy.

Village	Dhankurali	Mamani	Gharara	Makhet	Bainoli	Total
Area (ha)	30.68	21.66	75.00	40.23	36.16	203.73
Households	58	65	88	96	61	368
Total Population	323	329	496	521	320	1989
Av. Hhold size*	6	5	6	5	5	5
Sex Ratio**	1168	859	1000	1035	1078	1021
Castes						
SC Households	0	1	43	-	-	**44**
OBC Hholds	-	-	35	96	-	**131**
Rajput Hholds	58	40	10	0	15	**124**
Brahmin Hholds	0	24	0	0	46	**70**
Literacy Status						
Male	79%	92%	80%	90%	97%	93%
Female	46%	70%	62%	74%	88%	73%
Total	63%	82%	71%	82%	93%	83%

Note: * Rounded off to the nearest whole number; ** Females/1000 males
Source: Social mapping, 2006.

Natural Assets

Reserved forests dominate the northern and western upper reaches of the Hilaugad watershed (See Fig.1). The main species are chir pine, oak, rhododendron and cedar (deodhar) at the top, with pine being dominant. Other important species are Utees, Kharsu, Mauroo and Kafal. About a dozen first order streams (*gaderas*) emerge from these forests and feed the main Hilaugad stream. People practice terrace farming. On the slopes the plots are small and narrow. Their sizes increase near the outlet of the watershed.

The present land use pattern of the selected villages is shown in Table 2. All the five villages are small, their geographical areas being well below 1 km^2. Just over half the geographical area is cultivable land. Community forests cover about a quarter of the area. The civil land (village commons) is quite degraded and is used mainly for grazing animals.

Table 2: Land use pattern.

Reach	Village	Cultivable Land		Waste Land (ha)	Civil Land (ha)	Van Panchayat Land (ha)	Other Land (ha)	Total (ha)
		Irrigated (ha)	Unirrigated (ha)					
UPPER	**Dhan Kurali**	1.0	19.6	0	6.4	0	3.7	30.7
	Mamani	5.2	7.5	2	0	4.1	2.9	21.7
MIDDLE	**Gharara**	9	32	0	23	8	3	75
	Makhet	8.1	3.4	2.3	2.3	22.1	2	40.2
LOWER	**Bainoli**	10.3	7.9	0.2	2.2	13.9	1.7	36.2
	TOTAL	**33.6 (17%)**	**70.4 (34%)**	**4.5 (2 %)**	**33.9 (17%)**	**48.1 (24%)**	**13.3 (6%)**	**203.8 (100%)**

Source: Land revenue records, 2004.

Agriculture: Not all the cultivable land is being farmed presently. Transect walks revealed fallow fields in Makhet, Gharara and Mamani. A flash flood about 15 years ago had left many fields uncultivable in Makhet. Food grains are the main crops in these villages. Paddy in the kharif (summer monsoon) season and wheat, barley and mustard in the rabi (winter) season are the main irrigated crops. Irrigation has a substantial impact on paddy productivity but much less on the productivities of the rabi crops as shown in table alongside. Information on agricultural trends indicates that the productivity of irrigated fields has increased over the years. Farmers tend to use better quality seeds, fertilizers and even modest amounts of pesticides in these fields.

Crop	Productivity (Q/ha)	
	Irrigated	Unirrigated
Kharif		
Paddy	38.1	22.4
Mandua	-	14.3
Jhangora	-	11.4
Soyabean	-	4.3
Urad	-	1.6
Raans	-	3.5
Rabi		
Wheat	11.4	8.6
Barley	1.6	10.3
Mustard	2.2	1.4

Values are averaged from Bainoli, Makhet & Mamani
Source: Sample household survey, 2006.

The creation of irrigation canals has been significantly stepped up since the formation of the state of Uttarakhand. Once the systems presently under construction are completed the irrigation potential will increase from 33.6 ha to 64.2 ha in the five villages taken together. The pity is that not all of the existing potential is fully utilized due to inadequate maintenance. This is more so the case with the larger systems built by the Irrigation Department. The canals built by the Minor Irrigation Department or the *guhls* made by the communities tend to be smaller but better maintained, generally by the villagers' own efforts.

Vegetable cultivation in these villages is quite limited. Most villagers grow some vegetables in their kitchen gardens for household consumption. There is some commercial farming of potatoes in Dhan Kurali village. Makhet has one enterprising farmer who does a substantial amount of vegetable cultivation. Traditionally onions and garlic have been cultivated for sale on irrigated lands. But farmers in Bainoli claimed that this practice was also in decline now, ostensibly due to reduced productivity.

