

Major Findings of the Survey

The major findings of the survey of the 10 selected villages are summarised in Tables 1 to 3. The smallest unit of settlement is a hamlet. Each village consists of a number of hamlets. Villages cover an area of 3 to 4 sq km and hamlets within a village are usually scattered. As a result, they may depend on the same forest to meet their biomass needs but they rarely depend on the same water source for domestic purposes. Natural springs are the major source of drinking water and most villages have access to tap water. Few villages depend upon streams for their water supplies. Distribution centres serving a number of hamlets have a catchment of approximately 6 km radius and are generally located along the highways.

Agriculture is the main economic activity during the summer months in all the surveyed villages. In roughly half of these villages there are other sources of income, including livestock, during the winter months, whereas in the remaining villages the people do not have any source of income during this period. The size of landholdings per household was observed to vary from 0.40 ha to 4.91 ha among the villages. Villages with gentler slopes have larger sized holdings compared to those with steeper slopes. Corresponding to the variation in size of landholdings, the volume of agricultural produce consumed and sold per household also varied across villages. The number of animals and the production of livestock products per household also showed a wide variation among these villages.

The survey indicated that villages with an average altitude of 1,800 m consumed 15 kg of fuelwood per household in summer and 30 kg in winter, whereas the corresponding figures for villages with an average

Table 1: Household Characteristics Occupation, and Income and Expenditure Patterns in the Sample Villages of Kulu District

Village	Hamlet	Altitude (in meters)	Average Household Size	Average No. Of Working Members (Per Household)	Occupational Pattern Per Household	Income and Expenditure Pattern (Per Household in Rupees)									
						Winter (months)	Average Monthly Income	Average Monthly Expenses	Food	Animals	Education	Health	Household Maintenance	Others	
Tarungali	Tarungali Bagan	1280 m	9	8	Summer (months)	Others (3)	2271.25	504.50	162.50	56.25	177.00	27.5	18.75	62.50	
		1240 m	6	3		Others (3)	725.00	410.00	200.00	137.50	35.00	37.5	0.00	0.00	
Kalwari	Kalwari Mujhalli Nannaut	1720 m	10	7	Summer (months)	Others/Nothing (5)	146.00	123.00	49.00	0.00	35.00	3.0	6.00	25.00	
		1760 m	10	3		Nothing (4)	33.30								
		1800 m	10	3		Others/Nothing (5)	1100.00								
Chanon	Tilru	2240 m	9	4	Summer (months)	Animal husbandary (4)	472.22	460.78	288.78	65.56	12.00	15.56	78.89	000	
Ghingh	Shoja	2700 m	7	5	Summer (months)	Others/Nothing (4)	1241.25	1286.50	849.25	25.00	384.75	15.00	12.5	000	
Sharchi	Jutli Bursdal Sulgad	1960	9	5	Summer (months)	Nothing (4)	1700.00	337.00	240.00	2.00	16.00	12.00	0.00	67.00	
		1800	5	2		Other Nothing (5)	350.00	263.00	226.67	25.00	5.00	4.00	2.33	0.00	
		2360	10	6		Others (5)	990.00	512.33	433.33	0.00	20.00	60.00	0.00	0.00	
Pekhri	Farrari	1800	9	5	Summer (months)	Nothing (3)	459.09	710.36	645.36	16.82	13.64	1.82	32.73	0.00	
Lajheri	Kausia Joun Bhargol Ghai	2360	7	4	Summer (months)	Animal hush/others (4)	303.00	262.60	200.00	22.60	9.00	11.00	20.00	0.00	
		2200	11	5		Nothing (4)	811.75	943.00	824.25	0.00	87.50	31.25	0.00	0.00	
		2400	7	3		Nothing (4)	1350.00	862.25	400.00	262.25	100.00	37.5	62.50	0.00	
		2480	10	6		Nothing (4) Nothing (4)	1537.00	972.00	649.5	0.00	240.00	82.5	0.00	0.00	
Bashher	Jaun Lafalli	2200	8	5	Summer (months)	Nothing (5)	218.00	336.00	299.8	0.20	25.00	1.00	00.00	10.00	
		2340	6	2		Others (4)	2250.00	2099.00	999.00	0.00	400.00	200.00	00.00	500.00	
Manjhadesh	Shamsher	1350	6	2	Summer (months)	Others (4)	359.50	727.80	460.00	141.00	54.00	40.0	32.80	0.00	
Fnanali	Tilona Nishani	1300	8	4	Summer (months)	Others (4)	341.67	593.33	316.67	1.67	166.67	108.33	0.00	0.00	
		1600	4	3		Others (6)	170.00	2015.67	999.00	100.00	0.00	666.67	250.00	0.00	

Source: Primary Survey

Table 2: Agricultural and Livestock Characteristics, Fuel Consumption Patterns, Water Sources, and Type of Building Materials Used in the Sample Village of Kulu District

