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UNDERSTANDING ENVIRONMENTAL HEALTH : A Study of Some Villages of Pauri Garhwal

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CERTIFICATE

Certified that the dissertation entitled "Understanding Environmental Health: A Study of Some Villages of Pauri Garhwal", submitted by Ramila Bisht is in partial fulfilment of six credits for the degree of Master of Philosophy of this University. This dissertation has not been submitted for any other degree of this University or any other university and is her own work.

We recommend that this dissertation be placed before the examiners for evaluation.

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Ramila Bisht.

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CHAPTER I

THE PROBLEM

Apart from biological factors, the health of an individual or a community is largely determined by the interplay of the social environment created by man himself and the external ecological setting which surrounds him. In this context 'environment refers to the whole gamut of influences which impinge on man and affect his well being: it includes man's physical surrounding of land, sea and air, the rivers, bacteria and other organisms of the biological environment (M.Howe, 1972). Therefore, environment is the matrix of physical, natural and social circumstance surrounding man and affecting his well being.

The emerging perspectives consider environment as something more than the air, water, land and presence of living things (M.Eisenbud, 1978). Environment is considered as an eco-system or an integration of national, physical and social relations. It is also being realized that to view environment as just an internal, physical entity with nothing but a functional or economic bearing on people, is not adequate. Forests, rivers, and other such components of finite natural environment are not the only factors requiring environmental management. It is necessary to recognize the importance of integrated physical and social setting in which people live. Therefore, environmental problems are not just limitedto depletion of forests or the pollution of rivers, they also encompass problems of the

physical and social environment. The satisfaction of basic needs such as housing, drinking water, sanitation and health, also form important problems of the environment. These variables along with the components of the socio-economic environment play a major role in the availability and accessibility of these variables to the people, determining the quality of the environment in any society (K.R.Nayar, 1983).

Though environment is an aggregate of all external conditions and influences affecting the life and development of man, for the sake of understanding and analysis, the environment here has been conceptualized as a system comprising of the following systems:

(a) The natural environment

(b) The physical environment

(c) The socio-economic environment

(a) <u>The natural environment</u>

Includes structures which have originated without human activity such as landforms, riversystem, soil forms, climatic conditions, forests etc.

(b) <u>The physical environment</u>

Some of the components of the natural environment can also be included under this subsystem. However, predominantly the components of physical environment have originated as a result of human action or human labour.

Housing, water supply, sanitation and other variables like roads, electricity form part of the physical environment.

(c) The socio-economic environment

Consists of variables such as caste structure, class, education, occupation, landownership, family structure etc.

We must emphasize that there are no fixed neat categories like the above. Environment is a totality of all these factors and this categorization has only been done for sake of description and for analysis of the data.

Since health conditions are an integral part of an environment, health issues must be seen embedded within the ecological, social, economic and political systems. Our understanding of health tells us that health is not an absolute quantity but a concept. It is an outcome of a complex set of socio-cultural, economic as well as physical and natural factors. "Health of individuals and groups is largely determined by socio-economic political and technological factors." (I.Qadeer, 1985). Health is thus a state of well-being which is determined not only by social services, but also by social dimensions. "It is a product of harmony between man and his environment: biological, physical and social" (J.J.Schiffers, 1954).

"Health" or "ill-health" is located in the social conditions of living and work of the people. It arises out of developmental processes in which the individual interacts

with his environment. Therefore, health of a community at any given moment is the function of the environment of that community.

Such an understanding of health makes the study of environmental health most critical. Though the development of environmental health as a separate field is a later outcome, the relationship between environment and health has been asserted since at least 400 B.C. According to the Hippocratic doctrines, "the well-being of man is influenced by all environmental factors: the quality of air, water and food; the winds and the topography of the land; and the general living habits.... Health is the expression of harmony among the environment, the ways of life and the various components of man's nature" (cf. R.Dubos, [1968] in M.Turshen, 1981). Therefore, environmental dimensions were understood much before medicine took shape (I.Qadeer, 1990).

ENVIRONMENTAL HEALTH: THE HISTORICAL PATHWAY

Environmental health possibly derives from the term, "environmental sanitation". Envrionmental sanitation as we understand the term today, began in England in the mid-nineteenth century when Sir Edwin Chadwick established the first sanitary commission and Dr.Southwood Smith organized a "Health of Town Associations" (J.J.Schiffers, 1954).

Frequently, throughout history, the status of

environment, which historically has been equated with sanitation, but is now much broader in concept, has been the measure of civilization. In fact, the aggregation of population has always seemed to create environmental health problems which had to be solved before the populace could survive and enlarge (E.H. Purdom, 1978).

Though it is customary to trace the origin of environmental control to the efforts of man to cloth, feed, house and protect himself, but these early measures and practices of cleanliness and hygiene did not rest on secure foundation. The earliest measures specifically directed to health were concerned with the isolation of the infection and it was not until the fourteenth century that even the most rudimentary public health regulations were introduced (following the catastrophe of the Black Death [1348]), R.M. Acheson, et' al, 1984). The measures used before the eighteenth century are notable both for their nature and for their limitations. By this time it was recognized that housing and clothing might contribute to the spread of disease.

During the eighteenth century there was a considerable advance in recognition of the significance of the environment, supported by a demonstration of the

effectiveness of its control in prevention of two diseases,

scurvy and lead poisoning.

As early as 1719, Richard Meade his report 'Short Discourses on Pestilential Contagion' in which he prescribed much wider changes in the total environment - better housing, cleanliness, ventilation, disinfection and control of nuisances along with very stringent application of traditional measures like isolation and quarantine to deal with plague. A little later there were notable investigations of the association between living conditions and disease by Pringle ("Observation on the Disease of the Army", 1752) in the army, Lind in the navy (Treatise on Scurvy, 1748), Blane in the navy (Observation on the disease of Seaman, 1785). In 1773, Howard undertook a journey of the prisons in England in which he showed the association between insanitary conditions and disease, and pointed to the need for reform. In all these studies that we have referred, the evidence about the association between environment and disease was of an indirect kind. It was essentially the observation that infection and insanitary conditions tended to be found together it did not amount to a demonstration that improvement in any specific feature of the environment resulted in prevention of a specific disease (Acheson et' al, 1984; McKeown, T., 1979).

From the onset of the nineteenth century, the effects

of the industrial revolution became marked. The new factories required labour, and as many people required work there was a rapid movement of population from the country to the towns. People were forced into accepting very poor working conditions and even the domestic environment was bad (Acheson, et' al, 1984). Engel's classical work on the conditions of the English working class was published in 1844. The effects of industrialization was superimposed upon hygienic conditions which were already bad. New hazards to man were introduced into his environment - physical injury from machines and work methods, toxic exposures, and other stresses. It was about this time that the first organization of public resources and society in the interest of public health began. Developments in England and the United States were somewhat parallel, and they can be traced to two reports. In England, it was the "Report on an Inquiry into the Sanitary Conditions of the Labouring Population of Great Britain by Edwin Chadwick in 1842 (P.W. Purdom, 1978). In it Chadwick presented the results on an investigation into the relations between environmental conditions and ill health.

In 1850 in the United States, the "Report of the Sanitary Commission of Masachuesetts" was published by L.Shattuck commonly called "Shattuck Report".

Both these reports are hailed today as historical

landmarks, not so much because they are forerunners of actions ultimately taken to establish organized public health agencies but because of their insights and perspectives (Purdom, P.W., 1978).

Public concern about the environment was also sharpened by the experience of infectious diseases especially the new threat of cholera (Acheson, et' al, 1984). The effectiveness of hygienic measures was greatly extended from the time when Pasteur established the bacterial origins of infectious diseases.

In the United States the great motivators towards better environmental sanitation were L. Shattuck, Stephen Smith and William Thompson Sedgwich, while the first important measure in Britian was the Public Health Act of 1848. But it was not until the Act of 1875 that control of essential features of the environment was enforced. Although environmental services have improved progressively during the twentieth century, the work of controlling the disease which stems from the physical environment is still far from complete (Acheson et' al, 1978) and the underdeveloped nations still face problems of preventable diseases while the technological advance in the developed nations have brought newer problems of atmospheric

pollution, radioactive material, nuclear hazards etc.

(J.J.Schiffers, 1954).

Therefore, "in its narrow sense environmental health is the offspring of public health, which, represented, historially, man's effort to protect himself and his community against communicable diseases. Environmental health broadens the field enormously. It seeks to identify and provide positive protection for health individuals against adverse influences that crop up in an expanding society, which is becoming even more technical and complex." (J.J. Schiffer, 1954).

While P.W.Purdom (1978) defined environmental health as "that aspect of public health that is concerned with those forms of life, substances, forces and conditions in the surrounding of man that may exert an influence on man's health and well-being. This definition includes other people as part of man's surrounding that contribute to the status of environmental health."

Another definition given by the National Health Services in England (1974) (cf. in R.M. Acheson, et al, 1984) interprets Environmental Health to include: "measures for prevention of the spread of communicable disease other than immunization, some epidemiological investigation, and treatment; powers relating to food safety and hygiene, port health and the disease of animals which affect human health; public health aspects of environmental services; and

enforcement of requirements about environmental conditions at work place."

Talking of Environmental Health, Herat V.T. Gunaratne (1980) says, "Broadly speaking, the problem today is how to carryout interventions in the environment to improve the quality of life, without producing adverse effects due to those very interventions. Interventions are also needed to prevent and mitigate the spectrum of activities spread over a diversified area. Broadly speaking, it relates to the provision to communities of safe water supply and facilities for the sanitary disposal of liquids and solid wastes; means for ensuring the hygienic quality of food and drink; sanitary housing conditions that promote health; protection against pollution of water and the atmosphere; and control of insects, rodents and other vectors of diseases. It involves, in all of these appropriate measures to prevent and/or control them. In brief, Environmental Health connotes control of the environment for the promotion and protection of health of the people."

Closely linked to environmental studies, environmental health is in a state of change since its inception. Traditional approaches are being challenged and new approaches sought in response to a number of converging developments (M.Schaefer, 1974). There is a major concern in the developed countries over the ecological effects of

production and consumption processes. The developing countries are feeling the untoward effects of some aspects of these very same processes. Environmental deterioration from rapid industrialization, resource degradation and inadequate environmental control has become a matter of concern in these countries. services. Not only does the field of Environmental Health embrace far more than its historical predecessor - sanitation, but it also operates in a context charged with political and economic conflict.

It was in the seventies that the Green Parties emerged with the formation of the first national ecological party, called values in 1972 in New Zealand. Britain followed suit an year later with a very small party called 'PEOPLE', formed by citizens in the industrial town of Coventry. Later in the 1970s, Europe wide protests against nuclear energy led to the second wave of green party formation. The early formation of the German green party Die Grunen (the Greens) was a particularly delicate political balancing act, uniting a broad spectrum of anti-nuclear and ecological activities. Green parties have now spread beyond Europe to all five continents. The Green movement thus emerged as a political movement for an alternative to environmental degradation and pollution and consequent threat to public health, born out of unbridled greed and lack of public accountability of the political-industrial system (W. Rudig

1991, cf. A. Agarwal and S.Narain, 1992).

This brief review of the emergence of environmental health reveals three features of the concept of Environmental Health.

(a) It goes beyond environmental sanitation to explore physical, natural, technological and social environment for causality of disease.

(b) That while the definition emphasizes action for health protection, the efforts are limited to means within the same political, social or technological structures.

(c) With the Green movement political and social issues were focussed even if for the West.

Theoretically, despite the above, the definition of environmental health did not crystallise any further.

ENVIRONMENTAL HEALTH - TRENDS IN THE THIRD WORLD

The conditions in the Third World were even more difficult for the evolution of the emerging approach to Environmental Health. The political, economic and social constraints do not permit any rapid action. Research in this area is far behind than what is required for action.

Most of the work is on understanding the environmental problems. It gives an indication of the possible impact environment will have on health, but the impact is studied only in isolated cases. Most health impact studies are

technical and do not explore social dimensions.

There are three major trends in literature available on environmental health in the third world. We can represent them as:

(a) efforts at identifying and measuring the health impact of environmental hazards.

(b) efforts that try to link population growth with environmental degradation and project population growth as a major factor in determining environmental health.

(c) studies which are not limited to technology and population alone but encompass physical, social and natural dimensions of environmental health.

These trends are also reflected in studies done in India.

(a) In the first category studies deal with technology in an isolated manner. These studies identify chemical hazards, production processes, quantification etc. and do not examine them in relation to other factors and social dimensions. Some of the best examples of these studies are those which relate pesticides to health hazards (Gupta et' al 1984; P.Prakash, 1985; R.Banaji, 1985; Jagdish et al, 1985; D.Mohan, 1987; J.Jayaratnam, 1990); chemical pollutants, dusts, gases emitted in various occupations like mining, quarrying, petro-chemical, cement, nuclear raditation and many other

industries involving hazardous processes and their impact on health (J.R. Sinha,1980; Jaitli et' al, 1993; G.Thyagarajan, 1993; A.K.Abdullah, et al; S.B. Clerk, etc. and V.T.Padmanabhan, 1985.

(b) a dominant trend is to focus on environmental impact of population growth contending that population growth is the major factor in destroying environment. For example, studies done by Caldwell (1985) and N.H.Fesik (1984). But, the most effective example of this trend is the 'Club of Rome'. The first report to it 'Limits of Growth' (1972) and its latest publication 'The first Global Revolution: A Report by the Council of the Club of Rome" (1991) both emphasise on population growth in the South as the major problematique. However, there is a shift in the last report it does talk of over consumption and consumerism by the affluent North and need to improve the economic conditions in the poor countries. But having said all, the point of intervention remains, population in the South.

All these authors either do not look at the environment-population links or even if they do they tend to ignore or underplaying the issue. D.Banerji (1993) in his critique of "The first Global Revolution: A Report by the Council of the Club of Rome" (1991) points out that although -they have identified the

variables which constitute the world system, they have been unable to work out interlinks between them, despite consistently pointing out that this is a critical prerequisite for developing a global perspective for the 'Global Revolution' to be a success.

(c) As early as 1956, a conference which reviewed the social and cultural factors in environmental sanitation in rural India pointed out caste as the most important barrier in environmental sanitation programme. Khare (1964) and later Hasan (1967) also reiterated the cultural resistance viewpoint. K.R.Nayar (1983) reveals the fallacy of this view on the basis that caste alone does not provide an adequate framework for analysis of behaviour. Socio-economic factors when integrated into the analytical framework give a different picture.

I. Qadeer (1985) examining the concept of health argues that though ecological approach to health has developed, still, the emphasis on physical and biological basis of health continues with little effort to bring out the significance of its social basis.

Researchers in the Third World identify these problems, but empirical studies in this area are lacking (K.R.Nayar, 1983). P.Blanc (1984) reports field investigations into the

effects of economic development on environmental health in Rawanda, a poor, overpopulated country with a subsistence economy whose development has been largely stimulated by international aid projects. Economic development in the form of mining activity and agricultural commercialization (use of agricultural petrochemicals) have led to both chronic diseases among farmers using pesticides and general environmental degradation such as run-off to surface water. It is concluded that Rawanda represents an example of the failure of economic developers to consider the far reaching effects of changes in the work environment, introduction of new agricultural techniques, alteration of rural-urban equilibrium and degradation of the air, water and soil quality.

There are problems with the first two trends. The technical studies talk of the technical question of pollutants etc., giving us an idea about the nature of ecological problems. They do not highlight the processes involved in the production of detrimental environmental conditions, the reasons for making such choices and the political implication of a particular kind of structure. Studies emphasizing population growth as the main cause of decline in environmental quality ignore the fact that "hunger and overpopulation are not ecological manifestations; they are signs of economic and political

problems that can be solved humanly, by economic and political means" (B.Commoner, 1987).

The problem with the third trend is lack of empirical studies using this framework. In this trend there is a movement from sectoral approach towards dealing with many sectors together, and in the process, discovering the powerful sectors and then seeing how they are all related. However, in India, only few studies have been done which attempt to look at micro-level dynamics within this perspective. Examples of these are Djurfeldt and Lindberg (1975), K.R. Nayar (1983); D.Banerji (1982), V.Bhasin (1990).

It is this link with population numbers, population movements, growth of technology, the ecological setting and its interaction with socio-economic and physical environment that we intend to explore. A better understanding of the social, political and economic aspects of the environment, linkages between them and the impact of the totality on health is the focus of our study.

CHAPTER II

METHODOLOGY

SECTION I

CONCEPTUALIZATION OF THE PROBLEM

The Himalayan eco-system is one of the most important and most threatened life-support systems. Its land resource degradation has been a matter of considerable concern in recent years. For centuries the people of this region have wrested a living from a very difficult terrain. The pattern of life which survived for centuries has now been transformed by the in roads of "development" which has been resource-intensive, ignoring the socio-economy of the local people.

The advent of industrialization and the modern state with its political centralization, development of transport and communication and other aspects of infrastructure such as permanent markets, the extension of the law and order machinery etc. have undermined village self-sufficiency and the close relationship of man with nature.

All through history, the environment had governed economic activities and laid out norms for living and carrying out those activities with a regularity which became the culture of these people. With the coming of the modern era this close relationship of man and environment, maintained through culture was severed.

The process of capitalist development characterized by

heavy industrialization and green revolution had little to offer to the hills. It had its own technical and social implication wherein certain trends became dominant. These were:

i) the earlier community controlled land, forest and water reservoirs gradually went into private hands;

ii) government intervened in a large way and introduced the policy of reservation;

iii) to maximise profits unchecked use of natural resources was allowed;

iv) the general impulse for growth provided by the government encouraged the pattern of growth prevailing in the plains.

This kind of strategy has created major problems for the economies of dryland and hilly areas which were ecologically different and needed specific kinds of technological innovation. Hill areas largely became the "Islands" of underdevelopment in this overall model of capitalist growth.

These changes were brought about through a process of

a) Resource outflow in the form of timber, forest produce, electricity, water resource outflow etc.

b) General technological growth was unsuited to these areas, while they provided resources, what came into the area was not appropriate and therefore agriculture did not

develop.

c) Agencies of development for example, roads, electrification and schools brought in along with them a lot of middlemen who only increased the process of resource depletion.

d) These inroads of development, also brought in a culture which did not follow the traditional norms of hill economy.

e) Lack of development and depletion of natural resources led to outmigration.

It is this gamut of changes which had serious implications for the hill economy and its people.

In our study, the questions we are interested in are:

i) which of these changes have taken place in the study area;

ii) their cumulative impact on local ecology and its people;

iii) implication of the changed conditions for health of the community.

Our main concern is not the direct assessment of health or ill-health but understanding what is conducive to health in their surrounding and what is not. Therefore, our focus is on understanding the factors within which physical health is rooted. For this the emphasis of the study is on understanding the major changes that have taken place in this area and on the perception of the impact of such

changes on peoples livelihood and survival, factors which contribute to their state of health. With this problem in mind the objective of the study was formulated as follows:

OBJECTIVES The broad aim of the study is to explore the objective and subjective component of environmental health of a Himalayan eco-system.

This broad objective is further split into the following sub-objectives:

1. to understand the current socio-economic and environmental problems and people's perception about it.
2. to understand the processes that have led to the present situation.
3. to examine the relevance of different developmental approaches that have emerged in relation to the existing realities in this area.

DATA REQUIRED In order to study the major problem of environmental health some general and specific data were required for the study villages.

General Information General information pertaining to historical background, demographic features, area and its use, cropping pattern, occupational facilities, infrastructure, services and facilities available at the block and the village level were collected. Secondary data about the district was gathered from statistical handbooks,

district handbooks, census reports and from various government reports and records available at the District Statistical Office and from the Hill Development Office, Lucknow. For general information, data was collected at all levels - village, block, tehsil, district etc. A village schedule was also developed to get basic information about the village (refer to page Appendix 1, for the Village Schedule).

Specific Information Specific household information was gathered at three levels.

(a) Household Schedule

A household schedule was developed to collect information on key issues like family profile, living condition, agriculture and its allied activities, livestock, food consumption pattern, outmigration pattern, forest, water resources, social environment and health (refer to page, Appendix II, for the Household schedule).

(b) Qualitative Data

Apart from filling the schedule at household level, time was spent in informal discussion in every family to get information on peoples perception about changes over time, nature of development in the area, implication of these changes for different categories of families and peoples hopes and expectations.

(c) Case Reports Developed

In a certain number of families with members over sixty, the issue of changes overtime was studied in much greater detail to understand the impact of the government policies on the ecological pattern of the area and its implication for the people of this area.

PROCEDURE OF DATA COLLECTION

(a) **Selection of Area**

On the basis of the pilot study, five villages (Pokhari, Bharet, Ghayalgaon, Badoli [Choti] and Badoli [Bari]) were chosen keeping in mind the feasibility and adequacy of population size. The details regarding these villages are discussed under a separate section 'Area of Study' in this chapter.

(b) **Selection of Household**

Household was defined as a group of persons who commonly live together and who take their meals from a common kitchen, unless the exigency of work prevents them from doing so. It was taken as a unit of study. A detailed schedule was administered to all the households in the village. Besides this, an in-depth/intensive study was done on households where three generations were available in order to explore the process of change. and nineteen case reports were prepared from this intensive study.

(c) **Tools Used**

Both qualitative and quantitative data were gathered. For this various tools were used.

(i) Secondary Sources : Secondary sources were used to gather general information from the block, tehsil, district and state level.

(ii) Interview Schedule: An interview schedule for the household was developed on the basis of information gathered during the pilot study, keeping in mind the objectives of the study. This was the main tool used and both structured and unstructured questions were asked.

(iii)Case Reports: In addition to the quantitative and qualitative data collected through the interview schedule, case reports were prepared to understand the process of change that has been occurring in this area.

(iv) Informal Interview and Discussions: Informal interviews and discussions were held with various government officials like the patwari, pradhan, block development officer, civil engineers, PHC staff, village chowkidar, school teacher and villagers on identified key issues.

(v) Observation: All through the study an effort was made to keenly observe peoples interaction with each other, their behaviour pattern and other dimensions of a social and physical environment.

(vi) In-depth Interviews: Taking one single issue detailed interviews were conducted with key informants.

PILOT STUDY

Pilot study was undertaken in the month of August 1992, for a period of three weeks. Base line survey was done on all households in the village Pokhari and case reports were made from the other six villages. Basic data on the villages was also collected. This was done by visiting the tehsil office, block office, PHC, patwari, pradhan and school teacher. This was a preliminary step in preparation for extensive research work.

The pilot study helped in:

(a) providing familiarity with the conditions of the people, their culture and problems;

(b) finalising the selection of the five study villages;

(c) preparation of schedules and pre-testing it.

The schedule was also pretested on four respondents who had recently migrated to New Delhi from the selected five villages. This greatly helped in designing the schedule which was not altered much by the pilot phase.

STUDY PROPER

In the month of September field work started which continued till first week of November 1993. For the main

study, Household interview schedule and village schedule were used along with informal interview and discussions with other key individuals and groups. Case reports were also prepared side by side.

The researcher stayed in the village with different caste households in order to build a rapport and to get the co-operation of the different groups. She went to the fields, forest, to the spring and at night to chase the animals with the villagers in order to build a rapport with them. Some knowledge of Garhwali language also aided in field work.

The study proceeded from village Pokhari to Ghayalgaon but the researcher had to leave the work incomplete in these two villages and proceed to Badoli (Choti and Bari), because harvesting season was on and everyone was extremely busy in the fields. Badoli (Choti and Bari) being situated in the valley, at a lower height, the crops were yet not ripe. After completing these two villages, the researcher went back to Pokhari and Ghayalgon, completed the work there and proceeded to Bharet. The fieldwork proceeded slowly because of difficult terrain and monsoons. There were no transport facilities, hence the researcher had to cover all the villages by foot. Heavy rainfall caused the river Rawasan to become flooded. That meant wading through water to go from one village to another. Data collection also included

visits to the PHC, block office at Yamkeshwar and also interviewing the registered medical practitioners (RMP) and a shaman in a nearby village.

The study was designed in such a way that the data collected was cross-checked between families, classes and individuals.

LIMITATIONS OF THE STUDY

i) The study was done under a severe time constraint. The limitations also arise out of being a single-person study especially considering the difficult mountainous area.

ii) Many outmigrants were not available for interviewing at the time of study. There was no time to follow them up in cities or wait for them to come back. So, the study lacks in some details in this area.

iii) This is a point study and is therefore, largely a descriptive one which at best can suggest linkages between environmental factors and health. It needs to be followed up by long-term study where these linkages can be studied in detail.

SECTION II

AREA OF STUDY

The study was conducted in a cluster of five villages in Yamkeshwar block of Pauri Garhwal district of Uttar Pradesh (UP). On the basis of intra-state variation, UP has

been divided into five economic regions viz., Hill region, Western region, Central region, Eastern region and Bundelkhand region. The Hill region consists of the Garhwal and Kumaon divisions. Pauri Garhwal forms a part of the Garhwal division, a vast hilly tract comprising of the five districts of Chamoli, Dehradoon, Tehri Garhwal, Uttarkashi and Pauri Garhwal.

"Pauri Garhwal" or "British Garhwal" came into existence as a separate district in 1840, since then it remained (till 1960) under the administrative control of the Commissioner of Kumaon (Dabral, S.P., 1964). It was one of the largest districts of UP until one of its sub-division (Chamoli) became a separate border district in 1960.

This district of Pauri Garhwal is bounded by the districts Chamoli on the north-east, Bijnore on the South, Almora and Nainital on the east, while its western boundary is formed by the river Ganga as far as Devaprayag and the Alaknanda as far as Rudraprayag. The river Ganga separates it from the districts of Dehradoon and Tehri Garhwal. It lies between latitude $29^{o}26'$ and $30^{o}18'$ north and between longitude $78^{o}10'$ and $79^{o}10'$ east. The district has a geographical area of 5440 sq.kms. (District Census Handbook, 1981) and a population of 666,165 according to 1991 census (UP provisional figures). For administrative purpose the district has been divided into three tehsils and fifteen

development blocks. There are a total of 1214 gram-sabhas with 3565 villages and 8 towns (District Census Handbook, 1981).

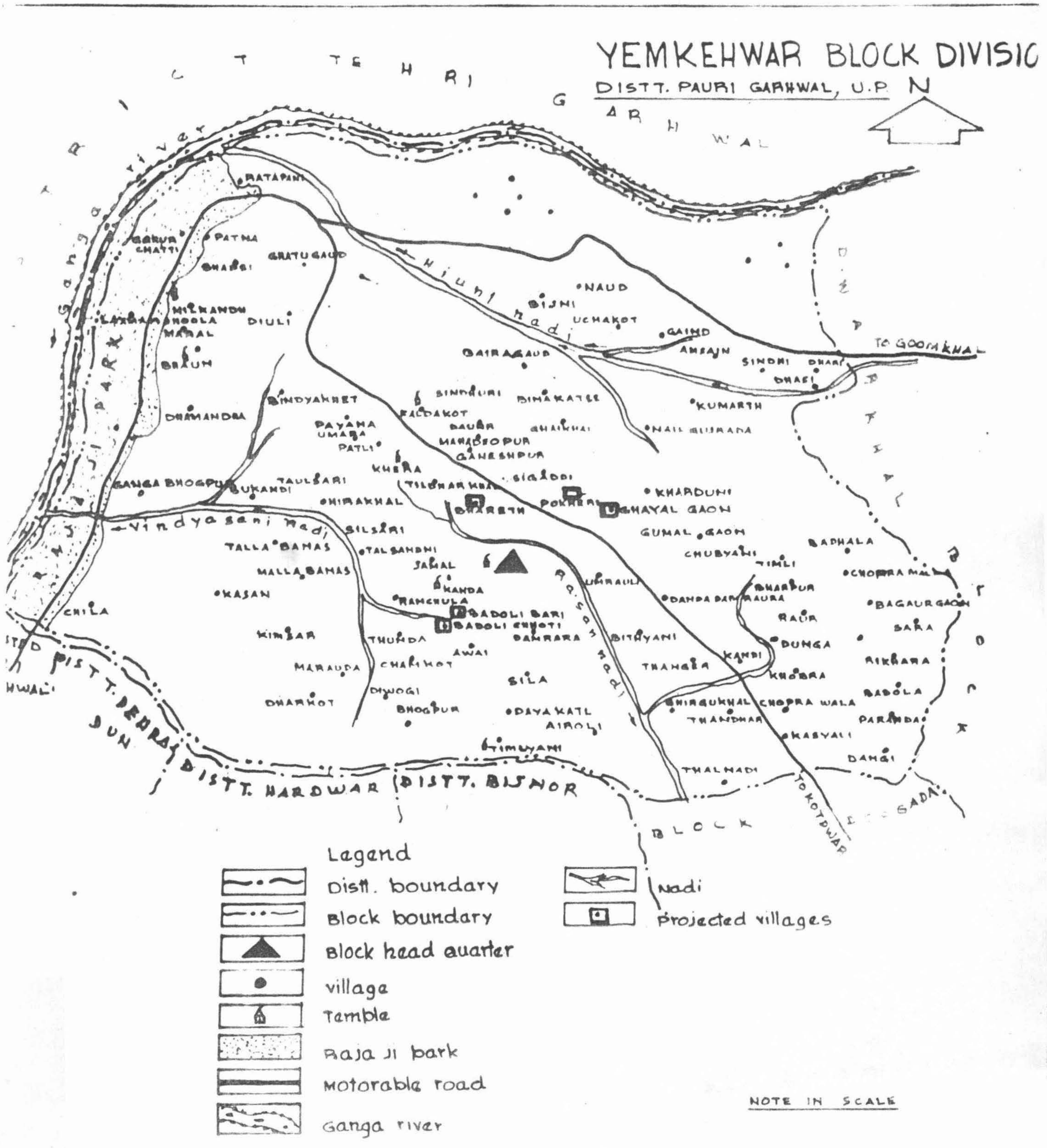
The five selected study villages fall in Yamkeshwar block in Kotdwara tehsil. Yamkeshwar block has an area of 644 sq. kms. It has 8 Nyaya Panchayats, 90 gram sabhas and a total of 213 revenue villages out of which 199 are inhabited. According to 1981 census, the total population of this block is 37,351.

