Japan International Cooperation Agency (JICA)
His Majesty's Government of Nepal

THE DEVELOPMENT STUDY ON INTEGRATED WATERSHED MANAGEMENT IN THE WESTERN HILLS OF NEPAL

SOCIO-ECONOMIC BASELINE SURVEY

MAIN REPORT

JANUARY 1998

JAPAN FOREST TECHNICAL ASSOCIATION (JAFTA)
KOKUSAIKOGYO CO., LTD.

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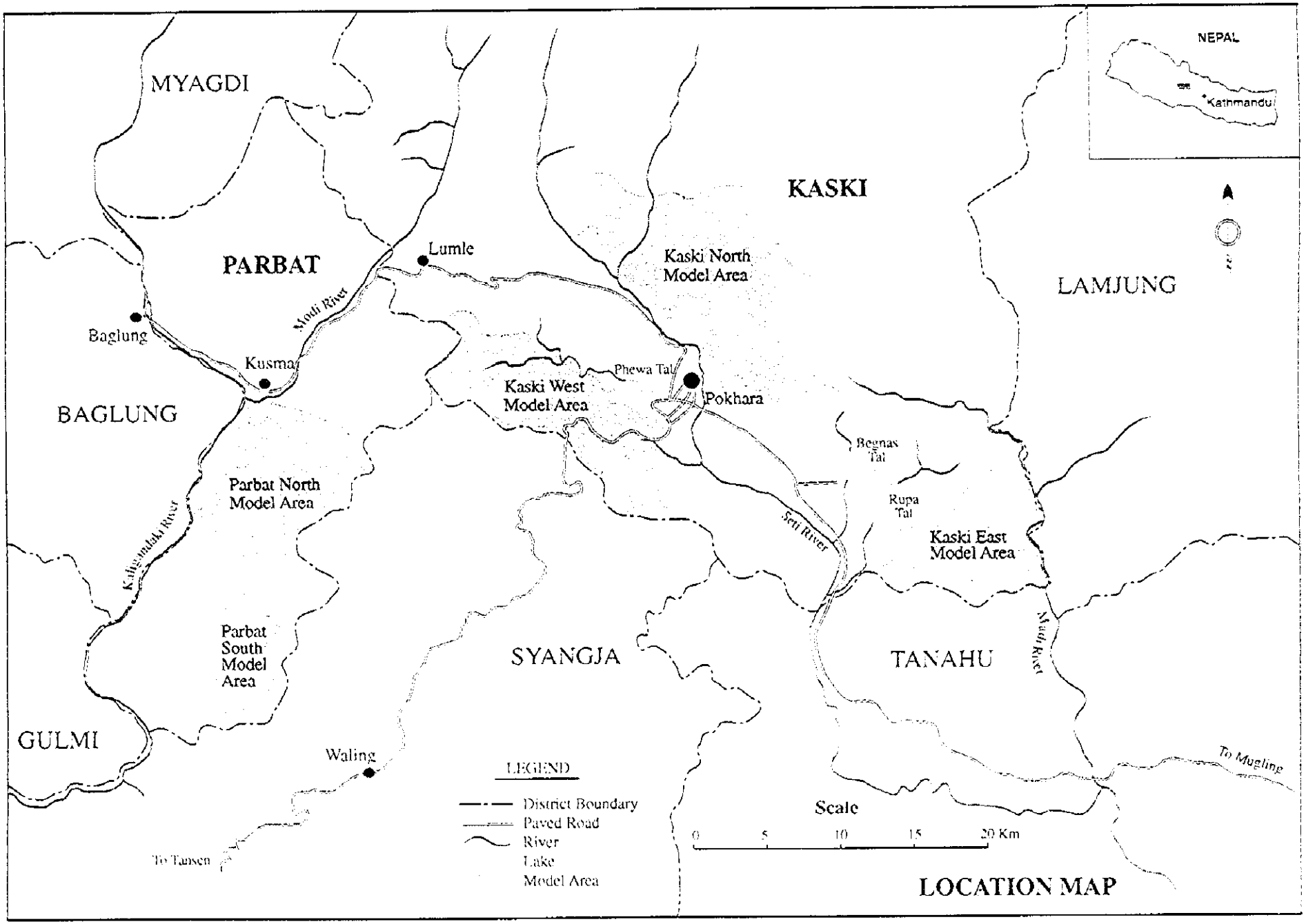
NEPAL
Kathmandu
MYAGDI
KASKI
PARBAT
Lumle
Kaski North
Model Area
LAMJUNG
Modi River
Baglung
Kusma
Phewa Tal
Kaski West
Model Area
Pokhara
BAGLUNG
Begnas
Tal
Parbat North
Model Area
Rupa
Tal
Seti River
Kaski East
Model Area
Kaligandaki River
Parbat
South
Model
Area
SYANGJA
TANAHU
Madi River
GULMI
Waling
To Mugling
To Tansen
LEGEND
District Boundary
Paved Road
River
Lake
Model Area
Scale
0
5
10
15
20 Km
LOCATION MAP

THE DEVELOPMENT STUDY
ON
INTEGRATED WATERSHED MANAGEMENT
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THE WESTERN HILL OF NEPAL

SOCIO-ECONOMIC BASELINE SURVEY REPORT

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1. INTRODUCTION

A socio-economic baseline survey for the JICA Development Study on Integrated Watershed Management in the Western Hills of Nepal was carried out from December 1995 to September 1996 by Multi Disciplinary Consultant (P) Ltd. (hereinafter called "Subcontractor") under a sub-contract basis. In total 8,123 households were sampled to clarify the household characteristics. In addition, a total of 18,895 adult household members were interviewed to find out their needs, perception on environmental issues, and their experiences and willingness to participate in community activities. In line with the above interview surveys, an administrative survey was also carried out to collect various socio-economic information of all the Village Development Committees (VDCs) and wards concerned.

This report was prepared based on the Subcontractor's report and the findings of a JICA expert in charge of the baseline survey. It is divided into five chapters. The survey objectives and survey method are provided in Chapter II. Chapter III describes the results of Household Survey and Administrative Survey. The results of Household Member Survey are explained in Chapter IV. Finally Chapter V presents the analysis of watershed degradation problems putting emphasis on socio-economic factors.

Numerous tables were produced in the course of the analysis. In addition, maps were prepared using Geographical Information System (GIS) to abstract wardwise socio-economic characteristics at a glance. Because the tables and maps are so voluminous, only selected VDC-wise tables and GIS maps are attached in this report. All other tables and maps are compiled as DATABOOKS. The contents of the DATABOOKS are presented in Appendix-1.

Interview of Women

2. SURVEY OBJECTIVES AND METHOD

2-1 Survey Area

The survey area comprises five Model Areas in Parbat and Kaski districts as shown in the location map. The area covers 307 wards in 43 VDCs with a total area of 41,176 ha as shown below:

Survey Area

Model Areas	No. of VDCs covered	No. of wards covered	Area
Parbat North Model Area	16	113	7,860 ha
Parbat South Model Area	8	50	3,795 ha
Kaski East Model Area	3	27	5,472 ha
Kaski North Model Area	12	81	14,162 ha
Kaski West Model Area	4	36	9,887 ha
Overall	43	307	41,176 ha

Table 2-1 shows the VDCs and wards concerned in each Model Area. MAPs 2-1 to 2-5 show the location of the VDCs and wards in each Model Area. The elevation and broad classification of agricultural and forest lands are given in MAPs 2-6 and 2-7, respectively.

2-2 Objectives of the Baseline Survey

The socio-economic baseline survey was conducted for the following objectives:

1) To clarify the current socio-economic conditions and the characteristics of VDCs and wards within the five Model Areas.

2) To identify the relationship between socio-economic factors and environmental issues (e.g., reduction of forest, landslide, nature of people's participation in development activities, etc.)

3) To provide opportunities for local people to consider various problems related to their life and environment and the solutions thereto

4) To establish a baseline database to measure the effects of the long term assistance being provided by the JICA's "Community Development and Forest/Watershed Conservation Project," and "Greenery Promotion Cooperation Project."

2-3 Survey Method

2-3-1 General

The socio-economic baseline survey consisted of three different surveys. They are:

1) Household Survey
2) Household Member Survey
3) Administrative Survey (to prepare VDC/Ward Profiles)

These surveys were subcontracted to a local consulting firm. The preparatory works, including translation and pre-testing of questionnaires, selection and training of enumerators, and mobilization of survey teams, were done from December 20 1995 to January 10, 1996. Then the field survey was conducted until the end of May 1996. Construction of a database was simultaneously carried out along with the field survey and completed by the end of June 1996. Data analysis and reporting followed and were completed at the beginning of September, 1996.

A socioeconomist of the JICA Development Study team prepared the questionnaires and supervised the survey works from the beginning. He actively engaged in database construction, data cleaning in particular, and additional analysis of the data.

The details of the above three surveys are described in the following sections.

2-3-2 Household Survey

(1) Objectives

The objectives of the Household Survey are to find out the household characteristics such as family composition and background, living condition, crop production, and resource utilization.

(2) Questionnaire

The questionnaire for this survey was prepared in consultation with the experts of on-going "Community Development and Forest / Watershed Conservation Project (CDFWCP)" and a counterpart from the Department of Soil Conservation (DOSC). Reference was also made to similar surveys conducted under the JICA Forestry Extension Project (1994) and Bagmati Watershed Project (1987). In developing the questionnaire, much attention was paid to easiness of answer by respondents. In addition, only close-ended questions were used and precoded possible answers were listed in the questionnaire in order to minimize the time required for interviewing and data processing. The survey items in the questionnaire are listed below. The questionnaire is presented in Appendix-2.

1) General Information
   a) Details of the respondent (name, age, sex)
   b) Information about family members
      • Total number of family members
      • Sex, age, education status, and occupation
      • Organizational membership of family members
      • Temporary absentees among family members
   c) Cash income sources
   d) Length of settlement

2) Living Condition
   a) Source, distance and sufficiency of drinking water
   b) Source and availability of fuel
   c) Annual consumption of fuelwood
   d) Distance to fuelwood sources
   e) Food availability at home and deficit period
   f) Health and family planning
   g) Availability of toilet facility

3) Agriculture
   a) Khet and Bari land area owned, rented, and leased
   b) Frequency and area of farmland affected by disasters
   c) Cropping pattern in Khet and Bari land
   d) Cultivated area, production, disposal and selling price of major crops
   e) Major crop damage

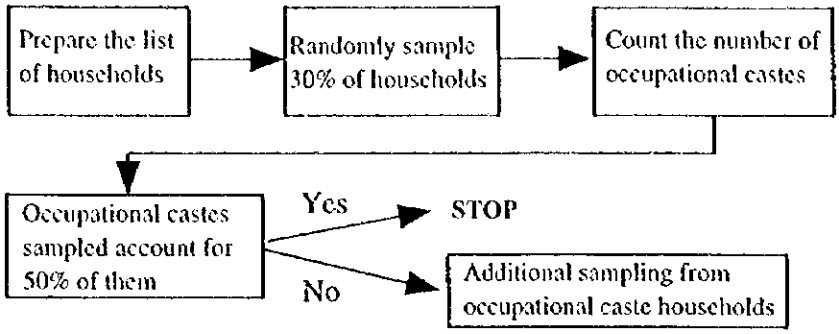
4) Livestock / Animals
   a) Number and types of livestocks
   b) Main feed and sufficiency level

5) Forests
   a) Nature, types and conditions of community-based forests and resource bases
   b) Nature, types and conditions of privately managed forests / farm resources
   c) Nature and types of horticultural trees and plants privately owned
   d) Other privately owned trees and their species name and socio-economic values

(3) Sampling

Prior to the survey in the targeted wards, household lists were prepared with the help of ward chairmen. Then about 30% of households were randomly sampled in each ward based on the lists. Additional sampling from occupational caste households (Damai, Kami and Sarki) was made in some wards in order to enable the survey to

cover 50% of occupational caste households. The survey procedure is illustrated in the following figure.



Sampling Procedure

The total number of households sampled in each Model Area is given in Table 2-2 and summarized below:

Caste Group Composition of Households Sampled

Model Area	Households Sampled (nos.)	Caste Group Composition (%)				
		Brahman Chhetri	Damai Kami Sarki	Gurung Magar Kunwar	Newar	Others
Parbat North	2,312	63.4	22.5	8.0	2.6	3.6
Parbat South	1,143	47.5	14.5	30.2	1.3	6.5
Kaski East	805	43.5	15.9	15.8	9.6	15.3
Kaski North	2,358	52.9	21.5	14.5	0.5	10.5
Kaski West	1,505	44.1	27.5	20.5	0.1	7.8
Overall	8,123	52.6	21.4	16.1	2.0	7.9

Source: Household Survey, JICA/Multi Disciplinary Consultant (P) Ltd. (1996)

2-3-3 Household Member Survey

(1) Objectives

The objective of the survey is to understand the people's involvement in different activities, their needs, their perception on environmental issues related to forest and watershed, and willingness to participate in community activities. Clarifying gender difference on the above matters is another objective.

(2) Questionnaire

Another type of structured questionnaire was prepared. The survey items in the questionnaire are listed below. The questionnaire is presented in Appendix-3.

1) Participation and engagement of household members (adults) in various activities.

2) Activities which household members want to make easy.

3) Degree of present concerns / awareness of household members on given topics.

4) Experience of participation in collective activities and of receiving external support for given topics.

5) Willingness to participate in collective activities in given topics.

6) Importance of forest and proposed measures to improve it.

7) Proposed preventive measures for landslide.

8) Proposed measures to reduce terrace destruction.

(3) Sampling

This survey targeted adult members (above 17 years old) in the households sampled for the Household Survey. Though enumerators tried to interview as many as three adult members per sample household, the actual number was 2.3 persons per household because many adult household members were absent from home at the time of survey.

The VDC-wise number of household members interviewed and their age group composition are presented below:

Number of Household Members Interviewed

Model Area	Members Interviewed	Male (%)	Female (%)	Age Group (%)					
				17-19	20-29	30-39	40-49	50-59	60 <
Parbat North	5,446	41.7	58.2	8.8	22.2	19.1	17.8	15.9	16.4
Parbat South	2,825	41.2	58.8	9.9	23.2	18.8	18.0	13.2	17.0
Kaski East	1,758	40.4	59.6	9.6	23.1	19.7	18.2	14.7	14.8
Kaski North	5,504	41.4	58.6	9.1	23.8	19.2	19.8	15.5	12.8
Kaski West	3,362	38.5	61.5	9.9	23.9	19.4	17.0	14.1	15.8
Overall	18,895	40.8	59.2	9.3	23.2	19.2	18.3	14.9	15.2

Source: Household Member Survey, JICA/Multi Disciplinary Consultant (P) Ltd. (1996)

2-3-4 Administrative Survey

The administrative survey attempted to collect and compile unpublished data and

information on socio-economy, agriculture, forestry, natural hazard, and development activities in each VDC and ward. To do so, the survey teams contacted more than 700 key informants including VDC secretary, ward chairman / members, social workers, political leaders, leader farmers, and school teachers. Data and information were also solicited from governmental offices in Pokhara and Kathmandu and local NGOs. All the data collected were entered in Excel formats and printed out as VDC/Ward Profiles. An example of the VDC/Ward profile is presented in Appendix-4.

2-4 Survey Team

2-4-1 Selection of Enumerators

In order to organize teams of qualified enumerators, the Subcontractor invited applications by advertising in a Nepali daily newspaper in mid of December, 1995. There were as many as 170 applicants. In screening the applications, previous experience in similar works and having resided in the Model Areaa or neighboring districts were used as criteria. After the screening, 80 candidates were invited for interview. The candidates were tested in the aspects of technical capacity, personality, and ways of handling problems. Based on the test results, about 40 candidates were selected and invited for the training session.

2-4-2 Training of Enumerators

Orientation classes were organized in Kathmandu for five days (January 4 to 8, 1996) to acquaint the enumerators with the subjects and terminology included in the survey questionnaires. Training classes were designed for map identification and sketching techniques, practical techniques of interview and data collection, communication methods within survey teams, determination of cropping pattern, and conversion of local to standard units of measurement. Information regarding socio-culture, economic and administrative background of the survey area were also provided to trainees. Moreover, they were briefed about their duties and responsibility along with team organization including line of command to be followed during the course of the survey works. The trainers included the staff of the Subcontractor and HMG staff from Departments of Soil Conservation and Statistics. The training program is given in Table 2-3.

Training of Enumerators in Kathmandu

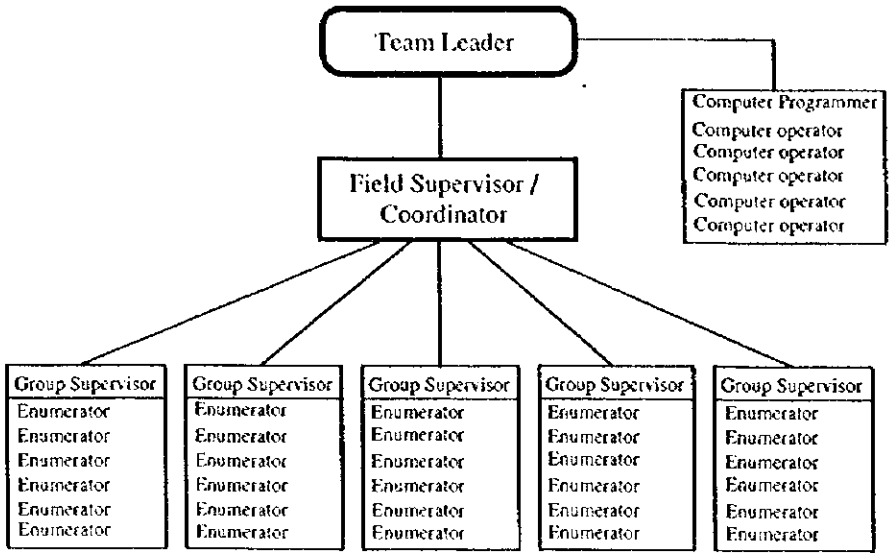
2-4-3 Survey Organization

At the end of the training session, 35 candidates including four females were finally selected as enumerators. Of those 35 candidates, five including one female were assigned as group supervisors, based on their capability and leadership. They were divided into five survey groups, each consisting of one group supervisor and six enumerators. In organizing the group, due attention was paid to the formation of a balanced group, by including at least one resident of the Model Area.

A Survey Group Moving to a Next Survey Site

The survey groups were supported by a backup team consisting of a field supervisor/coordinator (rural sociologist) and two trainee enumerators[1]. They were stationed at Kusma, Waling, and Pokhara site offices during the field survey period. The field supervisor often visited survey groups to give necessary advice and acted as a nodal point between the field and the Subcontractor's head office in Kathmandu. There was a team composed of Team Leader (Socio-/Agro-economist), a computer programmer, and computer operators at the Subcontractor's head office in Kathmandu. The head office team was responsible for overall supervision of the survey works, database construction, and data analysis.

The survey organization is illustrated below. The members of survey groups and their assignment are given in Table 2-4.



Organization of Socio-economic Baseline Survey

[1] : These could not be selected as enumerators but were provided with on-the-job training opportunity.

2-5 Quality Control

For the quality control of data, the filled questionnaires were checked at three levels.

Firstly, respective group supervisors checked the filled questionnaires every day in the field to find out missing information and unrealistic figures. In many occasions the enumerators were asked to verify unrealistic figures or collect the missing information immediately. Because of the large volume of completed questionnaires, the group supervisors could thoroughly checked only around 60% of them.

Secondly, the questionnaires checked by group supervisors were passed to the field office, where the questionnaires were again checked by the field supervisor / coordinator. Serious mistakes detected during this stage were corrected by sending the questionnaires back to the concerned survey groups. Minor or obvious mistakes were noted down with comments and passed to the respective enumerator so as not to repeat the same mistake.

Field Supervisor is Checking Questionnaires

Thirdly, the filled questionnaires were sent to the Subcontractor's head office in Kathmandu and thoroughly reviewed before entering the data into computer. Comments and suggestions noted during this stage were regularly sent to the field office for incorporation and further improvement of data quality.

2-6 Preparation of Database

2-6-1 Database of Household Survey Results

The data collected through the Household Survey were entered into computer using a database software named "Microsoft FoxPro version 2.6." The database of Household Survey consists of two files: JICAM.DBF and JICAS.DBF.

Data Input in Kathmandu

The main database is JICAM.DBF. It covers all data of the Household Survey except those of face sheet (data of family members). It contains 220 fields most of which are of numerical type. The key field is the household number (sample

number, named "hh_no" that is a unique number of four digits. The secondary database JICAS.DBF contains 8 fields with the key field named "hh_no" which can be linked with the main database JICAM.DBF. Each data field in the questionnaire was given a field name as indicated in the sample questionnaire in Appendix-2.

2-6-2 Database of Household Member Survey Results

The data collected through the Household Member Survey were also entered into computer using a database software named "Microsoft FoxPro version 2.6." The database was named JICA2M.DBF. It covers all data of the Household Member Survey and contains 187 fields. Most of the data fields are of numerical type. The key field is the household number (sample number, named "hh_no") that is a unique number of six digits. Each data field in the questionnaire was given a field name as indicated in the sample questionnaire in Appendix-3.