VILLAGE	HAMLET	AGRICULTURAL PATTERN PER HOUSEHOLD				LIVESTOCK PER HOUSEHOLD							FUEL CONSUMPTION PER HOUSEHOLD					WATER SOURCE		BUILDING MATERIAL		
		Land Holdings	Cropped Land	Produce Consumed	Produce Sold	No. of Animal	Milk	Meat	Skin/Wool	Fodder consumed	Wood	Agri. Waste	Coal	Kerosene	Electricity	Man	Animal	Wall	Floor	Roof		
																					(in ha.)	(in kgs. per year)
Tarungali	Tarungali Began	4.91	2.84	2,619.5	4,979.0	10	10.4	-	0.4	10,120	163.44	0.31	0.41	45.83	Tap	Tap	Stone	Wood	Slate			
		1.08	0.88	1,469.0	-	5	3.5	-	-	7,580	128.75	112.5	1.0	28.33	Tap	Stream	Wood	Wood	Slate			
Kalwari	Kalwari Mijhalli, Namat	2.72	1.34	2,173.6	416.0	10	4.6	0.8	6,780	113.20	-	14.4	1.1	50.22	Tap	Tap	Stone	Wood	Slate			
		1.33	0.93	814.7	-	4	1.0	-	5,150	49.5	-	-	-	16.30	Tap	Tap	Stone	Wood	Slate			
		2.36	2.04	2,730.0	2,940.0	6	13.0	-	6,500	45.0	-	-	0.06	22.22	Tap	Stream	Stone	Wood	Slate			
Chanon	Tiru	1.05	0.90	1,808.4	2,004.9	11	3.0	1.2	17,500	63.0	-	-	0.65	Tap	Tap	Stone	Wood	Slate				
Ghaigh	Shoje	0.76	0.76	1,690.0	1,378.0	17	2.5	5.0	8,200	62.0	-	-	0.24	Tap	Tap	Stone	Mud/Wood	Slate				
Sharahi	Jaffi Bundal Sulgad	1.15	0.56	2,898.0	5,200.0	10	3.2	3.0	14,200	61.0	-	-	0.2	6.22	Tap	Tap	Stone	Wood	Slate			
		0.88	0.83	936.0	34.7	3	1.0	-	1,400	40.0	-	-	0.02	30.37	Tap	Tap	Stone	Wood	Slate			
		0.67	0.67	2,773.3	173.3	5	1.0	-	9,150	106.0	-	-	0.13	-	Stream	Stream	Stone	Wood	Slate			
Peabri	Farrari	0.81	0.75	1,474.9	-	9	1.5	0.2	12,750	60.0	-	0.45	-	Tap	Tap	Stone	Wood	Slate				
Lajheri	Kanda Joan Biargol Ghad	0.89	0.84	208.0	728.0	9	4.4	-	12,000	61.0	-	-	0.6	26.67	Tap	Tap	Stone	Wood	Slate			
		1.00	0.86	1,820.0	1,755.0	11	2.3	2.0	6,000	71.9	-	-	0.04	36.11	Tap	Tap	Stone	Wood	Slate			
		0.96	0.84	1,118.0	3,120.0	9	3.25	2.5	13,999	66.9	-	-	0.08	27.78	Tap	Well	Stone	Stone	Slate			
		0.66	0.64	1,976.0	1,625.0	16	2.0	-	10,500	69.4	-	-	0.03	23.33	Tap	Tap	Stone	Wood	Slate			
Boeher	Joan Lafalli	1.95	1.45	1,726.4	759.2	11	3.8	0.6	9,550	48.5	-	-	0.02	22.22	Stream	Tap	Stone	Wood	Slate			
		4.80	3.2	2,080.0	3,120.0	5	4.0	-	4,500	60.0	-	-	-	-	Stream	Stream	Stone	Wood	Slate			
Manjhadash	Sharesher	1.27	1.12	842.4	1,305.2	4	4.5	0.1	16,350	24.35	-	1.0	0.03	27.11	Tap	Stream	Stone	Wood	Slate			
Fanzali	Tilona Niabani	0.85	0.85	2,340.0	173.3	7	1.67	-	1,000	151.9	-	-	1.5	81.48	Tap	Tap	Stone	Wood	Slate			
		0.40	0.40	450.7	-	4	-	-	-	2.15	-	-	-	22.22	Stream	Stream	Stone	Wood	Slate			

Source: Primary Survey

Table 3: Availability of Educational and Medical Facilities in the Surveyed Villages of Kulu District

Village	Hamlet	Distribution Centre	Altitude (In metres)	EDUCATIONAL AMENITIES				MEDICAL AMENITIES				
				Primary	Middle	Higher Secondary	College	Dispensary	Private Doctor	Primary Health Centre	Veterinary Hospital	Hospital
				1 2 3 4 5	1 2 3 4 5	1 2 3 4 5	1 2 3 4 5	1 2 3 4 5	1 2 3 4 5	1 2 3 4 5	1 2 3 4 5	
Tarangali	Tarangali Bagan	Tarangali	1240									
Kalwari	Kalwari Mujhalli Namaut	Dhad	1340									
Chamon	Tiru	Chargad	1800									
Chhagh	Shoja	Chhagh	2100									
Sharchi	Juli Bandal Sulgad	Gosaini	1600									
Pelhari	Ferari	Gosaini	1600									
Lajhari	Kanda Joan Bhargol Chai	Khang	2400									
Bachhel	Jain Lalali	Gogri	1600									
Manjibachan	Shanher	Ani	1200									
Pramh	Tilona Nihani	Uwa	1800									

Source: Primary Survey

NOTE: The number 1-5 denotes the time taken to reach the amenities.