Livestock: Almost every household has one or more heads of cattle (See Table 3). In the last few years there has been a growing preference for buffaloes over cows. This is largely a result of the demand for milk from the roadside *dhabas* (restaurants) or teashops. It is surprising that mules are not domesticated in the selected villages since they are routinely used as beasts of burden in mountain villages. Goats and sheep are raised by a few families and their meat is sold commercially. The sheep are sheared for wool which is subsequently used for making woolen materials like shawls and blankets.

Table 3: Livestock population.

Village	Large Animals				Others	
	Cows	Bulls	Buffaloes	Mules	Goats	Sheep
Dhankurali	46	54	46	0	31	10
Mamani	50	39	39	0	35	20
Gharara	35	59	59	0	8	-
Makhet	68	75	65	0	32	30
Bainoli	52	51	38	0	40	7
Total	**251**	**278**	**247**	0	**146**	**67**

Source: Household survey, 2006

Fodder for the livestock is obtained from the reserved forests, community forests, the village commons and fields. A few families migrate with their cattle to '*chaanis*' in the reserved forests during the monsoons and stall feed them there. Free grazing is generally done in the early part of the year. Agricultural stalks are fed to the animals after harvesting the paddy and wheat crops in the early winter and summer seasons.

Forests: Reserved forests are outside the village boundaries. They are under the control and management of the state's Forest Department. Villagers have the right to enter these forests and collect fodder grass and fallen branches for fuelwood. In the early part of the 20th century, every village was allocated a fixed volume of timber annually for construction purposes. The Forest Department identified the trees to be cut and the *Gram Panchayat* organized the cutting of these trees. Individual families obtained timber on application to the designated forest official. The tardiness of the Forest Department in granting requests for timber led to unauthorized lopping and felling of trees. This system was curtailed in 1996 by a ruling of the Supreme Court of India in the interest of forest conservation. Nibbling of forestland near the villages is visible. In some locations there is actual encroachment inside the reserved forests. Good quality forests are visible mainly in the uppermost slopes.

Community forests were extracted from civil lands, village commons, following the promulgation of a government order in 2001. This was accompanied with the formation of Van Panchayats in every village to manage them. Under the provisions of the new rules a minimum of 4 ha was allocated for the new Van Panchayat forests. No Van Panchayat has been formed yet in Dhan Kurali. The ones in Mamani, Gharara and Makhet are dysfunctional. The Van Panchayat in Bainoli, registered earlier in 1995, is functioning very well. Van Panchayat lands in Mamani and in Gharara have been encroached for a long time by the local villagers; hence their lack of interest in the functioning of the Van Panchayats.

The biomass productivity of the Van Panchayat lands is very low in comparison to the reserved forests, except in Bainoli where the Van Panchayat has been managing its forest in an effective manner. In Mamani there are no trees in the Van Panchayat area.

Table 4: Biomass per unit area

Village	Van Panchayat Area (ha)	Tree Density (Trees/ha)	Biomass density (VP)		Biomass density (RF)	
			Fuelwood (tons/ha)	Fodder (tons/ha)	Fuelwood (tons/ha)	Fodder (tons/ha)
Dhan Kurali	-	-	-	-	NA	NA
Mamani	4	0	0	0	910	882
Gharara	8	217	35	35	300	177
Makhet	22.1	326	28	14.7	300	177
L;Bainoli	13.9	297	270	0	274	-

Source: Biomass measurements; NA = not available; RF = Reserved Forests

Civil Lands: Village commons or civil lands in all the villages are degraded and heavily encroached upon. Villagers have parceled most of them into small plots for growing fodder for their livestock. The parts not encroached are left open for free grazing.

Water: The average annual rainfall in the watershed is 1243mm, two-thirds of which falls during the June-September monsoon period.[3] Dhan Kurali, the uppermost village in the watershed receives some snowfall during the winter. The annual precipitation replenishes a large number of springs and streams in the study villages (See Table 5). About half the *gaderas* and the most of the springs have a perennial character. Discussions during the seasonality exercises showed that there is less water in the *gaderas* during the lean months now than compared to a decade ago. The villagers believe that the 1999 earthquake, which resulted in heavy damages in the watershed, has affected the underground flows.