2-6-3 Database of Administrative Survey Results

The data collected through the Administrative Survey were put into the format of VDC/Ward Profile (see Appendix-4) that is made by Microsoft Excel.

2-7 Data Processing Method

Data collected through the Household and Household Member Surveys were processed by various FoxPro programs and presented in cross tabulation forms. Mean, percentage, and frequency of each survey item were calculated at three levels: ward, VDC, and Model Area. Scoring method was applied for questions that seek more than one answer in priority basis or for those whose answers are expressed in priority or degree. The scoring method is explained below:

Question (example)

I-4 Importance of cash income sources.
(please indicate the priority, 1, 2, 3).

		Importance
1.	Selling crops	_____*FN11*
2.	Selling livestock / dairy products	_____*FN12*
3.	Selling forestry products	_____*FN13*
4.	Salary from permanent job	_____*FN14*
5.	Wage from temporary jobs	_____*FN15*
6.	Pension	_____*FN16*
7.	Remittance from family	_____*FN17*
8.	Private business	_____*FN18*
9.	Other 1 : (_____)	_____*FN19*
10.	Other 2 : (_____)	_____*FN20*
11.	Other 3 : (_____)	_____*FN21*

Remarks: FN11, FN12 .... are field names assigned to each answer and used in Database.

1) Score assigned : 3 points to 1st priority
2 points to 2nd priority
1 point to 3rd priority

2) Formula to calculate mean score :

$$(A \times 3 + B \times 2 + C \times 1) \times 100 / (T / 3)$$ [max. =100, min.=0]

where: A: number of answers for 1st priority
B: number of answers for 2nd priority
C: number of answers for 3rd priority
T: total number of answers for the question

Sampled households and the members are broken down into several groups such as caste, age, education status, cereal sufficiency of household, and sex of household head. The data were also processed by such groups at the level of the Model Area in order to clarify the difference between groups.

In this report, only selected VDC-wise and Model Area-wise results are presented. Other results are given in DATABOOKS.

2-8 Re-sampling Survey Results

A re-sampling survey was carried out in both Parbat and Kaski districts in mid June, 1996 to confirm the validity and stability of quantitative answers of the respondents. A total of 96 households were selected from the households already surveyed. The same respondents were asked again about a selected number of questions in the Household Survey questionnaires, such as distance to their drinking water source, farmland area, number of trees owned, etc. The results of the re-sampling survey are presented below:

Results of Re-sampling Survey

Items		Difference #1
Distance to drinking water source	(Wet season)	36% ↑
	(Dry season)	4% ↑
Fuelwood Consumption	(Annual total)	3% ↓
Distance to fuelwood forest		25% ↓
Area of owned land	(Khet)	9% ↑
	(Bari)	15% ↓
Frequency of farm damage	(by Flood)	16% ↓
	(by Land slide)	32% ↓
	(by topsoil erosion)	16% ↓
No. of tree owned #2		2% - 16%

#1: Comparing the re-sampling results with the original survey results.
#2: The difference varied tree by tree.

The above results indicate that respondents' quantitative answers were fluctuating. It should not be viewed that the survey results were totally unreliable, however.

3 RESULTS OF ADMINISTRATIVE AND HOUSEHOLD SURVEYS

3-1 Demography

3-1-1 Household and Population

(1) Totals of the Model Area

According to the Administrative Survey, the total number of households and population in the Model Areas were 20,769 and 129,384, respectively, as of the end of 1995. The male and female ratio was 49:51. The VDC-wise household and population data are presented in Table 3-1 and summarized below:

Total Number of Household and Population in Model Areas

Model Area	Total HH (nos.)	Female-headed HH (%)	Population			Average Family Size (persons/HH)
			Male	Female	Total	
Parbat North	6,061	22.5	19,128	19,590	38,718	6.4
Parbat South	2,823	18.2	9,075	9,544	18,619	6.6
Kaski East	2,026	26.1	6,270	6,410	12,680	6.3
Kaski North	5,958	16.1	17,134	17,553	34,687	6.8
Kaski West	3,901	14.0	12,349	12,331	24,680	6.3
Overall	20,769	19.0	63,956	65,428	129,384	6.2

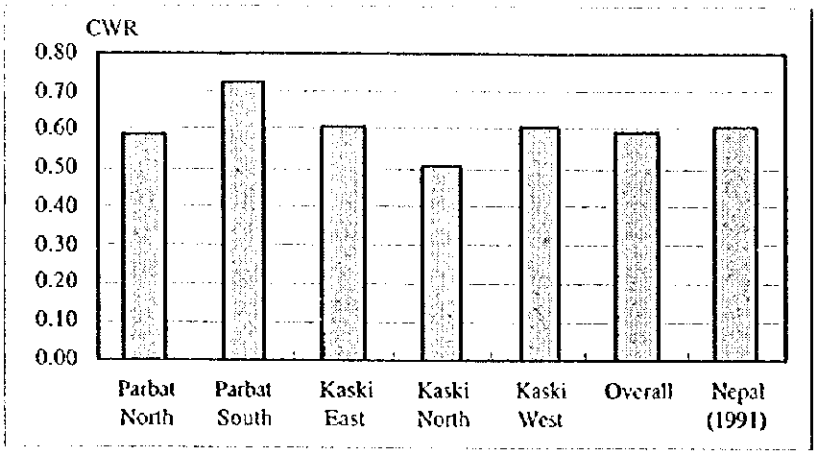
Source: Administrative Survey, JICA/Multi Disciplinary Consultants (P) Ltd. (1996)

Of the total numver of households in the Model Areas, about 19% were female-headed households. A higher proportion of female-headed households was found among Gurung and Magar families more commonly than in other castes. A female-headed household is defined as a household in which a female, among other family members, has the highest authority in decision-making. It is considered that this high percentage of female-headed households was attributable in part to the high absence of male members in families.

The annual population growth rate was estimated based on the 1991 census data. The results show the growth rate in Parbat and Kaski districts between 1981 and 1991 was 1.12% and 2.85% per year, respectively. The higher growth rate in Kaski district was attributable to the high growth rate (7.41%) recorded in Pokhara municipality. The growth rate of Kaski district except Pokhara was only 1.24% per year. This suggests the population growth rate in the Model Areas between 1981 and 1991 was low compared with the national average of 2.08% per year. However, when CWR (child woman ratio) [1] -- an indicator of fertility -- was

[1] : The ratio is computed by dividing the total number of children below 5 years old by the number of women at the ages between 15 and 49.

calculated using data from the Household Survey, it was almost the same as that of the national average as shown in the figure below. This implies that the actual population who originally belongs to the Model Areas has been increasing at a rate of more than 2.0% per year. Out-migration of adults resulted in the ostensibly lower population growth rate in Parbat and Kaski districts.



CWR (Child Woman Ratio) in the Modea Areas

(2) Sampled Households

The total population of the sampled households was 53,533 with a male and female ratio of 51:49. The average family size was 6.6 with absent members[2] and 5.3 without absentees. This revealed that the Model Areas in Parbat district had larger family size and higher absentee ratio than the Model Areas in Kaski district, as shown in the following table:

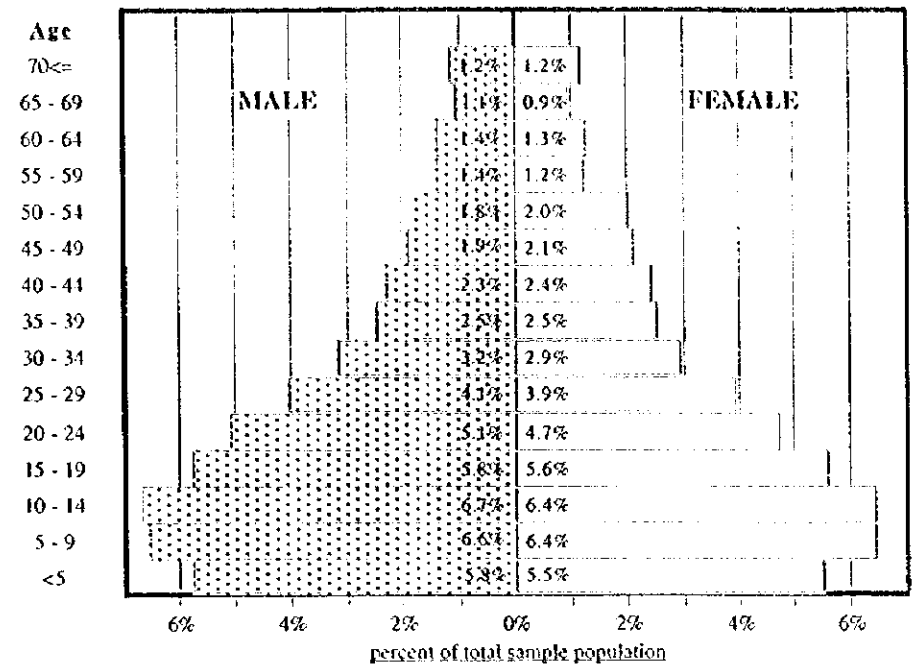
Population and Family Size of Sampled Households

Model Area	Sample HH (nos.)	Female headed HH(%)	Sample population			Absentee Ratio			Family size	
			Total (nos.)	Male (%)	Female (%)	Total (%)	Male (%)	Female (%)	#1	#2
Parbat North	2,312	21.2	16,132	51.4	48.6	21.9	29.7	13.7	7.0	5.5
Parbat South	1,143	20.4	8,405	51.6	48.4	20.1	27.7	12.0	7.4	5.9
Kaski East	805	22.5	5,134	51.0	49.0	19.5	28.8	9.9	6.4	5.1
Kaski North	2,358	21.9	14,167	50.4	49.6	16.3	24.4	8.0	6.0	5.0
Kaski West	1,505	23.4	9,684	51.2	48.8	19.4	27.3	11.1	6.4	5.2
Overall	8,123	21.8	53,534	51.1	48.9	19.5	27.5	11.1	6.6	5.3

Refer to Table 3-2 for VDC-wise details.
#1 : with absent family members
#2 : without absent family members

The age group composition of the sample population in the five Model Areas is given in Fig. 3-1. The overall characteristics are shown below.

[2] : Household Survey clarified the number of family members who were absent in the village more than three months in a year. They are called "absentees".

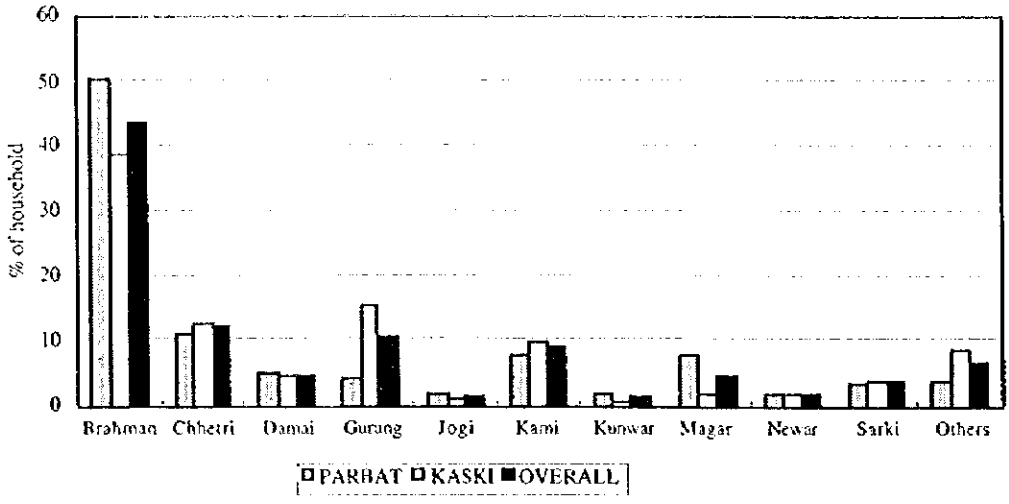


Sampled Population by Age Group and Sex

Among the age groups, children between 10 and 14 years are the highest in proportion (13.1%). This suggests the population growth has been lessening over the last 15 years. The Parbat South Model Area is the exception in which children between 5 and 9 years occupy the highest proportion. Meanwhile, economically active population (age 15 to 60 years old) in the five Model Areas accounted for about 56% of the total sampled population.

3-1-2 Caste Composition

Ethnic composition in the Model Areas is shown in Table 3-3 and illustrated below. In the five Model Areas as a whole, Brahman is a major caste group (43.6% of the total households) followed by Chhetri (12.2%), and Gurung (10.7%). One of the so-called "occupational caste," Kami, is the fourth largest in the Model Areas and constitutes 9.0% of the total number of households. Comparing Parbat district with Kaski, more Brahman were found in Parbat than Kaski, while the proportion of Gurung was larger in Kaski than in Parbat.



Caste Composition in the Model Areas

According to the Administrative Survey, there was a great variation in the caste composition at VDC-level and ward-level. There are 11 wards with occupational caste constituting more than 80% of the total number of households, while 86 wards have no occupational caste households, as shown in MAP 3-1.

3-1-3 Migration and Absentees

(1) Migration in the Model Areas

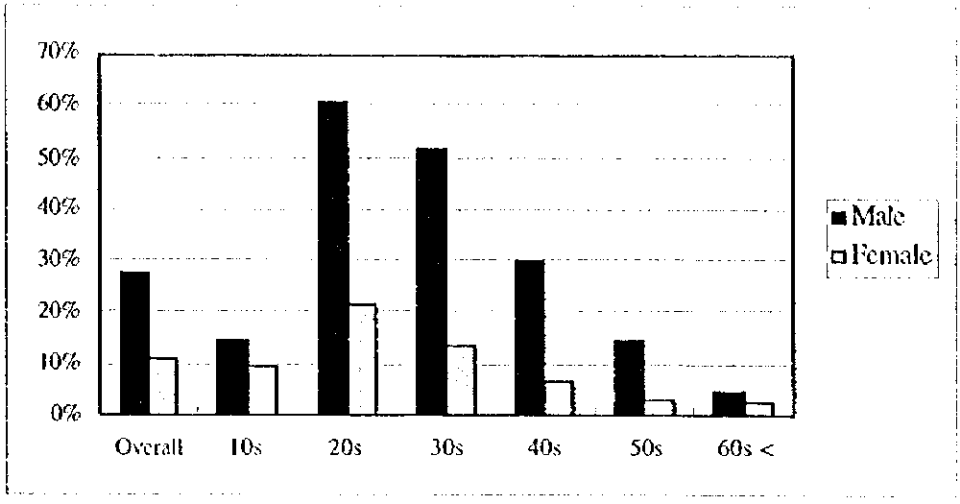
The Administrative Survey found that the number of households which migrated from the Model Areas surpassed that of immigration (see Table 3-4). In total 434 households (equivalent to 2.1% of the total number of household) migrated from the Model Areas in the last five years. On the other hand, the number of households which immigrated in the Areas was 154. The net number of migrants from all the Model Areas during the period was 280 households or 1.35% of the total number of households. Pokhara and districts in Terai were popular destinations of the out-migrants. The exodus can be attributed partly to comparatively easy access to farmland, higher farm productivity, and better working opportunity in these areas. Moreover, the migrants can expect to receive better public services there. The net percentage of migration to the total number of households was the highest in Parbat South Model Area. It is speculated that the high percentage was attributable to the comparatively severe remoteness and economic condition of the area.

(2) Absent family members in the sampled households

The Household Survey clarified the proportion of population who was absent from the village for more than three months in a year. The VDC-wise results are given in Table 3-5. Overall, 19.5% of the total population of the sampled households was absent. The absentee ratio was higher among males (27.5%) than females (11.1%). The males of Gurung/Magar/Kunwar group had the highest absentee ratio of 33.2%.

Many of the absentees have gone to India, England or other places of Nepal in connection with their employment.

If one looks at the absentee ratio by sex and age group, one can find that the ratio is surprisingly high (61%) among males in the 20s, as presented below:



Absentee Ratio by Sex and Age Group

Overall absentee ratio in each ward is illustrated in MAP 3-2. The proportion of absentees by sex and 5-year age group in each Model Area is shown in Fig. 3-2.

3-1-4 Education Status

(1) General

According to the Household Survey, the education status of economically active sampled population (15 - 60 years old) is tabulated in Table 3-6 and summarized below:

Education Status of Economically Active Sampled Population

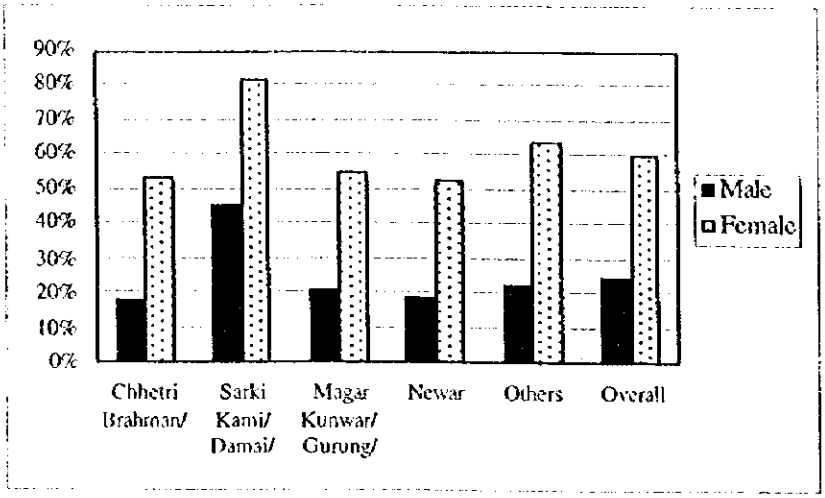
Model Area	Econo. active population	Educational Level (%)					
		No formal education	Upto class 6	Class 7 to 10	SLC passed	Inter-mediate	Graduate / University
Parbat North	9,083	43.4	15.5	25.0	10.1	3.7	2.4
Parbat South	4,513	45.8	18.9	26.2	6.5	2.0	0.6
Kaski East	2,857	38.2	23.6	27.6	5.3	3.6	1.8
Kaski North	8,279	40.2	17.0	30.0	7.6	3.0	2.2
Kaski West	5,313	41.2	20.5	29.4	5.3	2.3	1.3
Overall	30,052	42.0	18.1	27.6	7.5	3.0	1.8

Refer to Table 3-6 for VDC-wise details.

Of the total economically active population, 42.0% did not receive formal education at all. The proportion of non-educated population was higher in Parbat than Kaski district. Meanwhile, the proportion of those who attained higher education of more than SLC level is higher in the Parbat North Model Area than in others. Particularly, the proportion in Devisthan VDC of the Parbat North Model Area showed a significantly high percentage of 29.4% because VDC has a campus there. The proportion of non-educated population and existence of school facilities in each ward are illustrated using GIS as shown in MAPs 3-3 and 3-4, respectively.

(2) Education status by sex and caste

The proportion of non-educated population was much higher among females (60%) than males (24%). Among caste groups, the proportion is the highest in the occupational castes (Damai, Kami, Sarki): 45% for males and 82% for females, as shown in the following figure:



Proportion of Population without Formal Education by Caste Group

3-1-5 Occupation

(1) Occupation

The occupation of economically active sampled population in each Model Area is shown in the table below:

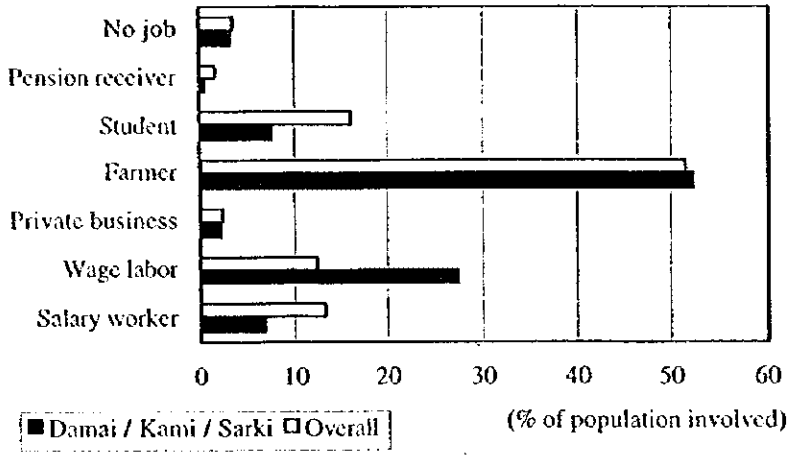
Occupation of Economically Active Sampled Population

Model Area	Econo. active population	Occupation (%)						
		Salary worker	Wage labor	Private business	Farmer	Student	Pension receiver	No job
Parbat North	9,083	11.4	7.7	2.2	58.5	17.0	0.1	2.5
Parbat South	4,513	14.1	11.5	2.1	53.1	12.9	1.6	4.6
Kaski East	2,857	14.3	15.4	2.5	46.7	13.6	3.0	4.5
Kaski North	8,279	12.0	17.6	2.8	44.2	17.6	2.2	3.5
Kaski West	5,313	16.5	11.4	2.8	48.2	14.4	2.1	4.5
Overall	30,052	13.1	12.4	2.5	50.8	15.7	1.5	3.6

Ref. to Table 3-7 for VDC-wise details.