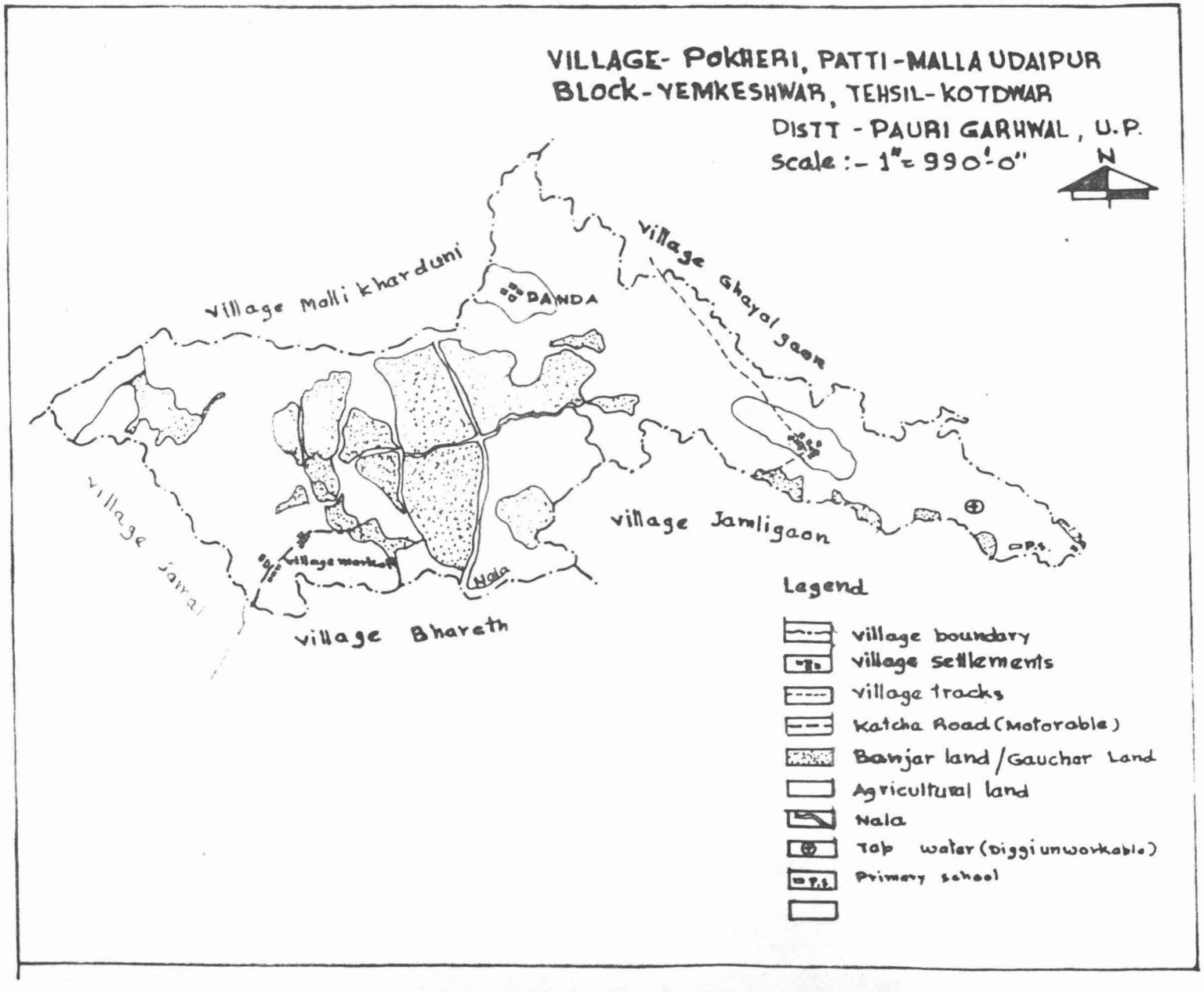
Pokhari, Ghayalgaon, Bharet, Badoli (Choti/palli) and Badoli (Bari/walli) are the five study villages. On account of diversities and variations in landform characteristics, the micro-level differences in the Himalayas are very great. Variations may be found in hill villages which are situated at a distance of less than five kilometers from each other. Batten (cf Atkinson, E.T. 1984-86) aptly said:

> However notorious one sub-division may be for its plenty and another for its poverty, no opinion in either case can be formed of the natural capabilities of the one village by a view of its neighbour in even the smallest sub-division of a tract.

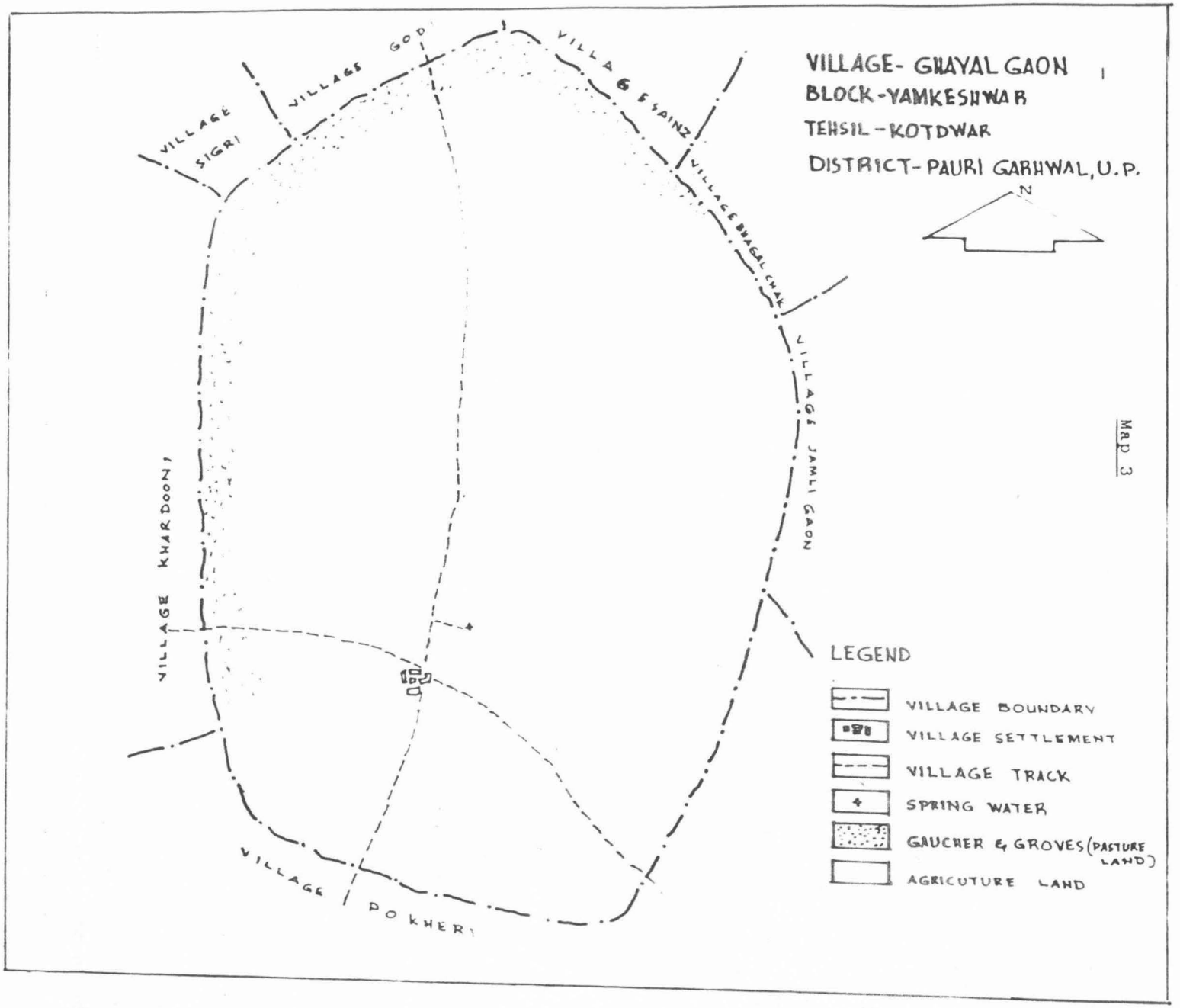
Even these five study villages have many differences in terms of their topography, slope, soil, socio-economy etc.

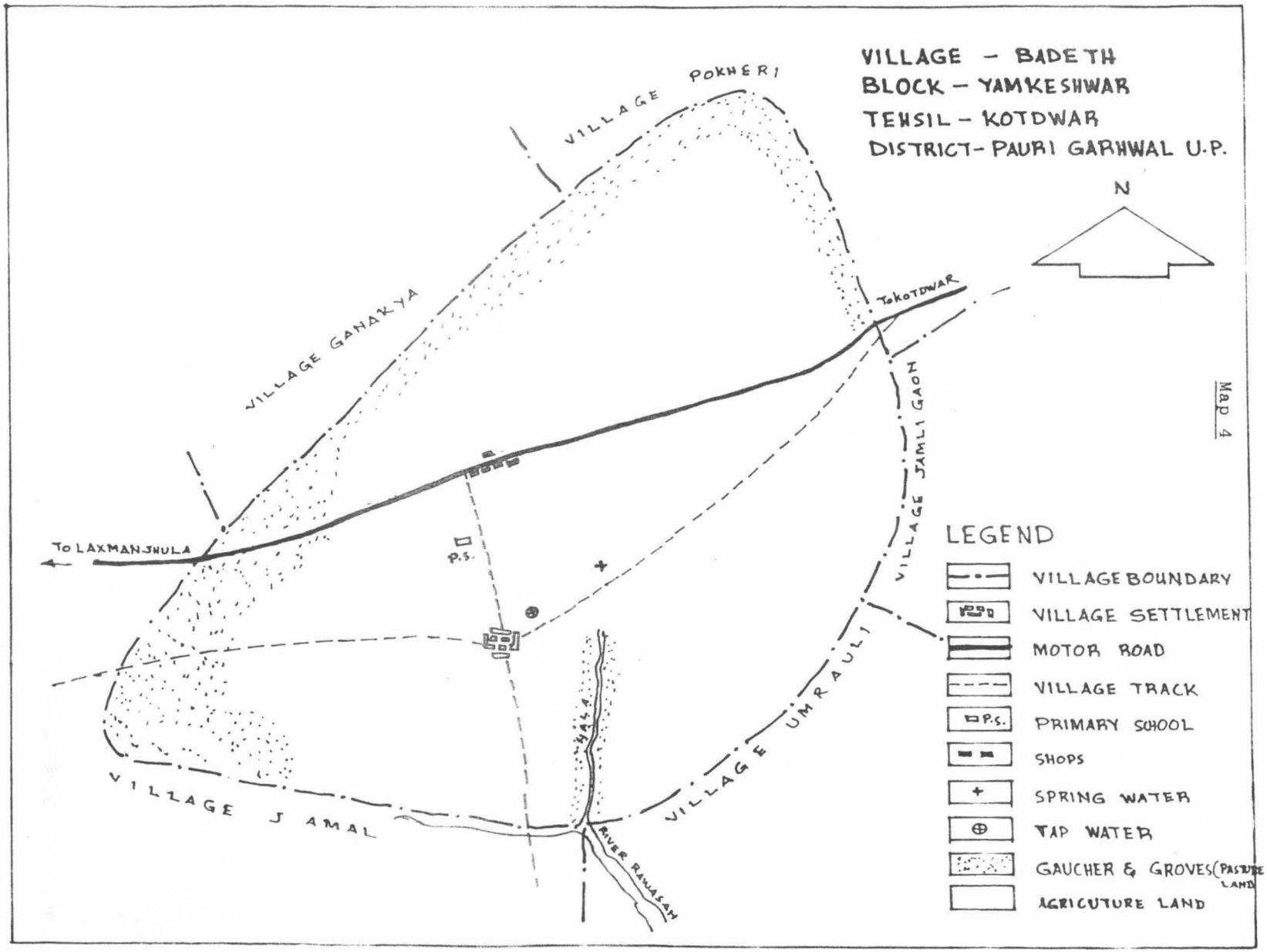
Map 1


YEMKEHWAR BLOCK DIVISIO
DISTT. PAURI GARHWAL, U.P.
N
TEHRI GARHWAL
Ganga river
RAJA JI PARK
Hiunl nadi
Vindyaseni nadi
Rasan nadi
TO GOOMKHAL
TO KOTDWAR
DISTT. HARDWAR
DISTT. BIJNOR
DISTT. DEHRA DUN
BLOCK
NAUD
BIJNI
UCHAKOT
GAIND
DIULI
PATNA
MARAL
KUMARTH
KHARDUNI
GUMAL GAON
CHUBYANI
TALLA BAMAS
MALLA BAMAS
KASAN
CHILA
KIMSAR
THUNDA
SILA
DAYAKATL
AIROLI
BITHYANI
DUNGA
SARA
BADOLA
DAMGI
THALNADI
KASYALI
BAGAUR GAON
CHOPRA WALA
Legend
Distt. boundary
Block boundary
Block head quarter
village
Temble
Raja ji park
Motorable road
Ganga river
Nadi
Projected villages
NOTE IN SCALE

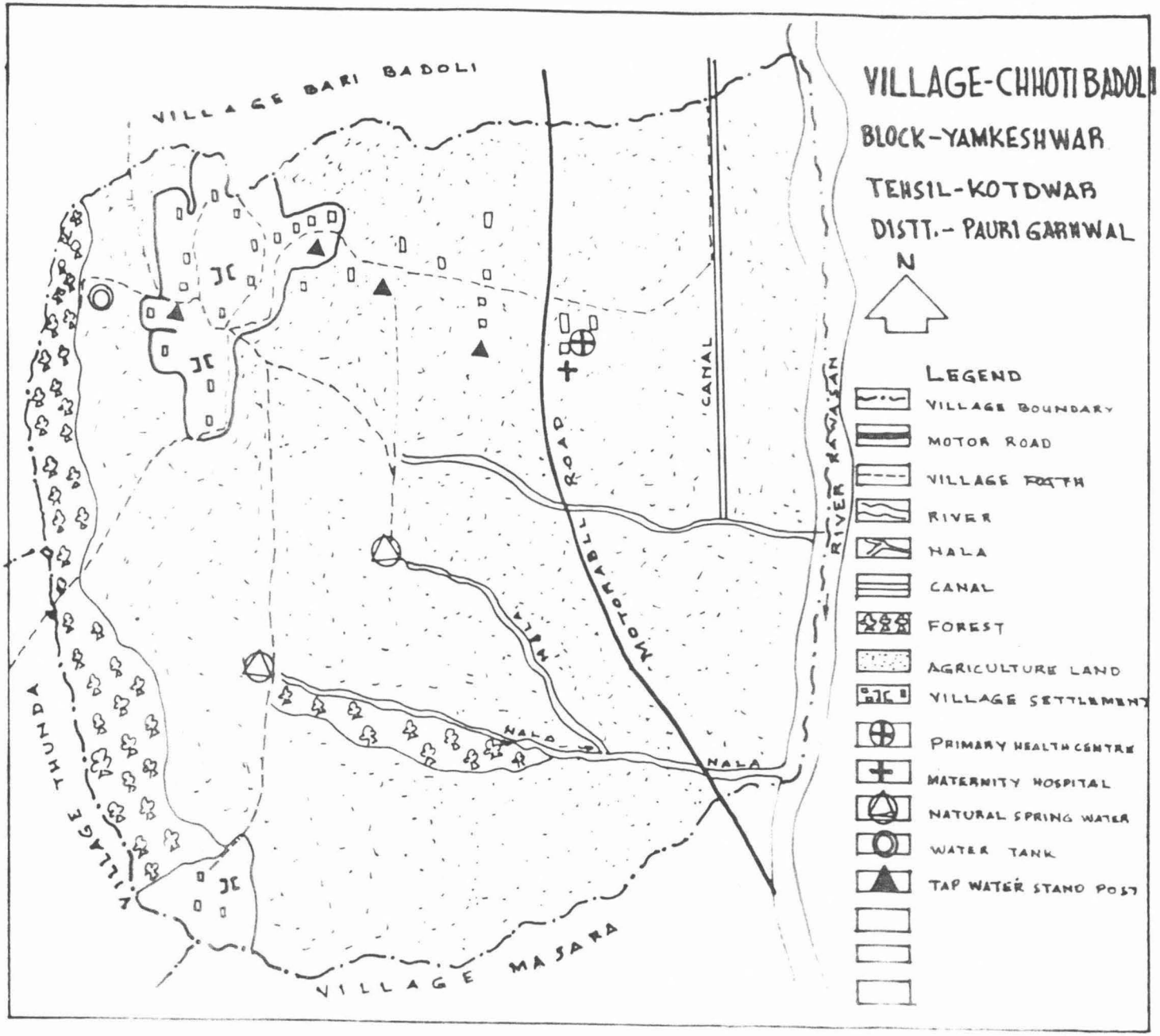

VILLAGE- POKHERI, PATTI-MALLA UDAIPUR
BLOCK-YEMKESHWAR, TEHSIL-KOTDWAR
DISTT - PAURI GARHWAL, U.P.
Scale :- 1"= 990'-0"
N
village Malli khardani
village Ghayal gaon
PANDA
village Jamligaon
village Jaiyal
village Bhareth
Nala
P.S.
Legend
village boundary
village settlements
village tracks
Katcha Road (Motorable)
Banjar land / Gauchar Land
Agricultural land
Nala
Tal water (Diggi unworkable)
Primary school

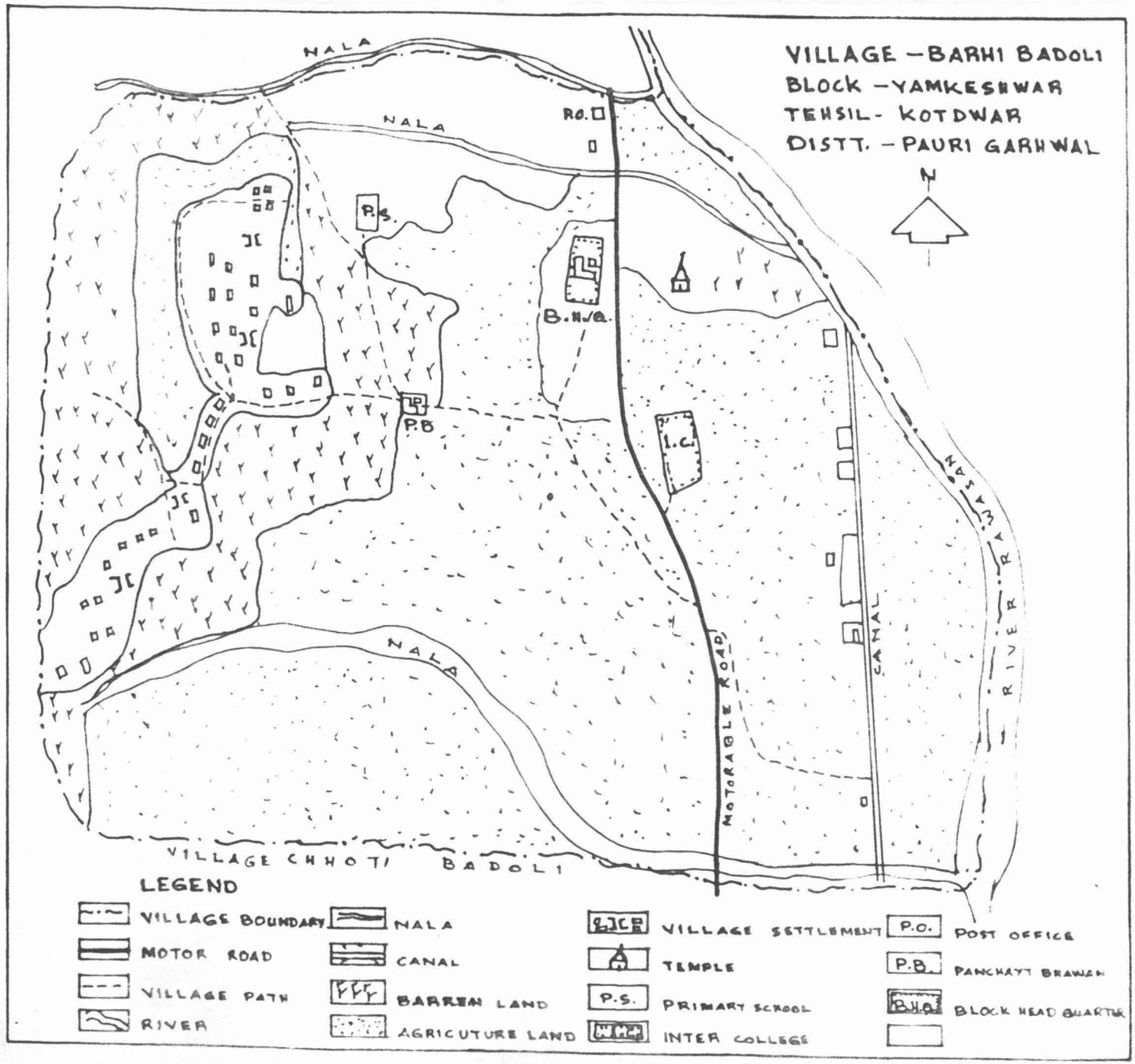
Map 2


VILLAGE- GHAYAL GAON
BLOCK-YAMKESHWAR
TEHSIL-KOTDWAR
DISTRICT-PAURI GARHWAL, U.P.
N
Map 3
VILLAGE SIGRI
VILLAGE GOD
VILLAGE SAINJ
VILLAGE BHAGAL CHAK
VILLAGE JAMLI GAON
VILLAGE KHARDOONI
VILLAGE POKHERI
LEGEND
VILLAGE BOUNDARY
VILLAGE SETTLEMENT
VILLAGE TRACK
SPRING WATER
GAUCHER & GROVES (PASTURE LAND)
AGRICUTURE LAND


VILLAGE - BADETH
BLOCK - YAMKESHWAR
TEHSIL - KOTDWAR
DISTRICT - PAURI GARHWAL U.P.
N
Map 4
VILLAGE POKHERI
VILLAGE GANAKYA
To KOTDWAR
VILLAGE JAMLI GAON
To LAXMAN JHULA
P.S.
VILLAGE UMRAULI
VILLAGE JAMAL
RIVER RANASAN
LEGEND
VILLAGE BOUNDARY
VILLAGE SETTLEMENT
MOTOR ROAD
VILLAGE TRACK
P.S. PRIMARY SCHOOL
SHOPS
SPRING WATER
TAP WATER
GAUCHER & GROVES (PASTURE LAND)
AGRICUTURE LAND

Map 5


VILLAGE-CHHOTI BADOLI
BLOCK-YAMKESHWAR
TEHSIL-KOTDWAR
DISTT.- PAURI GARHWAL
N
LEGEND
VILLAGE BOUNDARY
MOTOR ROAD
VILLAGE PATH
RIVER
NALA
CANAL
FOREST
AGRICULTURE LAND
VILLAGE SETTLEMENT
PRIMARY HEALTH CENTRE
MATERNITY HOSPITAL
NATURAL SPRING WATER
WATER TANK
TAP WATER STAND POST
VILLAGE BARI BADOLI
VILLAGE THUNDA
VILLAGE MASARA
MOTORABLE ROAD
CANAL
RIVER KAWASAN
NALA
NALA
NALA


VILLAGE – BARHI BADOLI
BLOCK – YAMKESHWAR
TEHSIL- KOTDWAR
DISTT. – PAURI GARHWAL
N
NALA
NALA
NALA
RD.
P.S.
B.H.Q.
P.B
I.C.
CANAL
MOTORABLE ROAD
RIVER
VILLAGE CHHOTI BADOLI
LEGEND
VILLAGE BOUNDARY
MOTOR ROAD
VILLAGE PATH
RIVER
NALA
CANAL
BARREN LAND
AGRICUTURE LAND
VILLAGE SETTLEMENT
TEMPLE
P.S. PRIMARY SCHOOL
INTER COLLEGE
P.O. POST OFFICE
P.B. PANCHAYT BHAWAN
B.H.Q. BLOCK HEAD QUARTER

Map 6

OVERVIEW OF THE STUDY VILLAGES AND THEIR POPULATIONS

The five study villages can be clustered into two groups according to the location. Village Pokhari, Bharet and Ghayalgaon are located on the Neelkantha-Pokhari Danda Hill/ridge. Pokhari is situated at a height of 1380 m. Ghayalgaon is a kilometer and a half north-east of Pokhari at a height of 1360 m and Bharet is two kilometer south of Pokhari at a height of 1220 m. No river drains through these villages. The other two villages, Badoli (Choti) and Badoli (Bari) are located at a height of 1070 m on Naugaon hill/ridge. They lie in the valley of river Rawasan (or Satruda nadi), a non-perennial river (See Maps 1-6).

Area:

After a close look at the five study villages, their total geographical area can be divided into the following well defined segments:

i) area under forest,

ii) arable area (cultivated area - unirrigated)

iii) arable area (cultivated area - irrigated)

iv) cultivable wasteland (gauchar + groves or pasture land)

v) uncultivable land

vi) area not available for agriculture.

TABLE - 1

AREA (IN HECTARES) UNDER VARIOUS CATEGORIES IN THE FIVE STUDY VILLAGES

SL NO.	VILLAGE	POKHARI		BHARET		GHAYALGAON		BADOLI (CHOTI)		BADOLI (BARI)	
	LAND USE PATTERN	Block	Census	Block	Census	Block	Census	Block	Census	Block	Census
1.	Under Forest	33.35	-	1.94	-	N.A.**	-	2	8.09	4	20.64
2.	Arable (unirrigated)	N.A.**	18.21	20.76	19.83	N.A.**	22.46	46	57.86	43.81	38.45
3.	Arable	-	-	0.76	0.81	-	-	5.27	4.86	6.8	4.86
4.	Cultivable Wasteland	N.A.**	21.85	N.A.**	8.91	14.251	22.66	12	0.4	21.38	13.15
5.	Uncultivable	9.9	-	6.04	-	9.871	-	36.4	-	38.67	-
6.	Area not available for Agri.	N.A.**	2.03	N.A.**	2.02	5.048	4.05	N.A.**	4.45	N.A.**	5.67
	Total Area	43.25	42.09	29.5	31.57	29.17	49.37	101.67	75.66	114.66	82.77

NOTE : (i) ** N.A. - information not available

(ii) Discripancy in data between Block and Census reflects the problem with the quality of data available.

SOURCE : Block :- Block office, Yamkeshwar, district Pauri Garhwal, U.P.

Census:- Census 1981, District Handbook, 1981.

Table 1 shows the area in hectares, under various categories. The discrepancy between the data available from the different sources is indicative of the problem in the quality of the data. Very often on certain types of land use the census gives no information. Even with this limitation certain trends can be delineated.

i) In Pokhari village, according to the Patwari's information (field survey), the "forest area" is 17.511 hectares. This area is covered with trees and bushes. But the Census reports no area under forest while the Block office gives the figure as 35.35 hectares. Such discrepancies in data reflect the problem with the quality of data.

ii) The area is drained by rain-fed rivulets, hence the belief that rivers, streams and rivulets in the Himalayan belt are snowfed, therefore perennial is not always correct.

iii) In Ghayalgaon village the pradhan and patwari insist that there is a stretch of 12.60 hectares of forest on the fringes. This is contrary to the reports available from the Block Office and Census, 1981. Both give absolutely no data on forest area.

iv) The block office report and Census, 1981 reveal wide discrepancies in the area under forest and pasture and in Badoli (Choti). Block office puts the forest area as 2 hectares while Census, 1981 puts the figure at 8.09

hectares. Similarly pasture land according to Block Office is 12 hectares and Census, 1981 says it is 0.40 hectares.

v) In Badoli (Bari) again the area under "forest land" differs in the Block Office report and Census, 1981. While the Block Office puts the forest area only as 4 hectares, Census 1981 reveals that the area under forest is as high as 20.64 hectares.

ii) Infrastructure

The hill region in general lacks in basic infrastructure. Other amenities such as power, roads, medical, educational and para-medical facilities are also lacking.

The road construction drive is making a headway in the region. Still there are a large number of villages which are more than 3 kms from *pucca* (metalled) road. A motorable road from Kotdwara to Bharet via Pokhari was made in 1974. A motorable road from Kotdwara to Yamkeshwar is right now under construction.

Yamkeshwar is located on the bank of river Rawasan. Yamkeshwar was declared as a block in 1983 but the block office at Yamkeshwar was constructed in 1991. Till then the office was operating from Amola in a rented area. The villagers of these five study villages make use of facilities at Yamkeshwar and Amola. However, a post-office and a fixed-price shop is also located in Pokhari. The

Table 2: AVAILABLE FACILITIES/SERVICES AND THEIR DISTANCE (IN KMS) FROM THE RESPECTIVE STUDY VILLAGES

S.No.	Service/Facilities	Distance from service/facilities in villages (in kms.)				
		Pokhari	Bharet	Ghayal Gaon	Badoli Choti	Badoli Bari
1.	Services at Yamkeshwar	5	6	4	2	2
	I. PHC					
	II. Family Welfare					
	III. Alaknanda Gramin Bank					
	IV. Inter College					
	V. Block Development Office					
2.	Services at Amola	4	6	4	4	4
	I. Seed/fertilizer					
	II. Krishi Sewa Kendra					
	III. Telegram Office					
3.	Other Facilities					
	I. Fair price shop	2	1	2	2	2
	II. Motorable road	1	0.5	2	4	4
	III. Nearest Bus stop	1	0.5	2	4	4
	IV. Primary School	0	0	1	2	0
	V. Post office	2	1	2	2	2

Source: Block Office, Yamkeshwar.

people of Bharet and Ghayalgaon make use of this also.

The details of various facilities in Yamkeshwar and Amola and other facilities and their respective distance from the five study villages are given in Table 2.