Table 5: Water resources

Village	Springs	Gaderas	Chaal*	Tank	Diggi*	Comm. Standpost	Hand pump	Canal	Guhl	Hydram
Dhankurali	8 (8)	4 (2)	0	5 (4)	3 (3)	9 (9)	0	3 (3)	1 (1)	0
Mamani	6 (3)	5 (1)	0	5 (3)	1 (1)	5 (5)	0	4 (4)	1 (1)	1 (1)
Gharara	5 (3)	3 (2)	0	2 (1)	2 (2)	18 (18)	0	3 (2)	1 (1)	0
Makhet	6 (3)	3 (2)	0	2 (1)	1 (1)	17 (10)	0	4 (4)	1 (1)	1 (0)
Bainoli	3 (3)	6 (3)	2 (2)	3 (2)	0	8 (8)	1 (0)	4 (4)	0	0
Total	**28 (20)**	**21 (10)**	**2 (2)**	**16 (11)**	**6 (6)**	**57 (50)**	**1 (0)**	**18 (17)****	**4 (4)**	**2 (1)**

( ) : Functional Resources; * A chaal is a small pond and a diggi is a small cemented tank; ** Some are only partially functional.
Source: Water resources maps, 2006

A number of water harvesting structures and irrigation systems have been constructed to meet the communities' needs. The larger canals convey water from the main Hilaugad to the fields while the smaller guhls bring water from the *gaderas*. The guhls are earthen channels made by the villagers whereas the canals are cement-lined and made by state agencies.

Social Assets

Two types of institutions can be discerned in the Hilaugad watershed – traditional and modern. Tradition institutions, e.g., caste, kinship and *panchayats* are strong and enduring. It is well-known that a person's caste often plays a decisive role in determining his/her livelihood opportunities. Typically, Scheduled Castes are likely to come from poorer families, with small landholdings, and have a relatively lower level of education. Such effects of caste can be observed in the selected villages. Kinship ties with outmigrants in towns and cities, along with education, provide opportunities for further migration from the villages in search of employment.

In recent years state governments have promoted a number of development-oriented institutions like the Gram Panchayat, Van Panchayat, Mahila Mangal Dal and Yuvak Mangal Dals. These, however, are quite weak. As a local self-governance body the Gram Panchayat is the most important institution in the villages, formed by direct elections every five years. Rural development funds are being increasingly channeled through Gram Panchayats. But these bodies are dominated by the Gram Pradhans. The affiliated sectoral sub-committees are non-existent while the Gram Sabhas are not actively involved in decision-making. Since many of these institutions have been formed as a result of government orders, villagers

[3] Forest Department, Jakhni (2003), based on ten year rainfall data.

display little sense of their ownership.[4] Similar institutions have also been promoted by voluntary organizations as part of development projects. They help spend the project funds effectively but their sustenance beyond the project period is questionable. Increased participation of the community in decision-making in such projects is creating a base for ownership of the development process by the community.

The villagers believe that community spirit has waned over the years, e.g., earlier people would help each other in farming operations or in house construction. Now such cooperation is limited to family or kinship ties. Farmers do come together as informal users' groups to manage the traditional irrigation systems or the smaller canals. In addition to undertaking repair and maintenance of irrigation channels they also supervise the distribution of water by rotation.

Physical Assets

Compared to mountain villages in general the selected villages have reasonable access to infrastructural facilities like schools, health centres, banks, markets, etc. as shown in Table 6. Most of these facilities are located in Jakholi, the block headquarter, Mayali and Tilwara. Though Mayali and Tilwara are officially revenue villages, in reality they have the character of urban areas.[5] Tilwara lies on the main Kedarnath tourist route, Jakholi has a Tourist Rest House run by a state agency along with a number of administrative offices, Mayali boasts of a bank, bus stand, restaurants, a lodge and photocopying and fax facilities.

Metalled motor roads connect Mamani and Bainoli to Mayali, Jakholi and Tilwara. Buses and jeeps are the main means of transport for people and goods. Dhan Kurali, the uppermost villages in the watershed is closer to Jakholi than to most other villages in the watershed, though the distance has to be traversed on foot. Telephone facilities exist in all the villages. Many residents also own mobile phones.