The table indicates that more people engaged in farming in Parbat district than in Kaski district. On the contrary, the proportion of salary workers and wage labors was slightly higher in Kaski district than in Parbat. It is considered that the difference was attributable to the higher employment opportunity in Kaski district due to its proximity to Pokhara, the biggest market center in the Western region.

The graph below clearly shows the characteristics of occupational castes: lesser number of salary worker, more people engaged in temporary labor works, and fewer enrollment in education.

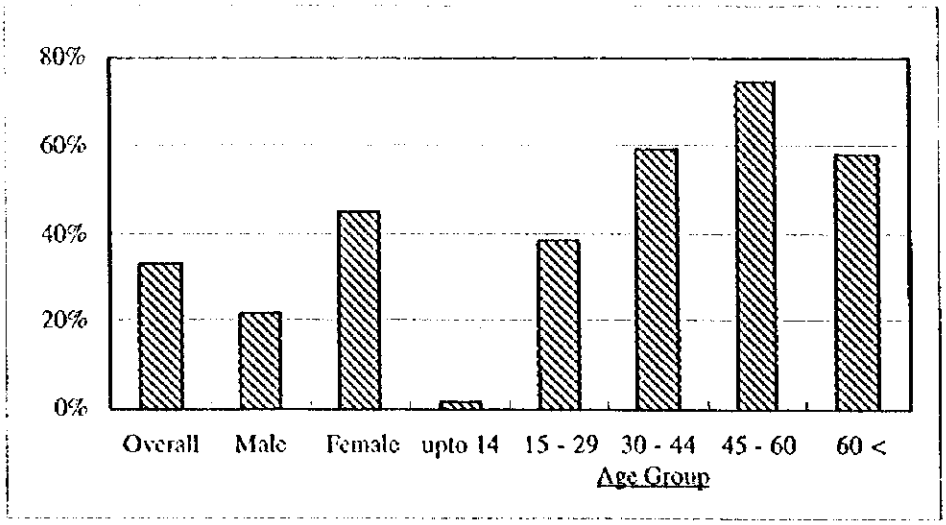


Occupation of Occupational Castes

(2) Involvement in Farming

The Household Survey questionnaire asked the involvement in farming by the members of sampled households including youngsters and elders. The VDC-wise results are presented in Table 3-8. It is noted that the males' involvement rate in Kaski district was a half of that in Parbat, probably due to better employment opportunities other than farming. The results by sex and age group are illustrated below. It shows more women were involved in farming than men. The higher absentee ratio of men might be the cause of this difference. Among age groups, the

group of 45 to 60 years old has the highest involvement rate of about 75%.



Farming Involvement by Sex and Age Group

3-1-6 Community Organization

(1) Community organization in the Model Areas

The Administrative Survey found that there exist different types of community organizations in the Model Areas as shown in the table below.

Number of Community Organizations

Unit : nos.

Model Area	Mother's club	Farmer's club	Youth club	Users' group	Ethnic group	Others
Parbat North	76	9	16	92	0	5
Parbat South	31	9	12	37	2	0
Kaski East	26	2	5	24	2	1
Kaski North	67	27	20	77	0	13
Kaski West	35	5	8	35	1	3
Overall	235	52	61	263	5	22

Remarks : "Users' group" does not include forest users group.
Source : Administrative Survey, JICA/Multi Disciplinary Consultant (P) Ltd. (1996)

Mothers' clubs are the most active organizations. They exist in almost all VDCs in the Model Areas and have been engaging in motivating people in the construction of temples, toilets, foot trails, Chautara, vegetable nurseries, and income generating activities. They have also worked as pressure groups to control males' undesirable behaviors: gambling (playing cards) and drinking alcohol. In Kristi Nachnechaur VDC of the Kaski West Model Area, the activities of mothers' club have further extended to the construction and operation of a primary school. The mother's clubs are seen as most active in the Kaski North Model Area. They are actively involved in temple construction and stone paving of foot trails and improvement of school

facilities by providing cash and labor.

Users' groups including water users' groups (irrigators' group) and drinking water users' groups account for 265 in all the Model Areas. Generally, they have carry out the operation, repair and maintenance of the systems under their own rules and regulation. A well-organized drinking water users' group was found in Bhadaure Tamagi VDC of the Kaski West Model Area. The group has collected money from users and used it as a revolving fund to repair and maintain pipelines.

About half of VDCs concerned have farmers' clubs. They have been engaging in the production and marketing of improved seeds or livestock raising. In the Kaski North Model Area, the farmers were organized to get agricultural loans from the Agricultural Development Bank (ADB) through farmers' cooperatives. However, there is a tendency that farmers' organizations become inactive after the withdrawal of external support.

There are 61 Youth clubs in the Model Areas. Their activities are more or less similar to those of the Mothers' clubs and are directed toward the betterment of community life through, for example, the repair of foot trails and construction of school buildings. However, there is a general phenomena that the youth clubs have weakened due to the lack of fund and temporary or permanent out-migration of young population.

(2) Participation of sample population in community organization

According to the Household Survey results, the organizational membership of sampled adult population (above 15 years old) is shown below.

Involvement in Community Organizations by Sampled Population

Unit : % of population (above 15 yr.)

Model Area	Male				Female			
	Total	Farmers' club	Users' group	Other	Total	Farmers' club	Users' group	Other
Parbat North	8.8	0.3	5.6	2.8	10.6	9.5	0.7	0.4
Parbat South	3.8	0.0	2.1	1.7	7.3	6.5	0.2	0.6
Kaski East	9.8	0.1	6.1	3.6	7.8	5.4	1.6	0.8
Kaski North	24.7	0.6	20.7	3.4	17.0	10.0	6.1	0.9
Kaski West	25.6	0.2	23.7	1.6	21.0	11.6	8.4	1.0
Overall	15.5	0.3	12.5	2.7	13.4	9.2	3.6	0.7

Ref. to Table 3-9 for VDC-wise details.

In general, forest and/or water users' groups are popular organizations among male members, while mothers' clubs among female members. The above table indicates that the proportion of those who belong to community organizations is higher in Kaski, particularly in Kaski North and West Model Areas, than in Parbat. While more female members belong to organizations in Parbat than male members do, the

reverse characteristics are observed in Kaski. As for female of occupational caste households, the membership ratio in mothers' club is smaller than that of other castes.

3-1-7 Cash Income Sources

The importance of cash income sources of the sampled households was scored as shown in the table below.

Relative Importance of Cash Income Sources by Model Area

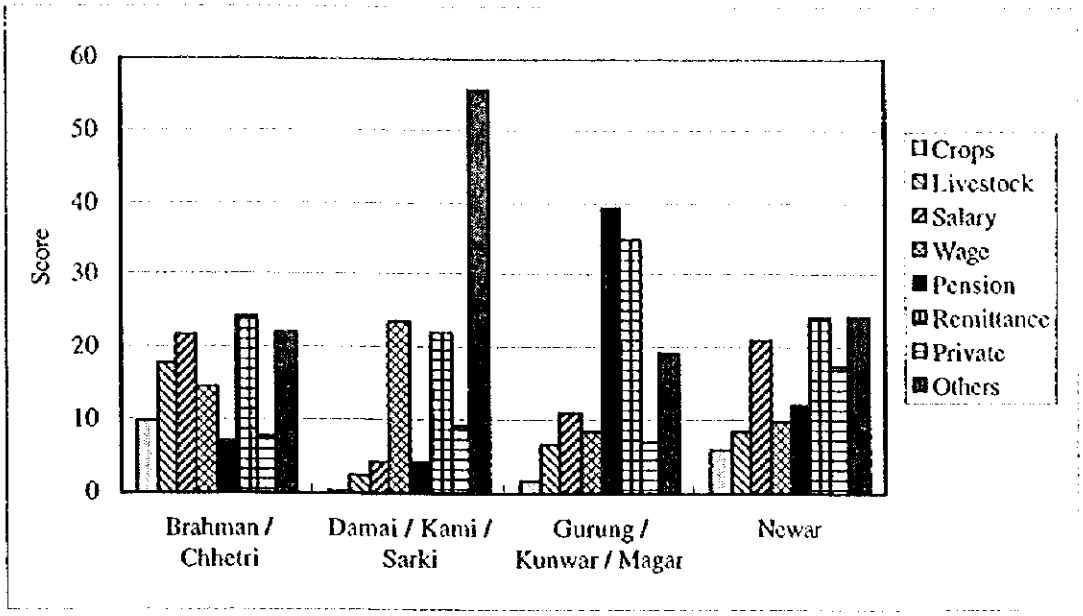
Model Area	Importance of Cash Income Source (score)								
	Crops	Livestock	Forest products	Salary	Wage #1	Pension	Remit-tance	Private business	Others #1
Parbat North	5.7	11.6	0.7	17.7	21.2	7.3	23.6	10.4	27.0
Parbat South	2.2	10.0	0.9	13.4	16.4	19.5	28.9	6.2	26.7
Kaski East	3.9	8.7	0.4	18.5	6.3	18.4	21.8	6.1	37.1
Kaski North	9.8	10.5	1.2	15.2	20.0	12.6	26.9	7.9	25.4
Kaski West	4.8	16.4	0.5	13.6	5.8	13.7	28.7	8.6	39.2
Overall	6.0	11.7	0.8	15.7	15.8	12.8	26.1	8.3	29.7

Ref. to Table 3-10 for VDC-wise details.

#1: Due to mistranslation of the Household Survey questionnaire, wage was treated as the payment for relatively long-term labor works. Therefore, the sampled households whose important cash income source include short-term labor charge selected "others".

Among the income sources mentioned above, remittance from family members working outside their villages including foreign countries is the most important cash income source in all Model Areas. It is followed by salary, wage and pension. The dependency on farming as cash income source is generally higher in VDCs located near markets, Pokhara and Kusma. However, the cash income from farming and livestock raising has lesser importance compared to the income from non-farming activities. Only few households answered forest products as an important cash income source.

A significant difference was found in the importance of cash income source by caste group. Livestock raising is an important income generating activity for Brahman and Chhetri, though they depend more on the income from salary and remittance. Occupational castes (Damai, Kami and Sarki) rely much more on wage and other income sources (both are from temporary jobs) than other castes do. The importance of remittance and pension is the highest in the group of Gurung, Kunwar and Magar. Newar is most active in business fields.



Importance of Cash Income Source by Caste Group

3-2 Living Condition

3-2-1 Drinking Water

(1) Drinking water sources

On average more than 60% of sampled households use piped water as a main source of drinking water. Natural springs scattered in the Model Areas also serve as drinking water source for about 30% of the sampled households. The reliance on piped water is higher in Kaski than in Parbat. The higher popularity of piped water in Kaski might be attributable to the active support to drinking water projects in that area by NGOs and donor agencies. The Kaski North Model Area shows the highest reliance on that source. On the contrary, the reliance on piped water is least in the Kaski East Model Area. This could be because the settlements are located mostly on the top of the mountain, above the elevation of water sources.

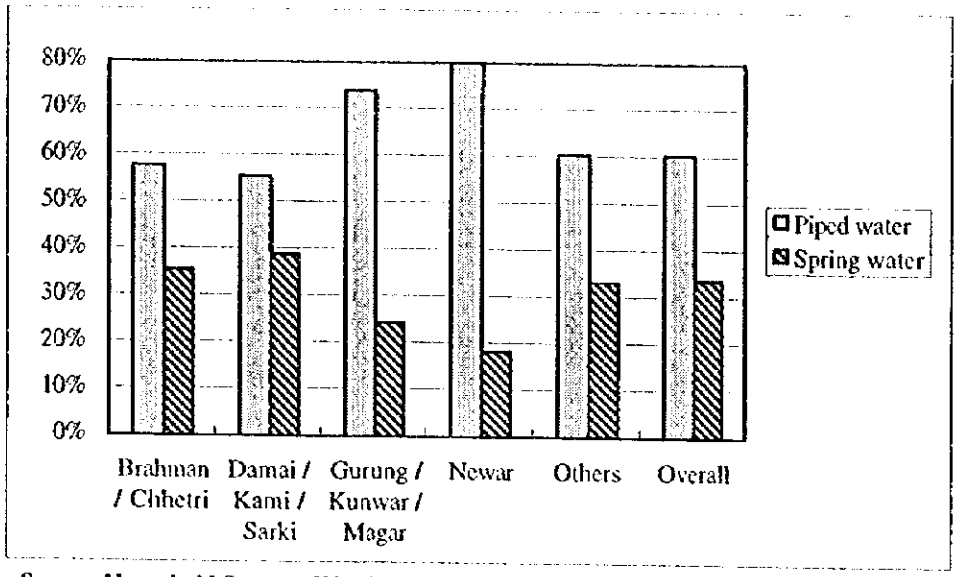
Sources of Drinking Water

Unit : HH %

Model Area	Dry season			Wet season		
	Piped water	Spring water	River	Piped water	Spring water	River
Parbat North	50.4	38.6	3.8	47.6	41.0	4.4
Parbat South	55.7	41.2	3.0	54.3	42.3	3.3
Kaski East	47.2	50.6	2.1	50.7	47.3	1.7
Kaski North	79.9	16.9	3.0	86.0	12.0	1.7
Kaski West	56.0	39.5	4.4	74.4	24.1	1.2
Overall	60.4	34.0	3.4	65.0	30.3	2.6

Ref. to Table 3-11 for details

When looking at the main water sources by caste group, the Gurung, Kunwar, and Magar group and the Newar group use more piped water than other groups, while the use of piped water was least in proportion among occupational caste groups.

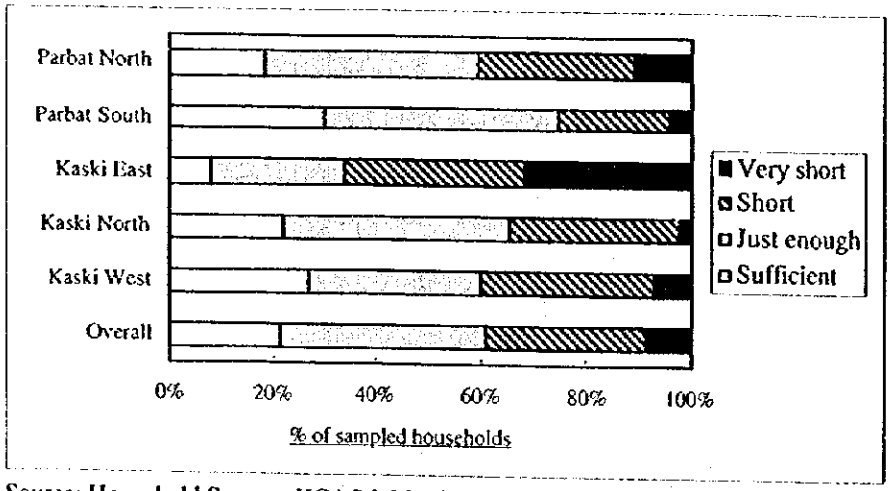


Source: Household Survey, JICA/Multi Disciplinary Consultants (P) Ltd. (1996)

Drinking Water Sources in the Dry Season by Caste Group

(2) Sufficiency level of drinking water

Regarding the sufficiency of drinking water, the proportion of the sampled households who reported short or very short in supply was about 40% and 24% for the dry and wet seasons respectively, as shown in the figure below. Among the five Model Areas, the Kaski East Model Area suffers the most from drinking water shortage. Moreover the proportion of households who reported short or very short in supply was the highest in occupational caste groups. The sufficiency level in each VDC is shown in Table 3-12. The ward-wise results are illustrated in MAP 3-5.



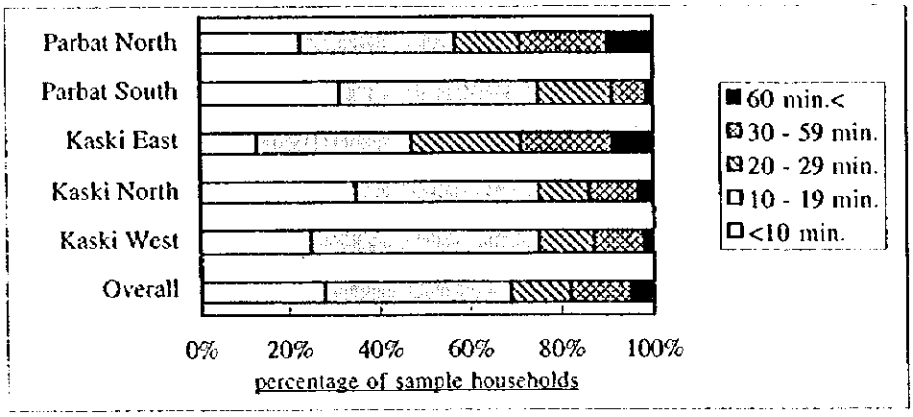
Source: Household Survey, JICA/Multi Disciplinary Consultants (P) Ltd. (1996)

Sufficiency Level of Drinking Water in the Dry Season

(3) Time required to fetch water

The average time required for fetching water is indicated in Table 3-13. It shows the time needed for collecting water from piped sources is about 17 minutes in the dry season and 16 minutes in the wet season. It takes longer time in case the source is springs (38 and 32 minutes in the dry and wet seasons, respectively). The occupational castes generally spend more time to collect water than other castes do.

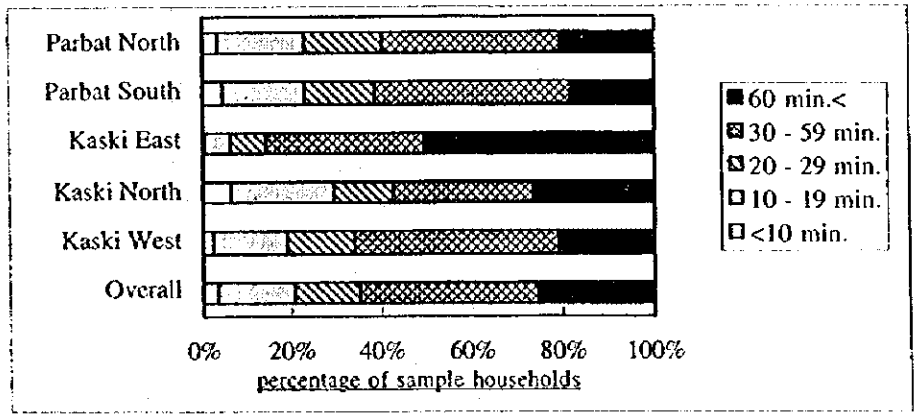
The figure below indicates the proportion of households by the time required for collecting water from piped water source in the dry season. Overall, nearly 70% of the sampled households spend less than 20 minutes, but about 5% of them need more than one hour to do so. The figure suggests that people in the Kaski East Model Area suffer the most in terms of distance to piped water source, followed by the Parbat North Model Area.



Source: Household Survey, JICA/Multi Disciplinary Consultants (P) Ltd. (1996)

Time Needed for Fetching Water from Piped Source (Dry Season)

As for springs, about 65% of the sampled households spend more than 30 minutes, including about 25% which need more than one hour. It is significant that the Kaski East Model Area suffers shortage of spring water sources near their settlements.



Source: Household Survey, JICA/Multi Disciplinary Consultants (P) Ltd. (1996)

Time Needed for Fetching Water from Springs (Dry Season)

3-2-2 Fuel

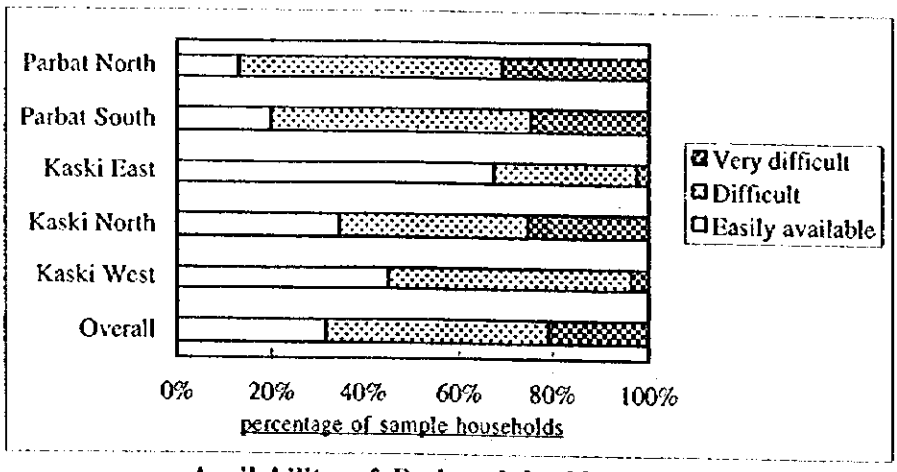
(1) Fuel sources

The Household Survey revealed that fuelwood is the most important fuel source for cooking and heating purposes for almost all of the sampled households, as shown in Table 3-14. Crop residue constitutes a second important fuel source. Unlike households in the Terai area, use of dried cow dung for cooking purpose is not popular in the Model Areas. Kerosine is generally used for lighting purpose only because it is hardly available in remote villages due to the high cost associated with transportation problems. Only a few households who have better access to market are using kerosine for cooking. In the Kaski North Model Area, VDC Lamachaur in particular, kerosine is used for cooking by villagers.

