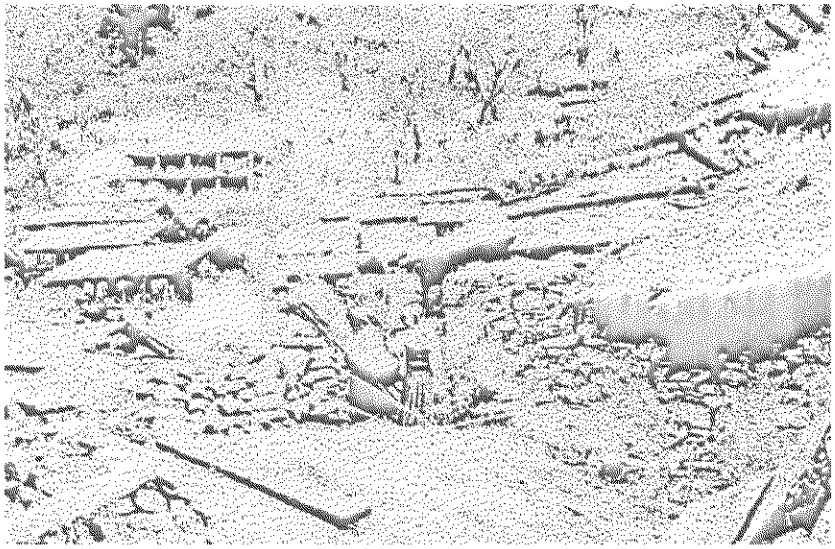
A view of Hurri village with the bulk of the houses with Slate roofs on earth and timber planking and Stone random rubble masonry in mud mortar for the walls. In the background one of the two RCC roofed building in the village can be seen. Though apparently undamaged, the walls and columns of this building are severely damaged. The slate for these roofs comes from local quarries and there is extensive use of cane "ringal" that the women is unloading from her basket. This could be used to fabricate panels and mats that could be used for insulation under an employment programme.



Hurri village in Bhatwari Tahsil, Uttarkashi District.

Occupational Structure

The primary occupation of most villagers is animal husbandry with 250 cows, 150 bullocks and over 1,200 goats and sheep. There are 8 mules in the village that are used for carrying loads. Most families undertake agriculture and grow Potato, *ramdana* and *chana*.

Infrastructure

Two springs located within the village supply water. The pipe water supply system has been damaged by the earthquake and water is available in one standpipe close to the central courtyard. Electric supply is not available to the households after the earthquake, though a few street lights are working. The residents are afraid of connecting their households to the power line because of apprehensions of a future earthquake.

The village has a primary school that has been damaged in the earthquake. The nearest dispensary is at Bhatwari about 20 km. away.

Local building materials

The building materials used are granitic boulders and slatey, sheared rocks. The granitic colluvial materials are unweathered and well suited for dry stone masonry. The slatey rock is available from a quarry situated on the southern edge of the village. The Slates used are generally around 2 to 5 cm thick and are heavy.

Local construction workers

There are no traditional masons or carpenters in the village. They either come from adjoining villages or from Uttarkashi.

Materials of Construction

Random rubble stone masonry in mud mortar was the only kind of walling material found for housing. The traditional grain storage structures are made of timber walls and roofs. They have suffered virtually no damage except for horizontal displacement. Slate on earth and timber planks is the most common form of roofing followed by thatch and RCC. The two RCC roofed houses in the village have been constructed over the last three years. At least two new houses were being constructed using composite techniques of mud-pathri, timber and RCC have been heavily damaged, with resultant loss of over 1 lakh investment by each of the owners.

All the houses that collapsed had Slate roofs. The major causes of failure were: low quality of stone masonry, gable failure and subsidence of the hill-slope. A wide crack had developed in the hillside that ran alongside the building that collapsed killing three people.

Table 6.3 Village Huri: Estimated Structure of Housing Stock (% to total houses)

Material of Wall	*Material of Roof*			
	Thatch and timber planks	*Slate on earth on timber planks*	*RCC*	*TOTAL*
Mud-pathri	16%	79%	5%	100%

Source: TARU field appraisal

The price of cement is Rs. 140 per bag delivered and sand is available from the river below at Rs. 20 per bag. Steel is available at Rs. 1350 per quintal.

Damage

Three people were killed and 20 injured in the earthquake. 13% of the houses collapsed, 44% were severely damaged and 43% heavily or moderately damaged.

None of the families are staying in their houses. Approximately 50% of them continued to store their belongings, fodder and in some cases, cattle in their moderately damaged houses, at the time of this survey. Cooking was also being done in the houses during the day.