Table 6: Infrastructure facilities

Facilities	Location	Distance from the village (km.)				
		Dhankurali	**Mamani**	**Gharara**	**Makhet**	**Bainoli***
Primary School		**Each village has at least one primary school**				
Sr Sec School	Jakholi	5	5	18	8	11
Degree College	Jakholi	5	5	18	8	18
Health Sub- Centre	Tiyonkhar	5	4	0	2	11
Pr. health centre	Jakholi	5	5	18	8	11
Bank	Mayali	5 (Jakholi)	8	13	13	11
Post office	Kot	3	1	0.5	0	11
Veterinary	Jakholi	5	5	18	8	11
Market	Mayali	10	8	18	8	11
Road	-	3	0	0	2	0

Note: * Bainoli residents go to Tilwara (11 km) or Agastyamuni (18 km).
Source: Venn diagrams, 2006.

[4] R.Chopra, D.Sen, S.Bharadwaj & D.Negi: "Disowned Institutions in Hilaugad watershed", a report on institutional frameworks prepared by PSI as part of the CP-23 Project.
[5] Many villages in Uttarakhand with an urban character are resisting conversion into urban areas because the quantum of funding for rural areas is much greater at present than for urban areas with the same population.

Education facilities upto a degree college are available within Jakholi block. For post-graduate education the nearest college is located in Agastyamuni, about 25 km from Mayali. The presence of these facilities is enabling the younger generation to go for higher education, which in turn improves their prospects for off-farm employment. Basic health facilities have been established by the government in Jakholi, Tyonkhar in Gharara village and in Tilwara. Private ayurvedic medical practitioners also exist in these locations.

Financial Assets

By mountain standards there is a relatively high proportion of well-to-do households in the selected villages. Forty households reported a combined value of over Rs. 100,000 annually from cash income and farm production. There are about 40 households engaged in business enterprises. Thus there is a good number of households with investible surpluses.

The main sources of financial capital for consumptive or productive purposes are the traditional moneylenders. Loans for agriculture are obtained from them. Most villagers do not go to banks for loans because of their cumbersome procedures. Some of the wealthier people have, however, taken bank loans to purchase motor vehicles for plying taxis. Individuals in Mamani village have taken bank loans for purchase of buffaloes and establishing a tailor's shop in Mayali. Members of a thrift group in Makhet have collectively accessed a bank loan for purchase of buffaloes.

In addition to moneylenders and banks each village has one or more saving and credit (thrift) groups, who have accumulated from Rs.18,000 to Rs.40,000 in their bank accounts. Only a few of them provide loans and those too are only for consumptive purposes. So far none of these groups has accessed any bank credit.

IV. LIVELIHOODS ASSESSMENT

In each community, the villagers ranked every family in the village as well-off, middle-class and the poor. This was followed by a 50 per cent households sample survey to determine their incomes, expenditures, livelihood activities and resource use patterns. The categorization of households into the different wealth classes was done on the basis of the major source of income for the family, assets ownership and their quality. Though there are some variations between the different villages, the broad composition of the three groups is:

Well-Off: Government servants or pensioners, officers in the private sector or persons serving overseas, businessmen (store owners, taxi owners and local contractors) head the well-off families. The number of well-off families is estimated to be 152 in the selected villages.

Middle-class: These households are headed by modest jobholders in the private sector (hotels staff), tradesmen (like painters, electricians, water millers), drivers, small shopkeepers and sheep or goat rearers. Middle-class families number 153.

Poor: The poor include households headed by widows, disabled persons, unemployed elderly persons not receiving a pension, milk or grass vendors, labourers and artisans (including masons and carpenters). The villagers characterized 63 households as poor.

Household Income Levels

Household incomes include cash incomes and subsistence values.[6] Cash incomes are largely received in the form of salaries, wages for daily labour, business transactions or sale of services. All farm production has been monetized at prevailing prices and included in the household income. The sampled households have been divided into three income groups as shown below:

A: > Rs.65,000/hh/yr
B : Rs. 25,000-Rs.65,000/hh/yr
C: < Rs.25,000/hh/yr

Class A accounts for 39 per cent of the sampled households. Class B is slightly larger (42%) while Class C (19%) makes up just under one-fifth of the sampled households in the selected villages.

There is a clear difference in the assets owned by the three classes (Table 7). The more than six-fold average annual incomes difference between the well-off and the poor is mainly due to the wide gap in cash incomes. Landholdings per household in this table appear to be higher than the state average as revealed by other sources.[7] But it should be noted that in general only about half the agricultural land is actually being cultivated.