As shown in Table 2

i) the nearest bus stop for villagers of Pokhari, Ghayalgaon and Bharet is at Pokhari, while for Badoli (Choti and Bari) the nearest bus stop is at Amola.

ii) Post Office and Fair-price shops are located at Pokhari and Yamkeshwar only.

iii) Primary school is located in Pokhari, Bharet and Badoli (Bari) only. The children of the other two villages come to these schools. Children of the study villages go to the Inter-college in Yamkeshwar.

iv) PHC was established at Yamkeshwar in 1981 but is still operating from a rented place.

v) Seed and Fertilizer store in Amola is still not constructed, but seeds and fertilizers are available at the Panchayat Bhawan and they are being supplied since 1983.

Hill region is the least electrified region of UP. In 1985-86 electric poles were put in Pokhari but electricity was supplied two years later. Most villagers took legal connections in 1992 only. The situation in Bharet, Badoli (Choti and Bari) is similar, while in Ghayalgaon the poles were put two years ago but the villagers have yet not taken

connections. The voltage is so low that most of the time it cannot even light the bulbs.

As far as drinking water is concerned, all villagers depend on natural spring. In 1984-85, under drinking water scheme, water was supplied to Pokhari, Bharet and Ghayalgaon from a spring in Naugaon village which is 9 km from Pokhari. Water came for 4-5 months only, since then there has been no supply of water due to many reasons. In Badoli (Choti and Bari) in 1985-86 water was supplied through another scheme and under this scheme two water points were made in Badoli (Bari) and three in Badoli (Choti) - here again the scheme was effective for 7-8 months and ever since water has not come in the taps.

Various Health Services Available Around the Study Area

The Primary Health Centre (PHC) is located at Yamkeshwar which is approximately 5 kms from Bharet, Pokhari and Ghayalgaon, and 2 kms from Badoli (Choti and Bari). The PHC was established in 1981, but it is still functioning out of two rented rooms. Accommodation for doctors and other staff is not available, most living in one room rented accommodation. The PHC lacks in basic infrastructure and there are many vacancies at various levels. This PHC usually has only one medical officer, as doctors sent here prefer to somehow get their posting elsewhere as soon as

possible. At the time of field work, two medical officers were present. But three months later, the medical officer (allopathic) was transferred to the district hospital Uttarkashi. Since then there is only one medical officer.

The PHC staff at present comprises of a Medical Officer (Ayurvedic) one pharmacist, one laboratory technician and one sweeper. Amongst the field staff there are 17 ANN, 12 MPWs, 4 Supervisors and 2 health visitors.

Besides the PHC there are private practitioners like the Registered Medical Practitioner and traditional healers like the "ayurvaids", and traditional religious healers in this area.

A mixed pattern of health services is used in the study area, people usually choosing a combination of these services. For some illness like recurrent headaches, abdominal pain, epilepsy, abnormal behaviour, traditional healers, especially the religious ones are preferred in comparison to the medical doctors.

The PHC services are generally availed by the villagers from Badoli (Choti and Bari). Few except the very poor from Bharet, Ghayalgaon and Pokhari go to the PHC for treatment since it is located far away. For them reaching the PHC is a difficult task as it entails walking through a difficult terrain, an exercise which the sick are unable to undergo. But even among those for whom the PHC is accessible, the

TABLE - 3

SALIENT FEATURES OF DEMOGRAPHY OF THE FIVE STUDY VILLAGES

SL NO.	VILLAGES	POKHARI		BHARET		GHAYALGAON		BADOLI (CHOTI)		BADOLI (BARI)		GRAND TOTAL	
		* Field Survey	Census** 1981	Field Survey	Census 1981	Field Survey	Census 1981	Field Survey	Census 1981	Field Survey	Census 1981	Field Survey	Census 1981
1.	Total No of Household	42	38	25	23	8	14	44	49	42	40	181	164
2.	Total Population	275	167	160	133	44	74	260	201	242	183	981	758
3.	Male	157	78	99	61	29	35	146	104	132	70	563	348
4.	Female	119	89	62	72	13	39	114	97	110	113	418	410

SOURCE : * House hold survey

** District Handbook, 1981

private practitioners are preferred over the PHC. They feel going to the RHP has more advantages. Even though PHC treatment is free, often there are no medicines available. While the RMPs are more accessible - they see patients at all hours, examine more carefully and always give medicines. Injections in general are considered better than oral drugs.

But most often action taken in illness consists of a combination of services depending on accessibility, circumstances especially economic conditions at that point of time. Often, in most cases villagers may be taking medicines from the PHC doctors, or RMP, and traditional healers at the same time in the hope that something may work.

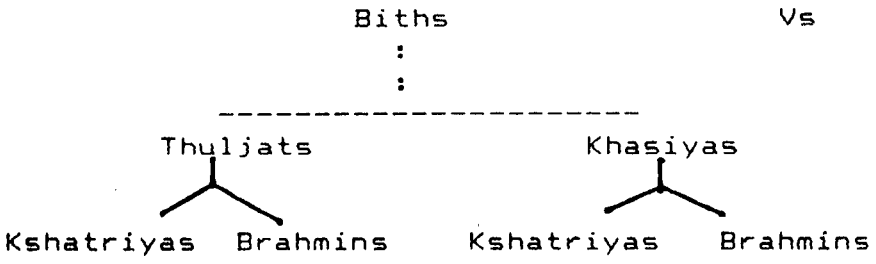
Therefore, traditional systems continue to persist in this area along with the PHC and people usually resort to a combination of these services.

Demographic Trends

The population numbers at two points of time in these five villages are shown in Table 3. It is evident that the population size of the villages is varied. There has been a considerable increase in populations since 1981 with an annual growth rate of around 3.0 per cent. Another obvious feature is that this growth is largely due to rise in female population.

Caste Stratification

Socially the area under study is stratified into a caste hierarchy of crucial importance. Traditionally, it is divided into two heterogeneous groups - the Bith and Doms. The Biths are further sub-divided into Thuljats and Khasiyas which in turn are divided into Kshatriyas (Rajputs) and Brahmins. It is said that the Doms were the original inhabitants of the hill region. The Khasiyas migrated from the plains and enslaved the Doms. The Thuljats were later migrants from the plains and further subjugated the Khasiyas. They gradually became politically powerful and ritually superior in the hierarchy of social stratification. The area under study shares many features with Kumaon, hence social stratification can be pictorially represented in the following manner.



Source: After R.D.Sanwal, "Social Stratification in Rural Kumaon", Delhi, 1976 cited in Guha R., "The Unquiet Woods", Delhi, 1991.

Brahmins, Kshatriyas and Doms have sprouted into number of branches and sub-branches, culminating into a caste galaxy (Barthwal, et al, 1957).

TABLE - 4

CASTE-STRATIFICATION IN THE FIVE STUDY VILLAGES

SL NO.	VILLAGES	POKHARI	BHARET	GHAYALGAON	BADOLI (CHOTI)	BADOLI (BARI)	GRAND TOTAL NO.	GRAND TOTAL %
1.	Total no of House Holds	42	25	8	44	42	161	
2.	Rajputs	23 (54.76)	25 (100)	8 (100)	29 (65.90)	39 (92.85)	124	77.0
3.	Brahmins	-	-	-	13 (29.54)	1 (2.38)	14	8.7
4.	Scheduled Caste	19 (45.23)	-	-	2 (4.54)	2 (4.76)	23	14.3

NOTE : Figures in parantheses show percentage of total households in each villages.

SOURCE : Household Survey

The Doms *(shilpkars)* worked as virtual slaves of the Rajputs. The village community allotted a particular job to each Dom and kept him restricted to that particular occupation. In course of time the sub-division hardened into occupational sub-castes such as *agari* (blacksmith), *badi* or *das* (dancing), *lohar* (iron smith), *orh* (masonary), *auji* (tailoring and drumming) etc. This is the most backward community educationally, economically and socially. The Brahmins are mainly *Sarolas* (original residents of village Nauti, Gairol, Thapli and Ratura) or *Gangaris* (living originally in Ganga valley) (UP District Gazetteer, 1989).

Our five study villages are predominately Rajputs villages. Table 4 gives the caste-stratification of the five villages.

The Kshatriyas or the Rajputs as they are commonly called are either Aswal, Bisht, Negi and Chowdhary. Pokhari is primarily a Bisht village with only two Negi Rajputs families who came and settled here four generations back. *Bisht* means, holding a grant of land from the government, therefore these families during the time of the British were mainly Thokdars of Thuljat origin. Their fields were tilled by the low-caste households who also gave them share of the produce. Presently there are 19 Scheduled Caste families living here and they are mostly doms, das, auji and lohar.

About eight to ten generations back, some members from the Bisht families in Pokhari went southwards, made new fields and settled there and this became village Bharet. They are of Thuljat origin and are considered superior to the Khasiyas.

Ghayalgaon is a Rajput village too - but people of this area regard the villager of Ghayalgaon as low-caste because they are of Kasiya origin. It is said that they were the lower caste who tilled the fields of *Pokhari wallas* and grazed their cattle. *Ghayal* in Garhwali language means to call out to the cattle. The inhabitants of Ghayalgaon while grazing the cattle called out to them or gave *ghayal*, hence their settlement came to be known as Ghayalgaon. But after independence 'The Kumaon and Uttarakhand Zamindari abolition and Land Reform Act of 1960' brought about a significant change in the social and economic life of these people. It ensured them rights of cultivation and they became masters of their lands. Most of them took up the last name of "Chauhan".

Both the Badolis are also predominantly Rajput villages, however, they both have a few Scheduled Caste and Brahmin families also (see Table 4). The Rajputs of these villages are mainly Chowdhary, Aswal and Negi. The word *Neg* means a prerequisite, "Negi" were originally officials of the government (UP District Gazetteers, 1989). The

Brahmins of these villages belong to the Uniyal and Badola sub-castes of Gangari Brahmins. The Scheduled Castes are doms, basically of *auji* and *das* sub-castes.

CHAPTER III

SOCIO-ECONOMIC AND PHYSICAL ENVIRONMENT

SECTION I

SOCIO-ECONOMIC ENVIRONMENT

The broad understanding of health locates health or ill-health in the social conditions of the lives of the people and is dependent on the forces that shape their lives and work. The social environment of man has to be visualized in terms of the dynamics of human relationships. Human beings organize themselves in order to acquire their basis needs through work. In the process of this organization they create political, administrative, economic, social, cultural and educational institutions. These institutions then play a critical role in the conduct of human activities.

In this section we will look at the landholding and occupational pattern, caste-class structure and education in order to understand the role that these socio-economic processes play in determining the health of the people.

LANDHOLDING AND OCCUPATIONAL PATTERN

a) Landholding and Economic Classes

In order to analyse the data within the constraints of the local economy, the total study population of 161 households is categorized into four groups according to the

TABLE - 5

DISTRIBUTION OF HOUSEHOLD POPULATION AND WORKERS ACCORDING TO LANDHOLDING

PEASANT GROUPS	HOUSEHOLDS SURVEYED		POPULATION OF HOUSEHOLDS SURVEYED		WORKER POPULATION				NON-MIGRANT WORKERS				MIGRANT WORKERS			
	TOTAL		TOTAL		TOTAL				TOTAL				TOTAL			
	NO.	%	NO.	%	MALE	FEMALE	NO.	%	MALE	FEMALE	NO.	%	MALE	FEMALE	NO.	%
VERY POOR PEASANTS (LESS THAN 2 ACRES)	94	58.4	546	55.7	180 (57.9)	131 (42.1)	311	57	93 (41.5)	131 (58.5)	224	53.6	87 (100)	0	87	49.7
MARGINAL PEASANTS (2 - 4 ACRES)	48	29.8	294	30	115 (58.4)	82 (41.6)	197	67	61 (43.3)	80 (56.7)	141	33.7	54 (96.4)	2 (3.6)	56	42
SUBSISTENCE PEASANTS (4.1 - 6 ACRE)	11	6.8	84	8.6	31 (73.8)	11 (26.2)	42	50	12 (52.2)	11 (47.8)	23	5.5	19 (100)	0	19	10.9
ABOVE SUBSISTENCE PEASANTS (MORE THAN 6 ACRE)	8	5	57	5.8	23 (53.5)	20 (46.5)	43	75.4	10 (33.3)	20 (66.7)	30	7.2	13 (100)	0	13	7.4
GRAND TOTAL	161		981		349 (58.9)	244 (41.4)	593	60.4	176 (42.1)	242 (57.9)	418	70.5	173 (98.9)	2 (1.1)	175	29.5

NOTE : (i) Of the 94 households in 'Very Poor Peasants', 6 households (i.e. 64%) are landless and they all belonged to the Scheduled Caste.

(ii) Figures in paranthesis show percentage of row total.

SOURCE : Household Survey

total landholding per household. This grouping does not necessarily reflect their economic status. However, land is the basic economic security for people in this area and its ownership is critical in the economy of Pauri. Often those who may earn a little more are economically less secure compared to those who may not earn that much but have land. Table 5 gives the landholding patterns and the number of workers in the study area.

Table 5 reflects a number of specificities.

i) Few own maximum land (only 5 per cent have more than 6 acres of land)

ii) Migration is maximum in the landed groups (45.2 per cent and 30 per cent in subsistence and above subsistence group respectively)

iii) There are only two women migrant workers and that too peasants.

These broad features of study population acquire greater complexity once the details of work are examined. There is a range of occupation in which people are involved.

(b) **Occupational Pattern**

The economy of the hill areas is moulded by its distinct environmental features which determine occupational and production pattern and income generation in the area.

Agriculture is the primary activity in the four study villages. Almost 100 per cent of the villagers are

agriculturists. Therefore, cultivators form the main segment of the workers in this area. Some cultivate their own land, others do share-cropping, but almost all, except few Brahmin families are engaged in some form of agriculture. Agricultural labourers are negligible. A section of the population is also engaged in non-agricultural activity but almost all the time with agriculture as the primary or secondary activities. This usually includes the Scheduled Castes who follow their traditional occupation and Brahmins who still earn their living by working as priests. Because of almost no expansion of non-agricultural activities in this area, the working population engaged in the secondary sector is small. Some percentage of the population migrates to the cities and gets absorbed in various jobs - mostly private, with only few getting work in government sector. Some households in the village are engaged in petty business like tea-shops, grocery shops, tailoring, running flour-mill etc. But this they do along with farming.

The following are some important features of the hill economy:

1. There is a high dependence of people on agriculture which is a primary activity.

2. Peasants form a significantly large segment of this primary activity.

3. There is no neat categorization of workers as cultivators or agricultural labourers.

4. Secondary activities like, artisans and their traditional occupations, purohit work, manufacturing industry are limited and under-developed.

5. There is a shift from agriculture to tertiary activities, with a sizable number of workers migrating to cities to find work in private or government services.

6. Government service is preferred to other services.

We looked into the details of various occupations into which people entered to strengthen their economic position. For the purpose of analysis these occupations have been clubbed as follows:

i) Peasants: Includes cultivators, tenants, share croppers and agricultural labourers.

ii) Artisan: Includes carpentary, blacksmithy, tailoring, construction work (making slate-roofing etc.)

iii) Petty business: includes business enterprises where the monthly income is not more than Rs.1500. Includes tea-shops, general merchants, sweet shops, meat shop, flour mill, RMPs, Homeopaths.

iv) Government service: includes armed and police forces, teachers and any other service under the government.

v) Private service: includes work in private office, hotels, shops, as household help.

TABLE - 6

WORKERS IN DIFFERENT OCCUPATIONAL CATEGORIES IN THE STUDY AREA

OCCUPATIONAL CATEGORIES	NON-MIGRANT WORKERS			MIGRANT WORKERS			TOTAL WORKERS		
	MALE	FEMALE	TOTAL	MALE	FEMALE	TOTAL	MALE	FEMALE	TOTAL
Peasants	124 (34.3)	238 (65.7)	362 (88.6)	6 (75)	2 (25)	8 (4.6)	130 (35.1)	240 (64.9)	370 (82.4)
Artisans	15 (100)		15 (3.6)				15 (100)		15 (2.5)
Petty Buisnesses	9 (100)		9 (2.2)	4 (100)		4 (2.3)	13 (100)		13 (2.2)
Purohit Work	4 (100)		4 (1)				4 (100)		4 (0.7)
Govt. Service	22 (84.6)	4 (15.4)	26 (6.2)	74 (100)		74 (42.3)	96 (96)	4 (4)	100 (16.9)
Private Service	2 (100)		2 (0.5)	57 (100)		57 (32.6)	59 (100)		59 (9.9)
Work in Manufacturing & other Industries				32 (100)		32 (18.3)	32 (100)		32 (5.4)
GRAND TOTAL	176 (42.1)	242 (57.9)	418 (70.5)*	173 (98.9)	2 (1.1)	175 (29.5)*	349 (58.9)	244 (41.1)	593

NOTE : Figures in paranthesis indicate
(i) Percentage of grand total for each row of 'Total'
(ii) Male and female percentage of each row total
(iii) * Shows percentage of 593

SOURCE : Household Survey

TABLE - 7

WORKERS IN DIFFERENT OCCUPATIONAL CATEGORIES IN VERY POOR PEASANTS GROUP
(less than 2 acre landholding)

OCCUPATIONAL CATEGORIES	NON-MIGRANT WORKERS			MIGRANT WORKERS			TOTAL WORKERS		
	MALE	FEMALE	TOTAL	MALE	FEMALE	TOTAL	MALE	FEMALE	TOTAL
Peasants	63 (33)	128 (67.0)	191 (85.3)	3 (100)		3 (3.4)	66 (34)	128 (56)	194 (62.4)
Artisans	14 (100)		14 (6.3)				14 (100)		14 (4.5)
Petty Buisnesses	4 (100)		4 (1.8)	3 (100)		3 (3.4)	7 (100)		7 (2.3)
Purohit Work	4 (100)		4 (1.8)				4 (100)		4 (1.3)
Govt. Service	8 (72.7)	3 (27.3)	11 (4.9)	31 (100)		31 (35.6)	39 (92.9)	3 (7.1)	42 (13.5)
Private Service				35 (100)		35 (40.2)	35 (100)		35 (11.3)
Work in Manufacturing & other Industries				15 (100)		15 (17.2)	15 (100)		15 (4.8)
GRAND TOTAL	93 (41.5)	131 (58.5)	224 (72)*	87 (100)		87 (28)*	180 (57.9)	131 (42.1)	311

NOTE : Figures in paranthesis indicate
(i) All percentage of total for each row are of the grand totals under respective total column
(ii) percentage of males and females are of the total
(iii) * Shows percentage of 311

SOURCE : Household Survey

TABLE - 8

WORKERS IN DIFFERENT OCCUPATIONAL CATEGORIES IN MARGINAL PEASANTS GROUP
(2 - 4 acres landholding)

OCCUPATIONAL CATEGORIES	NON-MIGRANT WORKERS			MIGRANT WORKERS			TOTAL WORKERS		
	MALE	FEMALE	TOTAL	MALE	FEMALE	TOTAL	MALE	FEMALE	TOTAL
Peasants	45 (36.3)	79 (63.7)	124 (88)	3 (60)	2 (40)	5 (8.9)	48 (37.2)	81 (62.8)	129 (65.5)
Artisans	1 (100)		1 (0.7)				1 (100)		1 (0.5)
Petty Buisnesses									
Purohit Work									
Govt. Service	13 (92.9)	1 (7.1)	14 (9.9)	20 (100)		20 (35.7)	33 (97.1)	1 (2.9)	34 (17.3)
Private Service	2 (100)		2 (1.4)	15 (100)		15 (26.8)	17 (100)		17 (8.6)
Work in Manufacturing & other Industries				16 (100)		18 (28.6)	16 (100)		16 (8.1)
GRAND TOTAL	61 (43.3)	80 (56.7)	141 (71.6)*	54 (96.4)	2 (3.6)	56 (28.4)*	115 (58.4)	82 (41.6)	197

NOTE : Figures in paranthesis indicate
(i) All percentage of totals for each row are of the grand totals under respective total column
(ii) percentage of males and females are of the total
(iii) * Shows percentage of 197

SOURCE : Household Survey

TABLE - 9

WORKERS IN DIFFERENT OCCUPATIONAL CATEGORIES IN SUBSISTENCE PEASANTS GROUP
(4.1 to 6 acre landholding)

OCCUPATIONAL CATEGORIES	NON-MIGRANT WORKERS			MIGRANT WORKERS			TOTAL WORKERS		
	MALE	FEMALE	TOTAL	MALE	FEMALE	TOTAL	MALE	FEMALE	TOTAL
Peasants	10 (47.6)	11 (52.4)	21 (91.4)				10 (47.6)	11 (52.4)	21 (50)
Artisans									
Petty Buisnesses	1 (100)		1 (4.3)				1 (100)		1 (2.4)
Purohit Work									
Govt. Service	1 (100)		1 (4.3)	14 (100)		14 (73.7)	15 (100)		15 (35.7)
Private Service				5 (100)		5 (26.3)	5 (100)		5 (11.9)
Work in Manufacturing & other Industries									
GRAND TOTAL	12 (57.2)	11 (47.8)	23 (54.8)*	19 (100)		19 (45.2)*	31 (73.8)	11 (26.2)	42

NOTE : Figures in paranthesis indicate
(i) All percentage of totals for each row are of the grand total under respective total column
(ii) percentage of males & females are of the total
(iii) * Shows percentage of 42

SOURCE : Household Survey

TABLE - 10

WORKERS IN DIFFERENT OCCUPATIONAL CATEGORIES IN ABOVE SUBSISTENCE PEASANTS GROUP
(More than 6 acres landholding)

OCCUPATIONAL CATEGORIES	NON-MIGRANT WORKERS			MIGRANT WORKERS			TOTAL WORKERS		
	MALE	FEMALE	TOTAL	MALE	FEMALE	TOTAL	MALE	FEMALE	TOTAL
Peasants	6 (23.1)	20 (76.9)	26 (86.7)				6 (23.1)	20 (76.9)	26 (60.5)
Artisans									
Petty Buisnesses	4 (100)		4 (13.3)	1 (100)		1 (7.7)	5 (100)		5 (11.6)
Purohit Work									
Govt. Service				9 (100)		9 (69.2)	9 (100)		9 (20.9)
Private Service				2 (100)		2 (15.4)	2 (100)		2 (4.7)
Work in Manufacturing & other Industries				1 (100)		1 (7.7)	1 (100)		1 (2.3)
GRAND TOTAL	10 (33.3)	20 (66.7)	30 (69.8)*	13 (100)		13 (30.2)*	23 (53.5)	20 (46.5)	43

NOTE : Figures in paranthesis indicate
(i) All percentage of totals for each row are of the grand total under respective total column
(ii) percentage of males & females are of the total
(iii) * Shows percentage of 43

SOURCE : Household Survey

vi) Manufacturing and other industries: includes work in factory, plantation, forestry, mining, quarrying.

vii) Traditional work/priest work: includes priests, pujaries, people who subsist on purohits and mahants work only.

Tables 6 to 10 represent the distribution of these occupational groups in the study area and in different landholding categories. Occupations when seen against land categories show certain specific trends.

1) one interesting observation in these villages is that a person is an owner-cultivator, share-cropper and agricultural labourer at the same time. Hence, there is an absence of neat categorization of workers into occupational groups.

2) The occupational categories shown in the tables represent the main occupation of the workers. The same worker may have other sources of income.

3) The secondary sector is highly underdeveloped in the study area. This is evident from the low proportion of non-migrant workers engaged in this sector. A small number of migrant workers are engaged in the manufacturing and other industries established elsewhere.

4) The percentage of migrant workers involved in the tertiary sector (i.e., private and government services, petty business and priestwork) is higher than those involved

in the secondary sector. There is a fair number of migrants in this sector. Government sector has more migrant workers compared to the private sector. This is because government service is considered more lucrative than private jobs. They provide security and regular source of income. Often there is the added facility of their children being educated in the cities.

5) The number of non-migrant workers engaged in the government sector is quite low. This is because of the paucity of government services in this area. Those employed are mostly at the schools, block office, PHC or post-office.

6) Female non-migrant workers are more compared to male non-migrant workers in all groups except the subsistence group. This is because of the high rate of migration of able-bodied men to the cities in search of work. Consequently, the number of males migrant workers are more than female migrant workers.

The tables also reflect inter-class differences.

1) Amongst the landed groups 35.7 per cent and 20.9 per cent of total workers are in government services as against only 13.5 per cent and 17.3 per cent of very poor and marginally landed groups respectively.

2) The opposite is true in manufacturing and other industries. No one is employed in this sector from subsistence groups while 2.3 per cent of above subsistence

groups are in manufacturing as compared to 4.8 per cent and 8.1 per cent amongst very poor and marginally landed groups respectively.

3) Peasants and petty business is largely confined to non-migrants.

This is a reflection of the nature of the labour market that the migrants enter.

Therefore a simple classification of peasantry as classical peasantry is not sufficient any more. We have to add occupational inputs to it. But at the same time it shows that the landed are able to push for better jobs. Hence, we cannot ignore their being landed. Even if we cannot identify economic status on the basis of landed class categorization, it becomes apparent that in terms of processes at work their being landed is very critical.

SOCIAL STRUCTURE AND CASTE-CLASS RELATIONSHIP

All the households in the study area are Hindus. As elsewhere it is patterned on the traditional caste system. The principal castes being Brahmins, Kshatriyas (called Rajputs) and scheduled castes (called Doms).

Before the advent of the British, the hill economy of this district was entirely agro-pastoral. Agriculture, forestry, livestock rearing and traditional industries constituted an integrated economic mix. The scattered,

isolated villages had to be externally more or less self sufficient, but internally inter dependent. This required a homogeneous social set up. They therefore, evolved a socio-economic system in which caste-system was practised but untouchability was not so pronounced. The scheduled caste or "Doms" actually did not own any land. They only cultivated allotted cultivable land called "Sanjait" land, for meeting their food requirements (Sherpa, 1992). They survived on share-cropping, their traditional occupation or by working as labourers for the Rajputs. They normally belonged to the lowest economic strata and still remain at that.

The geographical isolation of the hill area fostered an ambiguous relation with the so called 'Great Tradition' of Hinduism. Caste restrictions and other rules of orthodox Hinduism were found to be lax in the hill areas. Brahmins customarily used the plough and there was a great deal of informal interaction between high and low castes, especially on festive occasions. With reference to the scheduled-castes or 'Doms', ritual rules of purity and pollution were not defined as exclusively as in the plains. While each village had two water sources, one for the Rajputs and Brahmins and the other one for the Doms. The Doms would touch certain kinds of food like fruits and grains, but not cooked food. Hence there was disparity of some kind. The

Artisans and tenants, i.e., Doms, however, formed an integral part of the village community. This was especially true of the Bajgis and aujis - the drummers who played a leading part in all religious and social ceremonies (R. Guha, 1991).

The advent of the British rule had many impacts. The economic system of the British based on mercantilism and industrial revolution introduced money system in the hill areas where people were practising exchange and barter system. The widely scattered self-sufficient peasant settlements had practised limited production of exchange of value-oriented commodities. The capitalist mode of production as a feature of economic development was established during the British rule which soon overtook weak and decaying feudal system in the hills. The colonial mode of administration, in the form of snatching away community control over natural resources also took place. Therefore, the old caste-stratification based on equilibrium of village occupation and mutual functional interdependence which was the basic characteristic of village self-sufficient community was disturbed by the British (R.Guha, 1991).

The population of the district has essentially been agricultural. All the three castes, Rajputs, Brahmins and Scheduled Castes are engaged in some form of agriculture.

The Rajput cultivators could primarily be divided into

'thokdar', 'khayakars' or 'sirthans'. The 'thokdars' were the holders of thokdari leases and were considered proprietary superiors. 'Khayakars' were inferior or nominally inferior tenants of the soil. They were tenants with permanent right. They had to pay the customary fee to the village 'pradhan' and the proprietary dues to the 'thokdar' in his capacity of sharer. The 'sirthans' were tenants at will and they were chiefly small proprietors and permanent tenants who did not have sufficient land of their own.

The Brahmins were the professional priests and they could be divided into two classes - the personal spiritual priests or 'purohit' and the temple priest. They eked out a living by cultivating small grants of revenue free land or 'gunth' usually attached to each temple and had by prescription a right to a certain portion of the offerings and to dues on festival occasions, marriages, birth and harvest (called 'Dadwan') (E.T.Atkinson, 1884-86).

Then with Independence, the economic measures and acts adopted by the Government of India produced different effects on various groups. The Kumaon and Uttarkhand Zamindari Abolition and Land Reform Act 1960 came into operation in this district on 1 July 1965. This replaced the multiplicity of tenure holders into two main classes - 'bhumidhar' and 'sirdhar'. So the tenants who become

'bhumidar' and 'sirdhar' gained in status and became masters of their land.

There is a significant difference between hill society and rest of India in terms of control over land. Hill society exhibits an absence of sharp class division. A large percentage of agrarian population of this area are owner-cultivators, largely with the help of family labour. The extraordinarily low proportion of agricultural labourer confirm the picture of an egalitarian peasant community, with the absence of sharp inequalities in land ownership within the body of cultivating proprietors who form the bulk of the population.

Generally the ownership of land becomes a determinant of socio-economic status of an individual, but in the hill areas, unlike the rest of the agrarian society; "land is hardly purchased as an investment, but merely to satisfy the craving that all hill-men have to become proprietors." (G.W. Trail, 1823 cf Atkinson, E.T. 1884-6).

A look at Table 4 shows that our study population is predominantly Rajput, with Scheduled Castes being found only in Pokhari, Badoli (Choti) and Badholi (Bari). The Brahmins are only in Badoli (Choti) and Badoli (Bari). In order to understand the relationship between caste-hierarchy and economic structure, the affiliation of three castes should be examined for the four groups categorized in terms of

TABLE - 11

TOTAL LANDHOLDING AMONG THREE MAJOR CASTES OF THE STUDY POPULATION

SL. NO.	CASTE	VERY POOR PEASANTS (LESS THAN 2 ACRE)	MARGINAL PEASANTS (2-4 ACRE)	SUBSISTANCE PEASANTS (4.01 TO 6 ACRE)	ABOVE SUBSISTANCE PEASANTS (MORE THAN 6 ACRES)	TOTAL NO.	TOTAL %
1.	RAJPUTS	57 (46)	48 (38.7)	11 (8.9)	8 (6.6)	124	77.0
2.	BRAHMINS	14 (100)				14	8.7
3.	SCHEDULED CASTES	23 (100)				23	14.3
	TOTAL	94 (58.4)	48 (29.8)	11 (6.8)	8 (5)	161	

NOTE : Figures in parantheses indicate percentage of row totals

SOURCE : Household Survey

total ownership of land (Table 11).