Use of biogas is not widespread in the Model Areas yet because (1) the construction cost is high (roughly Rs.30,000) relative to the income level of the general population, (2) the biogas plant does not work well under the cold climate in the dry season, and (3) cattle and buffalo, main sources of gas, must be stall-fed and well managed. About 2% of the sampled households use biogas as a fuel source, mostly in combination with fuelwood. It is more popular in Kaski district than Parbat, particularly in the Kaski North Model Area as shown in MAP 3-6.

(2) Availability of fuelwood

Many villages have faced the shortage of fuelwood (Table 3-15). In Parbat district, about 85% of the sampled households reported difficult or very difficult in obtaining fuelwood, while in Kaski district the ratio was 55%. The Model Area-wise survey results on fuelwood availability are shown below.



Availability of Fuelwood by Model Area

Fuelwood availability is the highest in the Kaski East Model Area, with about 68% of the sampled households reporting easy access to fuelwood sources. On the other hand, the households in Parbat district generally suffer from fuelwood shortage. The principal cause of the difference is the extent of forest coverage. Among caste

groups, the occupational castes suffer the most from the shortage: about 32% replied "very difficult to obtain fuelwood", while the ratio was about 18% among non-occupational castes. The ward-wise availability of fuelwood is illustrated in MAP 3-7.

(3) Time required to reach fuelwood forest

Table 3-16 gives the average time required to reach fuelwood forest by VDC. It revealed that the distance considerably varies from place to place. The VDC-level average of the one way distance is in the range between 30 and 118 minutes. Among the five Model Areas, Kaski East has the shortest distance to the source (33 minutes on average). It could be said that the Kaski East Model Area is better situated in terms of availability as well as easiness in obtaining fuelwood.

(4) Estimation of fuelwood consumption

Per capita annual consumption of fuelwood varies from ward to ward and was estimated at 545 kg [3] on average (see Table 3-17). Of the total fuelwood consumption, the share of own harvest and purchased one was about 90% and 10% respectively in the five Model Area as a whole. In Parbat district, purchase of fuelwood seems to be a general practice and purchased fuelwood covers about 16% of the total consumption on average. On the contrary, fuelwood is rarely purchased in Kaski district.

3-2-3 Food

Most of the sampled households have been engaging in farming to produce cereals and vegetables not only for their home consumption but for income. According to the Household Survey results, however, more than 70% and 50% of the sampled households reported the deficit of own-produced cereals and vegetables respectively, as shown below:

[3] : The absent family members were included when calculating the per capita annual consumption. If they were excluded, the amount increases to 677 kg/year.

Sufficiency Level of Cereal and Vegetable Produced by Sample Households

Unit : HH %

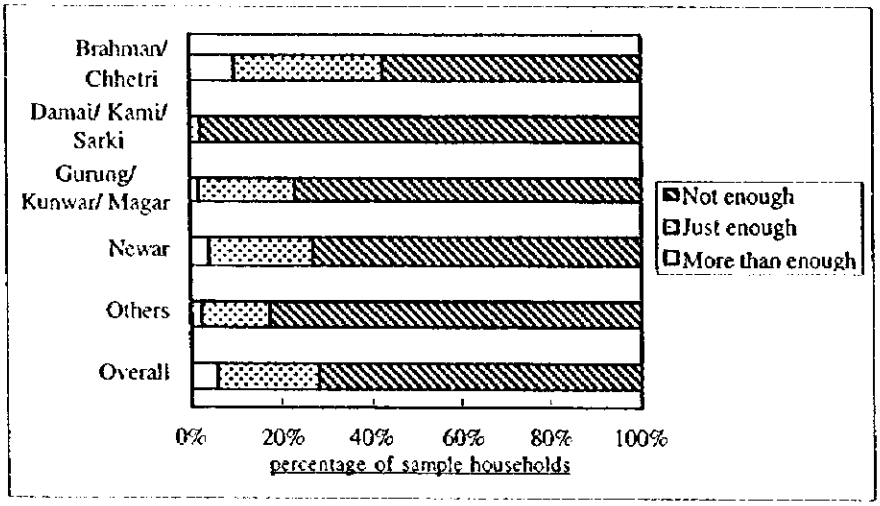
Model Area	Cereals			Vegetables		
	More than enough	Just enough	Not enough	More than enough	Just enough	Not enough
Parbat North	4.7	25.2	70.1	0.5	49.0	50.4
Parbat South	2.3	20.4	77.2	0.4	51.9	47.8
Kaski East	4.8	21.2	73.9	0.4	28.2	71.4
Kaski North	9.0	25.2	65.7	5.2	63.4	31.4
Kaski West	6.4	15.8	77.9	0.5	42.9	56.6
Overall	5.9	21.5	71.1	1.8	50.4	47.8

Refer to Tables 3-18 and 3-19 for VDC-wise detail.

Source: Household Survey, JICA/Multi Disciplinary Consultants (P) Ltd. (1996)

The proportion of households who are not self-sufficient in cereals is presented in MAP 3-8. The households who are self-sufficient in cereals consist of comparatively larger farms having access to irrigation. In addition, they use their farms very intensively, growing three crops in a year in most of their lands. Among the food-deficit households, the average periods of deficit for cereals and vegetables are about 4.6 and 3.0 months respectively. Many reported June to August as the most severe food deficit period.

The difference of cereal sufficiency lebel by caste group is shown in the figure below. About 40% of the Brahman and Chhetri households are self-sufficient in cereals, while most of occupational castes are facing severe cereal deficit. The biggest reason is their smaller holding of farmland.



Source: Household Survey, JICA/Multi Disciplinary Consultants (P) Ltd. (1996)

Cereal Sufficiency by Caste Group

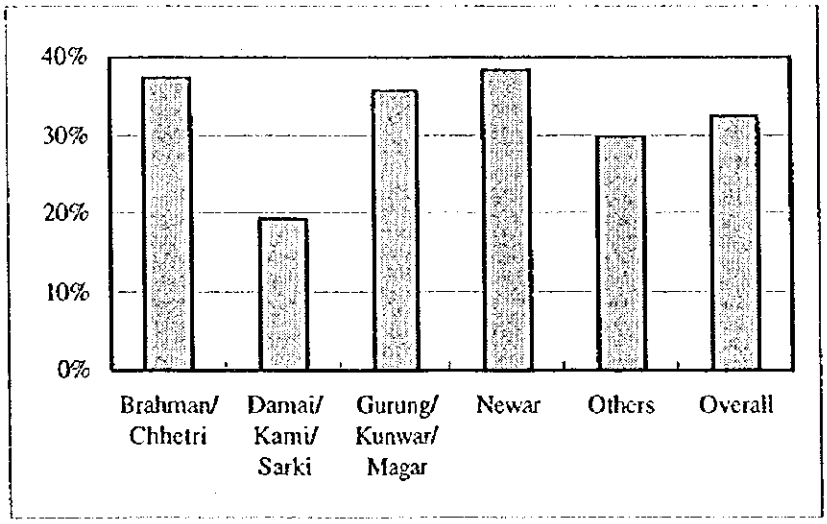
3-2-4 Health and Sanitation

(1) Diseases

In the Household Survey, the sampled households were asked about major diseases their family members had during the last 12 months. The VDC-wise results are presented in Table 3-20. Nearly 80% of the sampled households in Parbat district reported that they had some kind of diseases, while the ratio was 53% in Kaski district. Cold is a common disease in both districts. Bacillary dysentery and other diarrheal diseases were reported by 13% of sample households. It is probably due to the use of unsafe water for drinking and unhygienic surroundings. Respiratory diseases was reported in about 9% of the respondents. Their causes could be attributed to hard working without adequate nutrient intake. Eye diseases, which are attributable to smoky kitchen/rooms and less intake of green vegetables, were reported by about 8% of the sampled households.

(2) Toilets

Availability of toilets can be an indicator of better sanitary condition. The survey reveals that the sanitary condition is much better in Kaski district than in Parbat, with nearly a half of households owning toilets (Table 3-20). The toilet availability by caste groups highlights the worst sanitary condition among occupational castes, showing 19.2% of toilet availability in the households of occupational castes compared to 33% of overall average, as shown below:



Source: Household Survey, JICA/Multi Disciplinary Consultants (P) Ltd. (1996)

Availability of Toilets in Sampled Households by Caste Group

The toilet diffusion rate in each ward is given in MAP 3-9.

3-2-5 Family Planning

Table 3-21 presents the results of Household Survey about family planning. Of the sampled households, about 57% had been visited by family planning workers in the past. The percentage was higher in Kaski district (about 64%) than in Parbat (about 48%), probably due to the better access to villages in Kaski compared to Parbat. With regard to the contraceptive methods used, about 30% of the sampled households in Parbat and 52% in Kaski district did not answer. The available answers indicated the use of contraceptive methods is more popular in Kaski than in Parbat. One reason for the higher adoption in Kaski could be the comparatively active family planning workers. Of the methods, vasectomy is the most popular among the sample households followed by tubectomy and condom.

3-2-6 Public Facilities

School, drinking water supply system, health center, and post office are the major public facilities commonly found in the Model Areas, though their number is small due to the remoteness of the areas. The Pokhara - Baglung highway in the Kaski West Model Area is the only motorable road within the Model Areas. Absence of motable roads in other areas is due to the rugged geographical condition.

Public Facilities in Model Areas

Unit : nos.

Model Area	School (class 1-10)	Campus	Health center	Post office	Telephone	Police station	Bank
Parbat North	67	2	13	6	3	3	2
Parbat South	29	0	5	3	0	1	2
Kaski East	21	0	3	3	0	1	0
Kaski North	70	0	10	10	6	1	1
Kaski West	45	0	4	5	1	0	0
Overall	232	2	35	27	10	6	5

Refer to Table 3-22 for VDC-wise details.

Source: Administrative Survey, JICA/Multi Disciplinary Consultants (P) Ltd., (1996)

Schools up to high school level exist in almost all concerned VDCs except VDC Balakot in the Parbat South Model Area. The Model Areas in Kaski district have more schools than those in Parbat in terms of the number of schools per ward: 0.94 (Kaski) vs. 0.59 (Parbat) per ward. Many school children in remote areas spend hours to commute to their schools. The demand for improved education has been rising these days among parents. This calls for private boarding schools even in remote areas or the construction and management of schools by villagers themselves. Regarding higher educational facilities, only the Parbat North Model Area have campuses. Because of the availability of higher education facilities, the proportion of people with a degree higher than SLC is the largest (8.3%) in the Parbat North Model Area among the five Model Areas.

Health centers include hospitals, primary health centers, health posts and sub-health

posts. The health centers are operated by government agencies except one hospital in VDC Huwas in the Parbat South Model Area, which is managed by an American mission. Usually, they provide minor treatment to patients. In the case patients need further treatment, they are sent to hospitals in the district center. Family planning promotion activities are also a duty of the health centers.

Telephone facilities are rarely available in the Model Area. Of the 43 VDCs concerned, only 6 VDCs have telephone service. Writing letters is still a popular communication means in the areas.

There are five branch offices of banks in the Model Area. They extend loans to farmers for improved farming activities.

3.3 Agriculture

The farming system has been changed in and around the Model Areas. Following is extracts from a paper that best describes the situation.

BOX-1

Dynamics of the farming system around the Model Areas (1)

Slash and burn in decline

Local inhabitants, including older villagers, indicated that the farming system, including land use in the area, has undergone significant changes over time. Slash and burn agriculture, used to be widespread in the area, is in decline. The main reason for this decline is the intensification of agriculture, market influences, the cost of labor and the availability of external inputs such as fertilizers and seeds. Such changes have also resulted in changes in land use in the area. Not only are changes evident in farmers' fields, such as in the improved management of livestock and in increased tree growing, but changes are also seen outside the farms in the increase of forest cover due to secondary regeneration in abandoned khoriya (slash and burn) fields, and in the more active management of community forests by the local communities.

Source: Dynamics of farming system in hill area of Nepal - A Case of Lwang-Ghalel and Rivan VDCs, Kaski district -, ILEIA NEWSLETTER, April 1996, Vol. 12 No.1.

3-3-1 Farmland Area

On average, a sampled household has about 0.46 ha of farm land, composed of 0.29 ha of khet land and 0.17 ha of bari land. The Parbat South Model Area has the smallest farm land area per household. The average farm size in each ward is shown in MAP 3-10. The table below indicates that more than 90% of the sampled households own bari land, while only 75% khet land. This suggests the relative difficulty in obtaining khet land.

Average Holding of Farm in Model Areas

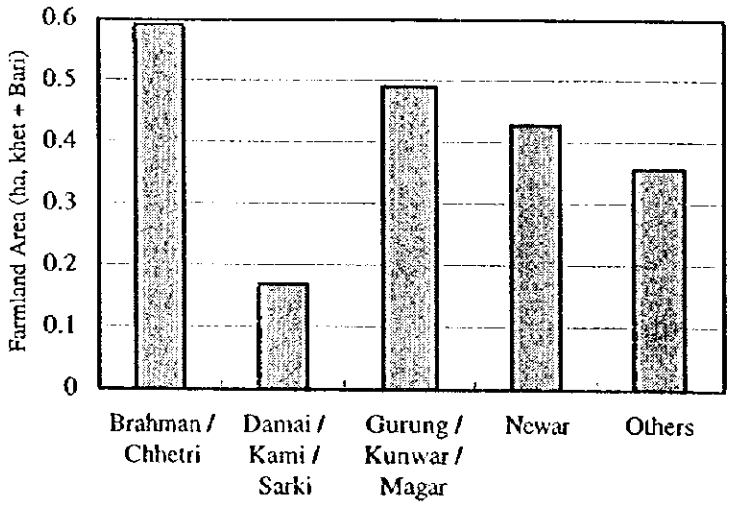
Model Area	Khet Land		Bari Land		Ave. farmland area (ha/HH)
	Landless (HH %)	Ave. area (ha/HH)	Landless (HH %)	Ave. area (ha/HH)	
Parbat North	18.4	0.30	7.3	0.19	0.49
Parbat South	26.8	0.19	3.6	0.19	0.38
Kaski East	31.2	0.27	6.1	0.21	0.48
Kaski North	25.6	0.30	12.3	0.15	0.45
Kaski West	31.8	0.32	7.2	0.15	0.47
Overall	25.4	0.29	8.1	0.17	0.46

Refer to Tables 3-23 and 3-24 for VDC-wise details.

Source: Household Survey, JICA/Multi Disciplinary Consultants (P) Ltd. (1996)

The survey results indicate that the farmers in the Model Areas cultivate rented land in addition to their own land. The average of such rented land area was calculated at 0.05 ha and 0.01 ha per household for khet and bari land respectively. Accordingly, the total farmland area per household averages 0.34 ha for khet land and 0.18 ha for bari land.

The survey also reveals that occupational castes have much smaller farmland area (0.17 ha) than other castes have. In addition, about 67% and 13% of the occupational caste households do not have khet and bari land, respectively. On the contrary, the Brahman and Chhetri have the largest farmland area of about 0.59 ha on average.



Average Farmland Area per Household by Caste Group (Khet and Bari)

3-3-2 Farmland Damaged by Natural Incidences

In the Household Survey, the sampled households were asked about the frequency of damage to their farm by natural incidences in the last 10 years. The results are shown in Tables 3-25 to 3-27 and summarized below:

Frequency of Farm Damage by Natural Incidences

Unit : % of HH reported

Model Area	Flood		Landslide		Topsoil Erosion	
	Occasionally	Regularly	Occasionally	Regularly	Occasionally	Regularly
Parbat North	5.8	3.9	19.8	13.6	3.6	7.1
Parbat South	4.3	5.5	17.9	12.9	4.6	10.4
Kaski East	11.7	17.8	5.3	3.6	3.9	3.5
Kaski North	5.6	8.4	8.4	3.4	1.3	2.1
Kaski West	2.3	9.6	4.3	7.6	0.4	0.5
Overall	5.5	7.9	11.9	8.4	2.5	4.5

Source: Household Survey, JICA/Multi Disciplinary Consultants (P) Ltd. (1996)

The table shows that flood damage has occurred more frequently in Kaski district than in Parbat district. The highest frequency of flood damage was reported in the Kaski East Model Area where a large portion of farm land is located along rivers. On the other hand, the frequency of farmland damaged by landslide and top soil erosion is higher in Parbat district than in Kaski. This is attributable to the comparatively steeper topography and scarce forest cover in Parbat district.

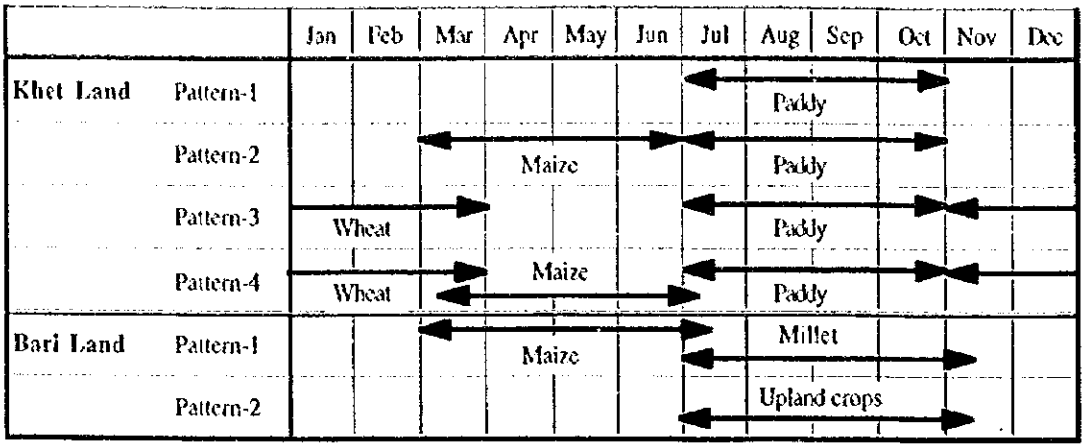
MAPs 3-11, 3-12, and 3-13 indicate the proportion of sampled households whose farm has been regularly damaged by these three natural incidences.

3-3-3 Cropping Pattern

(1) Cropping pattern

In the Model Area, the major crops grown in khet land are paddy, maize, wheat, potato, and mustard. In bari land, maize, finger millet and mustard are major crops. Pulses such as bean and soya bean are intercropped with maize, while finger millet is relayed with maize.

The cropping pattern varies in the Model Areas depending upon the climatic condition (elevation) and availability of irrigation water. The major cropping patterns in khet and bari lands in the Model Areas are shown below. VDC-wise popularity of cropping patterns is presented in Tables 3-28 and 3-29.



Major Cropping Pattern in Khet and Bari Lands

In both Parbat and Kaski districts, paddy-fallow-fallow is the dominant cropping pattern in khet land (Table 3-28). Paddy-wheat-fallow and paddy-wheat-maize are also prevailing where irrigation is available. In bari land, millet-fallow-maize is practiced by about 65% of the total sampled households. In Kaski district, some bari land is cropped three time a year where condition allows.

BOX-2

Dynamics of the farming system around the Model Areas (2)

Cropping system changes

Due to increased mobility, facilitated by improvements in basic infrastructure, such as a road leading to the terai, and due to the inherent nature of rural farmers to experiment, new crops have been introduced in the area. According to villagers, the Bangare rice variety was brought in around 1970 from the adjoining district of Syangia. This variety could be grown in even higher terraces where irrigation was possible. Villagers subsequently converted their khoriya (slash and burn field), wherever possible, into high altitude rice terraces. Rice replaced millet. At about the same time, millet was being replanted in maize fields. In a situation of increasing labor shortage for the collection and transportation of manure, this was the most optimum way of growing millet, more efficiently utilising the manure used in the corn fields.

Subsequent to a drought, when most of the traditional crops in the area failed, in 1978 some farmers experimented with the introduction of winter wheat to avoid famine. Since then wheat has become popular as a winter crop in irrigated fields. Thus, fields usually remaining fallow during winter were also brought into production.

Recent effort (since 1990) by ACAP to promote vegetable growing in the area in view of the potential market in Pokhara has further stimulated agricultural intensification. In the village of Dandagaun in the area, 52% of households were found to grow vegetables. These local adaptations and innovations allowed farmers to intensify agriculture and increase production, making labour intensive but extensive agriculture (khoriya: slash and burn) redundant.

Source: Dynamics of farming system in hill area of Nepal - A Case of Lwang-Ghalel and Rivan VDCs, Kaski district -, ILEIA NEWSLETTER April 1996, Vol. 12 No. 1.