Reconstruction

The emergency shelters are built out of wooden planks, retrieved from damaged and collapsed buildings, timber frames, CGI sheets and tarpaulin.

Risk

The hazard risk is very high as the earthquake has created a crack of around 5-20 cm. wide, running along the hill slope. The local soil is permeable, and is likely to cause a landslide in the near future (within the next two rainy seasons) and may render a major portion of the village unsafe for habitation. Immediate measures to relocate the village are necessary.

The villagers are very apprehensive that the whole hillside on which Huri is situated will collapse into the river. They are therefore considering moving to a lower altitude with their cattle for the winter. They are not inclined to construct emergency shelters in the present location due to this hazard. They demanded expert opinion on resiting their village, before starting reconstruction.

They are also strongly opposed to the supply of cement or steel by the Govt. at this point of time as they have no place to store the cement.

Village Ginda, Bhatwari Tahsil, Uttarkashi District

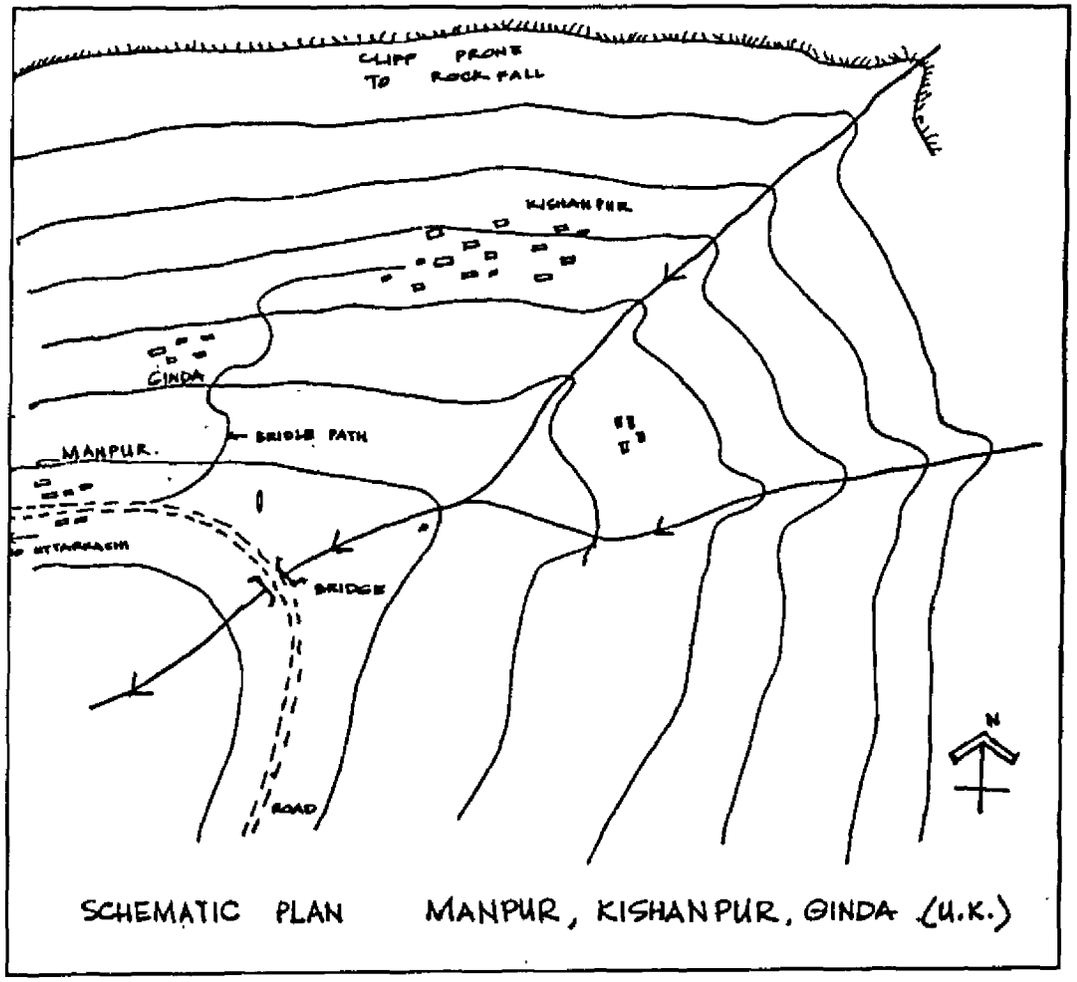
Ginda is a small village of 30 houses located at an altitude of 2,000 above msl. in the Indravati valley with a population of 41 households.