The table clearly shows that all the Brahmins and Scheduled Castes have less than two acres of land. While among the Rajputs, even though the majority (i.e., 46 per cent) are very poor peasants and almost 38.7 per cent are marginal peasants, the landed groups also comprise entirely of them.

But when the relationship between class and caste is to be established on the basis of landholding, the Brahmins must be excluded even though this caste is at the top of the social ladder. Brahmins always owned less land, but were at the apex of caste-system. They did not follow agriculture as their main source of livelihood but were economically well-off. In the study area too, despite the fact that Brahmins are superior in terms of caste-hierarchy, they are not the most powerful class compared to the large land-owning Rajputs. Though as compared to the plains, the size of the holdings in the hills is not so large. As stated by Atkinson, E.T. (1884-86), "A cultivator having six to eight acres of land is considered to have a large holding; and average one is two to four acres, whilst there are some as small as from one quarter to half an acre...."

The Rajputs though not the dominant caste in caste-hierarchy are numerically and economically dominant. In both the Gram Sabhas (Gram Sabha - Pokhari, Bharet and

Ghayalgaon; and Gram Sabha Badoli Bari and Choti) the pradhan and up-pradhan are Rajputs.

Since Independence, there have been many programmes for the upliftment of the Scheduled Caste and the poor class. There has been very little benefit of these programmes. Like elsewhere, here too programmes like Nirbal Awas Yojna, Indra Awas Yojna, Swach Shuchalya etc. are on. Each scheme promises a certain percentage of benefit to the scheduled caste. But in reality they are not the beneficiaries. For example, in Swach Shuchalaya Scheme money is given to the families to make toilets and as per the information from the Block office, 17 houses benefited in Badoli and 5 in Bharet and 2 in Pokhari. Thirty per cent of the beneficiaries had to be Scheduled Castes, but none of the Scheduled Caste families received any money under this scheme. In fact it is very interesting, all the beneficiaries under this scheme were the present or former pradhan, up-pradhan, teachers and those who had political clout.

The situation of the other programmes whether it is for housing or loan for buying cattle or poultry is much the same. Very few needy people get the aid and those who do, have to pay a percentage to procure these benefits. Very few, much below the required percentage of Scheduled Caste get any benefit and those who do, manage after bribing the government agents and the pradhan etc. This corruption in

loan distribution is found all over the district. Yashpal Singh, a Dom, from Pokhari said,

> The government is good, but people like the pradhan who have to implement the government schemes are not honest. I have been applying regularly since last four years for loan to build a room but every time my application is rejected. Till now I have got no aid while Sardar Singh from our village got the money two years back.

Sardar Singh is a Rajput, a former up-pradhan, has good connection with the staff at the Block office. This year he also got a loan of Rs.1700/- to build a toilet under the "Swach Shuchalaya Scheme".

Therefore, it is significant that the prominent people of a village are all Rajputs. They not only have larger land holdings, but they are also the ones who are in position of authority. While the Brahmins may not have large land holdings, nor do they have political power but they weild power due to the social hierarchy. Scheduled Caste on the other hand are most deprived and backward socially and economically. Even now their houses are in a separate cluster and mostly have a separate water source. They do not enter beyond the courtyard of the higher caste houses and they do not eat and drink in their vessels. Some observations during the field visit throw light on this. An old-lady, almost immobile due to old age lived alone in Pokhari. Being incapable of going to the spring to fetch water, she depended on the mercy of the villagers who

often did not oblige her. Since she was a Rajput, she refrained from getting water fetched by the Scheduled Caste, she instead preferred to die of thirst. Even the researcher was not given water to drink in the Scheduled Caste households as they feared the wrath of the Rajputs. However, the same scheduled caste works for the high caste, ploughs their field, sows their wheat and paddy, cuts grass for their animals and even fetches them fruits and vegetables.

Most of the respondents agree that the attitude towards the scheduled caste is changing, but there is still a long way to go. As Ram Das, a dom from Badoli (Choti) put it, "they treat us well, but still a lot has to change. They have yet to treat us as equals."

Thus, the economy has little economic differential. It is composed almost wholly of small peasant proprietors with a small number of agricultural labourers. Pauri's economic life is closely integrated with agriculture, forests and pastures. However, with the changing conditions, increasing outmigration and money inflow, the dissociation between the two is slowly visible signalled largely by governmental inputs of services and a nascent private tertiary sector.

EDUCATION

Education is a very important component of the socio-economic environment and is an indicator of the level of social development of a community.

Despite the fact that education has reached the villages in the form of schools, a brief description of the scenario will throw light on the reality. The schools in the study area had no proper infrastructure. The children sit on the floor without any mats. At the time of the visit to the primary school in Pokhari only two teachers were present to manage a school up to class five. The post of the other two teachers was lying vacant for three months. The appointed teachers refused to join because of the adverse living conditions in this area. One teacher handled two classes at a time. She taught the senior class while the junior class wrote something on their slate. The other teacher who was the principal of the school hardly took any classes. The teacher lived alone in Pokhari with an eight month old daughter whom she took to school everyday. In the office the daughter was found lying on the floor, being looked after by some girls. At about 10.30 a.m., two students were sent to the spring situated at a distance of about one kilometer of steep climb to fetch water. When the bucket of water arrived, the girls lit a fire and put water to boil - it was tea time for the teachers!

While talking to the villagers and teachers the researcher got the impression that there was no discrimination between children of different castes. A small observation during the field visit however spoke of the reality. Rambilas asked for permission to drink water. The teacher nodded and indicated to a child to give him water. Rambilas went near the bucket, the other boy poured water from the glass into Rambilas's cupped hands. Why was this done? Rambilas is a dom, a Scheduled Caste and hence he cannot touch the water which is also consumed by higher caste children. The Scheduled Caste households do not think there is anything wrong with this - they feel this is the way of the village and it cannot change.

The infrastructural facilities at the Inter College, Yamkeshwar were comparatively better. Science subjects were not offered in Intermediate. The result of the board examination in 1992 reflected the poor standard of teaching in the school. The teachers pointed out that this is due to the lack of resources. They also pointed out that the available resources were wasted because of thoughtless policies. They showed the investigator the books that NCERT sent to the school. There were many irrelevant books and all were in English. A teacher commented, "most of us can't read the books, then how can you expect the students to benefit from them."

TABLE 12

EDUCATIONAL LEVEL OF THE STUDY POPULATION (OVER 6 YEARS OF AGE)

GROUPS	ILLITERATE			LITERATE			TOTAL POPULATION (OVER 6 YEARS OF AGE)		
	Male	Female	Total	Male	Female	Total	Male	Female	Total
VERY POOR PEASANTS (LESS THAN 2 ACRE)	30 (20.8)	114 (79.2)	144 (29.7)	243 (71.3)	98 (28.7)	341 (70.3)	273 (56.3)	212 (43.7)	485 (55.2)*
MARGINAL PEASANTS (2 - 4 ACRE)	10 (25)	30 (75)	40 (15)	144 (63.7)	82 (36.3)	226 (85)	154 (57.9)	112 (42.1)	266 (30.3)*
SUBSISTENCE PEASANTS (4.1 - 6 ACRE)	4 (40)	6 (60)	10 (12.7)	46 (66.7)	23 (33.3)	69 (87.3)	50 (63.3)	29 (36.7)	79 (9)*
ABOVE SUBSISTENCE PEASANTS (MORE THAN 6 ACRE)	1 (20)	4 (80)	5 (10.4)	26 (60.5)	17 (39.5)	43 (89.6)	27 (56.3)	21 (43.7)	48 (5.5)*
GRAND TOTAL	45 (22.6)	154 (77.4)	199 (22.7)*	459 (69.6)	220 (32.4)	679 (77.3)*	504 (57.4)	374 (42.6)	878

NOTE : (i) The total population of the study area is 981, but the table shows educational level of 878 respondants only (199 & 679) because 70 respondents were below school-going age and details of 33 migrants from this area were not available.

(ii) Figures in paranthesis indicates :

a) Percentage of the totals are of total population row-wise.
b) Percentage of male & females are of total for each group row-wise.
c) ( )* Show percentage of total population above six years (878).

SOURCE : Household Survey

TABLE - 13

EDUCATIONAL LEVEL OF THE LITERATE POPULATION

SL. NO.	GROUPS	PRIMARY LEVEL			MIDDLE LEVEL			HIGH SCHOOL LEVEL			INTER LEVEL & ABOVE			GRAND TOTAL		
		MALE	FEMALE	TOTAL	MALE	FEMALE	TOTAL	MALE	FEMALE	TOTAL	MALE	FEMALE	TOTAL	MALE	FEMALE	TOTAL
1.	POOR (LESS THAN 2 ACRE)	78 (61.8)	47 (38.2)	123 (38.1)	58 (67.4)	28 (32.8)	86 (25.2)	53 (86.9)	8 (13.1)	61 (17.9)	58 (78.9)	15 (21.1)	71 (17.9)	243 (71.3)	98 (28.7)	341 (50.2)*
2.	MARGINAL (2 - 4 ACRE)	30 (44.8)	37 (55.2)	67 (29.6)	31 (58.5)	22 (41.5)	53 (23.5)	43 (72.9)	16 (27.1)	59 (26.1)	40 (85.1)	7 (14.9)	47 (20.8)	144 (63.7)	82 (36.3)	226 (33.3)*
3.	SUBSISTENCE (4.1 - 6 ACRE)	7 (46.7)	8 (53.3)	15 (21.7)	11 (61.1)	7 (38.9)	18 (26.1)	7 (63.6)	4 (36.4)	11 (15.9)	21 (84)	4 (16)	25 (36.2)	46 (66.7)	23 (33.3)	69 (10.2)*
4.	ABOVE SUBSISTENCE (MORE THAN 6 ACRE)	4 (30.8)	9 (69.2)	13 (30.2)	7 (53.8)	6 (46.2)	13 (30.2)	4 (66.7)	2 (33.3)	6 (14)	11 (100)		11 (25.6)	26 (60.5)	17 (39.5)	43 (6.3)*
5.	TOTAL	117 (53.7)	101 (46.3)	218 (31.4)	107 (62.9)	63 (37.1)	170 (25)	107 (78.1)	30 (21.9)	137 (20.2)	128 (83.1)	26 (16.9)	154 (22.7)	459 (67.6)	220 (32.4)	679

NOTE : Figures in paranthesis indicate

(i) all percentage of totals are of the grand total

(ii) percentage of males and females are of the total

(iii) ( )* percentage of total are of 679

SOURCE : Household Survey

The teachers in general feel that the number of schools in the area have increased but the quality of education has not. They blamed the government policies, lack of resources and infrastructure for this. But that is not all.

Table 12 shows the educational status of the study population while Table 13 shows the educational level of the literate population.

From the tables certain trends are evident.

1. The percentage of literates in each group increases with their being landed.

2. Less females are literate in very poor (28.7 per cent) and marginal (36.3 per cent) peasants in comparison to the percentage of literate males in these groups. The ratio improves as we go down to subsistence and above subsistence groups. This clearly indicates that more females are given education amongst the landed groups as compared to the poor or marginal peasants.

3. 69.6 per cent males are literate as compared to only 32.4 per cent females.

4. Very few (17.9 per cent) literates in the poor peasant group are of Intermediate level or above, as compared to 36.2 per cent of the subsistence group and 25.6 percent of the above subsistence group. This shows that the poor have to drop out of school earlier mostly due to compulsions to earn.

TABLE - 14

LITERACY RATE OF THE STUDY POPULATION

GROUPS	MALES %	FEMALES %	TOTAL %
VERY POOR PEASANTS (LESS THAN 2 ACRE)	89	46.2	70.3
MARGINAL PEASANTS (2 - 4 ACRE)	93.5	73.2	85
SUBSISTENCE PEASANTS (4.1 - 6 ACRE)	92	79.3	87.3
ABOVE SUBSISTENCE PEASANTS (MORE THAN 6 ACRE)	96.3	81	89.6
TOTAL	91.1	58.8	77.3

NOTE : Literacy rate was calculated as follows :

$$\frac{\text{Total literate male/female in very poor groups}}{\text{Total male/female population of that group}} \times 100$$

SOURCE : Calculated from data collected during field survey.

5. Majority of the females in the poor group stop education often in the middle level but interestingly the male-female ratio for this group at Inter and above level is better as compared to the male-female ratio of literates at Inter or above level in the landed group, which has no female reaching that level in the above subsistence group.

Table 14 shows the literacy rate of the population. It clearly shows that the literacy rate is lower for females as compared to the males. Total literacy rate is lowest for the very poor and it keeps increasing with the groups getting more landed.

The increase in literacy rate is recent and the growth of female literacy was commendable in 1971 in this district (Dhobal, G.L., 1986). Before this only few women went to school. Now there is a trend to send almost all children to school since school education is very cheap in this area. However, there is a tendency for female children to drop out of school much earlier. While talking to the villagers in Pokhari, Ghayalgaon and Bharet, it was evident that till Primary school they were ready to send their daughters as it was very near to the village or therein. But after that the Inter-college was almost 5 kilometer away, and even the most agile child of this area took 45 minutes to travel by foot, through this rough terrain. Most parents were not willing to send their daughters to Inter-college, unless and until a

group of 3-4 was going to the college, which was almost never the case. Sending the girls out of the block to a city for college education is unthinkable - firstly it is too expensive, most feel they cannot even afford to send their sons to the college. Secondly it is not practical - where and how would their daughter stay. 16 year old Sunita from Pokhari said, "I wanted to study after class 8. For some months I went to class 9, but since I was the only one going, my parents stopped my schooling. Now I spend my day doing household work, going to the forest and the fields. My brothers can study-they are males. Now I don't even have the time. My mother worked in her days, now I have to work."

Among the caste groups, the Scheduled Castes are most backward educationally. Though they have free education, very few go beyond middle school. The compulsions to work are more for them. Dabbal Das a Scheduled Caste from Pokhari said:

> I was a good student, but I couldn't continue after class 8 because my father passed away. I had to take up tailoring work. But I would like to give my children higher education. I would not like them to pull out of school like me. With better education they can hope to get government jobs and hence can make their lives more secure and not face an economic crunch like me.

Education is an indicator of the level of social development of a community and improvements in educational

levels result in better management of the health environment because of better knowledge and awareness of health related matters. Therefore education is an important component of the social environment.

SECTION II

PHYSICAL ENVIRONMENT

In Pauri it is difficult to categorise drinking water and sanitation facilities into the neat categories of physical or man-made components of environment. Only housing clearly falls in this category. The other two are a mixture of natural and man-made sources. All these, however, play an important role in determining the health, well-being as well as overall development of the community.

HOUSING

The housing pattern of a region is a reflection of the socio-economic, cultural and ecological factors influencing and shaping it. Houses in this region are essentially built on similar architectural plan, hence a common form of housing can be observed which cuts across socio-economic boundaries.

As one walks up the village path, one first comes across the cluster of houses belonging to the higher castes.

These houses are usually located at better sites with regard to slope of the land, accessibility to the field, spring and forest. The Scheduled Caste houses form a separate hamlet, a little away from the higher caste hamlet. Their houses are not as strategically placed in terms of locations and accessibility as compared to the higher caste hamlet.

The houses are built mostly of stone and timber and in the case of the well-off higher caste households they are often double-storeyed. The roof is sloping made of timber covered with slate or quartzite slabs called "patal" (slate or quartzite slab locally available used for roofing) with mud to keep in position. These slabs are locally available and are preferred by the people because they last longer and cannot be blown away by the wind. The walls are made of stone mortared with mud and in case of the well-to-do cement is used. Two houses of Rajput household built of red brick and cement could also be observed. The houses of the scheduled caste are mostly one-room accommodation often *patal* roofing being substituted with weak thatch and tin-sheets.

Traditionally, the cattle-barn called "gowshala" was built a little away from the main house. But over the years, as families grew bigger, division of land and property occurred and many households were left with no extra space to build the "gowshala". Hence, it is not so

TABLE - 15

ROOMS PER HOUSEHOLD FOR EACH CASTE IN THE FOUR GROUPS

SL. NO.	GROUPS	ONE ROOM				TWO ROOM				THREE ROOM				FOUR OR MORE ROOM				GRAND TOTAL
		RAJPUT	BRAHMIN	SCHEDULED CASTE	TOTAL	RAJPUT	BRAHMIN	SCHEDULED CASTE	TOTAL	RAJPUT	BRAHMIN	SCHEDULED CASTE	TOTAL	RAJPUT	BRAHMIN	SCHEDULED CASTE	TOTAL	
1.	VERY POOR PEASANTS (LESS THAN 2 ACRE)			12 (100)	12 (12.8)	10 (52.6)	3 (15.8)	6 (31.6)	19 (20.2)	6 (75)	2 (25)		8 (8.5)	41 (74.5)	9 (16.4)	5 (9.1)	55 (58.5)	94 (58.4)*
2.	MARGINAL PEASANTS (2-4 ACRE)					3 (100)			3 (6.3)	6 (100)			6 (12.5)	39 (100)			39 (81.3)	48 (29.8)*
3.	SUBSISTENCE PEASANTS (4.1-8 ACRE)					1 (100)			1 (9.1)	1 (100)			1 (9.1)	9 (100)			9 (81.8)	11 (6.8)*
4.	ABOVE SUBSISTENCE PEASANTS (MORE THAN 6 ACRE)									1 (100)			1 (12.5)	7 (100)			7 (87.5)	8 (5)*
	TOTAL			12 (100)	12 (7.5)	14 (60.9)	3 (13)	6 (26.1)	23 (37.7)	14 (87.5)	2 (12.5)		16 (9.9)	96 (87.3)	9 (8.2)	5 (4.5)	110 (68.3)	161

NOTE : Figures in parentheses indicate

(i) All percentages of total are of the grand total

(ii) Percentages of Rajput, Brahmin & Scheduled Caste are of the total

(iii) ( )* are percentage of 161

SOURCE : Household Survey

uncommon to come across houses having a room in the groundfloor for stalling family cattle. The poorer families, especially the Scheduled Caste who have only one room accommodation use the same room as kitchen, to sleep and even keep their livestock.

From Table 15 it is clearly reflected that all the households having one room accommodation are Scheduled Castes who belong to very poor peasants groups. Remaining six Scheduled Caste households have two-room accommodation. As against this all above subsistence peasants have either three, or four or more rooms accommodation and they are all Rajputs. Amongst Brahmins there is wide disparity but the majority of them have four or more rooms. Though the majority of households (68.3 per cent) have four or more rooms, if we look at various groups, we find that percentage-wise households belonging to the very poor peasants group are least in this category Therefore, the table clearly reflects socio-economic disparity amongst the various classes and castes.

Most of the households still use the conventional 'chulha' (stove) and firewood to cook food. Only seven households own liquid petroleum gas (LPG) stove and cylinder and not surprisingly, four of them are Rajputs and three are Brahmin households. Kerosene stove is not popular because of intermittent and irregular supply of kerosene. It is

only used for lighting the lamp at night. Besides its supply being irregular, people also do not have the means to buy kerosene for cooking purpose. Fuelwood is preferred because it is free and all it entails is the effort of collecting it.

TOILETS

Toilets are uncommon in this area and almost everyone defecates in the open. Only seven households (all Rajputs) have toilets. These seven households belong to the subsistence and above subsistence group. These toilets were built under the 'Swach Schuchalaya Scheme' in which government gives Rs.1700/- for households in general category and Rs.2020/- for Scheduled Caste households. The officials of the Block Office (Yamkeshwar) stated that 17 households (2 of which are Scheduled Caste) were granted monetary assistance under this scheme in Badoli (Choti and Bari), five in Bharet and two in Pokhari. But it appears that these numbers only exist on paper. No scheduled caste household claimed getting money for this purpose. This shows that such benefits are available to the higher class and caste, the lower groups being completely ignored in reality.

TABLE - 16

HOUSEHOLDS WITH/WITHOUT ELECTRICITY FOR EACH CASTE IN THE FOUR GROUPS

SL. NO.	GROUPS	HOUSEHOLDS WITH ELECTRICITY				HOUSEHOLD WITHOUT ELECTICITY				GRAND TOTAL
		Rajput	Brahmin	Scheduled Caste	Total	Rajput	Brahmin	Scheduled Caste	Total	
1.	VERY POOR PEASANTS (LESS THAN 2 ACRE)	20 (83.3)	4 (16.7)		24 (25.5)	37 (52.9)	10 (14.3)	23 (32.9)	70 (74.5)	94 (58.4)*
2.	MARGINAL PEASANTS (2 - 4 ACRES)	30 (100)			30 (62.5)	18 (100)			18 (37.5)	48 (29.8)*
3.	SUBSISTENCE PEASANTS (4.01 - 8 ACRE)	7 (100)			7 (63.6)	4 (100)			4 (36.4)	11 (6.8)*
4.	ABOVE SUBSISTENCE PEASANT (MORE THAN 8 ACRE)	5 (100)			5 (62.5)	3 (100)			3 (37.5)	8 (5)*
	TOTAL	62 (93.9)	4 (6.1)		66 (41)	62 (65.3)	10 (10.5)	23 (24.2)	95 (59)	161

NOTE : Figures in paranthesis indicates

(i) All percentages of total are of the grand total

(ii) Percentage of Rajput, Brahmins & Scheduled caste are of the total

(iii) ( )* are percentage of 161

SOURCE : Household Survey

ELECTRICITY

As stated earlier electricity came in Pokhari in 1985-86 and soon Bharet and Badoli (Choti and Bari) were also electrified. Electric polls were installed in Ghayalgaon last year but as yet no family has taken legal connection. Even in other villages very few people take the authorized government connection. There are many reasons for it. Prabha Devi of Badoli (Choti) sums it up as follows:

"Electricity poles have been installed for many years, but the supply is still very irregular. Electricity comes seldom and that even for very few hours. Those with legal connection get a bill of at least Rs.17 to Rs.35 per month. My husband takes the connection with "Kanta" (long iron wire with its 'U' shape at one end helps villagers pull illegal electric supply) whenever supply is coming."

From Table 16 it is evident that no Scheduled Caste has electric connection while a large percentage of Brahmins and Rajputs have the connection. It is interesting that despite both timing and money these households take official connections. It reflects their need.

DRINKING WATER

The main water sources for this area are natural springs and small rivulets, locally called "gaderas" (small rivulets in the mountain region), located near the village.

In 1984-85 efforts were made to bring piped water through rural drinking water scheme from Naugaon village, approximately 9 kilometer from Pokhari. Pipe lines were put from Naugaon to the five villages which covered Pokhari, Ghayalgaon and Bharet. Water points were selected at strategic spots in the village where tanks were constructed or taps put. Water came from this scheme for just 4-5 months. A similar scheme was made for Badoli (Choti and Bari), again water supply only lasted for six to seven months. The scheme brought with it hope for regular and clean supply of water and a freedom from the drudgery of walking kilometers to fetch water from the spring. But it turned out to be a failure. Villagers blame the government for this. They said, "The government installed the pipes and left. They thought their work is over. The pipes got broken in the meantime and despite many complaints no one came to repair them. Government is just not interested in solving our drinking water problems."

After talking to many villagers it was evident that the pipes were really broken, but by some villagers themselves. The water pipe ran through many other villages in which no water points were made. The people of those villages which were left out preferred to break the water pipe in their villages rather than go to the next village where a water outlet was available. It was also observed that the

Scheduled Caste hamlets were not given any water point.

Villagers also told the researcher that no official from the water works department bothers to come and check the state of affairs here. This comes as no surprise. Though the villages are by and large well-connected considering the local standards, it is almost a six hours uncomfortable drive from the Water Works office in Kotdwara to the first bus stop at Pokhari. From there if one wants to go to each village to check out the water outlets, it means many hours of walking through the difficult terrain. Obviously, very few government officials even make an effort to come here.

With the failure of this scheme the people were forced to fall back to the pre-existing source i.e., natural springs. Springs appear to be gradually drying up and often some springs become completely dry during the summers, causing more discomfort and inconvenience to the people who have to spend considerable amount of time and energy in walking to the springs in order to meet the water needs. Though most villages have separate water sources for the higher caste and the "Doms", often with certain springs drying up in summer, both higher caste and "dom" have to take water from a common source. In such times the scheduled caste have to wait for the higher castes to finish their work at the spring before they can use the spring.

This also reflects on the inter-caste relationship in the village. Even though people are aware that this is unjust, they feel that such protocol helps in preventing conflicts. Therefore, they simply follow it for fear of disrupting harmony.

CHAPTER IV

UTILIZATION OF NATURAL ENVIRONMENT IN THE STUDY VILLAGES

A. AGRICULTURE

Pauri Garhwal's poor agrarian economy is coupled with the absence of organized industrial sector. There are low investment facilities, poor soil and meagre irrigation facilities. Thus the people are wholly dependent on subsistence agriculture. This point has already been illustrated in Chapter III, through the analysis of the occupational structures which highlight agriculture as the mainstay of the people.

Agriculture in all five villages is primarily rainfed, very small percentage of Bharet, Badoli (Choti) and Badoli (Bari) peasants are able to partially carry out irrigated farming. Reliance on agriculture is not because it is highly developed or remunerative. It is so because other avenues of occupation are less developed and opportunity in non-agricultural sector is limited.

In contrast with the plains, hill agriculture presents peculiarities of its own. These are, in terms of the nature and the types of cultivation, terrace cultivation, *gul* (small water channels used for irrigation) irrigation, manuring and crop rotation. Each of these peculiarities constraints the level of productivity.

Cultivable land here is basically of two types viz. *uproan* (dry cultivated upland slope) land and *talaon* (irrigated and cultivated lowlands) land. *Talaon* land are

TABLE - 17

CULTIVATED LAND ACCORDING TO IRRIGATION STATUS OF LAND

SL. NO.	VILLAGES	TOTAL LAND CULTIVATED	UNIRRIGATED (IN ACRES)	IRRIGATED (IN ACRES)
1.	BHARET	65.50	62.50 (96.9)	1.90 (2.9)
2.	GHAYALGAON	22.80	22.80 (100)	
3.	POKHARI	62.00	62.00 (100)	
4.	BADOLI (CHOTI)	94.60	81.80 (86.3)	13.00 (13.7)
5.	BADOLI (BARI)	107.20	90.40 (84.3)	16.80 (15.7)
	TOTAL	351.10	319.30 (90.9)	31.80 (9.1)

NOTE : Figures in parenthesis represent the percentage of unirrigated or irrigated land for each village.

SOURCE : Household Survey

the irrigable lands, generally at the foot of the hills. *Uproan* lands are relatively at a higher level without any means of irrigation and are adapted mostly to dry land farming.

All agriculture in Pokhari and Ghayalgaon and almost 97 per cent in Bharet is totally rainfed. Dry land farming is the norm in these areas. Only 2.9 per cent of Bharet, 13.7 per cent and 15.7 per cent of fields in Badoli (Choti and Bari) respectively have *talaon* agriculture, the fields being irrigated by *pucca nahar* (cemented canal) from Rawasan river (Table 17).

The mountainous terrain has necessitated terracing in this region. The construction of terrace depends upon the slope of the ridge on which they are built. The steeper the slope of the ridge, the smaller the size of the terrace. Hence, the size of the terraces in Pokhari, Ghayalgaon and Bharet is relatively smaller compared to those in Badoli (Choti and Bari) which are located near the foot of the hill. On the whole the size of the holdings is very small. It is fragmented to the extent that an average holding remains uneconomical.

CROPS

The main harvest crops are both Rabi and Kharif. The important kharif crops being rice, *mandua* (eleusine coracana - kind of small millet), *jangora* (oplismenus frumentaceus -

coarse grain resembling rice), maize and pulses. Wheat being the most important rabi crop. The people are slowly taking up cultivation of soyabean, turmeric, ginger etc. Though this has as yet not led to a change over to a different cropping pattern.

The most important crops in *talaon* land are rice and wheat. Less land is put under *jangora* and *mandua* cultivation as these two grains are not consumed as much anymore. Jeet Singh (70 year old) of Badoli (Choti) summing up the attitude of most of the villagers in this area says,

> Now who wants to eat *mandua* and *jangora* - this is *mota anaj* (coarse grain) - when rice and wheat is available. We use *jangora* for feeding cattle and every year even after that we have to throw so much. And no one will buy it too. So what is the use of growing it in a large part of the fields. It is more beneficial to grow rice or wheat or even soyabean and potatoes.

Mandua and *jangora* adapt to poorer and unirrigated soil. They are grown and consumed comparatively more in *uproan* land of Bharet, Ghayalgaon and Pokhari. The villagers grow mandua in the fields where paddy and wheat are unable to prosper. These fields yield a rich harvest of *mandua*. *Jangora* too is found growing on edges of better fields, inferior terraces and shady parts of the fields. Maize was not found to be thriving in Badoli (Choti and Bari). Hence it was not grown there. While Ghayalgaon, Bharet and Pokhari grow maize for domestic consumption.

Diversified crops of pulses are grown in this area - *gohat* (Dolichos bitiorus or horse gram), *urad* (rayed kidney beans), *bhat* (Glycine soja - a soyabean), *matter* and *masoor* (pulses). *Urad* is most prominent. *Gohat* has the characteristic of growing without any care and is sown thinly. *Bhat* is grown as a mixed crop. *Matter* and *masoor* are grown with wheat. In Badoli (Choti and Bari) people were seen cultivating new variety of soyabean which they felt had market value. But on the whole production of pulses is very meagre, not even sufficient for domestic consumption.

Vegetables of different varieties are produced in the village for domestic consumption only. Most of them are only found during the monsoon period.

The cropping pattern of the rabi and kharif crops are as follows:

Rabi: wheat, jo, gram, *matter*, oilseed (mustard) and *masoor* is sown in October and November and harvested in March-April. Then in May-June, the fields are ploughed and left fallow.

Kharif: Paddy, *jangora*, *mandua*, *urad*, *gohat* and *til* is usually sown in unirrigated fields. Paddy is sown in March-April. In irrigated fields it is sown in June-July. *Mandua* and *urad* is sown in the same fields. Rice is harvested mostly in September.