(2) Cropping intensity

The average cropping intensity in khet and bari lands is 185% and 224% respectively as shown in the table below:

Cropping Intensity in Khet and Bari Lands

	Parbat North	Parbat South	Kaski East	Kaski North	Kaski West	Overall
Khet Land	194%	226%	139%	181%	169%	185%
Bari Land	201%	210%	204%	245%	257%	224%

Source: Calculated from Household Survey results

The cropping intensity in khet land is higher in Parbat district than in Kaski. As for the cropping intensity in bari land, the reverse was observed. In the Kaski West Model Area in particular, three crops a year is common in bari land. The cropping intensity in the Model Areas is much higher compared with the national average of 177%.[4] This suggests that the people in the areas have made best efforts to increase crop production by cultivating their limited farmlands as intensively as possible.

3-3-4 Cropped Area and Production

(1) Cropped area

In the Household Survey, the sampled households were asked about the cropped area and production of major crops in the previous year (1995). For major crops, the average of cropped area, crop yield and crop production per household were calculated for each VDC as shown in Tables 3-30 and 31. A Model Area-wise summary is given in the next page.

The cropped area of paddy in khet land was computed at 0.32 ha per household on average, which corresponds to the average khet land area per household. The average cropped area of maize and millet in bari land is 0.17 ha respectively. This indicates that bari land in the Model Areas is used at least twice a year for the cultivation of such crops.

[4] : The averaged cropping intensity in hill areas. (Statistical Pocket Book of Nepal, 1996)

Cropped Area, Yield and Production of Major Crops

Crops		Parbat North	Parbat South	Kaski East	Kaski North	Kaski West	Overall
Khet Land							
Paddy	Area (ha/HH)	0.33	0.21	0.32	0.33	0.37	0.32
	Yield (kg/ha)	1,841	1,972	2,087	2,117	1,642	1,914
	Production (kg/HH)	608	414	668	699	608	612
Wheat	Area (ha/HH)	0.08	0.10	0.02	0.08	0.04	0.07
	Yield (kg/ha)	1,303	1,192	1,075	1,029	941	1,151
	Production (kg/HH)	104	119	22	82	38	81
Maize	Area (ha/HH)	0.09	0.10	0.02	0.07	0.04	0.07
	Yield (kg/ha)	1,309	1,249	994	1,140	968	1,202
	Production (kg/HH)	118	125	20	80	39	84
Bari Land							
Maize	Area (ha/HH)	0.18	0.20	0.17	0.16	0.16	0.17
	Yield (kg/ha)	1,140	1,259	1,011	1,071	1,089	1,116
	Production (kg/HH)	205	252	172	171	174	190
Millet	Area (ha/HH)	0.18	0.19	0.18	0.15	0.16	0.17
	Yield (kg/ha)	1,342	1,300	1,174	1,160	1,241	1,249
	Production (kg/HH)	242	247	211	174	199	212

Source: Household Survey, JICA/Multi Disciplinary Consultants (P) Ltd. (1996)

(2) Crop yield and production

The yield of the major crops except millet are low compared with the national and regional averages. It is considered that the major constraints for crop production are low soil fertility caused by intensive use of land, inadequate supply of crop nutrient, higher altitude, and prevailing crop damage.

Comparison of Crop Yields

Unit : kg/ha

Items	Paddy	Wheat	Maize	Millet
National average (1994/95)	2,060	1,440	1,650	1,070
Western average (1994/95)	2,010	1,440	1,580	1,070
Model Areas (Khet Land)	1,914	1,151	1,202	-
Model Areas (Bari Land)	-	-	1,116	1,249

Source: Statistical Pocket Book of Nepal (1996), Central Bureau of Statistics
Model Area averages were calculated from Household Survey results.

Fertilizer application is common for paddy and wheat cultivation in khet land, while a minimal amount is used for crop production in bari land. Of the five Model Areas, Parbat North uses more fertilizer than others.

From the Household Survey results, overall production of major cereals per

household was computed at 1,180 kg, which corresponds to an annual per capita production of only 178 kg. Considering that post-harvest loss and use of cereals for making wine comprise more than 30% of the production, this clearly indicates cereal deficiency in the areas.

3-3-5 Crop Damage

As already mentioned, the crop productivity in the Model Areas is low to moderate in comparison with the national and regional averages. The major causes are crop damage by various reasons. The results of the Household Survey on crop damage are presented in Fig. 3-3. Drought is the most important cause for khet land crops. Since many farms are not provided with irrigation facilities, it is natural the crop production is affected by rainfall condition of the year. Diseases rank second as a cause of damage to paddy. As for maize, many households reported the damage by wind. This could be because the cropping period of maize extends over the windy monsoon season. Hail stone also affect maize particularly in the Kaski North and West Model Areas.

3-4 Livestock

3-4-1 Livestock Population

In the Model Areas, popular livestocks raised by farmers are buffalo followed by cow, goat, and chicken. Of the 8,123 sampled households in the five Model Areas, only 54 households are keeping sheep. Meanwhile, about 3% of sampled households, mainly occupational castes, are raising pig.

Buffalo is the most popular livestock raised by the sampled households probably because it can be used for multiple purposes: Production of milk and meat (only male) and draft animal. About 87% of households own buffalo in the Model Areas and the average animal population per household (including non-owner) is 2.0 heads. It is found that the majority of sampled households own comparatively a higher number of buffaloes in the Parbat South Model Area, probably because buffaloes produce more milk than cows and male buffaloes can be used for meat. Cows are owned by about 59% of the sampled households with an average of 1.2 cows per household. Goat and chicken are raised by about 47% and 44% of the sampled households respectively. No fish ponds were reported in the Model Areas.

Proportion of Sampled Households Who Keep Livestock

Unit: owner HH % (ave. heads)

	Cow	Buffalo	Goat	Pig	Chicken
Parbat North	64.1 (1.2)	89.5 (1.9)	48.0 (1.2)	1.0 (0.0)	33.7 (2.2)
Parbat South	66.5 (1.5)	94.5 (2.4)	40.9 (1.3)	4.8 (0.1)	44.3 (3.4)
Kaski East	61.6 (1.7)	87.1 (2.1)	62.4 (2.3)	10.7 (0.2)	68.9 (5.0)
Kaski North	53.7 (1.0)	82.8 (1.9)	41.9 (1.5)	1.4 (0.0)	38.9 (5.8)
Kaski West	51.7 (1.1)	85.7 (2.0)	48.7 (1.5)	2.7 (0.0)	49.8 (3.4)
Overall	59.3 (1.2)	87.4 (2.0)	46.8 (1.5)	3.1 (0.1)	44.4 (4.1)

Ref. to Table 3-32 for VDC-wise details.

Source : Household Survey, JICA/Multi Disciplinary Consultants (P) Ltd. (1996)

The figures in parentheses indicate the average population of each livestock per household (including those who do not own livestock).

BOX-3

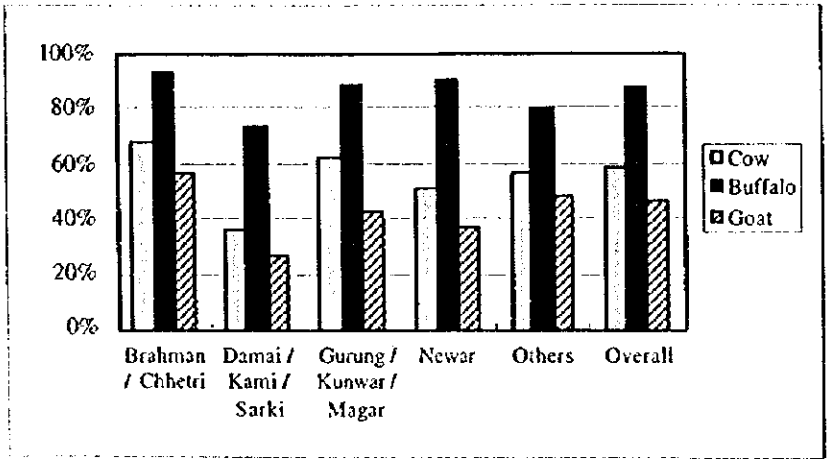
Dynamics of the farming system around the Model Areas (3)

Livestock system changes

The role and importance of livestock as a component of the farming system has gradually changed in the research area. Availability of fertilizer and reduced access to natural resources such as the forestlands are the main factor. Reduced access, mainly due to forest utilization regulations imposed by local institutions, has induced changes in livestock management and livestock type. The cow-dominated free grazing livestock system is gradually evolving into a buffalo-dominated and stall-managed livestock system. Village elders reported that in the past cows were more numerous among the large livestock. The present survey, however, shows that of the cattle owned, 60% were buffaloes and 40% were cows. Similarly in the past, it was common for each household to own 20 cattle. The present survey indicates an average of only 4.3 cattle per household.

Source: Dynamics of farming system in hill area of Nepal - A Case of Lwang-Ghalel and Rivan VDCs, Kaski district -, ILEIA NEWSLETTER April 1996, Vol. 12 No.1.

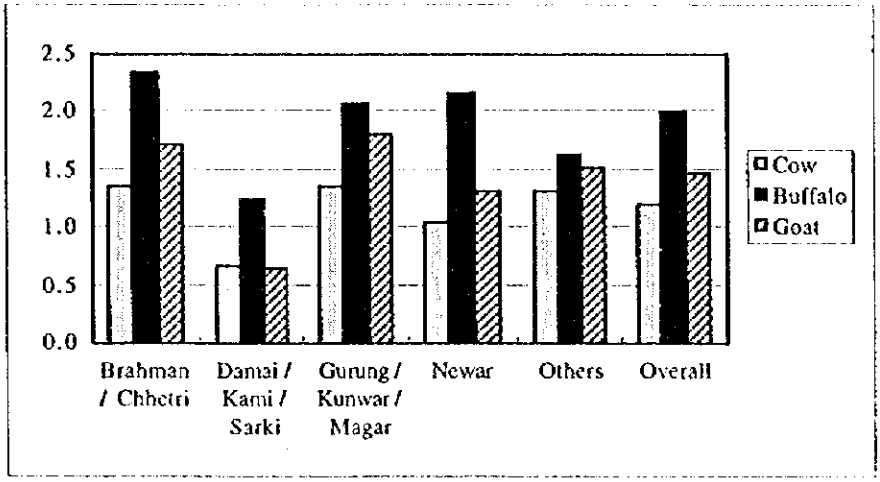
The caste-wise proportion of households who own livestock is presented in the figure below:



Proportion of Sampled Households Who Keep Livestock

Of the caste groups, the Brahman and Chhetri groups are the richest in terms of livestock ownership ratio: cow, buffalo, and goat are raised by 68%, 94%, and 57% of the households respectively. On the other hand, the proportion of occupational castes who own livestock is smaller than others.

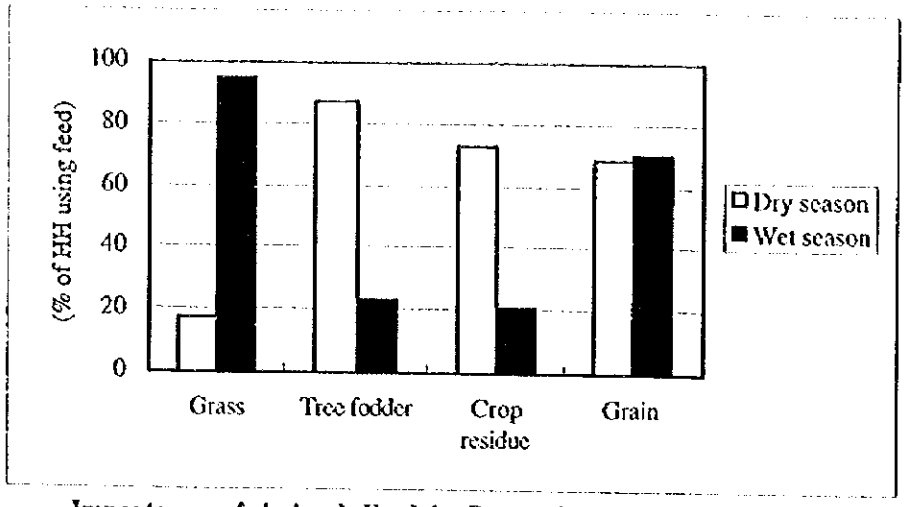
As for livestock population per household, an average household owns 1.2 cows, 2.0 buffaloes and 1.5 goats. Among the caste groups, occupational caste own a much smaller number of livestock than others: 0.7 cow, 1.2 buffaloes, and 0.6 goats, as shown in the figure below.



Average Number of Livestock per Household by Caste Group

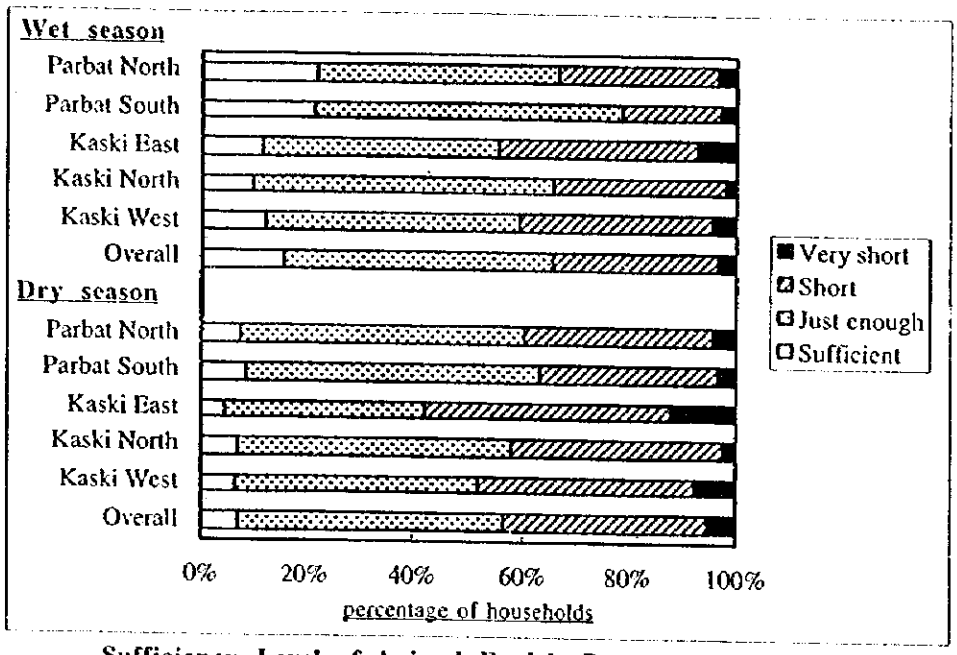
3-4-2 Livestock Feed and Sufficiency

Grass, tree fodder, crop residue (straws of paddy and millet) and grain are major livestock feed used by the sampled households. Grass is an important feed during the wet season because it is abundant from place to place. Tree fodder and crop residue are fed mainly during the dry season when grass is scarce. Grains are equally important throughout the year to supplement nutrient, particularly for milking animals.



Importance of Animal Feed in Dry and Wet Seasons

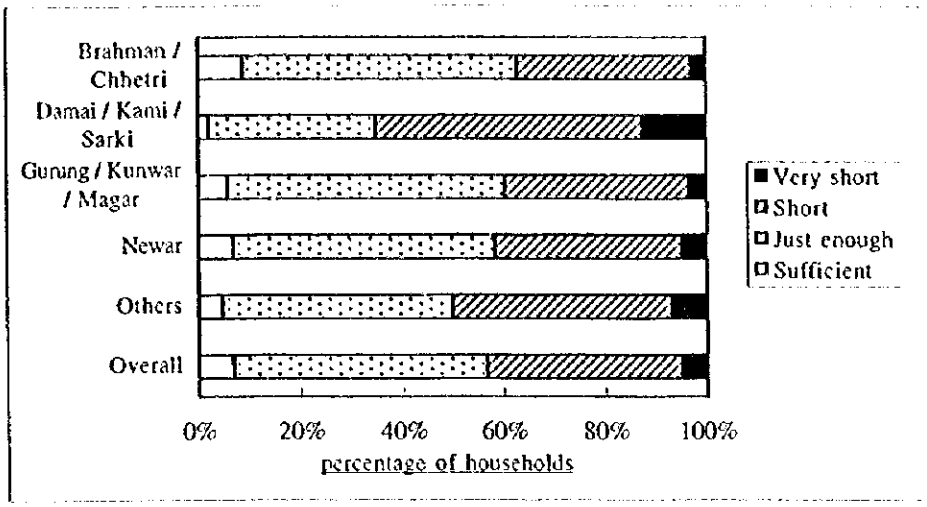
The sufficiency level of animal feed in the dry and wet seasons is given in Table 3-33 and illustrated in the following figure:



Sufficiency Level of Animal Feed in Dry and Wet Seasons

The figure indicates that the proportion of those who reported "short" or "very short" in the sufficiency level of feed reachs about 45% in the dry season and 36% in the wet season. Among the five Model Areas, Kaski East show a higher insufficiency in animal feed: 58% and 45% in the dry and wet seasons respectively. The higher animal population in this Model Area might be one of the reasons. The ward-wise animal feed sufficiency level is shown in MAP 3-14

Meanwhile, the survey revealed that a larger proportion of occupational castes face severe shortage of animal feed despite of the smaller number of livestock they own.



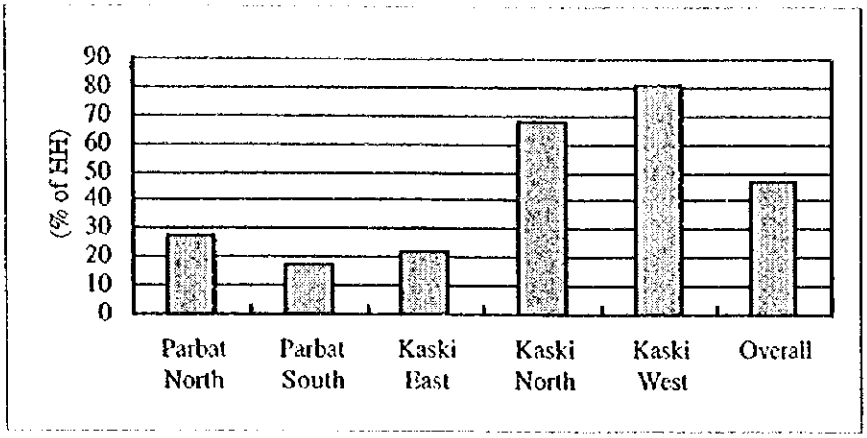
Sufficiency Level of Animal Feed by Caste Group (Dry Season)

3-5 Forests

3-5-1 Community and Private Forests

In the Household Survey, the sampled households were inquired about the ownership of private forests and their participation in forest users' groups. The VDC-wise results of the survey are given in Table 3-34. They reveal that about 17% of the sampled households possess private forests with an average area of 0.18 ha per household. The proportion of the households who own private forests is slightly higher in Parbat district than in Kaski district. An analysis by caste group indicates that the proportion of households who possess private forests is least among the occupational castes group. However, there is no difference among caste groups in terms of the participation in forest users' groups.

Forest is an integral part of life in the area. There is a growing popularity in protecting and managing the limited resource by organizing the households in users' groups. According to the Household Survey results, about 47% of the households are members of forest users' groups (either formal or informal). The average proportion of the member households is highest in the Kaski West Model Area (81%). In Puranchaur, Sildujure and Sardikhola VDCs in the Kaski North Model Area particularly, 100% of sampled households are members of forest users' groups. MAP 3-15 shows the proportion of sampled households participating in forest users' groups.



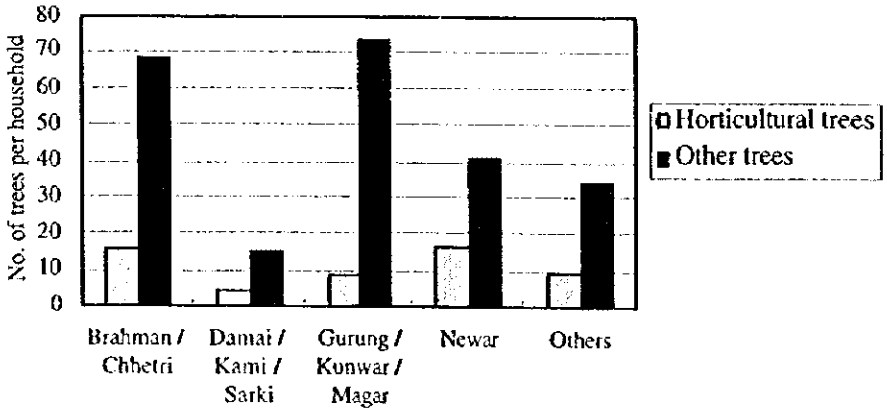
Proportion of Households Belonging to Forest Users' Group

3-5-2 Private Trees

People have grown a variety of horticultural trees in the area. The average number of horticultural trees per household is 11.8 as shown in Table 3-35. These include orange, banana, guava, lime, papaya, pear, mango, lichee, and coffee. Banana, mango and lichee prefer hot climate and thus are grown mainly in lower altitudes. Meanwhile, lime, lemon, orange, pear and guava are grown in comparatively higher altitudes. Farmers grow these trees for home consumption as well as for marketing, if the village is located near markets.