Table 7: Average ownership assets of the livelihood groups

Class	No. of Hholds	Land/Hhold (ha)	Cattle* / Hhold	Av. Ann. Income/ Hhold (Rs)
A	72	1.86	3	135432
B	77	1.08	3	43904
C	35	0.79	2	21240

Note: * Rounded off to the nearest whole number.
Source: Sample Household survey, 2006

In general income levels increase across classes as one moves down the watershed from the upper reach to the lower reach. From Table 8 it can be seen that Mamani has middle reach rather than upper reach characteristics. Gharara village in the middle reach has income levels somewhat close to Dhan Kurali in the upper reach. This is mainly because SC households are about 50% of the village population and their income levels are comparatively lower than the other households.

Table 8: Average class-wise income-levels.

Reach	Upper Reach		Middle Reach		Lower Reach
Village	Dhan Kurali	Mamani	Gharara	Makhet	Bainoli
Class	(Rs)	(Rs)	(Rs)	(Rs)	(Rs)
A	87,612	111,926	96,605	184,278	130,561
B	38,808	45,919	37,070	46,110	54,410
C	21,735	24,043	16,631	22,737	24,306

Source: Sample Household survey, 2006

[6] In the final version of this paper we intend to add a non-market flows component to cover the fuelwood and fodder that are collected from community or private lands.
[7] Uttarakhand Rural Development Survey, PSI, Dehra Doon, 1998-99 (unpublished).

The sample household survey also collected information on occupations to determine the primary (major) sources of income for each household. The average income levels for the different occupation groups are summarized in Table 9.

Table 9: Average annual households & incomes by occupational groups.

Reach	**Upper Reach**		**Middle Reach**		**Lower Reach**	
Village / **Primary Source of Income**	**Dhan Kurali (Rs)**	**Mamani (Rs)**	**Gharara (Rs)**	**Makhet (Rs)**	**Bainoli (Rs)**	**Total Hholds**
Agriculture	NA (2)	NA (2)	NA (3)	35120 (1)	- (0)	35120[8] (8)
Livestock	- (0)	45,812 (3)	10,744 (1)	42,880 (2)	NA (1)	33634 (7)
Business/Trade	NA (1)	84,727 (5)	52,562 (7)	123,040 (19)	78,261 (14)	93888 (46)
Daily Labour	27,069 (13)	34,189 (14)	35,290 (36)	35,824 (33)	25,420 (2)	34021 (98)
Service/Pension	59,245 (42)	89,229 (41)	71,918 (41)	174,587 (41)	80,933 (44)	94806 (209)

Note: NA = Not available;
Source: Sample Household survey, 2006 and social mapping, 2006

Table 9 reveals the most startling finding of the study, i.e., that agriculture is the primary source of income for a negligible number (~ 2%) of households in the selected villages. Even though all families possess some agricultural land, only 8 out of 368 derive a major part of their annual income from farming. Service or pension is the primary income source for more than half the households (57%), while another 27 per cent largely depend on daily labour, e.g., roadwork, house construction, etc. for their income. Business or trade is the major income source for about 12.5 per cent of the households.

The massive shift of livelihoods from agriculture to off-farm employment has serious implications for community based natural resource management in the area. When the primary source of income for a family shifts from agriculture to non-farm employment, it has a reduced incentive to participate in the various activities required to manage common property resources. For example, such families are less likely to offer voluntary labour for communitarian tasks like the management and maintenance of community irrigation systems.[9] A study of 39 farmer managed irrigation systems in Himachal Pradesh showed that only 11 systems were able to retain their traditional management systems.[10] In nine others the traditional system of management collapsed completely. Nineteen communities responded by changing their governing structure and/or their operating rules. The effectiveness of these changes varied from system to system.

[8] This value is not representative of the total agricultural households. In the household survey only one such family could be surveyed. This figure will be revised after interviewing a few more families from this group.
[9] R.Chopra: Survival Lessons, People's Science Institute, Dehra Doon, 2003, p.21.
[10] J.M.Baker: "Common Property Resource Theory and the Kuhl Irrigation Systems of Himachal Pradesh, India", Human Organization, v.56, n.2, 1997.

Poverty Analysis

The Government of India (GoI) has assessed Uttarakhand's poverty line as Rs.478/capita/month for rural areas.[11] This works out to an average of Rs.30974 per household for the selected villages. By this criterion 92 households (25%) live below the poverty line.[12] Two-thirds of them are labourers. The procedure adopted in Uttarakhand for identifying families living below the poverty line (BPL) is quite complicated, based on a score for 13 factors. Using these norms, revenue records show that there are 105 BPL households in the study villages.