ORGANIZATION OF AGRICULTURAL ACTIVITIES

Majority of the holdings in these villages are small, self-owned and self operated, with 54 per cent households doing share-cropping. Talking of the size of the holdings, Atkinson, E.T. (1884-86) wrote "that majority of the holdings are very small cultivator having six to eight acres of land is considered to have a large holding; an average one is two to four acres, whilst there are some as small as from one quarter to half an acre." According to Atkinson, E.T. (1884-86) the probable reason for the small holding was, "The prevailing custom of dividing all immovable property equally amongst the sons, together with the tenacity with which all hillmen cling to their hereditary property, has had, and still must have, the effect of diminishing the size and multiplying the number of holdings."

This picture has not changed much even in 1993. Atkinson's explanation of small landholdings due to division within family however appears incomplete as even in 1993 people still own the same size of the holdings. The explanation of simple division leading to small holdings alone then cannot explain the present size which should have been even smaller and then there should be many more landless.

TABLE – 18

TOTAL OWNERSHIP, TOTAL LAND CULTIVATED AND SHARE CROPPERS IN THE STUDY AREA

CASTES	VERY POOR PEASANTS (LESS THAN 2 ACRE)				MARGINAL PEASANTS (2 -4 ACRES)				SUBSISTENCE PEASANTS (4.1 - 6 ACRES)				ABOVE SUBSISTENCE PEASANTS (MORE THAN 6 ACRES)				GRAND TOTAL	
	OWNED	CULTI-VATED	DIFFE-RENCE	SHARE-CROPPER	OWNED	CULTI-VATED	DIFFE-RENCE	SHARE-CROPPER	OWNED	CULTI-VATED	DIFFE-RENCE	SHARE-CROPPER	OWNED	CULTI-VATED	DIFFE-RENCE	SHARE-CROPPER	HOUSE-HOLDS	SHARE-CROPPERS
RAJPUT	57 (46)	98 (79)	(+)41	46 (71.9)	48 (38.7)	19 (15.3)	(-)29	18 (28.1)	11 (8.9)	4 (3.2)	(-) 7	0	8 (6.5)	3 (2.4)	(-) 5	0	124 (77.0)	64 (73.6)
BRAHMIN	14 (100)	14 (100)	0	0													14 (8.7)	0
SCHEDULED CASTE	23 (100)	23 (100)	0	23 (100)													23 (14.3)	23 (26.4)
TOTAL	94 (58.4)*	135 (83.9)*			48 (29.8)*	19 (11.8)*			11 (6.8)*	4 (2.5)*			8 (5)*	3 (1.9)*			161	87 (54.0)*

NOTE : Figures in paranthesis show :

(i) Percentages of owned and cultivated are of the row-wise grand total.
(ii) Percentages of Share croppers are of the row-wise grand total of share croppers.
(iii) Percentages of grand total households is of 161.
(iv) Percentages of grand total share cropper is of 87.
(v) ( )* are percentage of 161.
(vi) The difference does not tell us which category they enter or where they come from.

SOURCE : Household Survey

Our data shows that leaving land fallow and share-cropping are the two major trends today in the organization of agriculture. From Table 18 it is evident that Rajputs cultivate less land than what they own. Brahmins and Scheduled Caste already own very little land (less than two acres) so their whole land is cultivated. Most Brahmin households (almost 70 per cent) do not cultivate the land themselves but give it to the Rajputs on share-cropping basis. Almost 54 per cent households do share cropping. Amongst them 73.6 per cent are Rajputs and 14.3 per cent Scheduled Caste. But if one considers share-croppers caste-wise only, then 100 per cent Scheduled Caste do share-cropping to enhance their food production. Owning very little land, and lacking other means, they do share-cropping in order to subsist. But despite that they are not able to meet their food requirements (as shown later) because they totally (owned and share cropped) have less than 2 acres of land and most of it is of poor quality.

Amongst the Rajputs also the share croppers are either very poor peasants (71.9 per cent) or marginal peasants (28.1 per cent). They too need to do share cropping in order to meet their food requirements.

There is a growing tendency amongst the landed peasant to cultivate less land, either giving it on share-cropping basis or often leaving it fallow. Most of them only

TABLE - 19

FOODGRAIN PRODUCTION (IN KG/ANNUM) AND CORRESPONDING AGGREGATE LAND PRODUCTIVITY IN THE STUDY VILLAGES

SL. NO.	NAME OF VILLAGE	RICE	WHEAT	MANDUA	JANGORA	DAL	TOTAL GRAIN PRODUCTION	CULTIVATED LAND (IN ACRES)	AGGREGATE LAND PRODUCTIVITY (YIELD/ACRE)
1.	Bharat	1870	2430	1355	1450	319	7424	64.5	115.1
2.	Ghayalgaon	425	1310	1140	1954	187	5016	22.8	220
3.	Pokhari	755	2872	2241	2868	438	8974	62	144.7
4.	Badoli (Choti)	20280	9795	4440	455	1469	36439	94.6	385.2
5.	Badoli (Bari)	27570	14470	6080	300	1468	49888	107.2	465.4
	Total	50900	30877	15256	6827	3881	107741	351.1	306.9

NOTE : Aggregate Land productivity is calculated by using total food grain production and cultivated land in the village assuming that the proportionate distribution in the same.

SOURCE : Household Survey

cultivate the fertile fields themselves leaving the rest either fallow or giving them on share-cropping basis. This trend is clearly visible in Table 18. It is reflected in the difference between ownership of land and actually cultivated land holdings. More than 50 per cent of the large owners actually cultivate less than what they own.

FOOD PRODUCTION LEVELS IN DIFFERENT VILLAGES AND THEIR CASTE CORRELATES.

Food production levels are dependent on the agricultural productivity of an area. Our data shows that the productivity levels are low in this area due to various reasons which will be discussed later. On enquiry it was evident that the production of food grains is decreasing everywhere except in areas which have irrigation facility. If we look at production of foodgrains villagewise (Table 19) the picture that emerges is very bleak. Only the irrigated villages of Badoli (Choti and Bari) have substantial production, while in the other three villages production is very meagre. The villagers explain that there is substantial production in Badoli (Choti and Bari) because in these villages 13.7 per cent and 15.7 per cent land respectively is irrigated (Table 17). These fields are located at the foot of the hill and have fertile soil. New variety of seeds and fertilizers are used here to increase production.

Table 20

Total Wheat Production (Kg./Annum) Castewise

Wheat Production (in Kgs.)	Number of Households							
	Rajput		Brahmin		Scheduled Caste		Total	
	No.	%	No.	%	No.	%	No.	%
0-100	43	34.7	10	71.4	21	91.3	74*	46
101-200	33	26.6	1	7.1	2	8.7	36	23.4
201-300	2	1.6					2	1.2
301-400	28	22.6	2	14.3			30	18.6
401-500	7	5.6	1	7.1			8	5
501-600	4	3.2					4	2.5
601-700	4	3.2					4	2.5
Above 700	3	2.4					3	1.9
GRAND TOTAL	124		14		23		161	

Note : (i) % of Rajputs, Brahmins and Scheduled Caste are of Grand Total for each Column

(ii) % of Total are of Grand Total 161

(iii) * Out of 74 household, 36 households (16 Rajputs, 6 Brahmin and 14 Scheduled Caste) had less than 30 KG. Wheat/annum

Source : Household Survey

Table 21

Total Rice Production (Kg./Annum) Castewise

Rice Production (in Kgs./Annum)	Number of Households							
	Rajput		Brahmin		Scheduled Caste		Total	
	No.	%	No.	%	No.	%	No.	%
Upto 100	58	46.8	7	50	23	100	88*	54.7
101-200	3	2.4					3	1.9
201-300	10	8.1	1	7.1			11	6.8
301-400	7	5.6	1	7.1			8	5
401-500	5	4.0					5	3.1
501-600	5	4.0					5	3.1
601-700	4	3.2					4	2.5
701-800	7	5.6					7	4.3
801-900	8	6.5	3	21.4			11	6.8
901-1000	11	8.9	2	14.3			13	8.1
Above 1000	6	4.8					6	3.7
GRAND TOTAL	124		14		23		161	

Note : (i) % of rajputs, brahmins and scheduled caste are of the grand total of each columns

(ii) % of total are of the Grand Total (161)

(iii) * Out of 88 households, 62 households (35 rajputs, 6 brahmins and and 21 scheduled caste) had less than 30 Kg. rice/annum

Source: Household Survey

Higher grain production in Badoli (Choti and Bari) can be explained in terms of higher aggregate land productivity in these villages. The yield per acre is 385.2 and 465.4 (kgs/annum) in Badoli (Choti) and Badoli (Bari) respectively which is much higher than the dry farming villages of Pokhari and Ghayalgoan where the land productivity is as low as 144.7 and 220 (kgs/annum) for these two villages respectively. Bharet has negligible irrigated area (2.9 per cent) and therefore its yield per acre is also low (115.1 kgs/annum). Interestingly, despite 2.9 per cent irrigated land, the land productivity is the lowest in Bharet.

Table 20 and 21 reflect on the disparity of wheat and rice production per annum amongst the three castes in the study area. 100 per cent Scheduled Caste produce up to 100 kilograms of wheat while 91.3 per cent Scheduled Caste produce up to 100 kg rice. Therefore the foodgrains production of both wheat and rice for Scheduled Caste households is very meagre. On enquiry it was evident that for almost 91.3 per cent (21 out of 23 Scheduled Caste households) rice production was less than 30 kg/annum and for 60.7 per cent (14 out of 23 Scheduled Caste households) wheat production was less than 30 kg/annum (from field survey).

Though the production of wheat and rice is also poor for Brahmins as a whole, we must remember that their

economic situation is not the same as the Scheduled Caste. Therefore, despite poor production they are financially in a condition to buy these grains from the market.

Amongst the Rajputs there is greatest disparity. A large proportion i.e., 46.8 per cent and 34.7 per cent produce less than 100 kg/annum of rice and wheat respectively. There are some who produce large quantities of both the grains, though the numbers of such households are very small. If one considers the entire study population as a whole, for the majority, the production of wheat and rice is very meagre (46 per cent and 54.7 per cent households produce only up to 100 kgs./annum wheat and rice respectively). With such poor agricultural produce, the area faces scarcity of foodgrains and majority are compelled to buy grains from the market. It is the poorer section specially the Scheduled Caste who suffer the most. Poor foodgrain production and lack of access to other means creates conditions conducive to ill-health.

FOOD SUFFICIENCY

In our interview we asked all the families as to how long the foodgrains that they produce lasts them and for how many months they have to depend on sources other than their own produce. This was taken as a measure of food sufficiency for the family. In this definition we are

TABLE - 22

AVERAGE FOOD SUFFICIENCY (IN MONTHS) FOR THE STUDY VILLAGES

SL. NO.	VILLAGE	TOTAL LAND CULTIVATED (IN ACRE)	AVERAGE FOOD SUFFICIENCY (IN MONTHS)
1.	Bharat	64.5	2.76
2.	Ghayalgaon	22.8	4.22
3.	Pokhari	62	1.83
4.	Badoli (Choti)	94.6	6.25
5.	Badoli (Bari)	107.2	9.6
	Total	351.1	4.9

SOURCE : Household Survey

Table 23

Average Food Sufficiency (in Months) for Class and Caste Groups

Average Food Sufficiency (in Months)	Very Poor (Less than 2 Acre)				Marginal (2-4 Acre)			Subsistence (4.1-6 acre)			Above Subsistence (More than 6 Acre)			Total Households			
	Rajput	Brahmin	Scheduled Caste	Total	Rajput	Brahmin	Scheduled Caste	Total	Rajput	Brahmin	Scheduled Caste	Total	Rajput	Brahmin	Scheduled Caste	Total	Rajput	Brahmin	Scheduled Caste	Total
0 Month	5	6	11	22	5			5									10	6	11	27
	(22.7)	(27.3)	(50)	(23.4)	(100)												(37)	(22.2)	(40.8)	(16.8)
Upto 4 Months	19	3	11	33	20			20	6			6					45	3	11	59
	(57.6)	(9.1)	(33.3)	(35.1)	(100)			(41.7)	(100)			(54.5)					(76.3)	(5.1)	(18.6)	(36.6)
Upto 8 Months	12	2	1	15	11			11	5			5					28	2	1	31
	(80)	(13.3)	(6.7)	(16)	(100)			(22.9)	(100)			(45.5)					(90.3)	(6.5)	(3.2)	(19.3)
Upto 11 Months	10	2		12	2			2					2			2	14	2	0	16
	(83.3)	(16.7)		(12.8)	(100)			(4.2)					(100)			(25)	(87.5)	(12.5)		(9.9)
All year round	11	1		12	10			10					6			6	27	1	0	28
	(91.7)	(8.3)		(12.8)	(100)			(20.8)					(100)			(75)	(96.4)	(3.6)		(17.4)
GRAND TOTAL	57	14	23	94	48			48	11			11	8			8	124	14	23	161
	(60.6)	(14.9)	(24.5)		(100)				(100)				(100)				(77)	(8.7)	(14.3)	

Note : Figures in paranthesis show

(i) are % of total are of the grand total (columwise)

(ii) % of rajput, brahmin and scheduled caste are of the total

Source : Household Survey

excluding all money inflows. Food sufficiency as defined here is just a measure of local production.

Table 22 shows the total land cultivated in the study villages and the average food sufficiency (in months) as expressed by the people. Though the produce is not sufficient to last the whole year in any village, the condition in the rainfed farming areas is worse. In Bharet, Ghayalgaon and Pokhari foodgrains last for 2.76, 4.22 and 1.83 months respectively. Food deficit in these areas increase in periods of poor rainfall. Food is comparatively more sufficient in Badoli (Choti and Bari) where it lasts for 6.25 and 9.6 months respectively. These villages have irrigated fields and their aggregate and productivity is also higher (Table 17 and 19).

When we relate food sufficiency to caste and class groups (Table 23) we find that there is a great disparity between classes. In zero month sufficiency amongst the very poor peasants 50 per cent are Scheduled Caste as compared to 22.7 per cent Rajputs and 27.3 per cent Brahmins. While in the same group (less than 2 acres land) if one looks at all round sufficiency, 91.7 per cent are Rajputs and 2.3 per cent are Brahmins. Only one Scheduled Caste amongst the very poor peasants is able to produce food sufficient for eight months. All peasants in marginal, subsistence and above subsistence groups are Rajputs. 41.7 per cent

marginal peasants have food sufficiency for four months and only 20.8 per cent of them have food all year round. While among the subsistence peasants, 54.5 per cent have sufficiency for four months and the remaining 45.5 per cent for eight months. Though being more landed than the marginal peasants, none of them have sufficiency, all year round.

This group also sends the largest number of migrants, hence having other sources of income it is not entirely dependent on agriculture and therefore there is a move away from agriculture amongst the peasants of this group. Average food sufficiency is highest amongst the above subsistence groups, as 75 per cent of them have sufficient food grains all the year round and the remaining 25 per cent have food sufficiency for 11 months. When we look at the total households we find that majority (36.6 per cent) have average food sufficiency of four months. Therefore the study area in general faces food deficit problem which becomes compounded for the poorer sections specially the Scheduled Caste who also often lack access to other means.

REASONS OF LOW PRODUCTIVITY

From the above discussion it becomes clear that the area has low agricultural productivity which is gradually declining. Low levels or productivity can be attributed to

a number of reasons like poor rainfall, non-availability of irrigation facilities, increasing expenses of purchase of seeds, fertilizers and hiring of labour for different agricultural operation.

In the rainfed villages, most of the villagers complained of irregular and poor rainfall as a cause for poor yield. In these villages there is no facility for irrigation nor do people expect to get this facility in future. There is no river nearby, so they cannot expect water to be ever brought into the village for irrigation. As one of them said, "when there is no water to drink here, how can one even hope to get water to irrigate the fields."

In Bharet, 1.96 acres of land are irrigated with the help of *guls*. Water is brought into the fields from small rivulets by means of *guls* or channels made for irrigation. But here too, water is only available for 5-6 months.

Badoli (Choti and Bari) have some fields which are irrigated by the canal. Till the canal was constructed, these fields were also irrigated by the *guls*. One would think that making of the *pucca* (cement) canal would have improved irrigation in the areas, but the villagers report in contrary. They say that "earlier we ourselves made the *guls* and water reached our fields. But ever since the *pucca nahar* (canal) has been made we face a lot of problems. This *nahar* breaks often because it is not well maintained. Very

often we do not get water on time and the canal water does not reach many of the fields which could earlier be irrigated with the *guls*." Many villagers also complain that some fields have become useless because at certain places the canal overfloods wiping away the field. They feel that on the whole the *nahar* has caused more harm than benefit. As seventy years old Madan Singh Chowdhary says "for centuries we have irrigation from *guls*. Then the government in the name of improving agriculture made the *pucca nahar*. They then began taxing us. It only multiplied our problem. They claimed that the *nahar* would aid in soil conservation, but on the contrary it overfloods and wipes away our fields. What kind of conservation is this?"

For the peasants in Badoli (Choti and Bari) and those who have irrigated fields in Bharet production has increased. This is because of the use of the fertilizers like DAP, potash, urea, etc. and use of new varieties of seeds. Though the production in these fields has increased, it has led to non-irrigated fields being left fallow. As one of the villagers Chet Singh of Badoli (Choti) said, "I have been using fertilizers like Urea, DAP, Potash for almost 10 years now. I also buy new variety of wheat and rice seeds from the "seed *bhandar*" (seed store) in Amola. The yield has increased three fold now. Because of this I do not cultivate the infertile land anymore - why should I

waste time on it?"

But the use of fertilizers and new varieties of seeds has its own problems which often lead to fall in production. As a resident of Badoli (Bari) said, "Since the last two years the supply of fertilizers and seeds has not been regular. They have not been available on timeand so produce has gone down because these fields no longer produce enough wheat or rice without being provided fertilizers."

Prem Das, a Scheduled Caste from Badoli (Choti) commenting on the new variety of seed said, "Three years back, government sold us wheat seed. I too bought those seeds but the crop was very poor. Yield was almost nil. So now I have no trust on government seeds. I keep my own seeds. But production on the whole has risen despite working less hard on the fields and this is because of the use of urea as fertilizer."

So farmers in these villages use fertilizers because it increases production. They are unaware of the damage it does to the environment - even if they were aware, they would not be able to stop their use altogether because they are too dependent on quick returns. Though some of them can find a linkage between use of fertilizers and its effect on health. Kalyan Singh Negi of Choti Badoli said "Production has definitely increased with the use of fertilizers but the nutritional value of the grains has also decreased. But

despite this we cannot stop its use because without using it, the production is very meagre and if we stop its use we'll die of hunger".

But the adoption of improved seeds, fertilizers pesticides is even limited in the irrigated area because of its non-availability at appropriate time and insufficient quantity.

Thus manuring still occupies a significant place in hill agriculture. The land is still by and large dependent on replenishing its fertility through organic manure i.e., animal dung, animal bedding material and crop residences. Traditionally, the villagers used to do *goath* (involves constructing a temporary shed on the field under which the cattle are kept for six months. This shed is moved from field to field along with the cattle depending on wherever the manuring was required). But this practise is being given up gradually. The reason for this can be located in the decreasing number of cattle per family which is due to decreasing manpower to tend to the animals and scarcity of fodder and grass. This has led to scarcity of manure for the fields, especially those in the rainfed area which completely depend on organic manure for replenishing their fertility. As one of the villagers from Bharet said, "Now land is less fertile because less manure is added to it. This is because number of cattle and domestic animals have

decreased. People are not able to look after them now. They are also afraid of wild animals like *Bagh* which kill their goats and cattle. People do not do *goath* as much as before because now they do not keep as many animals."

Dinesh Singh of Pokhari feels, "No one keeps *goath* now because it is impossible to domesticate so many animals. I do not have a *gowshalla* and grass and fodder in the forest is also not sufficient. We have no facility for buying fodder here." While Madan Singh of Ghayalgaon says, "earlier there were more people to tend to animals. In every family there was at least one person who just looked after the animals. Now with few hands to help, less animals are also kept."

Operational costs are also constantly increasing. With lesser families owning oxen they either have to rent oxen to plough or depend on those owning oxen and willing to plough for wages. This adds to the cost. The increasing trend towards buying improved seeds and fertilizers has also added to the cost of production. Earlier most agricultural operations were carried out by households but now the trend is changing. In Uttarkhand the role of the males in agriculture is limited to ploughing the field. Now with a large percentage of males being away from the village, many households have to depend on hired labour to plough their fields. This not only increases the cost of production, it

TABLE - 24

HOUSEHOLDS OWNING OXEN IN THE STUDY AREA

PEASANT GROUPS ACC TO LAND HOLDING	TOTAL NO. OF HOUSEHOLDS IN STUDY AREA	HOUSE HOLDS OWNING OXEN			
		RAJPUT	BRAHMIN	SCHEDULED	TOTAL
VERY POOR (Less than 2 Acre)	94	15 (51.7)	3 (10.3)	11 (38)	29 (60.4)
MARGINAL (2 - 4 Acre)	48	14 (100)			14 (29.2)
SUBSISTENCE (4.1 - 6 Acre)	11	1 (100)			1 (2.1)
ABOVE SUBSISTENCE (More than 6 Acre)	8	4 (100)			4 (8.3)
GRAND TOTAL	161	34 (70.8)	3 (6.3)	11 (22.9)	48 (29.8)*

NOTE : Figures in parenthesis indicate

(i) all percentages of the total are of the grand total

(ii) percentages of rajput, brahmin and scheduled caste are of the total

(iii) ( )* is the percentage of 161.

SOURCE : Household Survey

also increases the burden on the women. Often the labour is not available on time, so many fields are left fallow. Hence, overall grain production falls and these fallow fields over time turn into *banjar* or infertile land.

Table 24 shows that the number of households owning oxen is very small, only 48. Majority of these households are very poor peasants for whom working on others fields is a source of income which adds to their livelihood. But for others it means additional operational cost. With no surplus to sell, meeting such costs is almost difficult for families who do not have other source of income. So many resort to giving their fields on share-cropping basis which under these circumstances is more economical. Though most complain that share-croppers often do not give the fair-share, but they feel it is better than leaving the fields fallow.

Apart from the adoption of chemical fertilizers and improved seeds in sown area, there is no other change in the method of cultivation. The small holdings preclude the use of new implements and people are still using the same traditional wooden plough, *datula* (sickle), *danyala* (wooden rake drawn by oxen) and *belta* (tool for weeding).

Many villagers feel that the productivity is declining because less people are interested in agriculture. They said that most of the boys are now sent to school. The few

years in school unsettles them so much that they become alienated from their traditional occupation of agriculture and cattle-rearing. These educated males do not want to stay in the village and do farming. Agriculture requires hard labour. They prefer to go to the city and find a job.

With many households having other sources of income like pensions and money orders to depend on, there is less compulsion to plough. Drupati Devi of Badoli (Bari) comments "Earlier we cultivated all the fields because then we all just concentrated on agriculture. Then there was no other source of income and everyone solely depended on agriculture. Now the children want to study and after that they go to the city to work. So naturally the fields which are left uncultivated slowly turn *banjar*."

So with less compulsion to plough, more fields are left fallow. Migration is therefore leading people to moving away from agriculture causing agricultural stagnation. Then there is non-investment in land leading to further impoverishment of the land.

Many fields situated near the forest are now left fallow, even though villagers regard them as most fertile. Often given reasons are that these fields are located far-off and that there is lack of manpower to cultivate them. But the main reason is the growing menace of wild animals. Wild bears, pigs, monkeys attack the fields and destroy the

crops. In order to prevent the wild animals from destroying the crops, villagers stay up at night and guard the fields. They shout and beat drums and cans to scare those animals. Villagers feel that since the Government put a ban on killing wild animals, their numbers have increased. The present condition of the forests does not provide sufficient food for these animals, so they come into the village in search of food and in turn destroy the crops. Thus a sufficient produce falls prey to these wild animals.

The above discussion shows that there are many constraints to agricultural productivity in this area. This causes the peasants to face food deficit problems resulting in unbalanced food intakes, leading to malnutrition and ill-health. At the same time use of fertilizers, pesticides and hybrid varieties of seeds and inappropriate forms of irrigation has its own consequences as is reflected by soil degradation and loss of more dependable varieties of grain specially in dry farming areas. What is most glaring is that despite this "development", sufficiency in foodgrains seems a far off dream in the study villages.

B. FOREST

Forests are considered to be the lungs of the country, but in the case of the hills they represent the very soul of the people living there. For generations people living in

these hills had a life-style based on subsistence economy comprising mainly of animal husbandry and agriculture. The support base of these came from the natural ecosystem which provided them with fuel and fodder. There was enough water source and fertile top-soil which managed its subsistence agriculture. People were able to comfortably meet their subsistence requirements and there was relative prosperity of hill society (Guha R., 1991). But over time there was large-scale degradation of forests. The hill production which is highly dependent on forests has certainly been put to various difficulties as a result of depletion of forests and the resulting policies which have been adopted by the forest department.

Till the coming of the British, the peasant communities enjoyed the untrammelled use of the forest and its produce. They knew that the forests were central to the successful practice of agriculture and animal husbandry and they protected the forests through informal management practices that regulated the utilization of forest produce by the community. But with the British era, this system was superseded by another system of forest management propelled by the powerful economic and political forces which rested on a radically different set of priorities. State monopoly was asserted through the Forest Act of 1878 which provided for constitution of "reserved" closed forests, divested of

existing rights of users to enable sustained timber production for their commercial purposes. This reservation meant an effective loss of control over their habitat for the forest-based communities. The commercial exploitation led to the rapid felling of trees and at the same time an increased pressure was felt on the forest that did remain open to villagers in many cases hastening their destruction (Guha, R. 1991).

The Forest Policy of post-colonial India continued on the colonial path of commercialization and denial of hill peoples basic needs, both through alienation of rights and through ecological degradation.

The researcher during her in-depth study of various manuals and gazetteers on "forest" in the study area could not find any account of organized deforestation. There is no evidence in any of the books available on the subject of government sponsored contractors being instrumental in forest depletion in this area.

This lack of information in journals was substantiated by first hand information available from the villagers. None of the villagers interviewed during the study talked about forest contractors being operational in this area at any point of time in the history of this area. But they do talk of an isolated case of one timber merchant coming approximately 18 years back who cut some trees in the forest

adjoining Badoli. The people interviewed included some very old village folks, so the question of missing historical links can be ruled out.

Recollecting the incidence of the timber merchant Bharat Singh (48 year old) of Badoli (Choti) said, "about 18 years back a contractor was here. He had a permit to cut only dry and dead trees but the contractor used to cut trees irrespective of the permit. But since then no contractors have come here".

In this area thus there is no account of organized deforestation but with certain forests like those on the Laldang range being turned into 'reserved' forest, more pressure was exerted on a smaller area of forests now designated civil and thus they presumably got deforested because of increased pressure on them, by the villagers of even those villages whose forests were turned into reserved forests.

The needs of the people are so inextricably mixed with the forests in the hills that the very life of the people would be almost impossible without forests. Their daily needs of energy, fodder, wood for huts are all met by the forest. Besides the daily needs, the productivity of the cropland, animals, the ecological balance and water resources are all dependent on the forest. It is only natural that any change in the forest even if apparently

insignificant in the forest, could lead to considerable changes in the way of life of the people.

In this study attempt was made to understand the peoples perception of the forest and to get an insight into the problems faced by the villagers with respect to fuel, timber, fodder etc. in the face of increasing deforestation.

The majority of the villagers felt that there is a great difference in the condition of the forest today as compared to twenty years back. Almost 95 per cent of the villagers said that forests surrounding their villages have decreased. This includes both dense forests becoming sparse, as well as getting totally erased leaving bare land. This denudation of forest cover makes collection of fuel wood, grass and fodder difficult. Most of the hill people even today use wood as their main source of fuel for cooking. Destruction of forest has brought about a major crisis of firewood shortage. With only seven households using liquefied petroleum gas (LPG), that too not on a regular basis, fuelwood shortage becomes a major problem. Villagers have to go further and further away to fetch wood. Changed condition of forest has also created scarcity of grass and fodder. This has led to decrease in milk-yield and increased the workload of the villagers who have to either go far away to collect fodder or go further away with the animals to graze.

Almost everyone interviewed is aware of the importance of forest cover in regulating soil and water regime. All across the village there is a fear that degradation of forests is causing the local streams to dry up, specially in the summers. They realize that "forests are the life-line of the hill people." More than the problem of fodder and fuel wood, it is the scarcity of water that this area faces. Villagers feel that deforestation is the main cause of this problem. They also feel that the absence of protective cover is causing the loss of top soil. Landslide and soil erosion is on the increase. Villagers feel that this soil erosion is also leading to the spring drying up and water becoming dirty.

This changed condition of forests has led to climatic changes according to the villagers. They said that rainfall has decreased and that it is getting hotter now. According to them, these climatic changes have an impact on their health. "Changed condition of forest have led to scarcity of pure air and now we find that villagers fall ill often."

The villagers recall that the forests earlier were the resource base for indigenous medicines. Many medicinal herbs and roots were found there. It was also a repository of all sorts of edible roots, fruits and shoots. Many of these herbs and roots have almost disappeared from the forest and its difficult to find traces of them. Whatever

is left is usually eaten by the wild animals. Their number is also increasing rapidly.

The villagers are aware that there is a close linkage between forests, agriculture and animal husbandry. They realize that forests are essential for providing stable perennial supplies of water for drinking and for irrigation (wherever there are streams) and for providing fertility directly through its foliage as "green manure", and indirectly as organic matter cycled through farm animals fed with fodder leaves and forest grass. According to them declining agricultural productivity and hence food production can be directly attributed to the degradation of hill forests.

Some villagers pointed out that the nature of vegetation in the forests has also changed. They said that earlier there were more variety of trees, with good quality wood. But with time good quality wood first fell to the axe and gradually many species of trees disappeared from the forest. Some villagers also point out that the forests have become very sparse. Earlier there were more trees, but now one finds more bushes. A resident from Badoli (Choti) points out "earlier our forest was so thick that even sun-rays could not penetrate through it. From Badoli, Pokhari village was not visible - such a dense forest came between the two villages. But now you can literally count the

trees. There are more bushes in the forest which are of no use - they only serve as hiding places for the wild animals".