In addition to horticultural trees, people privately grow and manage trees for producing fodder, fuelwood, timber, and crafting materials. On average, one household owns about 55 trees. Of these, about 60% are destinated for fuelwood production and the rest for fodder and timber production. People also grow bamboo but to a limited extent.

As for the difference between caste groups, the survey reveals that the occupational castes group possesses quite a smaller number of trees compared with other caste groups, as shown below.



Number of Trees Owned by Each Caste Group

3-6 Cottage Industries

Cottage industries are operating in a limited field in the Model Areas as shown in Table 3-36. Rice mills exist in almost all VDCs in the area. Poultry farming is observed in a number of VDCs. The products are sold in nearby markets. Bamboo works and wood processing are limited in number probably due to low demands in the area.

In spite of limited cottage industries in the area, a quite large number of people have acquired one or more traditional skills such as carpentry, mason, bamboo crafting, and tailoring as shown in Table 3-37. Their skills have been utilized from time to time within or in the vicinity of the Model Area. In the case of handicrafting skills, these are used mostly to produce souvenirs to relatives and guests rather than commercial products. More than 1,500 people earn their livelihood by working as porters in the Model Areas as a whole. Since most of the areas are inaccessible by motorable roads, there are a lot of opportunities for porters to carry living necessities, foods or construction materials to remote villages.

4 RESULTS OF HOUSEHOLD MEMBER SURVEY

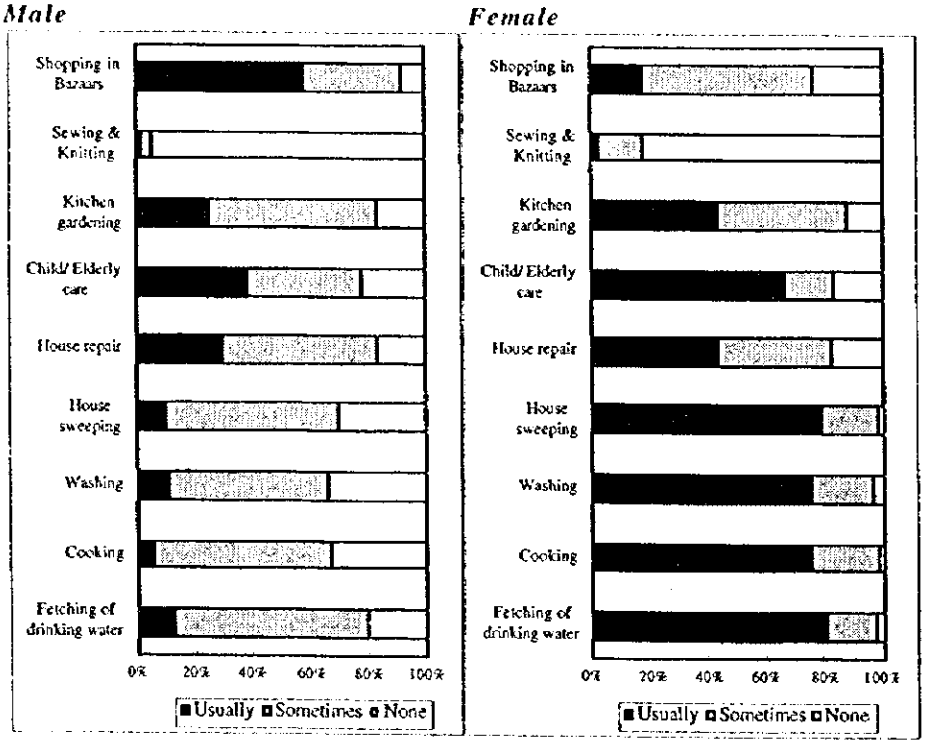
4-1 Role of Men and Women

In the Household Member Survey, sampled adult members were asked about the frequency of their involvement in major activities, in order to clarify the role of males and females. To make the interview and analysis easier, all the activities were grouped into seven categories: (1) home activities, (2) farming activities, (3) livestock raising, (4) forestry activities, (5) domestic business, (6) communication, and (7) religious and cultural activities. The results obtained in the five Model Areas are presented in Tables 4-1 to 4-6. It is important to note that though the characteristics of the gender roles are described below in generalized manner, there is a quite large variation in the survey results at VDC and ward levels.

4-1-1 Home Activities

(1) General

Home activities include fetching water, cooking, washing, house sweeping, house repair, child or elderly care, kitchen gardening, sewing / knitting, and shopping in bazaars. The survey result shows that women are much more responsible for all the activities except shopping in bazaars. These findings very well reflect the traditional and general practices of villagers in Nepal.

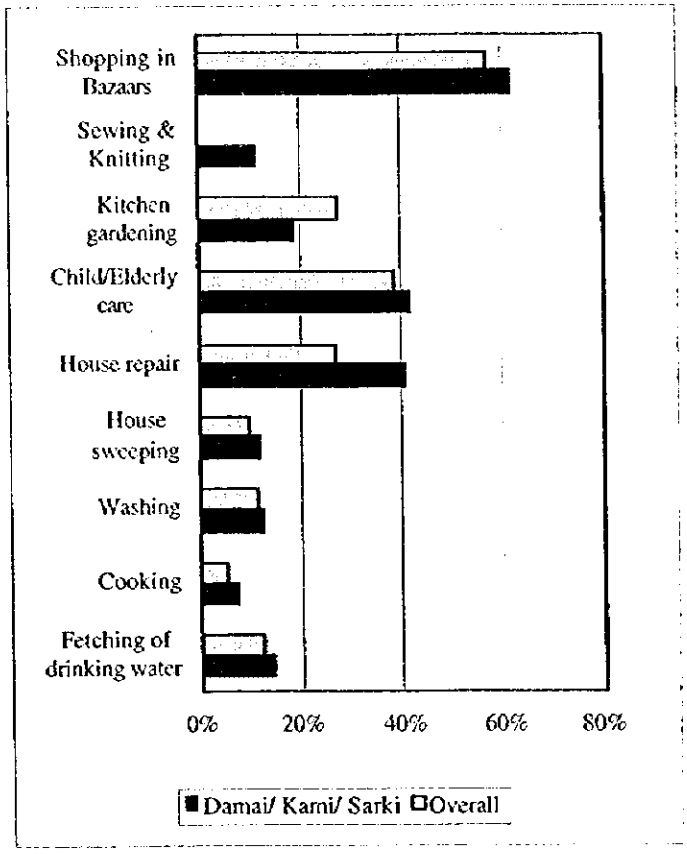


State of Involvement in Home Activities by Sex (Overall)

Fig. 4-1 shows the state of involvement in home activities by sex in each Model Area.

(2) Difference of occupational caste groups with others

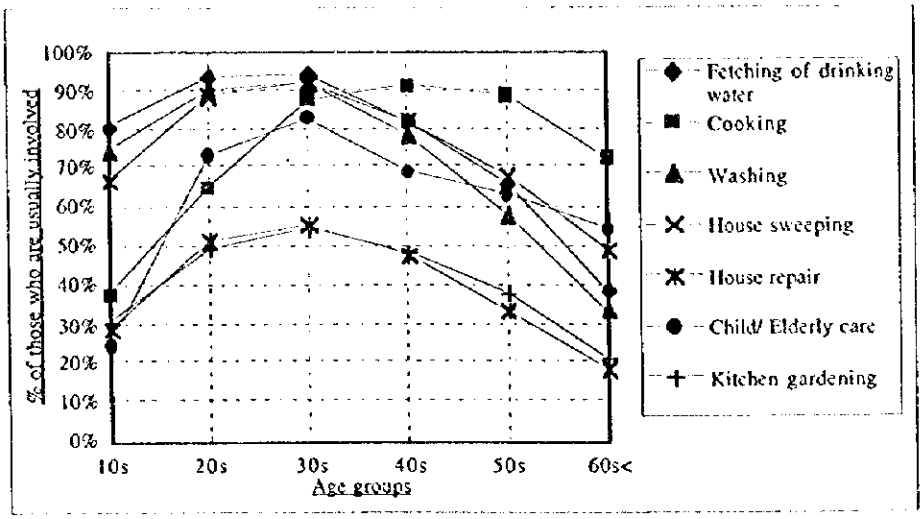
Many of male members of occupational caste households work as carpenters, tailors and masons. Therefore, their involvement in house repair and sewing/knitting is higher than that of other castes. For kitchen gardening, however, both male and female members of occupational castes were found less involved than other castes. This is probably due to the smaller land possessed by the occupational caste households than others.



State of Involvement in Home Activities by Caste Group

(3) Difference between age groups

Of the female members, those at the age of 30s are most active or, in other words, busy. The proportion of female members at age 30s who are usually engaged in the activities is the highest for all work items except cooking. For cooking, females aged 40s and 50s are more involved than younger ones.

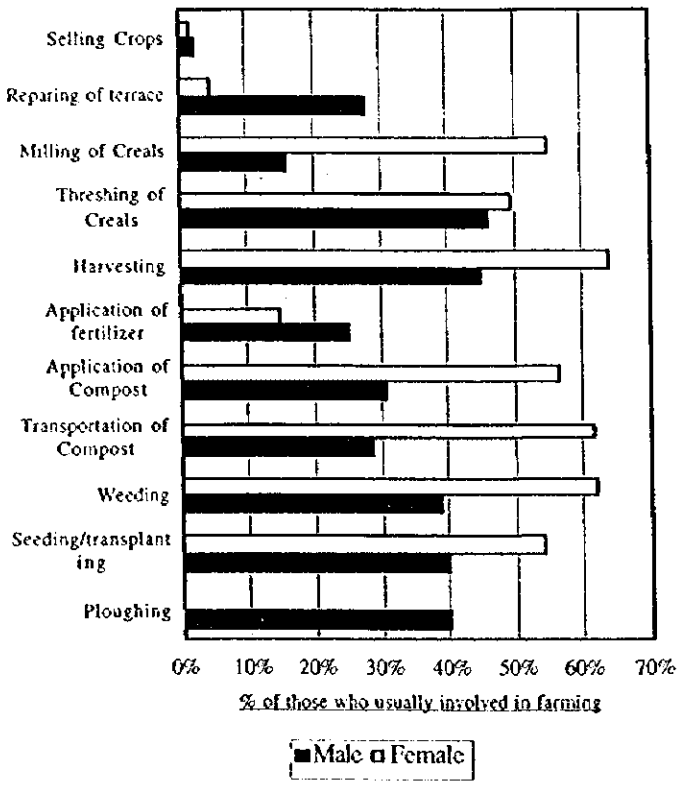


State of Involvement in Activities by Age Group (Females)

4-1-2 Farming Activities

(1) General

The survey clearly reveals that the responsibility of most of farming activities lies in women farmers as shown in the figure below:



State of Involvement in Farming by Adults

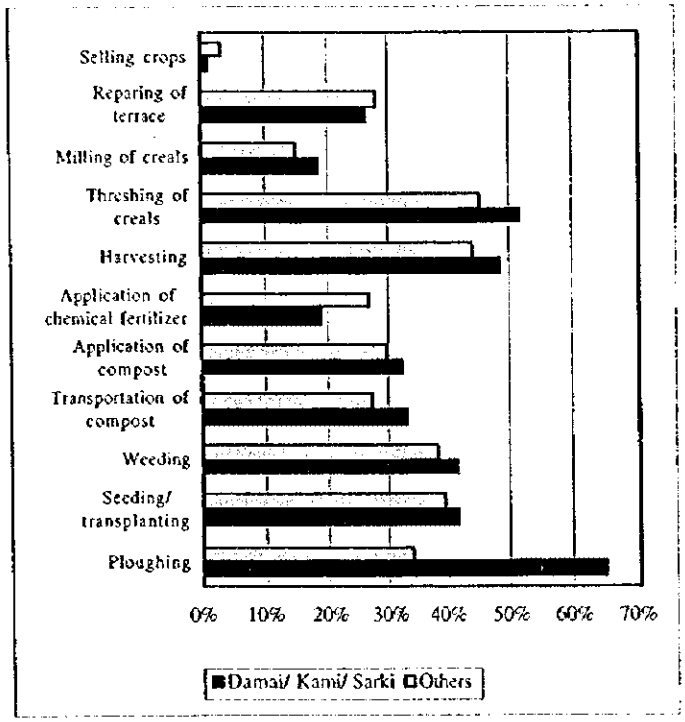
Men were found actively involved in farming activities that require either physical

inputs or some special technique such as ploughing, applying chemical fertilizers, and repairing of terraces. On the other hand, women are more engaged in seeding or transplanting, weeding, transport and application of compost, and harvesting and milling of crops. There is a traditional belief in the area that ploughing should not be carried out by women.

Fig. 4-2 shows the state of involvement in farming activities by sex in each Model Area.

(2) Difference of occupational caste groups with others

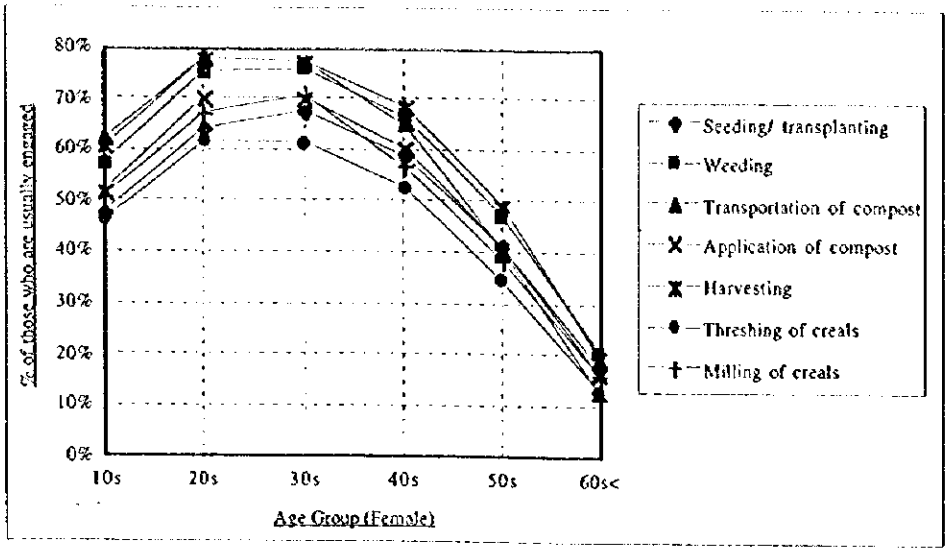
The figure below shows that a larger proportion of adult male members of occupational caste households are involved in ploughing farmland, despite their small holding of farmland. This clearly indicates that most of occupational households are under the patronage of higher castes and deal with crop cultivation in the patron's farm. There is no remarkable difference in the state of participation in farming activities by female farmers between occupational castes and others.



State of Involvement in Farming by Occupational Castes Adults

(3) Difference between age groups

Young women at the ages of 20s and 30s are most active in farming activities: About 80% of them are usually engaged in farming as shown below. Among male members, the 40s age group is most active in farming. Younger male members (aged 20s and 30s) are less involved in farming probably because many of them are away from the village for a certain period of time

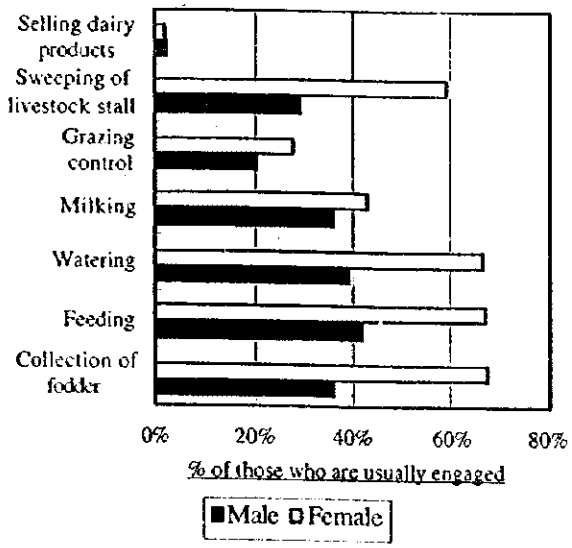


State of Women's Involvement in Farming by Age Group

4-1-3 Livestock Raising

(1) General

As for livestock raising, women have bigger role than men. They usually work for collecting fodder, feeding and watering animals, and sweeping livestock stalls. Men also involved in these activities but to a lesser extent as shown below.



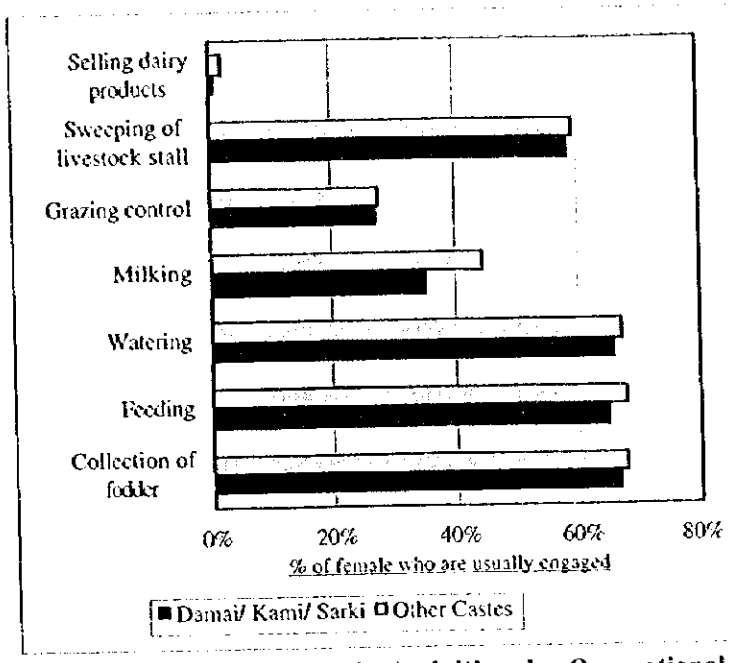
State of Involvement in Livestock-related Activities

Fig. 4-3 shows the state of involvement in livestock raising activities by sex in each Model Area.

(2) Difference between occupational castes with others

As for the state of involvement in livestock raising activities by females is concerned,

no remarkable difference was found out between occupational castes and others, except milking as shown below:

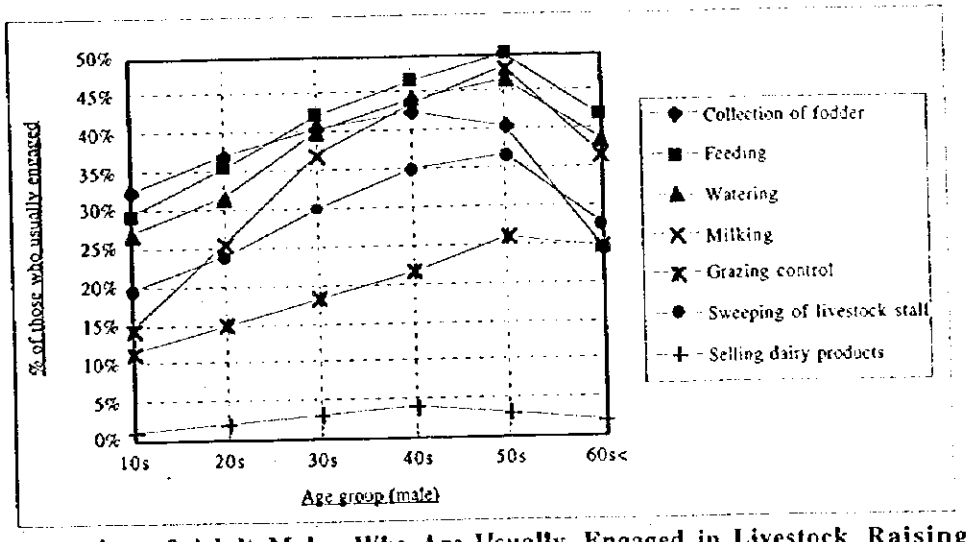


State of Involvement in Livestock Activities by Occupational Castes

As for males' involvement, the proportion of male members of occupational castes who are usually engaged in milking work is three-fourths of that of other castes.

(3) Difference between age groups

Among adult male household members, those at the age of 50s are the most involved in activities related to livestock raising in terms of proportion. As for adult females' involvement, those at the age of 30s are most active.

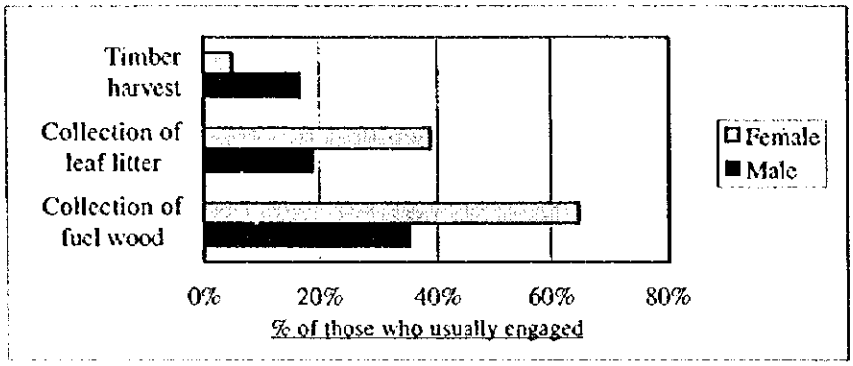


Proportion of Adult Males Who Are Usually Engaged in Livestock Raising

4-1-4 Forest Activities

(1) General

With regard to forestry-related activities, the gender role seems to be well defined. Women are more engaged in the collection of fuelwood, tree fodder and leaf litter. They usually carry out the activities together with neighbors. On the other hand, men are generally more engaged in timber harvesting than women, although it is not carried out often in the area. Selling fuelwood was not popular in the area.