An attempt was made to estimate the minimum income required to meet basic living expenses in the region. The sampled households were asked to estimate basic non-food expenses. They listed expenditure for clothing, fuel (gas and kerosene), education, power (electricity), medicines, local travel and essential social obligations. This figure is Rs.2161/person/year. To this was added the minimum expenditure for food, based on the ICMR (Indian Council of Medical Research) dietary recommendations and the prevailing food prices, i.e., Rs. 5110/p/yr. The minimum income required to meet basic living expenses as defined by the local people thus works out to Rs. 7271/p/yr or Rs. 606/p/m. This figure is about 27 per cent higher than the GoI's poverty line of Rs. 478/p/m for Uttarakhand. By this criteria 128 households (35%) in the selected villages are unable to meet their basic living expenses, about 63 per cent of whom are daily labourers. A caste analysis on income levels shows that 82 per cent of the SCs in the study villages have incomes below the locally defined poverty level of Rs.39263/hhold/yr. The figures for the other castes are: Rajputs -- 48 per cent, OBCs – 23 per cent, Brahmins – 11 per cent.

Migration

Table 9 also shows that in general households engaged in business or service are economically better off, with income levels well above the official or local poverty lines. This fact at least partly explains the preference of the younger generation for service and to a lesser extent for business. They do not want to work with their hands in occupations related to agriculture, livestock or artisanal work, as they are traditionally practiced, not only

Table 10: Migration from study villages.

Village	Number of Households	No. of Households reporting migration				Total number of migrated members			
		A	B	C	Total	A	B	C	Total
Dhankurali	58	8(14)	26(45)	3 (5)	**37 (64)**	9	34	3	**46**
Mamani	65	28(43)	11(17)	3 (5)	**42 (65)**	42	12	3	**57**
Gharara	88	3(3)	13(15)	14(16)	**30 (34)**	4	26	17	**47**
Makhet	96	28(29)	8(8)	16(17)	**52 (54)**	35	9	24	**68**
Bainoli	61	2(3)	8(13)	7(12)	**17 (28)**	2	11	9	**22**
Total	**368**	**69(19)**	**66(18)**	**43(12)**	**178 (48)**	**92**	**92**	**56**	**240**

( ) : Percentage of total households
Source: Household survey, 2006

[11] ---------: "Poverty estimates for 2004-05", Press Information Bureau (GoI), New Delhi, March 2007.
[12] The GoI has estimated 29% BPL households in Uttarakhand by the 365 days expenses recall method and 36% based on the 30 days recall method.

because such occupations require hard labour but also because the remunerations are low. Since jobs in the government (including armed forces) and the private sector – which are generally the first preference – are not locally available, there is a steady migration out of the villages as shown in Table 10. The table shows that more persons from the better-off households tend to migrate than from the poorer families. Persons from the better-off households are likely to have family or kinship contacts in urban areas, better education and more money to migrate with than those from the poorer families.

V. CONCLUSION

A most striking feature of the livelihoods assessment is that barely two per cent of the households derive a major part of their income from agriculture. About 70 per cent of them depend mainly on service/pension or business. Another 27 per cent earn most of their living from working on roads, house construction, etc.

Laboureres constitute the poorest occupational group. They are followed by people engaged in agriculture or livestock related activities. Persons engaged in business or service head the well-to-do households. Analysis of the income levels shows that about a third of the households are unable to meet the basic living expenses identified by the local communities. An estimated 82 per cent of the Scheduled Caste families and nearly half the Rajpur households (48%) live below this poverty line.

The irrigated lands have only modest productivities. Village commons and community forests are degraded. As state control over natural resources has grown in the past the local communities have become alienated. Most of the institutions for resource management are dysfunctional. The people do not show ownership of development programmes or processes, though some voluntary organizations are working to alter this situation.

Compared to mountain villages in general the selected villages have reasonable access to infrastructure facilities, especially for education. Enhanced education levels are encouraging the youth to look outside the villages for livelihood opportunities.

Given the good human assets in the region, adequate precipitation, streams and springs and good infrastructural resources, there is good scope for creating desirable local livelihood opportunities. The key to such a turnaround is to create a sense of ownership or community control over critical natural resources like forests and water. Once the community is engaged in planning and implementing its own development, then it can display ownership of the development process. This is visible in a watershed development project being implemented in a part of the Hilaugad watershed. It will require not only mobilizing the communities but also changes in the policy, legal and institutional frameworks.