Almost all villagers complain of the menance of wild animals. With the changing condition of the forest, less trees specially less fruit bearing trees are left. The wild animals not finding enough food in the forest, come into the village, attack the fields and cause great damage to the crops. Because of this the fields on the fringes of the forest are gradually being deserted. These fields are slowly turning into *banjar* land.

Villagers pointed out that the forests have been invaded by a foreign plant called 'Eupatorium'. It is a small bush with greenish-black leaves which has spread in the forest since the 1970s. This bush has no food value, neither for wild animals, nor for domestic animals. In fact, it spreads fast, suppressing the growth of other fodder plants creating further scarcity of grass and fodder. Commenting on grazing, villagers agree that the saplings get trampled with grazing. But they feel that they cannot afford to stop grazing as the animals are an essential part of this already fragile subsistence economy.

Majority of the villagers perceive themselves as the main destroyers of the forests. They know it, feel it and search for answers looking for explanations in human greed.

Being humble and honest they do not excuse themselves. Villagers understand the danger of cutting trees. They accept it is harmful, but they ask "what is the option? How do we survive in these conditions?" 36 years old Usha Devi of Pokhari comments, "for everything the tree becomes the target to meet the local demand. For fuelwood we cut trees, for fodder we lop branches. Very often we cut excessive wood and pile it up and this eventually rots. People think if they do not cut a particular tree someone else will surely cut it. So it is the human greed which is destroying the forest."

Villagers accept that they usually put fire in the forest in hope of lush grass after the monsoon. They are aware that fire not only burns the top layer of grass and dry leaves but also destroyes small trees, bushes and saplings. But they feel helpless, they have to depend on the natural grass and leaves for fodder.

Even though there is no organized felling of trees, the villagers in general have many complaints against the government officials specially the *patwari* (revenue officer). Villagers now have to take written permission to cut a tree for their personal use. The application goes through the *patwari* and often the *patwari* takes bribes for getting the permission sanctioned. They also quote incidents when *patwari* took bribe and allowed them to cut

more than what was permitted. So illegal felling does take place in connivance with the *patwari*.

But most villagers also know that they are not to be blamed entirely. People have no access to reserved forests. As a result civil forests have excess of pressure with many villages now becoming dependent on them. This is the case of Badoli where the forest across the river on Laldang range is reserved. So villagers of the village situated near it often come into their forest for fuel and fodder. With the increasing degradation of the forests in Badoli, the villagers of Badoli also sometimes enter the reserved forest and illegally cut wood. Therefore, destruction takes place in both the forests.

But we must remember that micro-subsystems have seldom been destroyed by pressure of local population alone It is true that the pressure of increasing local population has drastically reduced the regenerative capacity of the local environment. But more than this the alienation of the hill people from nature has led to the deteriorating condition of the forests. The produce of the forests no longer belongs to the hill people. This kind of alienation occasionally forces the villagers to degrade the surroundings with which they once lived in symbiosis. As one of them commented "earlier we looked after the forest ourselves. We planted more trees than we took from it. It was our own forest.

Now it's the government's, People of Kharduni, Jamali etc. also have legal right to the forest as much as we have. Why should we then protect and grow trees for others. If we decide not to cut the tree, there will be ten others who will be happy to see the tree left untouched for them to cut. Often the government officials like the *patwari* take money and sell the tree to the villagers."

The lack of interest that is often exhibited by the villagers in preserving the forest may thus be traced to the loss of community control of the forests. As Uttam Singh of Pokhari with his wisdom of seventy five years of life said "If the forests remain with the villagers they will look after them. Villagers understand best what the benefits of green forests are. It is they who can look after the trees and not the government. But if the government insists on asserting their right on the forest, trees do not remain our property, but the governments. No one will then look after them."

The villagers offered many suggestions for better management of forests. Some feel that the only way to rejuvenate the forest is by turning it into a reserved forest, thereby curtailing the villagers from using the forest for their everyday needs. But most are against this suggestion. Villagers fear that this will only create more problems for them. They associate forest officials with

corruption, bribery and harassment and see themselves suffering because of it.

Some feel that the cutting of the forest for local needs could be lessened if government provides alternative to fuelwood and timber consumption. They suspect that the growing populations' fuel needs will not be met by the forest alone. Under such circumstances it becomes imperative to encourage people to opt for alternative source of energy. The villagers realize that this change will not come easily. Hill people are used to obtaining firewood free of cost and opting for alternative sources will certainly be taxing on the poorer section. But most feel that if gas (LPG) is easily available, at least the better off would go in for it. However, considering the economic condition of the people, this will only have limited impact.

Villagers feel that probably people need to be educated about the significance of the forest. Though most people are aware of the importance of forests in the hill area, they need to be reminded of it and also be motivated to protect them. As one of them said, "We need to motivate the people to only lop dry wood and not to fell green trees and to only cut enough for their needs. People often waste wood - if each one cuts less wood forests can be saved."

In the hill region it is the women folk who are primarily engaged in work related to the forets. A few

villagers felt that any plan for the management of forests must involve the women. As someone said "maybe formation of Mahila Mandal Dal can help. This has been done in Uttarkashi, Tehri and Chamoli and results have been very promising."

Villagers also feel that the type of tree planted decides whether it will be cut or saved. Ramlal Uniyal of Badoli (Bari) feels, "forest department should plant more trees like *muscat* and *kikar*. These trees grow very fast increasing the forest cover and animals also do not eat their leaves."

Commenting on the forest officials inefficiency the villagers said that "saplings are never provided on time. Employees from Forest department sometime plant some trees. But they do nothing to ensure that these saplings are saved. Fences are seldom built around the plant." Often heard complaint is that *kakajun mein perh lagte hein, hakikat mein nahim* (trees are not planted in reality but only on paper i.e. government records).

The villagers are aware of the crucial functions of the forests. They do not simply see forests from the point of view of satisfaction of their economic needs. They realize that forest and land, forest and man are intricately linked. Forest, water, agriculture and livestock form an interconnected system to sustain ecology and human life.

They express the view that while it is necessary to cut trees for domestic needs, only the old and mature trees should be cut and they should be replaced by planting new ones. Peoples have a fair knowledge of forest management because they came out with the suggestion of growing different varieties of trees to be able to meet the various needs of the people. They were also fully aware of the vulnerability of their soil, forest, and water and their interdependence upon them.

The only ironic but entirely predictable development today is that many villagers view the thick forests as their enemy because there is the fear of the thick forests being declared "reserved", thereby further increasing their problems of meeting the basic needs. This is an extreme form of alientation wherein forest now appears as an entity opposed to the villagers.

It is true that after the government ban of 1981, the cutting down of trees has diminished a little, but still timber poaching and robbing is on because of corrupted *patwaries* and because the penalties are too mild. Despite the fact that the villager is aware that gathering firewood, cutting trees for fodder and other purposes, grazing of cattle and goats all are stripping his land of its greenery, he still goes on doing it. This is because there is no alternative to the use of forest - they owe their survival

to it - even though they realize it as a short-term policy and soon their villages are going to become treeless. Probably, if they have some control on their forests and the economy was strong enough to ensure the necessities of life to these villagers, the forest would be stable. Therefore, the reasons for deforestation have to be located in a host of other long-term problems like agricultural stagnation, lack of alternative employment and the participation of people in managing their environment. To blame the local people for forest destruction is an example of "blaming the victims". The government has largely devastated the mountains environment by its policies rationalized by the long-standing claims that deforestation results from over-use of trees by indigenous agricultural villages. But in reality villagers usually cut trees for their minimal needs for construction of houses, manufacture of agricultural implements and for firewood and fodder they lop branches instead - all activities which are essential to meet their basic needs.

Even though people are aware that the natural environment is being destroyed, on enquiry it was found that the people in general have not heard of the protest movement of Sunderlal Bahuguna, or of the appropriate technology of C.P. Bhatt or of the efforts of conservation by the Uttarkhand Sangharsh Vahini, movements aimed at conservation of the environment.

CHAPTER V

MIGRATION AND ITS IMPACT ON VILLAGE ECONOMY

Population movement within and between societies is a historical feature of both development and underdevelopment. By development, usually we refer to capitalist development. The specific feature of capitalist growth is that it creates unequal development. In India, despite efforts at planned development, this feature is imminent. Pauri Garhwal is an example of such an underdeveloped area, in an otherwise growing economy. In this chapter, we are only dealing with migration and how it accentuates underdevelopment.

In Pauri Garhwal migration is due to underdevelopment. It is one of the few districts of Uttar Pradesh which shows practically no trend of in-migration, but a growing tendency of outmigration. In the study villages, 58.4 per cent of the population has less than 2 acres of total landholding and agricultural productivity is fairly low (as discussed in the previous chapter). As a result a large number of able-bodied men have to migrate to earn their living, employment opportunities in this area being negligible.

PATTERN OF MIGRATION

Migration is usually partial, permanent or seasonal. In the study area there is limited permanent migration and the dominant pattern of migration is partial and male-dominated. There are primarily two reasons for this -

TABLE - 25

MIGRATION PATTERN IN THE FOUR PEASANT GROUPS

SL. NO.	CATEGORISATION ACCORDING TO TOTAL LAND HOLDING	TOTAL NO. OF HOUSE HOLDS	HOUSEHOLDS HAVING MIGRANTS		TOTAL NO. OF MIGRANTS	AVERAGE MIGRANTS PER FAMILY
			NUMBER	%		
1.	VERY POOR (LESS THAN 2 ACRE)	94	53	56.4	175	1.86
2.	MARGINAL (2 - 4 ACRE)	48	33	68.8	73	1.52
3.	SUBSISTENCE (4.01 - 6 ACRE	11	8	72.7	47	4.27
4.	ABOVE SUBSISTENCE (MORE THAN 6 ACRE)	8	6	75	18	2.25
	TOTAL	161	100	62.1	313#	1.94

NOTE : # Total number of migrants reported was 313 but detailed information was available of only 280 migrants.

SOURCE : Household survey.

(a) the majority of the migrants still own land in the villages and they are unwilling to forgo this ownership of land. Though land is regarded as a "status symbol", at the same time it is the last economic resort to fall back upon.

(b) a large number of migrants prefer to keep their families in the village. They can only visit them once a year, or more often, if possible, because of the transferable and temporary nature of their job or due to economic constraints. Majority of the migrants income is not high enough to enable them to keep their families at the work place.

It is this partial migration which compensates for the underdeveloped local economy and brings along with the money social and cultural changes as well.

Table 25 shows the pattern of migration in the four peasant groups. The landed groups report higher percentage of households with migrants as compared to the very poor peasants and marginal peasants. The average migrant per family is highest in the subsistence group.

PEOPLE'S PERCEPTION ABOUT CAUSES OF MIGRATION AND ITS DESIRABILITY

Increasing migration is primarily attributed to economic reasons. People feel it is more profitable and wiser to migrate to the cities in search of jobs. They

feel, "we toil so hard on the fields and what returns do we get? We even fail to feed our own families. Ultimately we buy from the shop. If one has to finally resort to buying from the market, why not work and live in the city? No one really wants to leave their ancestral home, but the conditions here compel them to migrate to the city to fill their stomach."

Fifty-seven year old Inder Singh said: "Why would anyone want to stay here in these conditions. Our fields have become infertile, forests are denuded - even grass and wood is difficult to get. Produce is diminishing. The steep land makes terracing a difficult job. These terraces also get swept away in the monsoon. Whatever little produce is there is often destroyed by the wild animals. It is better to go to the city, toil there and face hardships, at least the chances of making ends meet are more."

Thus many villagers feel that migration is due to the decline in the quality of life in the village. Ecological changes have brought about scarcity of fuel, fodder and water. These problems are compounded by declining agricultural produce, coupled with inadequate employment opportunities. Villagers have to work harder, walk further and still needs like water, food, fuel wood and fodder remain unmet. Then the area lacks basic infrastructure and other facilities, like nearby medical services, drinking

water, proper transport and communication links and regular electric supply. Villagers feel that people migrate from the village to get away from these difficulties. Others feel that the lure of the city life draws them to the city. They think that life in city is comfortable and there is a possibility of social mobility. A fifty-one year old "dom" from Badoli (Bari) said: "People migrate from the village to the city to improve their lot. By doing desk jobs they earn respect and soon become moneyed. Working in city makes them "bara aadmi" (big man)".

A few villagers feel that people are also forced to migrate to the city for sake of better education. The educated then do not want to work in the fields and it is impossible to get job commensurate to their educational qualification in the village itself. Many villagers also feel that without higher education their children stand no chance in the job market, hence for this they have to migrate.

Interestingly, many villagers viewed the "migrant" as the most eligible bachelor for their daughter. They do not want to marry their daughter to a farmer, a boy living in the city is "preferred" to even a farmer with more land.

The condition of the landless or very poor and marginal peasants is worse. With very little or no land, meagre produce and paucity of wage labour they find it difficult to

survive. Hence, finding it difficult to survive, at times they are forced to migrate in search of money. There is a general belief that the poorest sections of the village contribute maximum number of migrants. This is a myth, as indicated by our data on migrants per family, as well as families with migrants (Table 25). Compared to the very poor and marginal peasants, the peasants with more land have a higher rate of migration, according to both these indicators. Dabal Das, a dom, tried to explain this as follows: "migration is not an easy affair. The cost of migration in form of transportation and living expenses, till one finds a job is immense. Then it is not easy to find work. We lack the required education, means and contacts in the city to get work. Therefore, despite wanting to migrate we are unable to do so."

While the increasing migration in the rich class with sufficient agricultural produce was due to their desire to enhance their incomes. They also want to put their income in the land in the form of new agricultural methods, like use of chemical fertilizers and new variety of seeds like HYV seeds etc. This is also reflected in the villages by the return of successful individuals to build residences and use their land.

Thus extreme poverty is a deterrent to migration as it creates constraints of resources needed to migrate. But

there are some poor peasants who feel that besides lack of resources to migrate, it is definitely wiser to stay on in the villages. Twenty-seven year old Yashpal Singh, a dom said, "I prefer to stay here and look after what I already have, however small and invaluable it may be, than go in search of something and even loose this that I have. In the village even the poorest never sleeps hungry - that is the way of our village life. Everyone has some structure to call a home and something to eat. In the city you have to pay rent and buy everything. At least out here fuel, fodder, some milk and food can be raised free of cost. Thus, there is independence, respect and dignity in the village. City life is only full of difficulties. In the city job is not easy to get. Here one at least gets something to eat."

Many villagers blame the government for its lack of interest in this area as the main cause of migration. They feel that the government has not made any efforts to solve the problems of the people. It has been inadequate in dealing with the problems in the area. As a resident from Badoli (Choti) said, "The government has not made adequate efforts to give local people some jobs here. Government spends so much on Jawahar Rozgar Yojana, but what is the use of such a programme? Very few people get work under it and that even for very few days. Instead the government should

set up a factory keeping in mind the local needs of the people."

Others feel that more than opening a factory in the area, the government should solve the agriculture-related problems of the peasants. They feel that if improved methods through research and development specific for hill regions are implemented, production can increase in the hill region. But in absence of such efforts people will keep migrating. Therefore, in people's view the laxity on part of the government is another cause for increasing migration.

Out of 100 households reporting migration, 77 per cent households report only partial migration and 21 per cent households report cases of permanent migration. This indicates that migration is not out of choice but forced. If one looks at the reasons of migration in this area in terms of "push" and "pull" factors, both are found playing a role in migration. However, "push" factors are more dominant. In fact in the last few years the natural environment of the hills viz soil, water, forest has been so badly degraded that difficulties of the inhabitants have become manifold. The erosion of the common resources has also led to an uncertainty about their future. In order to mitigate their problem they are rapidly migrating away from the hills.

TABLE - 26

AGE DISTRIBUTION OF THE MIGRANT WORKERS ACCORDING TO LANDHOLDING

SL. NO.	AGE LEVEL (In Years)	MIGRANTS WORKERS POPULATION (NOS. & %)				
		VERY POOR PEASANT (LESS 2 ACRE)	MARGINAL PEASANT (2 - 4 ACRE)	SUBSISTENCE PEASANTS (4.1 - 6 ACRE)	SUBSISTENCE PEASANTS (MORE THAN 6 ACRE)	TOTAL
1.	0 - 15		1 (100)			1 (0.57)
2.	16 - 35	59 (52.7)	35 (31.3)	12 (10.7)	6 (5.4)	112 (64)
3.	36 - 55	25 (44.6)	17 (30.4)	7 (12.5)	7 (12.5)	56 (32)
4.	Above 56	3 (50)	3 (50)			6 (3.43)
	Grand Total	87 (49.7)	56 (32)	19 (10.9)	13 (7.4)	175*

NOTE : (i) * Information is pertaining to 175 migrants workers on whom detailed information was available.

(ii) Only two workers are female.

(iii) Figures in parenthesis indicate migrants

(a) peasant group percentages are of total (row)

(b) total percentage is of the grand total

SOURCE : Household Survey

... Thus people's perception of causes reflects a mixture of factors linked together. These are the very processes of underdevelopment with its ensuing lack of development of local resources and technologies, inadequate and inappropriate government strategies in providing services or initiating production activities. Declining trend of investing into land and gradual loss of control over forests and other resources derived from them, further adds to dwindling opportunities for employment locally.

CHARACTERISTICS OF THE MIGRANTS

Characteristics of the migrants like age, sex, educational level and skills, their links with the village all bear an impact on the village economy. We therefore, examine these characteristics in this section.

Age and Sex

Most of the migrants migrate between the age of 16 and 35 years. Table 26 shows that 64 per cent of the migrants fall in this age-group while 32 per cent are between 36 and 55 years. This suggests that the majority migrate at a young age so that they have a longer period of working age. An interesting observation is that when the ages of migrants from very poor and above subsistence groups are compared, the latter has a higher proportion of 36-55 age. Probably

TABLE - 27

THE EDUCATIONAL LEVEL OF MIGRANTS WORKERS ACCORDING TO LANDHOLDING

SL. NO.	EDUCATIONAL LEVEL	VERY POOR (LESS THAN 2 ACRE)	MARGINAL (2 - 4 ACRE)	SUBSISTENCE (4.1 - 6 ACRE)	ABOVE SUBSISTENCE (MORE THAN 6 ACRE)	TOTAL
1.	Illiterate	4 (100)				4 (2.3)
2.	Primary	10 (66.7)	5 (33.3)			15 (8.6)
3.	Middle	25 (71.4)	6 (17.1)	1 (2.9)	3 (8.6)	35 (20.0)
4.	High School	15 (38.5)	22 (56.4)	1 (2.6)	1 (2.6)	39 (22.3)
5.	Intermediate and above	33 (40.2)	23 (28)	17 (20.7)	9 (11)	82 (46.9)
	Grand Total	87 (49.7)	56 (32)	19 (10.9)	13 (7.4)	175

NOTE : Figures in parenthesis indicate

i) peasant group percentages are of the total (row)

ii) total percentage is of the grand total

SOURCE : Household Survey

.....this is because in the better off the urgency for earning is not as acute.

Out of the 280 migrants on whom information was available, 175 are workers (all males, except 2). Of the remaining 105, 32 are students (all males), 30 are wives and 43 children. This male-dominated pattern of migration results in the creation of a lop-sided demographic profile in the village. More women, children and older people are left in the village. Such demography has an impact on local production. In the local workforce women outnumber men and they have to labour more to perform household and agricultural task. Information collected during the field survey show that on an average a woman works almost 11 hours a day (agriculture 3.6 hours, household work 3.53 hours, animal tending 3.41 hours and children 0.82 hours). Apart from the heavy labour they perform, the women also carry the social burden of looking after the young and old, coupled with malnutrition and lack of adequate health facilities. These burdens create conditions conducive to ill-health of women.

Education

Compared to the total population (Table 12 and 13), the educational level of the migrant workers is more. 46.9 per cent of the migrants are Inter and above (Table 27) while

TABLE - 28

OCCUPATIONAL PATTERN OF MIGRANT WORKERS

SL. NO.	GROUPS	GOVERNMENT SERVICES	PRIVATE SERVICE	INDUSTRY & FACTORY	PETTY BUSINESS	OTHERS	TOTAL
1.	VERY POOR PEASANT (LESS THAN 2 ACRE)	31 (41.9)	35 (61.4)	15 (46.9)	3 (75)	3 (37.5)	87 (49.7)
2.	MARGINAL PEASANT (2-4 ACRE)	20 (27)	15 (26.3)	16 (50)		5* (62.5)	56 (32.0)
3.	SUBSISTENCE PEASANT (4.1 - 6 ACRE)	14 (18.9)	5 (8.8)				19 (10.9)
4.	ABOVE SUBSISTENCE PEASANT (MORE THAN 6 ACRE)	9 (12.2)	2 (3.5)	1 (3.1)	1 (25)		13 (7.4)
	GRAND TOTAL	74 (42.3)	57 (32.6)	32 (18.3)	4 (2.3)	8 (4.6)	175

NOTE : i) * Three are male and two female

ii) figures in parenthesis indicate that

a) occupation pattern percentages are of the grand total (column)

b) total percentage is of the grand total

SOURCE : Household Survey

TABLE - 29

PLACE OF MIGRATION

SL. NO.	PLACE OF MIGRATION	TOTAL MIGRANTS
1.	Within District	48 (27.4)
2.	Within State, outside District	46 (26.3)
3.	Outside state	
	a) Delhi	33 (18.9)
	b) Punjab	25 (14.3)
	c) Bombay	5 (2.9)
	d) Others	18 (10.3)
	Grand Total	175

NOTE : Figures in paranthesis indicate that the total migrant percentages are of the grand total.

SOURCE : Household Survey

the majority of the total population (Table 12) is educated only up to primary level. Such figures reflect that with the increase in educational level, the tendency to migrate also increases. Being educated they are comparatively more equipped to find jobs in the city and hence they migrate. Educational level of the landed groups is generally higher than the others, with all workers in this group being at least middle pass.

Occupational Pattern

The occupational pattern of migrant workers shows a diversified character (Table 28). They are engaged in various jobs from private work, including menial jobs to government services of high cadre. The high percentage of workers (42.3 per cent) in government services reflects the preference of this service to other jobs. Private services and industry and factory jobs are dominated by very poor and marginal peasants.

Links with the Village

Majority of the migrants migrate to places within the district (27.4 per cent); or they migrate outside the district but within the state (26.3 per cent). Among places outside the state, Delhi and Punjab get the major influx of migrants from this area (Table 29). 41.7 per cent migrants

TABLE - 30

FREQUENCY OF THE VISITS TO THE VILLAGE BY THE MIGRANT WORKERS

SL. NO.	FREQUENCY OF VISITS	VERY POOR (LESS THAN 2 ACRE)	MARGINAL (2 - 4 ACRE)	SUBSISTENCE (4.1 - 6 ACRE)	ABOVE SUBSISTENCE (MORE THAN 6 ACRE)	TOTAL
1.	Never	13 (40.6)	9 (28.1)	7 (21.9)	3 (9.4)	32 (18.3)
2.	Once a Year	44 (57.1)	23 (29.9)	7 (9.1)	3 (3.9)	77 (44)
3.	More than once a year	30 (45.5)	24 (36.4)	5 (7.6)	7 (10.6)	66 (37.7)
	Grand Total	87 (49.7)	56 (32)	19 (10.9)	13 (7.4)	175

NOTE : Figures in paranthesis indicate

i) peasant group percentages are of the total (row)

ii) total percentage is of the grand total

SOURCE : Household Survey

TABLE - 31

THE LEVEL OF INCOME OF MIGRANT WORKERS

SL. NO.	INCOME/MONTH (In Rupees)	VERY POOR (LESS THAN 2 ACRE)	MARGINAL (2 - 4 ACRE)	SUBSISTENCE (4.1 - 6 ACRE)	ABOVE SUBSISTENCE (MORE THAN 6 ACRE)	TOTAL
1.	Less 500	3 (50)	3 (50)			6 (3.4)
2.	501 - 1000	28 (58.3)	14 (29.2)	3 (6.3)	3 (6.3)	48 (27.4)
3.	1001 - 1500	14 (37.8)	16 (43.2)	4 (10.8)	3 (8.1)	37 (21.1)
4.	1501 - 2000	16 (44.4)	12 (33.3)	3 (8.3)	5 (13.9)	36 (20.8)
5.	2001 - 2500	14 (53.8)	6 (23.1)	5 (19.2)	1 (3.8)	26 (14.9)
6.	More 2500	12 (54.5)	5 (22.7)	4 (18.2)	1 (4.5)	22 (12.6)
	Grand Total	84 (49.7)	56 (32)	19 (10.9)	13 (7.4)	175

* Figures in parenthesis indicate

i) peasant group percentage is of total (row)

ii) Total percentage is of grand total

SOURCE : Household Survey

left the village two to twelve years back and 12 per cent left within the last two years (field survey). This shows that the process of migration is on.

Those migrants employed within the district or towns adjoining the district, visit their village more than once a year, usually during the ploughing time when their labour is required for this job. They constitute 37.7 per cent of the total migrant workforce (Table 30). But most of them i.e., 44 per cent visit their village once a year. They are either placed far off, or employed in services with only annual leave. Also frequent visits to the home village involve additional monetary burden, therefore, regular visits to the village are not made. 18.3 per cent migrants are those who have not visited their village for the last ten years. They are the ones who are relatively better placed, serving in far off places, having weaker links with their home village. Most of them have their families with them and they usually do not remit any money to the village.

INCOME AND REMITTANCES

The levels of income of the migrants are given in table 31. 27.4 per cent earn an income between Rs.501 and Rs.1000 per month. There are very few migrants who fall in the higher ranges. Only very poor peasants fall in less than Rs.500 per month group. The low levels of earning of the

TABLE - 32

REMITTANCES PER MONTH (IN RUPEES) BY THE MIGRANT WORKERS

SL. NO.	REMITTANCES PER MONTH (In Rupees)	VERY POOR (LESS THAN 2 ACRE)	MARGINAL (2 - 4 ACRE)	SUBSISTENCE (4.1 - 6 ACRE)	ABOVE SUBSISTENCE (MORE THAN 6 ACRE)	TOTAL
1.	Remit nothing	22 (40.7)	20 (37)	7 (13)	5 (9.3)	54 (30.9)
2.	Less 200	43 (62.3)	17 (24.6)	5 (7.2)	4 (5.8)	69 (39.4)
3.	201 - 400	11 (45.8)	9 (37.5)	3 (12.5)	1 (4.2)	24 (13.7)
4.	401 - 600	6 (37.5)	6 (37.5)	2 (12.5)	2 (12.5)	16 (9.1)
5.	601 - 800	3 (33.3)	3 (33.3)	2 (22.2)	1 (11.1)	9 (5.1)
6.	801 - 1000	2 (100)				2 (1.1)
7.	More 1000		1 (100)			1 (0.57)
	Grand Total	87 (49.7)	56 (32)	19 (10.9)	13 (7.4)	175

* Figures in parenthesis indicate

i) peasant group percentage is of total (row)
ii) Total percentage is of grand total

SOURCE : Household Survey

migrants lead to low level of remittance. All who migrate do not necessarily remit money. In our study 39.4 per cent of the migrants remitted less than Rs.200 per month - and 30.9 per cent did not remit any money (Table 32) majority being very poor peasants. Some of them remitted in the form of consumable goods instead of money. Migrants who do not send money are the ones who have either weak links with their families or who have their families with them. Often, it takes the migrant time to settle in a new place and to start earning enough to send home. The migrants feel that even if the amount remitted is small it enhances the family income and is more in comparison to the earnings of the non-migrant families. The small amounts of remittances and the meagre inflow of money into the households, determine the life pattern in a subsistence economy.

IMPLICATIONS OF MIGRATION

This area is an example of an underdeveloped area in an otherwise growing economy. Because of the problem of underdevelopment, it cannot support its population, therefore, push and pull factors become operant, causing migration. With migration, though the population decreases, the problems of underdevelopment remain. While the underdevelopment of an area acts as a push factor for migration, migration in itself has certain implications for

TABLE - 33

SHIFTS IN TERMS OF CULTIVATION OF LAND IN THE FOUR PEASANTS GROUP IN RELATION TO INCOME LEVEL PER MONTH OF THE HOUSEHOLDS

HOUSEHOLD INCOME FROM ALL SOURCES PER MONTH	VERY POOR PEASANTS (LESS THAN 2 ACRE)				MARGINAL PEASANTS (2 -4 ACRES)				SUBSISTENCE PEASANTS (4.1 - 6 ACRES)				ABOVE SUBSISTENCE PEASANTS (MORE THAN 6 ACRES)				TOTAL LAND CULTIVATED
	SHIFT	SAME	NEW	TOTAL CULTIVATE	SHIFT	SAME	NEW	TOTAL CULTIVATE	SHIFT	SAME	NEW	TOTAL CULTIVATE	SHIFT	SAME	NEW	TOTAL CULTIVATE	
NO SOURCE		23	7	30	7	3		3									33
BELOW 500		33	17	50	14	6	3	9	6		1	1	1	1		1	61
501 - 1000		26	8	34	6	3	1	4	3		2	2	2	2		2	42
1001 - 1500		7	5	12	5	1	1	2			1	1	2				15
1501 - 2000		3	1	4					1								4
2001 - 2500																	
ABOVE 2500		2	3	5	2	1		1	1								6
TOTAL		94	41	135	34	14	5	19	11		4	4	5	3		3	
HOUSEHOLDS ACCORDING TO TOTAL OWNERSHIP OF LAND		94*				48**				11				8			161

NOTE : (i) SHIFT refers to number of households who shift out of that group in terms of cultivating land to enter a new group.
(ii) SAME refers to number of households who cultivate the same area of land as they own and therefore remain in same group.
(iii) NEW refers to number of households who are new entrants in that group (from some other group) in terms of cultivated land.
(iv) Household income includes income/month from all sources.
(v) * 69 of these households do share cropping (i.e. 73.4%)
(vi) **18 of these households do share cropping (i.e. 37.5%)

SOURCE : Household Survey

the area which are both positive and negative.