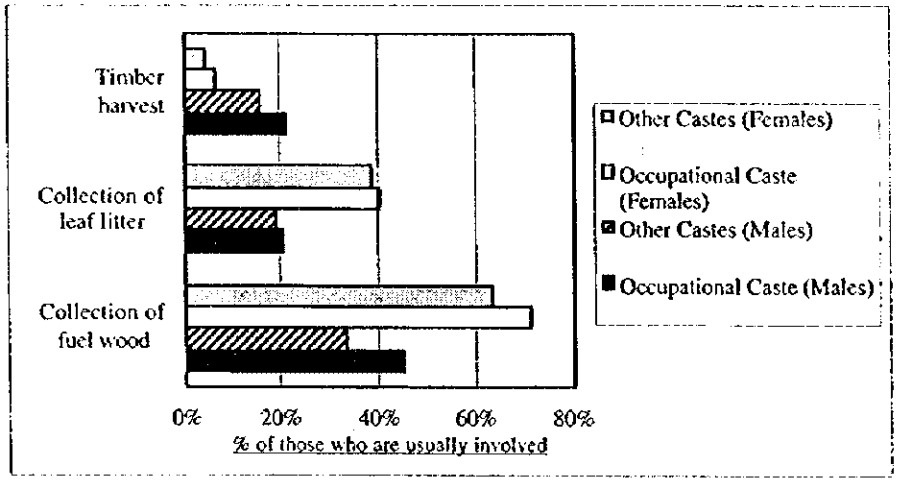


Gender Role in Forest-related Activities

Fig. 4-4 shows the state of involvement in forest-related activities by sex in each Model Area.

(2) Difference between occupational castes and others

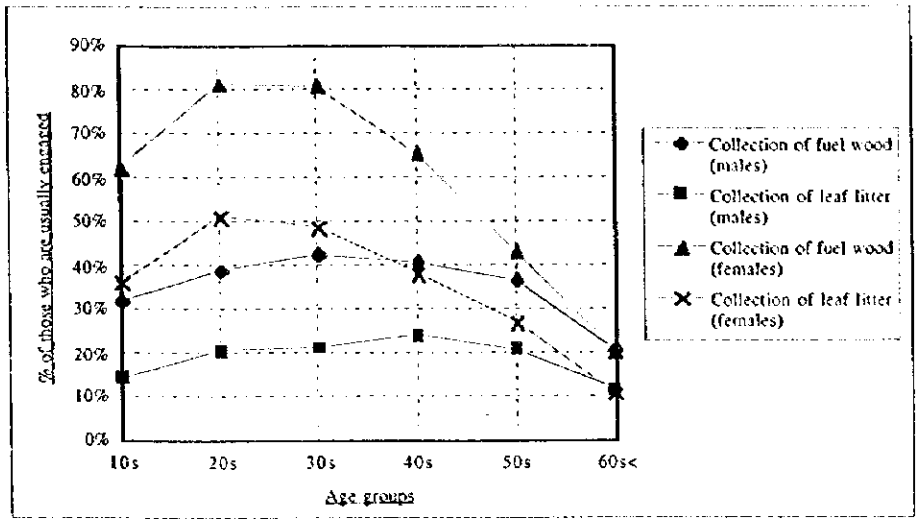
Both male and female members of occupational caste households are engaged in more in forest-related activities than those of other castes. The difference is particularly bigger in the involvement in fuelwood collection.



Comparison of the State of Involvement in Forest-related Activities

(3) Difference between age groups

An analysis was made of the difference in involvement in collection of fuelwood and leaf litter by age group. The results are illustrated in the following figure. They reveal that the difference among age groups is larger in females than males. Females at the age of 20s and 30s are more engaged in such activities than younger and older ones.

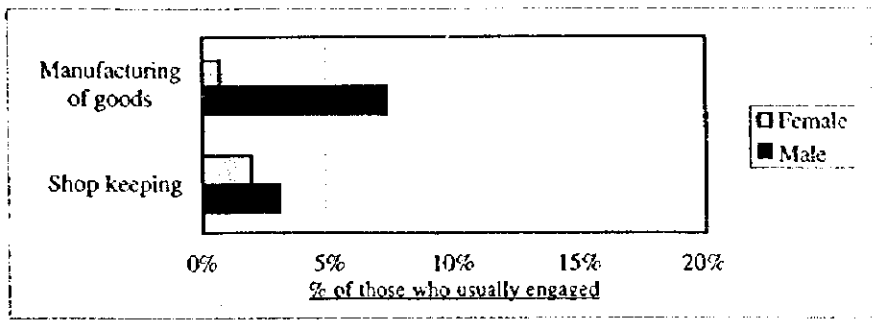


Proportion of Those Who Are Usually Involved in Forest-related Activities by Sex

4-1-5 Domestic Business

(1) General

A very small number of respondents responded they are engaged in domestic business like shop keeping and manufacturing goods. Although the number is small, the proportion of male members' participation is comparatively higher than females' one.

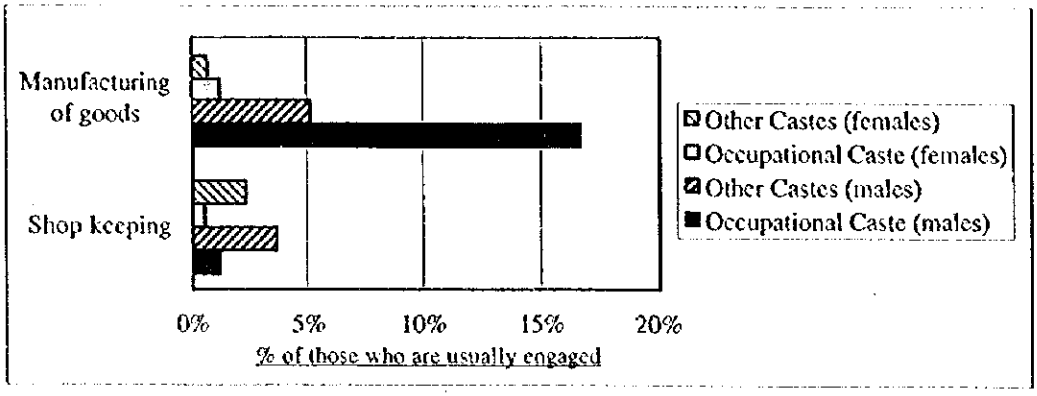


Proportion of Those Who Are Usually Involved in Domestic Business by Sex

Fig. 4-5 shows the state of involvement in domestic business by sex in each Model Area.

(2) Difference of occupational caste groups with others

Much more adult male members of occupational caste households are engaged in manufacturing goods as shown below. It is a natural result because many of the adult males of occupational castes are black-smiths, carpenters, and tailors.

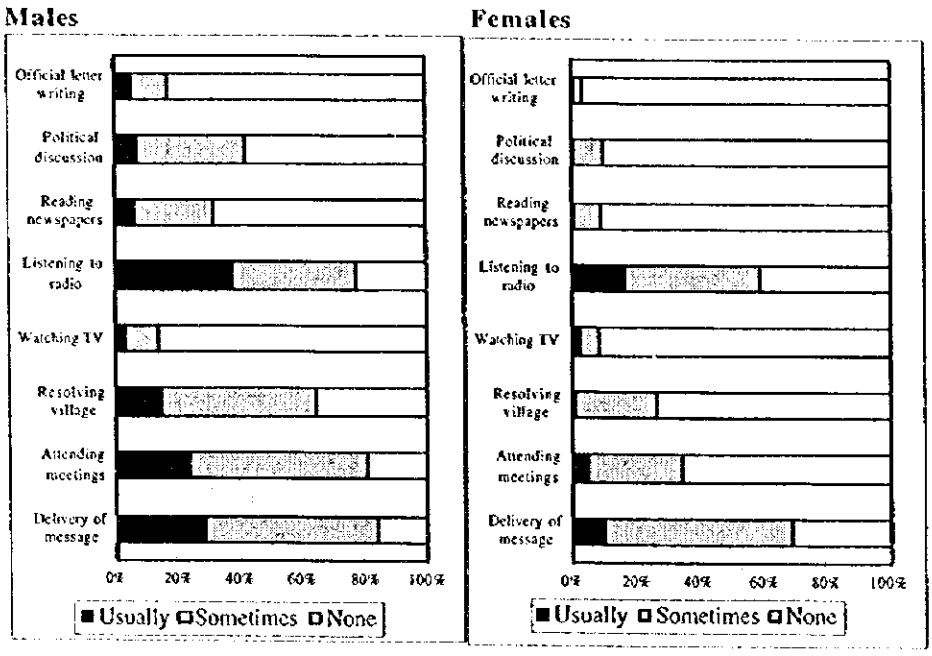


Caste Difference in Engagement in Domestic Business

4-1-6 Communication-related Activities

(1) General

Most of the communication-related activities such as message delivery, information gathering from TV, radio and papers, conflict resolution, and discussion with others are dominantly handled by male members of families. Female members are involved, to a lesser extent than males, in the delivery of message, attending community meetings, and getting information from radio.



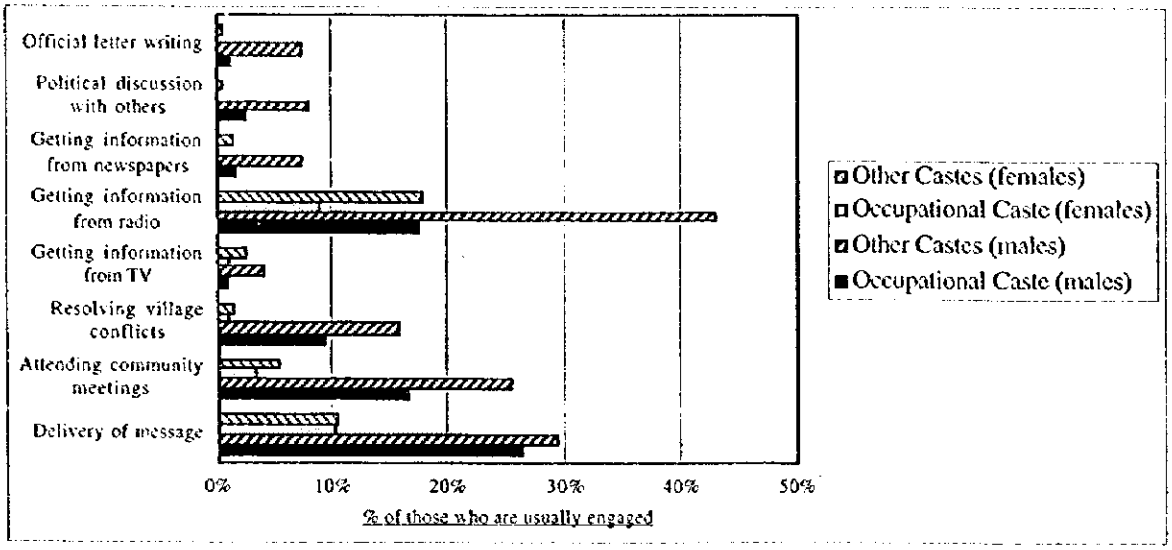
State of Involvement in Communication-related Activities

It was found that the people in the Kaski East Model Area rely more on radio in getting information than people in other areas. The possible reason could be the existence of a higher proportion of literate people as well as their awareness of development activities and interest toward political situation.

Fig. 4-6 shows the state of involvement in communication-related activities by sex in each Model Area.

(2) Difference of occupational caste groups with others

Occupational caste households are likely to have lesser means of getting information than other castes. In addition, the members of occupational castes are less involved in community meetings and in delivery of message.

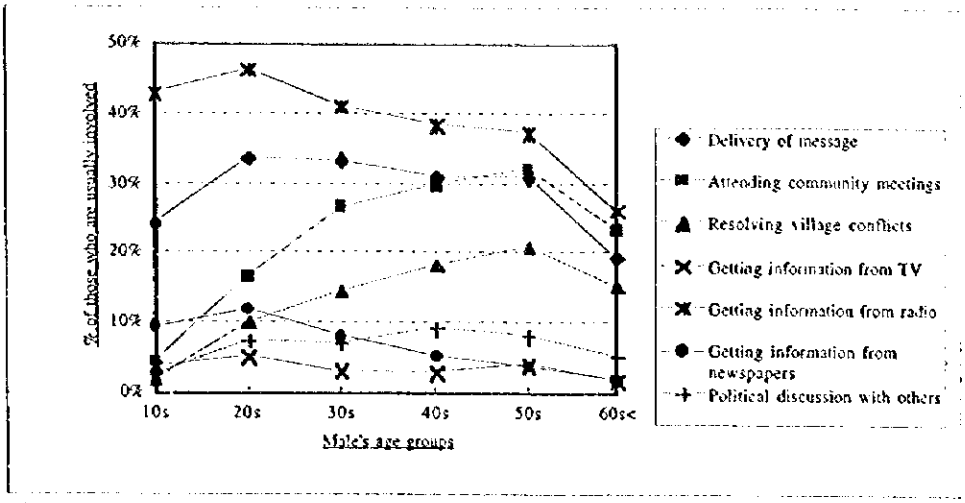


Comparative Difference in Involvement in Communication-related Activities by Caste Group

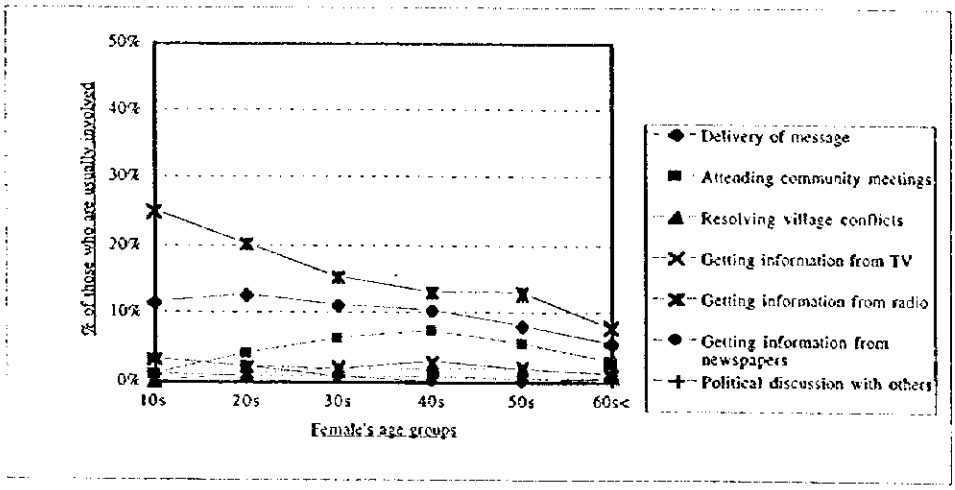
(3) Difference between age groups

There is a clear division of activities between young and old peoples. The younger people are more involved in information gathering from newspapers, TV and radio than old ones. On the contrary, more older people participate in community meetings and resolving village conflict than younger ones.

Males



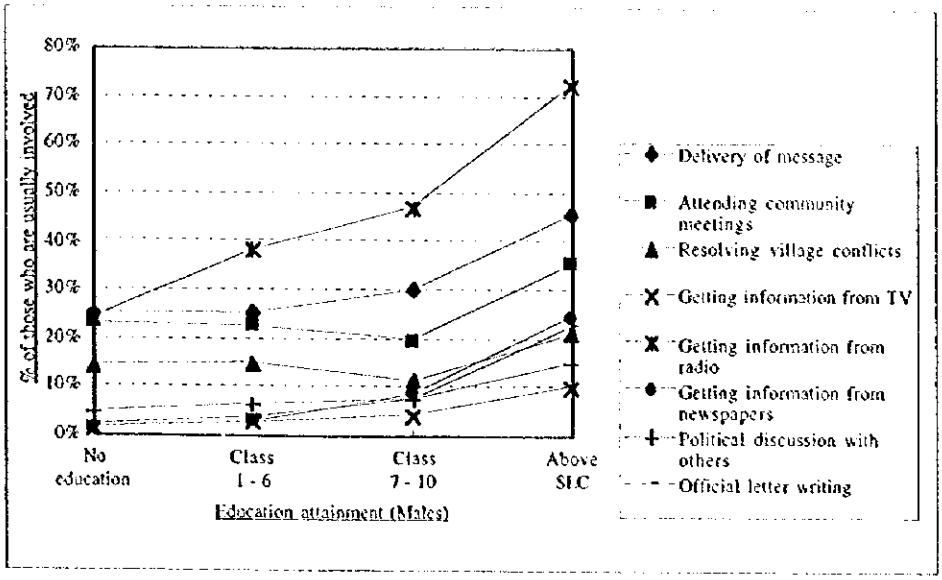
Females



State of Involvement in Community-related Activities by Age Group

(4) Other findings

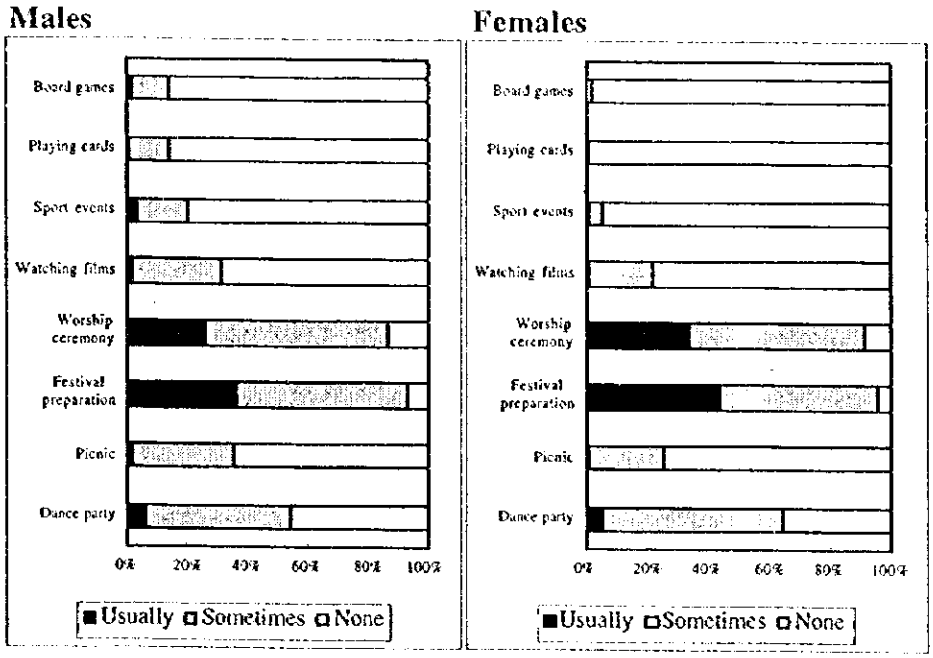
An analysis found that, unlike other activities, people become active in the communication-related activities as their educational status rises. This indicates that people with higher education attainment are more aware of external information and the development of their villages.



State of Involvement in Communication-related Activities by Education Status

4-1-7 Religious and Cultural Activities

Regarding religious and cultural activities, females play leading role but the gender difference was found to be smaller than in other activities. Among the activities, people tend to actively involve in festival preparations and worship ceremonies.



State of Involvement in Religious and Cultural Activities

Fig. 4-7 shows the state of involvement in religious and cultural activities by sex in each Model Area.

(2) Difference of occupational caste groups with others

Of the caste groups, the occupational castes are the least active in festival preparations and worship ceremonies. Hardship of their livelihood might be a reason.

(3) Difference between age groups

Age difference was quite notable in the participation in religious and cultural activities: Young people prefer dance party, picnic, film watching and games, while older ones are active in festival and worship.

4-2 People's Needs, Concerns and Aspirations

In the questionnaire of the Household Member Survey, respondents were requested to choose and prioritize up to five works (activities), out of 33, which they want to make easy. The answers to this question reflect the needs people have been facing day by day. They were also inquired about their degree of concern on the selected items. The responses can be treated as people's needs and interests. For easy comparison of the relative importance, these responses were converted into scoring points using the formula previously explained in this Chapter.