1. Less than 1/2 hour
2. 1/2 - 1 hour
3. 1 - 2 hour
4. 2, 3 hour
5. more than 3 hour

Table 4: Estimation of Biomass Requirements (by Litterfall Method) in the Surveyed Villages of Kulu District

Village	Hamlet	Hamlet Population	Fuel Consumption (in kg/yr)	PER CAPITA FUEL CONSUMPTION/REQUREMENT (in kg/yr)		Population 1981 Village Level	Total Litterfall (in kg/yr)	Area of Forest (in HQ)	Population 1991 Village Level	Total Litter Requirement (in kg/yr)	Area of Forest (in ha)	% Increase in Forest Area	Population 2001 Village Level	Total Litterfall Required (in kg/yr.)	Area of Forest (in ha)	% Increase in Forest Area
				Hamlet Level	Village Level											
1. Tarangali	Tarangali Bagan	68 23	97,564.50 88,056.25	1,434.77 3,828.25	2,631.65	682	17,94,785.30	1,929.87	768	30,21,107.20	2,173.23	12.61	830	21,84,269.50	2,348.67	21.7
2. Kalwari	Kulwari Mijhali Namaut	31 29 20	41,318.00 18,067.50 16,425.00	1,332.83 623.02 821.25	925.70	978	9,05,334.60	975.48	1,209	11,14,335.30	1,198.21	23.08	1,447	13,39,487.90	1,440.31	47.95
3. Chanon	Tilru	80	22,995.00	287.44	287.44	1,218	3,50,101.92	376.45	1,589	4,56,742.16	491.12	30.46	2,006	5,76,604.64	620.0	64.69
4. Ghingh	Shoja	28	22,812.50	814.73	814.73	316	2,57,454.68	276.83	364	2,96,561.72	313.50	13.25	404	3,29,150.90	353.92	27.85
5. Sharchi	Jutti Bursai Sulgar	45 15 29	22,265.00 14,600.00 38,872.50	494.78 973.33 1,340.43	956.18	1,381	12,92,864.60	1,390.18	1,649	15,43,760.80	1,659.95	19.4	1,969	18,43,338.40	1,982.08	42.58
6. Pekri	Farni	95	21,900.00	230.53	230.53	841	1,93,875.53	208.47	1,023	2,35,832.19	253.58	21.64	1,203	2,77,327.59	298.20	43.04
7. Lajheri	Kanda Joan Bhatgol Ghai	34 45 30 41	22,265.00 26,243.50 24,418.50 25,331.00	654.85 583.19 813.95 617.83	533.96	1,991	10,63,114.40	1,143.13	2,311	12,33,981.60	1,326.86	16.07	2,579	13,77,082.81	1,480.73	29.54
8. Baehar	Jan Lalali	42 6	17,702.50 21,900.00	421.49 3,650.00	2,035.74	1,623	33,04,006.00	3,552.69	1,794	36,52,117.60	3,927.01	10.54	1,891	38,49,584.30	4,139.34	16.57
9. Manjha desh	Shameher	72	8,887.75	123.44	123.44	4,106	5,06,844.64	544.99	5,030	6,20,903.20	667.64	22.5	5,940	7,33,233.60	788.42	44.66
10. Fernali	Tilona Nishand	46 11	55,443.50 784.75	1,205.28 71.34	638.31	2,326	14,84,709.10	1,596.46	2,984	18,83,829.00	2,025.62	26.88	3,709	23,67,491.80	2,545.69	59.46

altitude of 2,300 m were 30 kg in summer and 100 kg in winter. However, these villages did not show any significant variation in the consumption of forest biomass among different sizes of landholding. Since the biomass available from agricultural produce is generally used as fodder during the winter months, the size of landholdings determines the capacity of households to support milch cattle.

The building construction techniques and materials used are uniform across the study villages. All tension members used are invariably wood. Since each household is permitted to fell only two trees per year, the wood is shared on a community basis for building new houses or for repair. The timber is not usually seasoned and its lifespan is short and requires frequent maintenance. The sections used are much heavier than they actually need be for the dimensions covered, resulting in wastage of timber. The doors and windows are poorly constructed and are not well insulated. As a result, the energy consumption for space heating is very high, particularly in the winter. Since the kitchen is invariably located on the top floor, the rest of the building does not get the benefit of the heat generated during cooking.

Although wood is the major source of energy, those who can afford to and who have access to other forms of energy, such as coal, kerosene, and electricity use them. Electricity is the second-most widely used source of energy, however it is mostly used for lighting purposes and its use as fuel is limited. The kinetic energy of water is widely used to run water mills and sporadically, to run saw-mills.