Location

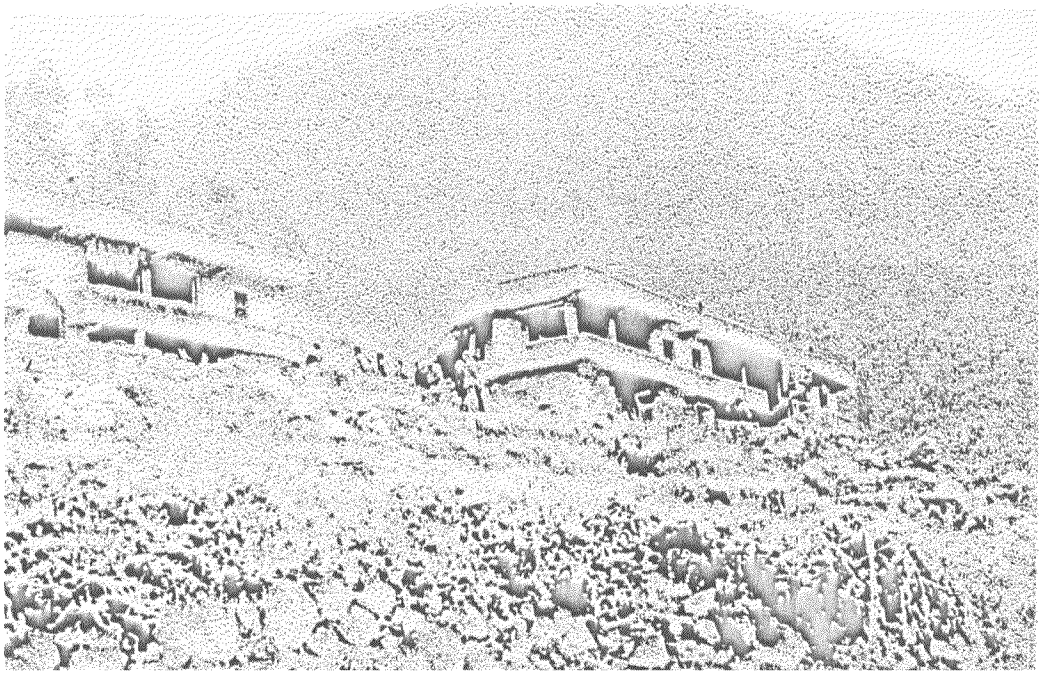
The village is located about 14 km. from Uttarkashi on Indravati valley on boulder-bed bearing slopes.

Geology

The country rock is quartzite. Both colluvial and glacio-fluvial deposits were observed. The slopes are steep, considerable area is terraced and the terrace heights vary from 1 m. to 4 m. Their width ranges from 1.5 m to 5 m. The soil thickness is low and even in the terraced fields, it rarely exceeds 30 cm.



A view from below of two houses in Ginda village, which appear undamaged from the road. The rear walls of both these houses have collapsed leading the RCC slab to collapse, giving the impression of a film set !



Severely damaged buildings in village Ginda, Bhatwari Tahsil, Uttarkashi District.

Occupational Structure

The primary occupation of the village is agriculture with animal husbandry as a subsidiary occupation. The village has a well built system of terraces and irrigation channels that have suffered severe damage. The local farmers estimate 2 to 3 years time to reconstruct these terraces and irrigation channels. The staple crops are paddy, wheat and potato. The village has 100 cows and 50 buffaloes. The people are concerned about the survival of these animals in the cold, especially the buffaloes.

Infrastructure

Springs above the village supply water. The pipe of water supply system has been damaged by the earthquake. Electric supply was restored a week after the earthquake and some households have tapped the line for use in their emergency shelters.

The village has a primary school that is located near the road. The nearest dispensary is about 1 km. down the road.

Local building materials

The local building materials used are phyllites and quartzites for walls. The block sizes are generally small. Slates for roofs were transported from more than 5 km.

Local construction workers

There are no traditional masons or carpenters in the village. They either come from adjoining villages or from the Uttarkashi area.

Materials of Construction

All the houses in the village are built with walls in Stone in mud mortar. The predominant roofing material is Slate (70% of the roofs), the rest are with RCC. Both types of roofs have failed. The proportion of people injured or killed in Slate roofed houses is more, than RCC. The RCC roofed structures have failed catastrophically.

Table 6.4 Village Ginda: Estimated Structure of Housing Stock (% to total houses)

Material of Wall	*Material of Roof*		
	Slate on earth on timber planks	*RCC*	*TOTAL*
Mud-pathri	70%	30%	100%

Source: TARU field appraisal

The price of cement is Rs. 130 per bag delivered and sand is available at Rs. 500 per bag. Steel is available at Rs. 1350 per quintal.