4-2-1 People's Needs for Lessening the Work Burden

(1) General

The overall scores on each work item are given in Tables 4-1 to 4-6. The top five work items that men and women wanted to make easy are listed below:

	Men's priority	Women's priority
Collection of fuelwood	1 (40.7)	1 (52.2)
Fetching of drinking water	2 (29.2)	2 (37.7)
Ploughing	3 (28.6)	- (0.6)
Collection of fodder	4 (25.7)	3 (34.1)
Shopping in bazaars	5 (23.9)	- (15.6)
Cooking	- (12.8)	5 (20.0)
Transportation of compost	- (14.8)	4 (31.3)

(Figures in parentheses indicate the score)

Both sexes gave first and second priority to fuelwood collection and fetching of drinking water, respectively. Collection of fodder ranked similarly; fourth and third by men and women respectively. The common features of these works are hardship. Though women have the main responsibility for these works, men also are involved in such works sometimes. This results in the similar prioritization by both sexes.

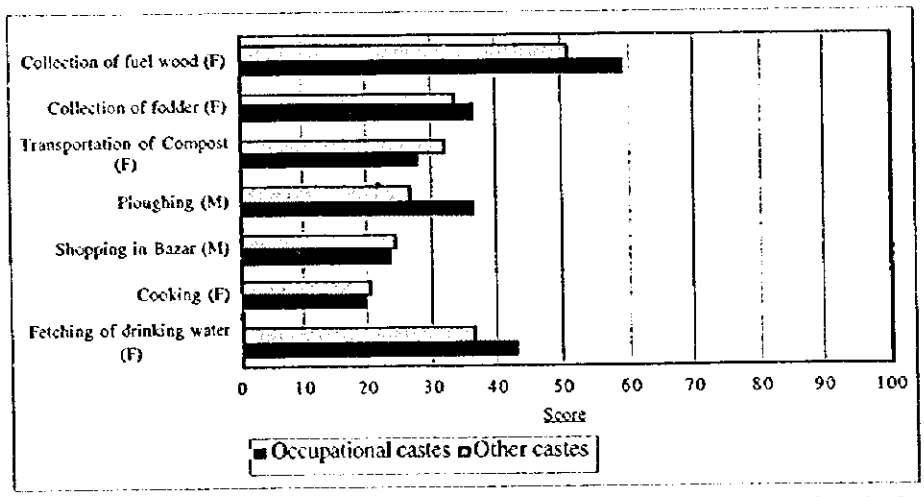
On the other hand, ploughing of land was cited as third priority by men while the women's score was almost zero. This reflects the fact that the work has been done almost exclusively by men. Shopping in bazaars is another hard work for men because it requires physical strength to carry food and living necessities from market to remote villages. For women, transportation of compost to farm and cooking meals are heavy works and given fourth and fifth priority, respectively.

It is important to note that the overall averaged scores given to the above work items are generally low. This is the result of generalization. Actually there is a quite big variation in the scores for these items among VDCs and wards. MAPs 4-1 to 4-7 show the ranking of the above seven work items by each ward.

Table 4-7 and Fig. 4-8 show the sex-wise ranking and the scores in each Model Area, respectively. It is quite impressive that fuelwood and fodder collection rank lower in the Kaski East Model Area. On the contrary, fetching drinking water rank at the top in the area. These well reflect the present condition of the area : Forest is relatively abundant but the source of drinking water is scarce.

(2) Difference of occupational caste groups with others

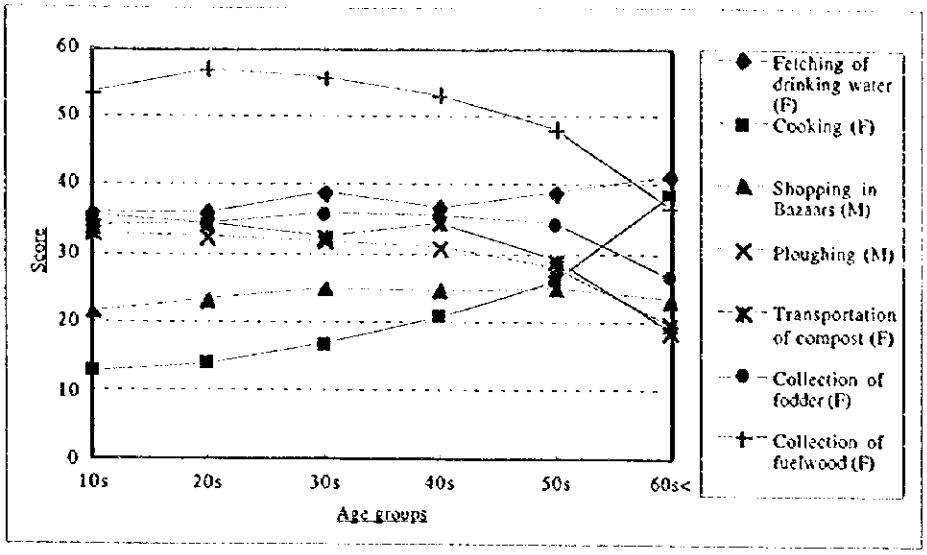
People of occupational castes show higher needs for lessening the work load of fetching water, collection of fuelwood and fodder, and ploughing as shown below.



Comparative Degree of Needs for Lessening Work Load by Occupational Castes

(3) Difference between age groups

For the collection of fuelwood and fodder, the needs for lessening work load are decreasing with the age. This relates to the fact that the work requires physical strength and is mainly carried out by younger women. On the contrary, the needs for lessening cooking activities is increasing with the age because elder women are engaged in the job more than young women.



Comparative Degree of the Needs for Lessening Work Load by Age Group

4-2-2 People's Concerns and Aspirations

(1) General

The levels of people's concern on the selected items are presented in Table 4-8 and Fig. 4-9. The top 10 concerns selected by men and women are shown below:

Concerns	Men's priority	Women's priority
Cash income	1 (90.5)	1 (89.4)
Motorable road	2 (89.1)	2 (87.5)
Irrigation	3 (79.7)	3 (76.7)
Crop productivity	4 (76.9)	5 (74.7)
Food availability	5 (76.7)	4 (76.5)
Communication facility	6 (76.2)	9 (67.6)
Forest resource	7 (70.4)	8 (68.1)
Electric supply	8 (68.6)	10 (67.5)
Education of children	9 (68.0)	7 (68.8)
Fuelwood availability	10 (67.7)	6 (70.1)

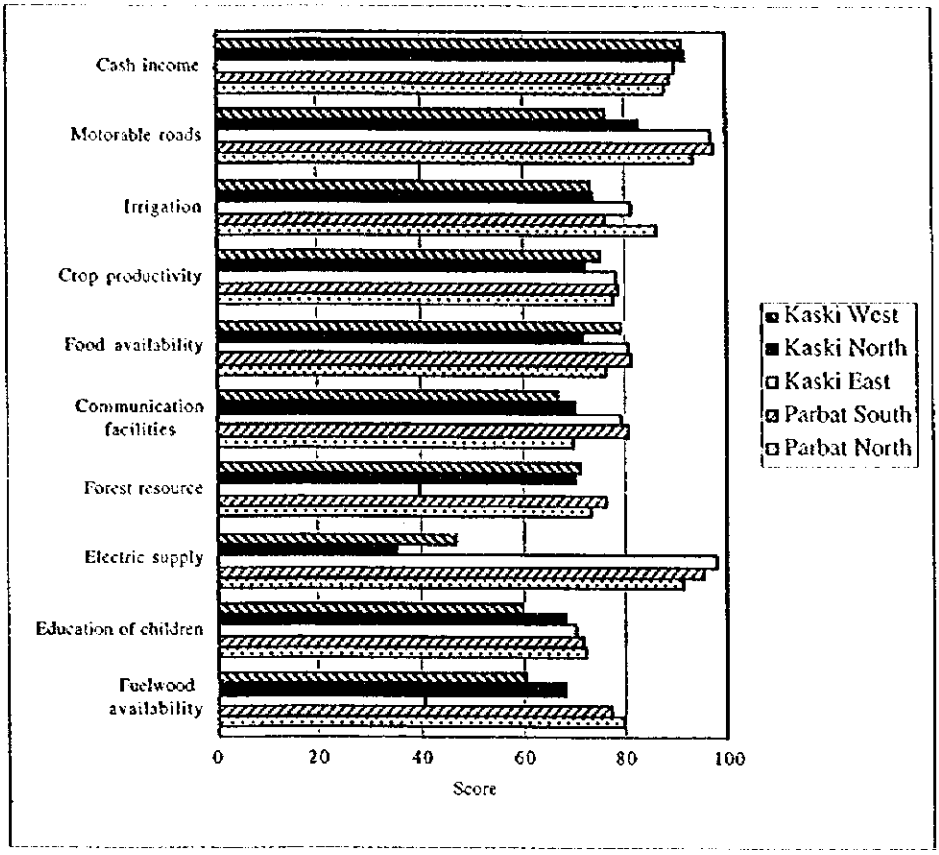
(Figures in parentheses indicate the score)

The majority of people, both men and women, are strongly concerned about cash income and motorable roads. This could be understood as a strong need for economic development, which is generally associated with the increase in cash income. Following these are concerns on the items related to food or food production such as irrigation, crop productivity, and food availability. Communication facility (telephone) is given higher priority by men than by women. The rest of the concerns shows more or less similar characteristics in terms of score and ranking.

Though the results show similarity in the levels of concern between men and women,

there are some items that are given different scores by both sexes. Men give higher score for terrace maintenance, political discussion and meeting on community development than women. By contrast, women give higher score to worship of god than men.

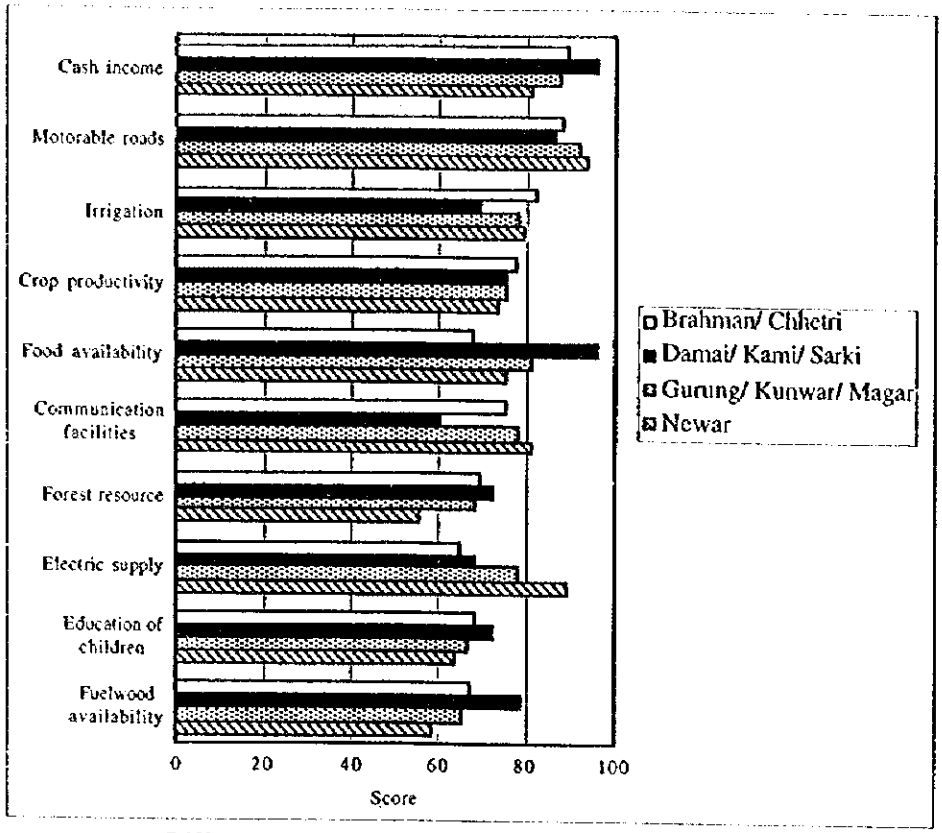
When looking at the Model Area-wise results, one can find the distinctive characteristics of each Model Area: people in the Kaski North and West Model Areas are less concerned about communication facilities, electricity and motorable roads than the people in other Model Areas; people in the Kaski East, Parbat South and North Model Areas are more concerned on electricity and motorable roads than cash income; and people in the Kaski East Model Area show much smaller concern on fuelwood than people in other Model Areas.



Difference in People's Concerns by Model Area

(2) Difference by caste groups

A comparison of the degree of concerns by caste group is presented in the figure in next page. It illustrates the general pictures of occupational castes households. Unlike other castes, food is as important as cash income for occupational castes. The level of concerns on living necessities such as fodder, fuelwood and drinking water is comparatively higher among occupational castes than that of other castes. By contrast, the desire for goods and condition that are not essential for living is lower among occupational castes than others.



Difference in People's Concern by Caste Group

(3) Other findings

Other findings on people's concern and aspiration are described below:

1) People under age 20s have more aspiration for modern convenience / attraction such as communication facilities, movie, and self education than others (see Fig. 4-10).

2) People at age 30s and 40s are more concerned on the availability of food, fodder and fuelwood, and child education (see Fig. 4-10).

3) People with lower educational status are more concerned on the availability of food and fodder, cash income, electric supply and education of children than those with higher educational status.

4) People with higher educational status are more concerned on terrace maintenance, communication facilities, labor availability, self education, forest resource, dance party, political discussion, meeting on community development, watching movie, and security than those with lower education status.

4-3 Participation in Community Activities

4-3-1 Experiences of Participation

Fig. 4-11 and 4-12 show the difference in the experience of participation by sex and Model Area, respectively. For most of the community activities, men have more experiences in participation than women. Exceptions are dance party, worship of god and health related activities, that are actively performed by women through mothers' groups.

Fig. 4-13 indicates the difference of participation in community activities among caste groups. It was found that the Gurung / Kunwar / Magar group is the most active in community activities, though the difference is small. On the contrary, the occupational castes are the least active, suggesting they are socially discriminated.

The difference in participation by age group is given in Fig. 4-14. It indicates that the participation seems to depend on the interests of generations: Younger generations (aged 10s and 20s) tend to participate more in education and entertainment such as watching movie and attending dance party, while the participation of elder generations incline to activities related to their livelihood improvement.

4-3-2 Provision of External Assistance

Fig. 4-15 shows the people's experience in receiving external assistance. It proves that the assistance in the past has been concentrated on activities related to drinking water supply, electricity supply, education, and health. Fig. 4-16 further proves that the Model Areas in Kaski district received much more assistance than the area in Parbat. Actually people in Kaski district got much assistance from NGOs or governmental agencies.

4-3-3 Willingness to Participate in Community Activities

The respondents were simply asked whether they are willing to participate in the items of their concern. Since the question did not limit the number of "yes" answers and required the respondents to prioritize activities for which they are willing to participate, the results given in Fig. 4-17 show quite good willingness to participate in most of the activities. Exceptions are for labor force availability, self education, family planning, sanitation, and political discussion. The proportion of those who are willing to involve in the activities is relatively low. A big reason for low willingness for family planning is that many of respondents are before and beyond the child-bearing age.

4-4 Perception on Importance of Forests

4-4-1 Importance of Forests

People were asked to prioritize the important functions of forests. The overall results are in the following order:

		Score
1.	Fuelwood source	(87.8)
2.	Fodder source	(64.8)
3.	Timber source	(52.0)
4.	Leaf litter source	(34.5)
5.	Soil conservation	(26.9)
6.	Water conservation	(15.9)

A detailed analysis of the importance of forests was made by Model Area, caste group, age group, and educational status group. The findings are summarized below:

1) There is no remarkable difference in the order of the importance of forests between the five Model Areas (see Fig. 4-18).

2) Women place more importance on the fuelwood, fodder, and leaf litter supply from forest than men (see Fig. 4-19).

3) Men place more importance on the soil and water conservation functions of forests than women (see Fig. 4-19).

4) Occupational castes pay less attention to water and soil conservation functions of forests than other castes (see Fig. 4-20).

5) Younger people place more importance on water and soil conservation functions of forests than older people (see Fig. 4-19).

6) People with higher education status give higher importance to water and soil conservation functions of forests than those with lower education status (see Fig. 4-21).

7) People with lower education status, by contrast, place higher importance on forest products than those with higher education status (see Fig. 4-21).

4-4-2 Measures to Improve Forest Condition

The respondents were requested to prioritize the selected measures to improve the production and conservation functions of forests. Overall results obtained in all the Model Areas are given below:

Measures Selected by Respondents for Improvement of Forest Functions

Unit : % of respondents

Measures	Functions of Forest					
	Fuelwood production	Fodder production	Leaf litter production	Timber production	Soil conservation	Water conservation
Tree planting in private land	25	52	26	21	25	4
Tree planting in community land	17	27	36	22	21	15
Protection of forests	13	17	38	53	50	78
Use of biogas as an energy source	28	1	1	3	1	1
Use of gas cylinder	0	0	0	0	0	0
Use of kerosene	1	0	0	0	0	0
Use of improved stove to reduce fuelwood consumption	16	0	0	1	0	1
Others	1	4	1	1	3	2

Source: Household Member Survey, JICA/Multi Disciplinary Consultants (P) Ltd. (1996)
See Fig. 4-22 for Model Area-wise results.

The table clearly indicates that people choose different measures for different purposes. They generally prefer tree planting for improvement of fodder and leaf litter production, while they emphasize forest protection for improvement of timber production and conservation of soil and water. An interesting response was found in the answers for the improvement of fuelwood condition. Many people choose the use of biogas and improved stoves as measures for improvement of fuelwood condition in the area. This means people consider the reduction of fuelwood consumption more seriously than production increase. There is a tendency that people in Kaski district pay more attention to the use of alternative energy sources including biogas and the use of improved stoves than those in Parbat. Perhaps people in Kaski district have been better influenced by the active support for such matters by NGOs and donor agencies.

The difference in the responses by caste group, sex, age group, and education status group were analyzed. Following are major findings:

1) "Tree planting in private land" is not a popular measure among occupational castes because many of them do not own private land (see Fig. 4-23).

2) The use of biogas and improved stoves as measures to improve fuelwood condition are not popular yet among occupational castes. This suggests

their poorer access to such technologies (see Fig. 4-23).

3) There is a tendency that younger people emphasize more the use of biogas as a measure to improve fuelwood condition than older people (see Fig. 4-24).

4) Similarly, people with higher education status give higher importance to the use of biogas as a measure for improving fuelwood availability than those with lower education status (see Fig. 4-25).

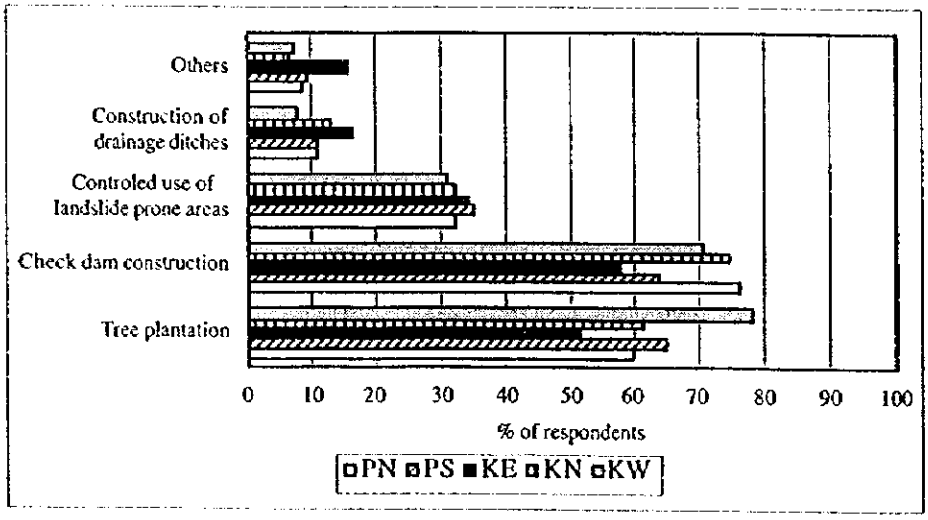
5) People with lower education status emphasize the protection of existing forests more than people with higher education status. People with higher education status, on the other hand, stress tree plantation more than people with lower education status (see Fig. 4-25).

4-5 Measures to Prevent Natural Disasters

In the Household Member survey, the respondents were asked about their ideas on the preventive measures against landslide and terrace destruction.

(1) Preventive measures against landslide

In the five Model Areas as a whole, people ranked, in terms of importance, the measures for landslide prevention in the following order: 1) check dam construction, 2) tree planting in and upstream of landslide prone areas, 3) controlled use of landslide prone areas, and 4) construction of drainage ditches.



Importance of Preventive Measures Against Landslide

There is no difference in the ranking order by caste groups. However, younger people tend to give more emphasis on tree planting than older people (see Fig. 4-26). People with higher education status have the same inclination as younger people.

(2) Preventive measures against terrace destruction

The respondents expressed the relative importance of preventive measures against terrace destruction in the following order: 1) regular maintenance of terrace, 2) tree planting upstream of farmland, 3) construction of drainage ditches, and 4) others. No remarkable difference was found in the selection of measures between caste groups, sex, age groups, and groups of educational status. Since the questionnaire provided only few possible answers, many respondents specified measures other than those provided. The measures specified by respondents include stone wall, gabion wall, construction of stronger ridge, land consolidation, rat control, etc..