Economic Implications

The positive implications of migration are that migration and its subsequent money inflow at least provides subsistence. It has led to inflow of money in the village, however small it may be. From the economic point of view most villages consider migration as both natural and beneficial. They point out - "migration from the village is like the city people going abroad. Too much emotionality on this count is not desirable."

But there are many negative implications of migration. Migration creates a "money-order" economy resulting in a situation where there is lack of productive activities and non-availability of local produce, but money comes and markets penetrate, further suppressing the urge to produce. Increasing rate of migration leads to decrease in manpower in the village, which in turn explains less land being cultivated and overall falling production. Table 33 shows the shifts in cultivation.

From Table 33 certain trends emerge.

i) Very poor peasants are unable to cultivate more than two acres of land, despite 73.4 per cent doing share-cropping. This is because they own negligible land and even with share-cropping they can add only a few more [illegible]

(local unit of measuring land - 1 nalli is equal to 240 sq.yards or 50 nalli = 2.477 acres) to their existing land.

ii) Even if the very poor peasants have some other source of income, whatever may be its level, seldom are they in a condition to leave their lands fallow.

iii) No household is able to cultivate much more than what they own, to be able to shift them upwardly in terms of land categories. This can be explained by the poor agricultural productivity and hence less incentive to invest in land.

iv) Interestingly, all households in the subsistence peasants group cultivate less than what they actually own. This group also sends the largest number of average migrant per family.

v) Among the above subsistence peasants, of the families with Rs.1,000/- per month as source of income, at least 50 per cent cultivate all the land that they own, but as soon as families have more than this amount of money, they start cultivating less land.

vi) In marginal peasants too, as soon as households have more than Rs.1,000/- per month, they start cultivating less than what they own.

vii) Landed groups have no households with no source of income. Among marginal peasants, seven of such households cultivate less than what they own.

viii) There are very few households with Rs.2500/- or

more per month. Majority of such households cultivate less than what they own, except one marginal peasant household. Very poor peasants even in this household income level have to cultivate all their land.

Therefore, due to migration and its subsequent money inflow, production impetus is gone, and small money investments are made in land or local produce.

Despite the "money-order" economy being in operation here, the growth of the area has remained more or less stagnant. The area still demonstrates low levels of living standards and productivity. This is because the maintenance of parents, wives and children left in the village by the migrants, necessitates that the remittances are channelised in the purchase of consumption goods rather than invested in productivity oriented activity. Given the lack of local manpower and technology such investment is not even seen as economical. The given low level of agricultural production does not generate sufficient food and income to even support the non-migrant population. This leaves little room for savings to accumulate.

Environmental Implications

With migration and money inflow, there is non-use of land to a considerable extent. This non-use spoils the quality of land and it breeds lack of concern and earlier tender care with which the villages tended to land and

....forest is slowly lost. It also creates lack of investment in land for renewing it, therefore local resources continue to degrade. Easy flow of money from outside adds to the problem. Since environment per se is no more the source of their sustenance, people tend to ignore it in their expenditure and use pattern.

Social Implications

In an area where for the past few decades grain production has been inadequate to sustain the population, a more widespread adaptive strategy has been to look for alternative sources of employment. Since these do not exist within the area, people have no option but to "follow their soils down the slope". This has created changes in the agrarian relations and social structures. Women's burdens are aggravated by the absence of adult males. Apart from the heavy labour they perform, they carry the social burden of looking after the young and the old. It also leaves women devoid of the normal protection of the male family member. With the absence of able-bodied males, young children are often compelled to work extra hours on the fields and graze animals.

Migration also leads to fragmentation of family often leading to two establishments, one at the work place and another in the village which is not viable economically.

Increasing rate of migration amongst the educated also reduces the pressure of the literate to improve the conditions.

Though migration has led to the opening up of the region to the outside world, the returning migrants bring with them new values which often makes them victims of consumerism, commercialization and emulation effect. This is reflected in the number of television sets, two-in-ones, one finds in the village. Given the emulative tendencies and savings of the richer migrants new homes requiring more timber and even cement structures are being built. Therefore, this money inflow does not necessarily reduce the environmental burden on the hills. Thus inputs that further escalate the problem are brought in e.g., cement houses etc. These are inputs of the capitalist development taking place outside the region and bringing them in does not help the area.

Thus we can conclude that while migration cannot be completely checked given the interlinked nature of the economy, appropriate developmental strategies can perhaps provide some checks on this process. It is clear that neither the intensification nor expansion of agriculture in hilly areas offers a viable solution to the problem of populations and loss of control over common resources. The process of ecological and social fragmentation will have to

be reversed through exploration of alternative technologies based on existing technologies (e.g., fertilizers and pesticides) and expansion in community controls. Only then can migration be checked to a certain extent.

CHAPTER VI

HEALTH AND ITS ENVIRONMENTAL CORRELATES

Having presented the data we would now like to examine the interlinkages between various subsystems of the environment and understand the way they cumulatively influence human health. In other words our attempt is to explore the linkages between social and natural environments which in turn alter the physical environment and thus influence health both directly and indirectly.

We would also like to analyze in the light of our own analysis the various approaches which are being used for tackling environmental problems in Uttarkhand.

Lastly in the light of our findings we would like to re-examine the definition of Environmental Health and attempt to sharpen it further. This chapter is therefore divided into three sections.

SECTION I

ENVIRONMENTAL CORRELATES OF HEALTH

I. PERCEPTION OF HEALTH AND NUTRITION

The emphasis of our study was to understand environmental issues in Pauri with a special focus on aspects that directly or indirectly influence health. Therefore, collecting data on health as such was not the focus of our study. However, we have tried to understand the perception of the people regarding common diseases in

Table 34

Peoples Perception of Common Diseases and thier Ranking

Ranking According to People	Fever Cold & Cough	Stomach Pain, Diarrhoea, Dysentry	Malaria	Breath-lessness	Weakness, Backache, White Discharge Anaemia	Skin Diseases Itching, Boil	Typhoid, Jaudice	T.B.	Total No.of Respond-ants
I	85 (57.8)	62 (38.5)			14 (8.7)				161
II	44 (27.3)	91 (56.5)		8 (5)	11 (6.8)	7 (4.3)			161
III			28 (17.4)	39 (24.2)	35 (21.7)	59 (36.6)			161
IV			5 (3.1)	26 (16.1)	64 (39.8)	61 (37.9)	2 (1.2)	3 (1.9)	161
V				27 (16.8)	89 (55.3)	31 (19.3)	11 (6.8)	3 (1.9)	161

Note : (i) Clinical names of diesases are not given because people were asked to name the five most common diseas in the area. They way people responded, the same names have been used here.

(ii) Figures in paranthesis show percentage of total number of households/ respondents. (161)

Source : Household Survey

the area and the use pattern of services (as discussed in Chapter II). Table 34 shows the people's perception of prevalence and ranking of diseases in the study area. From the table it is evident that the most commonly cited diseases are fever, cold and cough followed by stomach related problems like diarrhoea, dysentery and abdominal pain. Almost 57.8 per cent villagers feel that the most common disease is fever. But one must remember that the term "fever" has wider meaning for the people. It not only includes diseases like malaria, typhoid but also covers many unidentified diseases of which fever is only a symptom. On the other hand, 38.5 per cent villagers feel stomach related ailments are more common than even fever. However, the two are either ranked first or second by the villagers.

After these two diseases the villagers feel the most of them suffer from weakness, backache, blood deficiency (anemia). Women suffer more from backache, blood deficiency (anemia) and white discharge. They also complained of skin-related problems. Breathlessness was another frequently cited problem especially amongst the middle-aged and the old. But these ailments were not given priority in treatment by the villagers until they led to further complications. In any case, the villagers generally only attempt to combat diseases when it becomes so severe that it impedes their normal working. Fevers are still attended to

compared to other ailments like weakness, breathlessness etc. which are largely ignored. Priority is not given to these problems because villagers' experience tells them that there is usually no cure of these ailments. Many feel it is a waste of time, effort and money to treat them because with medicine one only gets short-term relief and very soon the person relapses into the former condition.

Peoples perception of common diseases was cross-checked with in-depth interviews with PHC doctors and local practitioners. From the interviews similar pattern of diseases emerged. According to the Medical Officer at the PHC:

> About 60% diseases are intestinal. Almost 70-80% people have worms. 10% patients who come to the OPD are malnourished and almost everyone is anemic, but the percentage of women in both cases is higher. People also have various kinds of skin diseases and among women leucorrhea is very common. There are few cases of T.B. here, the reason for them again being malnutrition and alcoholism.

The picture shows the pattern of disease is more or less the same as we find in any other underdeveloped area in the state of Uttar Pradesh. [According to survey of Causes of Death (Rural) Annual Report, 1988, the percentage distribution of death by major cause-groups in Uttar Pradesh (1988) are 24.9 per cent in coughs cause-group followed by 16.3 per cent causes peculiar in infancy, 9.2 per cent due to digestive disorders and 6.6 per cent in other clear

symptoms (like jaundice, measles, tetanus, poliomyelitis, cancer, anaemia etc.)]. This pattern is not surprising given what we have found as the state of physical environment in the area.

Food consumption pattern of a particular region is to a considerable extent dependent on food production pattern of individual households. E.T. Atkinson (1884-86) talking about the "food" of the people of Garhwal said:

> Taking them as a whole, the people are very frugal in their habits. Mandua (elevesene coracona) and mandira or Jhangora (oplismenlis frumentacens) form the staple food of the lower classes in the hills, varied occasionally with rice. The better classes use wheat, rice, and the various species of dal, with vegetable and gur, a preparation of molasses. But with few exceptions all classes readily take animal food except that forbidden by religion and the flesh of carnivorous animals. Goats, hill sheep and venison are eaten....Milk is a universal article of diet and tea is gradually making its way.... Vegetables of all kinds wild and cultivated are eaten, and hillmen consider most herbs and roots to be edible....

But with time considerable change in the food consumption pattern has occurred. This can be attributed to the changes in crops grown and the changing economic status of the household. A villager from Bharet says:

> earlier, coarse grains like mandua and jhangora and home pounded rice formed the staple diet of all people especially the poorer section. Milk was consumed by all. Meat was also eaten by most people. Now a lot of people prefer to eat rice and wheat. Grains like mandua and jhangora which are very nutritious are either not grown or whatever little is grown is hardly consumed by the households. Instead they are given to the cattles. Earlier all families had at least 4 or 5

TABLE - 35

MILCH CATTLE PER HOUSEHOLD IN THE THREE CASTE GROUPS

CASTE	TOTAL NO. OF HOUSEHOLDS	NO CATTLE	1 - 2 CATTLE	2 - 4 CATTLE	MORE THAN 4 CATTLE
RAJPUTS	124	13 (10.5)	46 (37.1)	45 (36.3)	20 (16.1)
BRAHMINS	14	1 (7.1)	2 (14.3)	7 (50)	4 (28.6)
S.C.	23	5 (21.7)	14 (60.9)	1 (4.3)	3 (13)
TOTAL	161	19 (11.8)	62 (38.5)	53 (32.9)	27 (16.8)

NOTE : (i) Cattle includes milch cattle (cow & buffalo).

(ii) Figures in parantheses are percentages of the total number of households (row-wise)

SOURCE : Household Survey

TABLE - 36

MILCH CATTLE PER HOUSEHOLDS IN THE FOUR GROUPS ACCORDING TO LANDHOLDING

GROUPS	NO. CATTLE			1 - 2 CATTLE			2- 4 CATTLE			MORE THAN 4 CATTLE			GRAND TOTAL
	Raj-put	Brah-mins	S.C.	Raj-put	Brah-mins	S.C.	Raj-put	Brah-mins	S.C.	Raj-put	Brah-mins	S.C.	
VERY POOR PEASANTS (LESS 2 ACRE)	6 (6.3)	1 (1.1)	5 (5.3)	22 (23.4)	2 (2.1)	14 (14.9)	22 (23.4)	7 (7.5)	1 (1.1)	7 (7.5)	4 (4.3)	3 (3.2)	94
MARGINAL PEASANTS (2 - 4 ACRE)	4 (8.3)	0	0	17 (35.4)			17 (35.4)			10 (20.8)			48
SUBSISTENCE PEASANTS (4.1 - 6 ACRE)	3 (27.3)			5 (45.5)			2 (18.2)			1 (9.1)			11
ABOVE SUBSISTENCE PEASANTS (MORE THAN 6 ACRE)				2 (25)			4 (50)			2 (25)			8
TOTAL	13 (8.1)	1 (0.6)	5 (3.1)	46 (28.6)	2 (1.2)	14 (87)	45 (30)	7 (4.3)	1 (0.6)	20 (12.4)	4 (2.5)	3 (1.9)	(161)

NOTE : i) Cattle includes milch cattle (cow and buffalo).

ii) Figures in paranthesis are percentage of the grand total (row-wise).

SOURCE : Household Survey

> cows, so all got some milk to drink - now with decreasing number of cattle per family, milk has became a rare commodity.

Milk availability has become very restricted because fewer families have enough cow or buffalo to fulfill their milk requirement. Milk yield per cattle has also decreased. Buying milk is out of question for most families, who barely have enough to buy essential food grains. The plight of the Scheduled Caste is worst - with very few having cattle most do not even have milk for tea. Table 35 shows that 21.7 per cent of Scheduled Caste households possess no cattle as compared to 10.5 per cent of Rajputs and 7.1 per cent of Brahmins. At the time of the survey, in Pokhari danda, which is the Scheduled Caste settlement only 3 families had cattle yielding milk. Rest of the 16 families did not even have milk for their tea.

The 'above subsistence' group has almost 25 per cent families with more than 4 cattle per household in comparison to the very poor peasants where 12.7 per cent posses no cattle at all. A surprising finding is that the subsistence group has the largest number of families (27.3 per cent) with no cattle. This is probably due to the fact that this group also reports largest number of migrants. With less manpower, these households probably find it difficult to domesticate cattle (Table 36).

TABLE – 37

FREQUENCY OF DAL COOKED PER HOUSEHOLDS IN THE FOUR GROUPS ACCORDING TO LANDHOLDING

GROUPS	ONCE A MONTH (One Meal)			TWICE A MONTH (One Meal)			ONCE A WEEK (One Meal)			TWICE A WEEK (One Meal)			THRICE A WEEK (One Meal)			EVERYDAY (One Meal)			GRAND TOTAL
	Raj-put	Brah-mins	S.C.	Raj-put	Brah-mins	S.C.	Raj-put	Brah-mins	S.C.	Raj-put	Brah-mins	S.C.	Raj-put	Brah-mins	S.C.	Raj-put	Brah-mins	S.C.	
VERY POOR PEASANTS (LESS 2 ACRE)		1 (1.1)			4 (4.3)		10 (10.8)	7 (7.4)		15 (16)	2 (2.1)	6 (6.4)	15 (16)	7 (7.4)	4 (4.3)	17 (18.1)	5 (5.3)	1 (1.1)	94
MARGINAL PEASANTS (2 - 4 ACRE)										18 (37.5)			19 (39.6)			11 (22.9)			48
SUBSISTENCE PEASANTS (4.1 - 6 ACRE)													7 (63.6)			4 (36.4)			11
ABOVE SUBSISTENCE PEASANTS (MORE THAN 6 ACRE)													5 (62.5)			3 (37.5)			8
TOTAL		1 (0.6)			4 (2.5)		10 (6.2)	7 (4.3)		33 (20.5)	2 (1.2)	6 (3.7)	46 (28.6)	7 (4.3)	4 (2.5)	35 (21.7)	5 (3.1)	1 (0.6)	161

NOTE : Figures in paranthesis are percentage of the grand total (row-wise)

SOURCE : Household Survey

TABLE - 38

FREQUENCY OF DAL COOKED/HOUSEHOLDS - CASTE WISE

CASTE	ONCE A MONTH (One Meal)	TWICE A MONTH (One Meal)	ONCE A WEEK (One Meal)	TWICE A WEEK (One Meal)	THRICE A WEEK (One Meal)	EVERYDAY (One Meal)	GRAND TOTAL
RAJPUT			10 (8.1)	33 (26.6)	46 (37.1)	35 (28.2)	124
BRAHMIN				2 (14.3)	7 (50)	5 (35.7)	14
S.C.	1 (4.3)	4 (17.4)	7 (30.4)	6 (26.1)	4 (17.4)	1 (4.3)	23
TOTAL	1 (0.6)	4 (2.5)	17 (10.6)	41 (25.5)	57 (35.4)	41 (25.5)	161

NOTE : Figures in paranthesis are percentages of the grand total (row wise).

SOURCE : Household Survey.

The typical diet of the people is largely vegetarian. Even for non-vegetarian families meat is not easily affordable, although significant number of people being non-vegetarians, would be happy to consume meat. With meat being consumed in very small quantities and consumption of egg being negligible due to the same reason, the main source of protein is only "dal". Pulses used in the area includes "bhatt", "Urad", "arhar", "gohatha", "masoor", "gram", and "moong". Since their production is so poor very few families consume dal everyday. Although dal is available even in fair price shops and also in the open market, it is an expensive food item for most people, hence not purchased for everyday consumption.

From Tables 37 and 38 it is clear that the poorer the group, the less dal they consume. Landed groups eat dal if not everyday at least thrice a week. If one looks caste-wise, it is the Rajputs and Brahmins who eat dal more often. On the other hand, the majority of Scheduled Caste households eat dal once a week only. Hence, poorer the group, the less would be its dietary proteins.

Vegetable production and consumption is poor. Only during the monsoon for approximately 2-3 months some vegetables are available. Consumption of ghee, oil, sugar, gur and fruits is also on a very low scale. The diet is thus dominated more by wheat, rice, potatoes and onion eaten

with a lot of green chillies.

Poverty and insufficiency of food thus creates conditions in which diseases originate. Villagers themselves recognize the direct link of scarcity with health. They are also aware that:

> despite clean and healthy air, people are usually sick and weak. This is due to the lack of sufficient nourishing food. After a hard days work, we do not even get enough healthy food to ear. *Pahar mein ek sukh to pachas dukh hein.* (If there is one comfort in the hills, there are fifty ills also).

Apart from poor diet, monotonous diet is also very common. Since irrigation facilities are not available in a large part of the area, the soils are also shallow and contain low nutrient contents and therefore a variety of crops cannot be grown.

Some cultural practises of child-birth and traditional beliefs regarding pregnancy etc. also lead to deteriorating health of women. It is a general belief that during pregnancy, the woman should not eat any green vegetable because it will cause pain and trouble at the time of delivery. Therefore, women abstain from taking green vegetables during this period.

Villagers in this area are also of the opinion that the quality of the food has gone down. They blame the use of fertilizers and pesticides for it and also the tendency to buy grains from the market. In comparison to their own

produce they consider the marketed grains to be of poor quality. They also feel that their dietary pattern has undergone change because of their alienation from forests. They say that:

> earlier people used to add seasonal items to their daily food. In winters people ate *Bicchu* grass (a form of green leafy vegetable which grows wild) which helped to keep away cold and they also ate *feru* and *ghenti* (a form of yam growing wild in the forest) during the rainy season. This was very good for the stomach. But these are only available in the forest. Now people did not like to go to the forest and search them out. Instead they resort to taking medicines when they fall ill. Besides, now the state of forests makes it difficult to find these things.

Thus we see that food scarcity and malnutrition in the study villages in Pauri is closely related to its stagnant agriculture, denuding forests and cattle, and the degradation of its soil.

Communicable diseases are rooted in water supply, environmental sanitation, housing and services provided in an area. They are also largely influenced by the availability of food and income. While food determines the status of nutrition of a population which is closely linked to their vulnerability to disease and infection, income determines not only access to food but also access to treatment. Thus we see that while physical environment (this includes those structures which are a result of human action or human labour. Housing, water supply, sanitation and other settlement variables like road, electricity etc.

form part of this subsystem) directly influences the health of the people, the natural and social environment influence health or ill-health indirectly. It does so by determining the physical environment as well as directly contributing to illness by determining availability of natural resources, incomes and access to services and resources.

II. PHYSICAL ENVIRONMENT AND ITS LINKS WITH HEALTH

Housing, drinking water and sanitation are inter-related variables which play a dominant role in determining the health and well-being of a community.

Houses in general are one-storeyed with the room in the groundfloor used for keeping cattle, cooking food and storing wood. The richer households have cowsheds a little away from the main house but such households are few. In most households animals and people stay in the same house. Scheduled Castes in contrast have one-room accommodation where man and animal live in the same room. Sanitary and hygiene conditions are extremely unfavourable in such a set-up. Heaps of cowdung can be seen gathered near the house resulting in insanitary conditions. Villagers are aware that this "is a breeding ground for flies and other insects, and diseases are bound to occur in these conditions".

The rooms in the house are small, dark and stuffy with almost no ventilation. Very few openings are kept in the

dwelling to keep out cold in the winters. Kitchen is the darkest room, the walls and wooden beams being blackened with smoke. Conventional *chula* (stove) and firewood are still being used for fuel. No outlet is made for the smoke and hence the kitchen is full of toxic fumes. This may be the reason for high incidence of respiratory diseases in this area. But there is a general belief amongst the villagers that kitchen smoke and dung both work as a deterrent against pests such as white ant and keep the timber safe.

People are in a habit of using open space for defecation and garbage disposal. There are only seven Rajput households who can boast of having toilets which were constructed under the 'Swach Schuchalya Scheme'. But the members of these households can seldom use these toilets because of unavilability of water for this purpose. They only use the toilets during the rainy season when roof-top water is collected. In fact, villagers are unable to comprehend why any intelligent person should install anything like this in the vicinity of their houses - "it would be dirty and smelly". They feel it is more hygienic to go to the forests to relieve themselves. They do not understand that when they defecate in the open, infection seeps into the sub-soil and travels and pollutes the springs and rivulets and other water courses. Some of the richer

villagers (Rajputs and Brahmins) have a room in the house in which the women bathe. Most villagers go to the natural spring to bathe and wash.

The road to the village is usually a stony pathway full of animal droppings. Walking on these paths is risky specially in the rainy season. There are no drains in this area, water is simply allowed to run-off, down the village path.

The main sources of drinking water here are the natural springs and small rivulets (locally called *gaderas*). In 1984-85 efforts were made to supply piped drinking water to these villages, but the scheme failed because of various reasons discussed earlier. Hence, people are still dependent on the natural openings for meeting their water needs.

Around the spring and rivulets "diggies" (or cement tanks) are built and the water collects into them. The water of the spring appears apparently clean, but it is in reality contaminated by washing and bathing - done in the same spot and by animal droppings found near it. This is specially severe during the summers when the water supply is less.

Many villagers complain about the quality of the drinking water. They are under the impression that the water from the spring is very clean, but the dirt and filth

around the "diggies" contaminates it, causing water-borne diseases like diarrhoea, dysentery, gastro entritus, typhoid, skin diseases like scabies and worm infections. The incidence of these diseases becomes highest in July and August because of the monsoons. This was cross-checked from the PHC doctors as well.

A large number of villagers are aware that if chlorine or bleaching powder is used in the stored water, it will become disinfected. But they complained that the officials at the PHC never distribute these.

During summers the situation becomes worse. People recall springs in Pokhari and Badoli drying up during the summers since last 5 to 6 years. Due to the shortage of water, villagers of these villagers have to walk to the other available springs often situated at great distances. In the monsoons, most families can be seen collecting roof-top rain water which is usually used for bathing and washing purposes. But it is not uncommon to see some people also using it for cooking and drinking purposes.

Water being such a scarce commodity, bathing and washing clothes is rare and consequently insanitary habits develop. Most villagers complain of skin diseases, boils, scabies etc. which are a result of such poor personal hygiene.

Although provision of safe drinking water is a major

need of this area, it cannot be implemented in isolation from environmental sanitation. In fact, the starting point of this should be environmental restoration which will go a long way in improving the sanitation as well as health, nutrition and economy of the area.

III. NATURAL ENVIRONMENT AND ITS LINKS WITH HEALTH

Natural resource endowment of the "environment" affects the health of a community. The relationships are extremely complex and may work through long causal chains which are not immediately apparent.

Forests

The hill population is highly dependent on forests and has certainly been put to various difficulties as a result of depletion of forests and the resulting policies which have been adopted by the forest department. Degradation of the forest resources affects all the links of the ecological chain. This degradation is linked with the changing and competing human perceptions of the "use of nature".

Before the advent of the British, the state had no rights over forests, and it was the local village community which for all practical purposes, owned the forests surrounding the village. Colonial rule brought in commercial forestry which led to conflicts between the peasantry and the state. These conflicts were embedded in

the very different understanding of the social roles of the forests for the peasant use and for the state use. It was aimed at radical reorientation of existing pattern of resource utilization. The forest policy of Independent India also continued on the colonial path of commercialization and denial of hill peoples' basic needs, both through alienation of rights and through ecological degradation.

The needs of the hill people are inextricably linked with the forests. Their daily needs of fuel, fodder, timber are all met by the forests. Besides this the productivity of the cropland, animals and water resources are also dependent on the forests. The forests provide fertility directly through its foliage as "green" manure and indirectly as organic matter cycled through farm animals fed with fodder leaves and grass. Forests also play an important role in providing stable perennial water supply. But because of the degradation of the forests, there is impoverishment of the eco-system leading to scarcity of fuelwood, timber, fodder and drinking water. Due to the depletion of broad-leaf species of trees which conserve rain water and then release it gradually through the year in the form of springs, natural resources of water which had served the villagers for so many years now do not exist or have thinned considerably. Drinking water schemes costing lakhs

of rupees have come to nought as the very source from which water was to be taken have almost dried up. With destruction of forests, there is heavy erosion of soil by water and huge boulders held together by soil get loosened. Due to extreme shortages of fodder some families find it difficult to keep cattle. The milk yield of malnourished cows and buffaloes has gone down drastically. These very forests were once a repository of many herbs and roots of medicinal value. Now, due to degradation many such species have almost disappeared.

It is generally believed that degradation of forests is caused by misuse or overuse of trees by indigenous agricultural villagers alone. Though the pressure of local population does reduce the regenerative capacity of the local environment. But more than this the forced alienation of the hill people from nature has led to the deteriorating conditions of the forest. Government's policies rationalized by the long-standing claim that deforestation results from the misuse and overuse by the local people is an example of 'blaming the victims'. In fact, in such a situation protecting the environment by barricading it further increases peoples alienation and lowers chances of its renewability.

Villagers do not see the forests as means to satisfy their economic needs. They realize that forest, land and

man are intricatly interconnected and this interconnection is important to sustain human life. They are compelled to often degrade the forests because of lack of alternatives. Probably if the economy was strong enough to ensure them the necessities of life, the forest would be stable. Therefore, reasons of deforestation have to be located in other long-term problems like lack of alternatives, employment opportunities and participation of people in managing the forests. The existing governmental policies and programmes and the kind of "development" adopted have led to further deterioration of the fragile eco-system while belying the generation of local employment or materially helping the hill economy. These programmes and policies have been implemented at the expense of the hill peasants and their life support systems.

Agriculture

Earlier writings (like E.T.Atkinson, 1884-86) indicate that before the advent of the British, the hill peasants were able to quite comfortably meet their subsistence requirements, and in certain areas had surplus of grain for the market. The egalitarian structure of the village community, with abundance of forests and other natural resources led to relative prosperity of hill economy. This depiction found verification from the numerous accounts of

European travellers and officials which repeatedly contrasted the fine hill peasantry of nineteenth century with poverty stricken villagers in other parts of India (R.Guha, 1991).

The picture today is considerably at variance from the situation as recorded in the nineteenth century. No doubt there is continuation of dependence on agriculture, the land holdings have been further fragmented and productivity has fallen considerably. The decreasing productivity is due to low investment facilities, decreasing fertility of soil due to decrease in manuring because of decrease in number of cattle, meagre irrigation facilities, decrease in labour because of increasing migration. Besides this, the operational costs have also risen because with increasing male-migration, households have to depend on agricultural labourers to plough the fields. The tendency to buy HYV seeds, fertilizer and pesticides in the irrigated areas also adds to the cost.

But on the whole, the agricultural productivity in the area is declining because of non-investment in land. This is so because

(a) investment in land in the form of use of improved seeds, fertilizers, irrigation etc. in hill agriculture is very limited.

(b) money-inflows are not sufficient.

(c) with migration and the resultant money-inflow, the need to invest in land and increase its productivity seems less as agriculture is becoming much harder to sustain as a viable economic activity.

Though the economy of the area is still primarily agricultural, it obscures one crucial fact that while farming systems still continue to be subsistence oriented, cumulative social and environmental changes have undermined the hill society's capacity to feed itself. As shown in earlier chapters, foodgrain output is no longer adequate for subsistence. Majority of the families have to buy a significant portion of their grain requirement.

The declining agricultural productivity in addition to the social factors discussed above can also be attributed to the deteriorating hill eco-system, particularly the degradation of the natural environment especially the forests. The direct and reciprocal relationship between the loss and degradation of forests and the decline of hill agriculture have been discussed earlier. Because of the denuding forests, there is impoverishment of the eco-system and hill agriculture is entering a downward spiral from which there is seemingly no escape.

In such a state of continuing economic deterioration, people are forced to look for alternative sources of employment. As these do not exist within the area, peasants

have no option but to migrate. Therefore, male-migration has greatly increased, leaving mostly children, women and old men in the village. This has placed additional strain on the women, but the malaise of hill society is by no means restricted to only one section of the society. The presence of environmental change has had a devastating impact on the social fabric of the area. It has created a dual-economy, based primarily on remittances and partially on eroding basis of subsistence agriculture.

The falling agricultural productivity causes the peasants to face food-deficit problems resulting in unbalanced food-intake leading to malnutrition and ill-health. Those located in the dry farming are worst hit, the number of fully 'self-provisioning' peasants or those who actually manage to feed their families all year round on what they grow being extremely small. The stagnation in Pauri is despite anti-poverty strategies of the government, green revolution and massive nutritional and health schemes. This is often explained by the operation of the vicious circle of environmental degradation, poverty, malnutrition and poor health. Within this understanding of vicious circle the major factors are given as increasing population and ensuing loads on natural environment. Our data explains that this vicious circle cannot be understood without looking at Pauri in relation to the developmental processes

in its surrounding areas which are not only creating the "pull" factors but also making in-roads into Pauri through their developing markets, communication systems, transportation and other tentacles of "development". We would therefore like to argue that the problem of environmental degradation needs to be understood within the context of reasons of underdevelopment of hill economies as microsystems within the larger macro-systems of capitalist economy.

IV SOCIAL ENVIRONMENT AND ITS LINKS WITH HEALTH

Pauri Garhwal is an example of an underdeveloped area in an otherwise growing economy. The area is faced with unequal development. Though the economy as a whole is growing, subsistence economy survives here. The area is faced with backwardness as a result of low levels of productive forces. This attributes to low living standards In order to understand the reasons for the backwardness of the area we must look at the specific nature of capitalist growth. The underdevelopment of the area is at once an effect and requirement of this capitalist growth.

In a capitalist economy, the relationship between underdevelopment and development is a relation of labour movements and resources exploitation. Though there is no big evidence of resource exploitation in the study villages,

labour movement is very obvious.

Pauri Garhwal is primarily an agrarian economy where a three tier caste structure of Thuljal/Khasa/Dom exists with an absence of sharp class-divisions. Majority of the population is owner-cultivator, farming with the help of family labour. Though there is absence of sharp inequalities in landownership, land is the basic security for the people and its ownership is something that people do not give up easily. It is true that only 5 per cent (all Rajput households) have more than six acres of land, there are 7.4 per cent households who are landless (all are Scheduled Castes) and remaining Scheduled Castes and the Brahmin households have less than two acres of land. Despite the fact that both Brahmins and Scheduled Castes have less than two acres land, their situation is not the same. Brahmins always owned less land, but were at the apex of the caste-system. But the importance of being landed can be assessed from the fact that in this area, though Rajputs are not the dominant caste, they are more landed. Being numerically and economically dominant, they are also found to acquire all seats of power in the area such as Pradhan, up-pradhan etc.

The ecological constraints to intensification and expansion of agriculture resulted in an emphasis on close regulation of common property resources so crucial for the

subsistence of individual households. Their economic life was closely integrated with agriculture, forest and pastures. However, with the division of land and rising demands on it, and rising costs of production, agricultural productivity which was based on intensive use of natural resources suffered. Therefore, more and more peasants turned off the land in order to sustain themselves. A more adaptive strategy was to look for alternative source of employment and since such opportunities did not exist in the area, they had to migrate to find supplementary off-farm employment to pay for purchased food. The migration in this area was therefore partial and male-dominated and interestingly, opposite to the general belief, the migration was more amongst the landed group, who migrated to enhance their incomes. This led to the creation of a "money-order" economy (in which people become dependent on the influx of money from outside and ability to produce locally and to be self-sufficient to some extent declines). This process further suppresses :

i) the incentives to develop local technology for increasing production.

ii) the increasing migration of the literate and the able-bodied takes away the pressure of unemployment and further enhances the indifference of the local bureaucracy.

iii) the money is invested in consumption and not production. This leads to overuse of resources and their further degration. The non-investment is largely for two reasons. Firstly the money is insufficient for agricultural investments. Secondly, given the level of technological development, irrigation and land conditions, such investment is not always considered economical by small peasants of this area.

iv) Even if some remuneration is invested in production, the pattern of production remains ill-suited to the local ecology.

v) The money that comes into the economy attracts markets whose penetration further suppresses the urge to produce.

Lack of development of local resources and technology buttresses the process of underdevelopment. Inadequate and inappropriate governmental strategies initiating productive activity and providing services further accelerates the 'push- factor' for migration.

With migration though the population declines locally, the problem of underdevelopment remains. The environment which was till a point of time sufficient to provide for the area's population is now overused and sometimes misused, both leading to degradation. The easy flow of money from outside adds to the problem. Environment per se is no

longer the source of their sustenance and people tend to ignore it in their expenditure and use pattern.

But the pattern of migration is also not the same for all caste and class-groups. The poorest section of people migrate the least. This is contrary to popular belief. However, this is true as extreme poverty creates resource constraints, for migration. Only the rich have the option to migrate, as they have enough to bear the required miscellaneous expenses. They go to the cities and return to build cement houses and use their land. Since education is a privilege of the landed group, they acquire better jobs in the cities. They mostly worked in government sector, while migrants from the group of marginal peasants and Scheduled Caste found jobs in industries and factories. The migration of the educated villagers also reduces the pressure of the literate to improve the conditions.

Various grass-root programmes and 'developmental' activities are also used by local power groups like the pradhan and up-pradhan to increase their dominance within the community. They get certain governmental resources at their disposal like funds for road, toilets, schools, cattle etc. which are used by them for the benefit of the landed and those who have a political clout. Therefore the monetary assistance for building houses, toilets etc. is available in reality only for the higher castes and classes.

The poor peasants and lower castes are thus deprived of such benefits which they actually need most.

Thus, we see the social environment dominated by Rajputs. It is marked by a process of migration of its labour, peasant dominated local economy largely dependent on remittances from outside and a subsistence agriculture. Such a social environment creates its own dynamics of social relations which are conducive to non-development of the area and its resources such as forests, irrigation and agriculture. It also contributes to the poverty of the areas physical environment because a handful of elites collaborate with the bureaucracy and use government resources for personal advancement rather than act on behalf of the majority of the subsistence and poor peasants. Together then the socio-economic, natural and physical environment create conditions which are conducive to poor nutrition and ill-health.

SECTION II

CRITIQUE OF APPROACHES TO ENVIRONMENTAL HEALTH

In Pauri ecological degradation has added to economic deprivation. It has led to narrowing down of natural resource base for survival of all but specially the economically poor and powerless, creating a situation where

people are unable to subsist on their land and therefore, are compelled to migrate in search of alternative employment. This has created a situation of labour movement which is to the benefit of the labour markets of cities where their labour becomes a commodity to be bought at very low wages. Even in migration the poor fare badly due to lack of resources to migrate. Due to migration, "money-order" economy becomes operative. It provides subsistence but it also leads to lack of productive activity locally. Markets penetrate through the village economy further suppressing the urge to produce. This leads to non-investment in land and movement away from agriculture, leading to further stagnation.

Therefore, the data shows links between cumulative social and envionmental changes taking place under the so-called "planned economic development" which have undermined the social, ecological and economic basis of peasant agriculture thereby undermining the hill society's capacity to feed itself, without replacing it with a more viable or prosperous system of production.

Over time there has been no industrial growth in this area to provide an alternative to agriculture. This kind of development thus ensures regular labour supply to the urban areas.

Uttarkhand has been swept with a wave of social

movements since the early seventies. Various groups have been tirelessly raising their voice against ecological imbalances in this region and stating reasons for growing conflicts over land, forests, fodder, grazing grounds, water resources and environmental degradation taking place due to increasing resource exploitation and mindless development in the area. The activities and perspectives of these groups, broadly termed as environmental groups have often provided the most acute critiques of development strategy in hill areas. These groups reflect several overlapping and sometimes conflicting strands of thinking. They can be compared in terms of their attitude towards technology, development, labour movements, likely alternatives and mechanism of redressal.

R.Guha (1988) states that one can see the emergence of these distinct ideological perspectives within Indian environmental movement, each resting on a different identification of the genesis of the problem and articulating rather different mechanism of redressal.

The first strand he terms as 'Crusading Gandhian'. This group relies heavily on religious idiom in its rejection of modern way of life. It upholds the precapitalist and precolonial village community examples of ecological and social harmony. The methods of action favoured by this group are in Gandhian tradition - fast,

padyatras (foot march) and *pujas* (religious ceremonies). They propagate an alternative, non-modern philosophy whose roots lie in Indian tradition.

The second strand can be termed as 'appropriate technologist'. This group strives for working synthesis of agriculture and industry, big and small units and modern and traditional technological traditions. They have done pioneering work in creation and diffusion of resource conserving, labour-intensive and socially liberating technologies. They do not lay emphasis on challenging the 'system' as in demonstrating in practise a set of technological and social alternatives to the present model of urban industrial development. They argue for a judicious mix of tradition and modern knowledge/techniques to fulfill the needs of social justice, local self-reliance and environmental stability (R. Guha, 1988).

The third strand embraces a variety of groups and can be called 'ecological marxists'. Here systemic economic change is viewed as logically prior to ecological stability, and political action towards the end becomes an overriding priority (R.Guha, 1988). The 'ecological marxist' are however not an unified single group. There are different shades, some emphasizing on aspects of systemic economic change, while others in the process of visualizing systemic change want to incorporate strengths of technological and

socio-cultural tradition and sensitivity to the need of further technological development. These groups lay emphasis on social organization of work and how it is linked with ecological imbalances.

Many groups are working in Uttarkhand with their own environmental philosophies and perspectives. By far the most popular are Sarvodaya workers (prominent leader is Sunderlal Bahugana); Dashauli Gram Swaraja Sangh (led by Chandi Prasad Bhatt) and Uttarkhand Sangharsh Vahini (USV). These can be called the three wings of the best known environmental movement - Chipko movement. Chipko is a peasant initiative against commercial forestry. However, state forestry is by no means the only threat to the ecological and social stability of the hills, for the past decades have witnessed a rapid expansion in the scale of commercial penetration in Uttarkhand. This is exemplified by location of large dams, increasing mining operation, spread of alcoholism etc. Chipko has been followed in rapid succession by movements directed against the above. This intensification of resource exploitation has been matched by sustained opposition of various groups other than the wings of Chipko like Tehri Bandh Virodhi Samitti, Friends of the Doon Valley and People's Science Institute, Dehradoon.

The leaders of the groups have put forward their own interpretation of local and national processes of

environmental degradation.

Sunderlal Bahuguna (most prominent Sarvodaya worker) perhaps the best known Chipko leader holds commercial forestry and the close links that exist between contractors and forest officials as responsible for the deteriorating Himalayan environment. He says 'the ecological crisis in Himalaya is not an isolated event. It has its roots in the (modern) materialistic civilization, which makes man the butcher of Earth." (S.Bahuguna, 1983). Bahuguna thinks the basic political economy divide is rural-urban. (R.Guha, 1991). He demands a Gandhian transformation of hill society towards a non-materialist, self-reliant, village based, non-industrial economy (M.J.Haigh, 1988). Kowal (1984) (cf. M.J. Haigh, 1988) stresses Bahuguna's commitment to a "deep ecology" worldview, in the heart of which is a belief in the spiritual and sacred bond between man and nature. He wants a total ban on commercial exploitation until the forests have recovered their lost ground. In the meantime, he argues both that the villagers' basic needs should, as far as possible be satisfied from the forest and that the villagers should have greater control over the forests than the nation (B.Dogra, 1983).

Talking of development, he believes that development as practiced today in official programmes is going to be unsustainable if ecology is not considered an imperative.

Accordingly the ecological rehabilitation of the Himalayan region has become his first priority. He believes that the material endowment of economy cannot be divorced from the production of ecological endowment and their stability. Thus economic development in the Himalayan must be based on an expansion of trees and not agriculture i.e., regeneration of forests. For Bahuguna, material benefits arise from lowering the ecological costs entailed by resource distribution and increasing the productivity of natural and man-made systems. The programme of ecological development as propounded by Bahuguna requires a serious change in consumption pattern and reorganization of interest groups in society (J.Bandyopadhyay and V.Shiva, 1987).

Chandi Prasad Bhatt, unlike Bahuguna does not deny the villagers role in deforestation, stressing however that this has been a result of separating the local population from the management of forest wealth (C.P.Bhatt, 1983). He lays stress on identification of macro forces such as overall state policy as the major cause of ecological degradation. He feels that hill development must be reformed gradually, not transformed immediately, towards a more environmentally stable model but the basic needs of the rural people must be met at once. These must be accomplished by any means which comes to hand including hill-based industries which may alleviate poverty and unemployment (M.J. Haigh, 1988).

Therefore, his is a mode of reconstruction. He places greater emphasis on alternative technology that would be more environmentally conscious as well as socially just (R.Guha, 1991). Bhatt's team attempts to lead by example. Their work in villages includes introducing fuel efficient stoves, biogas plants, low cost energy saving devices apart from afforestation projects. As far as deforestation is concerned, Bhatt argues that both forest officials and commercial forestry are merely agents of a development process biased in favour of the urban industrial complex. He is critical of the development schemes which have little relevance to the realities of rural India (cf R.Guha 1991).

Bhatt strongly favours an introduction of a productive development package in these regions. He firmly believes that acceptance of the present modes of resource utilization with a new emphasis on the location of manufacturing activities in the hill areas, and a strengthening of their raw material will lead to development and fight poverty. This model explains poverty as the absence of processing industries and recommends a solution in terms of technology transfer. For Bhatt, material benefits are not directly seen in the conservation of essential ecological processes. The instruments of production do not include nature and its ecological processes and productivity is defined in the classical concept of industrial management, through the

technological productivity of labour alone. In this respect, Bhatt's model is easily subsumed by the dominant developmental paradigm with minor environmental adjustments. The prescription here is that with the help of modern scientific knowledge the instruments of production are improved and the standard of living is raised (C.P.Bhatt, 1980; 1982). The programme of Bhatt, however, can be realized within the present social structure and is commonly known by the name of 'eco-development' (J.Bandhopadhyay, and V.Shiv, 1987).

Uttarkhand Sangharsh Vahini (USV) adheres to an ideology strongly influenced by Marxism. USV insists that man-nature relationships must not be viewed in isolation from existing relationships between humans. It has a more radical posture. It clearly prefers organizing social movements that confront the state to grass-root reconstructive work such as afforestation, arguing that it is the responsibility of the state to reverse the processes of capitalist penetration and environmental degradation. For USV, social and economic redistribution is seen as logically prior to ecological harmony (R.Guha, 1991).

In their own very different ways, all the three groups have questioned the normative consensus around Indian intellectuals, and political elites on their feasibility of rapid industrialization and technological modernization

(R.Guha, 1988). They throw light on the macro-micro development planning in which the survival of less powerful but more populous micro economy is directly threatened. They bring forth the reasons for the simultaneous existence of underdevelopment alongside economic growth in a developing country like India which accepted quick and resource intensive industrialization as a path towards development, revealing how this "development" has ecological destruction and economic deprivation built into it.

There are certain problems with Bahuguna's approach. Ecological and economic development as propounded by him is based on serious change in consumption pattern and an expansion of trees and not agriculture. Here, he ignores the fact that there is scarcity of food in the region and that everyone cannot eat from forests alone. In face of increasing migration and consequent consumerism pressures, it is difficult to imagine people changing their nutritional habits and putting an end to their material needs. He does not lay emphasis on the development that is taking place around the region and its impact locally. With no counter to it, certain "push" factors are bound to operate. Therefore, he is looking at the problem in an isolated manner.

Bhatt on the other hand is to a large extent raising the larger issues. He does lay stress on identification of

the macro forces which play a major role in ecological degradation, but at the same time he feels it is most important to first meet the basic needs of the people, alleviate poverty and unemployment. This he recommends through appropriate technology. Though he assumes that when appropriate technology and local aid come, vested interest may also come in and permit collectivisation, but he does not offer clear strategies for fighting these vested interests.

It is Guha's last group's approach that is validated by the finding of our study. Our study shows that the problems of environment are closely linked with the social forces such as non-development of local technologies, governmental policies of development, local socio-political power relations and the penetration of markets and plains culture. It also shows the links between forest denudation, subsistence agriculture, neglect of animal husbandry and population movement and suggests that environmental degradation cannot be stopped unless a totally different and comprehensive policy for overall development is thought of.

In our study area however, people were not aware of any of these environmental groups and their perspectives, although they all knew that the answers to the environmental problem lies in alternative type of policies and plans.

SECTION III

RE-EXAMINING THE DEFINITION OF ENVIRONMENTAL HEALTH

Our study also highlights linkages between environment and peoples' health. It does so by emphasizing certain characteristics of environmental conditions which affect the quality of health. These conditions are characterized by

i) a subsistence agricultural economy which has led to gradual disuse of land and its degeneration leading to lower productivity and food insufficiency;

ii) agriculture has lost its variety and the more hardy grains used by the poor are no more available. It now requires much harder labour which further makes the people more vulnerable;

iii) dwindling forests leading to lack of fodder and manure have affected availability of cattle (milk) and foodgrains.

iv) foods available from the forest are no more available;

v) availability of medicinal herbs have declined;

vi) even availability of drinking water has been affected;

vii) the women and children of the area are particularly affected. Government policies make access to resources difficult and do not provide alternative resources which are conducive to health.

The cumulative impact of this process is lack of food

sufficiency and consequent malnutrition and ill-health. Our findings thus highlight the limitations of medicine alone to alter the ill-health of people and makes it imperative to study health within the context of economic structures, social organization, political system and ecological constraints.

The definition and the understanding of environmental health as discussed in the first chapter is descriptive and broad. What it does not explicitly state is that the environmental health cannot effectively be tackled without dealing with the techno-political-social complex. Our data emphasize the fact that only when we begin to understand the exact mechanisms which operates at the social, economic and technological level - which gives rise to poor health - we can comprehend Environmental Health. We will therefore like to define Environmental Health as "the study of environmental conditions which are conducive to health or ill-health and their linkages with the same, as well as their larger environmental correlates."

Earlier the emphasis was on understanding the causality of a disease in terms of a particular environmental condition, but we define Environmental Health as a set of conditions which need to be understood, which collectively produce health or ill-health.

Our definition then demands that the mechanisms operating at social, economic and technological levels which give rise to a certain set of conditions be understood and their linkages clearly delineated. This however is possible only when we go beyond describing co-existence of certain environmental changes and their health hazards. It requires establishing associations indicating causal links by better designed studies. Our study is only an exploratory effort whose descriptions only suggest linkages and lay out the background for a more in-depth study.

CHAPTER VII

SUMMARY AND CONCLUSION

The main objective of this study has been to explore the objective and subjective components of environmental health of a Himalayan eco-system. The research design focussed on understanding the environment in its totality. This encompassed the physical, natural and social components of the environment and people's perception of it. It also tried to take into account the processes that have led to the present situation and an examination of the relevance of different developmental approaches that have emerged in relation to the existing realities in the area of study.

The study was conducted in five villages in Yamkeshwar block in Pauri Garhwal district of Uttar Pradesh. A variety of tools, such as observation, case reports, group discussions, in-depth interviews, interviews of key persons and detailed household schedules were employed to generate qualitative and quantitative data. The household schedule was administered to all 161 households in the study villages. Households where three generations were available were used as case reports in order to explore the process of change.

The following are the main findings and conclusions.

1. The economies of the study villages are primarily agrarian, still practising subsistence agriculture. Except small parts of Badoli (Choti), Badoli (Bari) and Bharet, most of the area has rainfed farming. Pokhari and

Ghayalgaon are totally unirrigated.

2. The peasants are mostly owner-cultivators, having small holdings which are usually self-operated.

3. The area has no sharp class differentials.

4. There are three main castes - Rajputs, Brahmins and Scheduled Castes or "doms". Rajputs are dominant, numericaly, socially and economically, occupying all positions of power in the villages.

5. Differences in quality of housing, its location, accessibility to fields, forest and water, space available, material used, availability of electricity are all reflective of the existing socio-economic differences.

6. Accessibility to the bureaucracy and local leaders is an important factor in procuring assistance for housing and sanitation programmes like building toilets etc.

7. The process of capitalist development and the government intervention in the form of programmes and policies led to the undermining of common resource control in the area resulting in the loss of control over land, forest and water reservoirs.

8. There were technical, social and economic implications of such "development" which further damaged the ecology of the area.

9. Green Revolution technology, on the pattern of plains was brought into the hills. The guls (or irrigation

channels) were cemented to bring in water. All this not only proved to be unsuccessful in the area, but also caused ecological impoverishment.

10. Government intervention in the form of roads, education, its programme and plans had many social implications. Collectivity was eroded. With market penetration and increasing outmigration new values were brought in. Tendencies of consumerism, commercialization and emulation made their way into the villages.

11. Further it also had certain economic implications. Villagers lost the impetus to increase local production. Instead migration increased, while remittances were used for consumption rather than production purposes.

12. The government policy of barricading the commons led to the alienation of the people from their natural resources causing further degradation and lowering chances of renewability.

13. Forests which are inextricably linked with the needs of the hill people have been degraded causing an impoverishment of fuelwood, timber, fodder, water and medicinal herbs.

14. Agricultural productivity also declined with the degradation of forests which were a source of manure for the fields and the force behind the natural water resources.

15. The number of cattle also diminished with the shortage of fodder becoming acute.

16. Agricultural productivity declined causing food deficit in the area.

17. Declining productivity could also be attributed to low investment in land. Agriculture is no longer regarded as a viable economic activity due to high costs, labour demands and land quality.

18. These conditions created a "push" for migration which had its own repercussions on the economy and the social fabric of the area.

19. Male-dominated migration increased the burden on the women creating conditions which led to a deteriorating health status of this section of the population.

20. With migration "money-order" economy became operational, suppressing the incentives to develop local technology or increase production, thus leading to a further degradation of the resources.

21. The phenomenon of migration was more amongst the landed and educated class, the poor were constrained by their meagre resources. 22. Increasing migration took away the pressure of unemployment and increased the indifference of the local bureaucracy to bring about any change.

23. Therefore, we find that the problems of the environment are closely linked with the social forces and governmental policies.

24. Characteristics of environmental conditions are such that they may be conducive to poor quality of health.

25. Food scarcity and consequent malnutrition and ill-health are closely related to stagnant agriculture, denuding forests, diminishing cattle and degradation of soil.

26. Poverty rooted in subsistence existence further adds to the creation of conditions in which disease originate and people have poor access to health services.

27. Communicable diseases are also rooted in poor water supply, environmental sanitation, housing condition and services provided in the area.

28. The study suggests that till these conditions are not taken into consideration in their totality, medicine alone cannot alter the health of the people.

Thus our study clearly shows that the problems of environmental health cannot effectively be tackled without dealing with the techno-political-social complex. Till we do not begin to understand the exact mechanisms which operate at these levels which give rise to poor health - we cannot fully comprehend environmental health.

The insights from this study help in crystallising the definition of Environmental Health as "the study of environmental conditions which are conducive to health or ill-health and their linkages with the same, as well as their larger environmental correlates."

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APPENDICES

VILLAGE SCHEDULE

1. a) Name of the Village
   b) Patwari circle
   c) Block
   d) District
   e) Area
   f) Height above sea level
   g) Total no. of household
   h) Total population
2. i) Total area under cultivation
   ii) Total area under forest
   iii) Type of forest (area)
   iv) Distance of the forest from the village-

3.

Water source	Name	Location
i) drinking water source		
ii) agricultural irrgation water source		

4. Cropping pattern - important crops grown in the village

Crops	Sowing	Harvesting	Total time for growing

5. Institutions in the village

	Within vilage	If outside village at what distance
District headquarter		
Block office		
Patwari		
Forest Office		
Post Office		
Primary School		
High School/Intermediate/ College		
Hospital		
Dispensary		
PHC		
Sub-centre		
Govt.Fair Price Shop		
Market (other shops)		
Cooperative Societies		
Seed Stores		
Fertilizer Depots		
Financial Institutions		

6. Officials

	located in the village	Visit the village
Patwari		
Pradhan		
Forest Officer		
BDO		
Village Chowkidar		
Water tank Chowkidar		
Forest Chowkidar		
PHC doctor		
MPW		
LHV		
Dais (Trained)		
Dais (Untrained)		
Hakeem/Vaids		
RMP		
Other govt.officials		

7. Government projects in the villages, if any

8. (i) Which year did the village get electricity -
   Is it regular/irregular supply
   (ii) If the village has govt.water tank,
   when was it made-
   How long did it supply water -

9. Transport
   i) Distance to the pukha road
   ii) Does the village have a bus stop?
   iii) Transport available
   - Public
   - Private
   iv) Frequency of public transport -
   v) To which all places is the village
   connected by public transport -

10. Existing Democratic Institutions
   i) Panchayat
   ii) No.of members
   iii)

11. Brief history of the village.

APPENDIX - II

HOUSEHOLD SCHEDULE

SERIAL NO. : _____

1. Village :
2. Name of the respondent :
3. Respondent's relationship to the head of the household :
4. Age :
5. Education :
6. Caste :
7. a) Family : Joint / Nuclear
   b) i) Total no. of family members : _____
      M _____ F _____
      ii) Adults : _____
      iii) Children (0-16 yrs) : _____
8. a) Any member of the extended family who has migrated with the entire family.

S.No.	Member	Period of migration
1.		
2.		
3.		
4.		
5.		
6.		
7.		
8.		
9.		
10.		
11.		
12.		

7. C) FAMILY COMPOSITION

S.No.	NAME	Migrant	Non-migrant	Age	Sex F/M	Marital Status M/UM	Relationship to the head of the household	EDUCATION: Literate (W.Educ)	EDUCATION: Primary	EDUCATION: Middle	EDUCATION: High School	EDUCATION: Inter & above	Place of outmigration	Period of migration	OCCUPATION: Agri	OCCUPATION: Industry	OCCUPATION: Service	OCCUPATION: Petty Business	OCCUPATION: Wage Labour	OCCUPATION: Agri. Labour	OCCUPATION: Artisan	OCCUPATION: Pensioner	OCCUPATION: Student	OCCUPATION: Other (specify)	INCOME
1.																									
2.																									
3.																									
4.																									
5.																									
6.																									
7.																									
8.																									
9.																									
10.																									
11.																									
12.																									
13.																									
14																									
15.																									
16																									

b) Did they leave land/farming behind ?
If yes, what happened to it ?

9. Details about the house

i) No. of rooms _____

ii) is it a) kutcha
b) semi-pukka (specify)
c) pukka

iii) Electricity connection Yes/No

iv) Toilet Yes/No

10. Agriculture & allied activities

a) Total area of holding _____

b) From total area of holding, how much is

i) cultivated

ii) uncultivated

iii) leased in (specify)

iv) leased out (specify)

v) under plantation

vi) under forests

c) Out of total area cultivated, how much is

i) irrigated _____

ii) unirrigated _____

d) Fertilisers used, if any

	Quantity	Cost
i) Inorganic		
ii) Organic		

e) Agricultural production

i)

S.No.	Names of the crop	Total quantity produced
1.		
2.		
3.		
4.		
5.		
6.		
7.		

ii) Is the quantity produced sufficient for the family ? If not, for what period is it sufficient ?

iii) Total quantity sold (wherever applicable)

iv) Subsidiary products

v) Were you able to cultivate more land earlier ? If yes, why has the land under cultivation decreased ?

vi) Did you have more land earlier ? If yes, why has your land decreased ?

vii) Have there been some changes in agricultural practices in terms of

a) crops grown

b) types of seeds & their source

c) use of fertilisers

d) irrigation

e) method of cultivation

f) others (specify)

viii) Have there been changes in the yield of your land ? If yes, in your view what are the reasons for these changes.

ix) In your view, have the irrigation facilities in the village improved or not. How have they improved or not improved ?

1. Livestock

a)

Type	No.	Amt. of milk produced (for milch)
Milch		
non-milch		

b) Did you have more animals earlier ? If yes, why have the animals per family decreased.

c) Do you

only graze your animals _____

graze as well as give fodder _____

don't graze, only give fodder _____

12. Food Consumption

a) How many meals do you take per day and when ?

b) Main ingredients of each meal.

c)

	Frequency	Quantity (for family)
1.	Pulses	
2.	Meat	
3.	Milk	
4.	Sugar	
5.	Jaggery	

d) Cereal consumption in a month _____

e) Oil consumption in a month _____

f) What forest produce do you consume ?

g) Does everyone get two full meals daily ?

h) Do women get as much cereal, pulses, meat, milk, sugar & jaggery to eat as others ?

i) Has there been any change in food consumption pattern in the last two decades ?

13. Out Migration

a) Annual remittances of outmigrant family members

b) Is it

Regular/ Irregular/ Stopped

c) Period

d) What are the causes of the remittances being irregular/ being stopped ?

e) How frequently does the outmigrant visit the village

_____ never

_____ once a year

_____ more than once a year

f) What are the reasons for increasing outmigration ?

g) Why didn't you and your family members migrate from the village ?

h) Can anything be done about these reasons for outmigration ?

14. Forests

a) How much forest does the village have ?

b) Is there any difference in the forests today as compared to twenty years back ?

c) How has the changed condition of the forests affected your life ?

d) What do you think is responsible for the changed conditions of the forest ?

e) Can you think of ways for better management of forests?

f) From your experience, what do you think is the impact of the following on the conditions of the forests

i) Grazing of animals

ii) lopping trees

iii) felling trees

iv) forest fires

v) forest guards

vi) forest policy

vii) mono culture plantation - growing pines

viii) contractors

15. Water

a) What is the source of drinking water

River

Spring

Govt. tank

Others (specify)

b) Do you perceive some changes in the condition of water presently as compared to the past ?

c) If yes, since when ?

d) What are these changes ?

e) Did you ever have a Govt. water tank in your village

Yes / No

f) Does it still supply water ?

g) If no, what are the reasons ?

d) If yes, what is the nature of the change ? (Both physical and social)

e) Do tensions exist between members of different caste in terms of

i) use of water

ii) use of forest

iii) use of Govt. facilities

iv) land use

f) What is the role of the village Panchayat in helping you in times of crises ?

h) Can anything be done to improve the management of drinking water ?

16. Social Environment

a) Do you perceive any changes in your condition of living in the last two decades ?

Are they any better, same or worse off ?

b) What are the reasons for it ?

c) During the last two decades, has there been any change in your village ?

g) What are the school teachers attitude towards your children ?

h) Have the wages in this area increased/remained the same over past ten years ?

i) Are they sufficient ?

j) Have you tried to make use of the following development projects in your village.

17. Health

a) What are the five most common diseases in this village?

i)

ii)

iii)

iv)

v)

b) Can you think of any specific reasons for their prevalence ?

c) Has any one in your family suffered from any disease which needed medical attention within the past one year ?

d) Have there been any accidents which have needed medical help in your family in the past one year ?

e) When a person falls sick what measures do you take

i) home remedies

ii) local healers

iii) RMP

iv) PHC

v) Others (specify)

f) Give reasons for your preferences