

CHAPTER III

STUDY AREAS AND THEIR RESOURCE BASE INFORMATION

An overview about the study sites regarding general features and their resource base information is described in this chapter.

3.1 General Characteristics of the Study Areas

This part elaborates about the bio-physical, socio-economic and demographic status and institutional development of research area.

3.1.1 Location and Agro-climatological Setting

The four Village Development Committees (VDCs) M, F, K and R selected for this study are located in the Kavre District, Central Region Mid hills of Nepal (Figure 3). The morphological diversity of the district has led to the differences in the socio-demographic and infrastructural development of the study areas. However, to a great extent, all these VDCs selected represent a fundamental features of the Mid hills of Nepal. The topography of the sites are similar to other hilly parts of Nepal with moderate to steep slope of mountain terrains and narrow tracts of plain land, converging into the valley between the hills. Despite the study sites covers a large and wide area, the major settlement are confined to the foot of the hills where water is available and soil condition are favorable for cultivation.

Agro-climatologically, all the study sites are located in the temperate zone mid-altitude (<1700 msl.). The VDCs are characterized by warm and temperate humid climate with annual mean temperature of about 20°C and total annual rainfall of about 951 mm. The lowest temperature are in December and January while the highest are in June and July. The differences between monthly maximum and minimum temperature is greatest in May when the maximum is 31°C and the minimum is 11°C. Rainfall is mainly concentrated in the monsoon season during May to September (Figure 4). Soils are comprised of Sandy loam to red fertile with good drainage. Frost is common during December to February, which is considered as constraint for winter crops. (Details in Appendix 2).

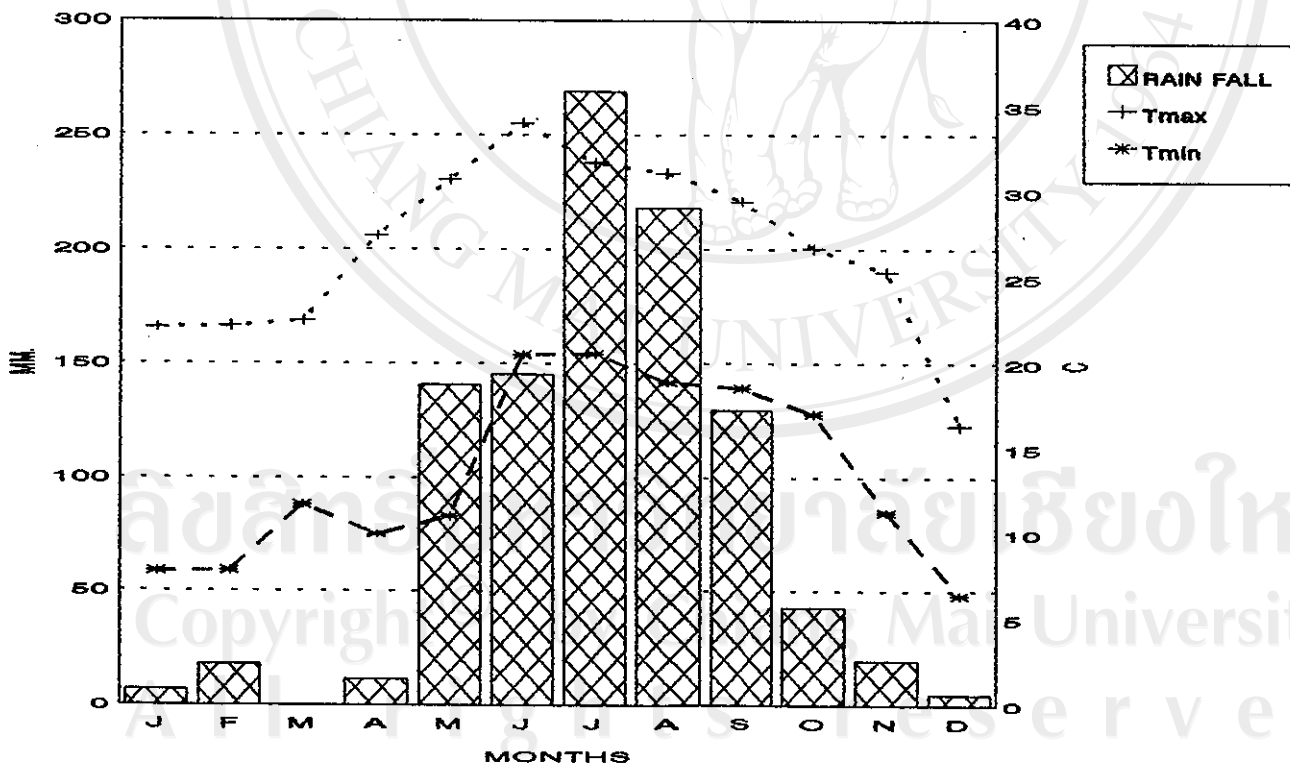


Figure 4 Monthly Temperature and Rainfall
Source: Meteorological Station, Kathmandu (1989-1991)

3.1.2 Demographic and Socio-Economic Status

Of the 54 households sampled from each VDC, more or less similar number of population was found with approximately equal proportion of male and female ratio (1:1). The households of all the sites constituted of a medium size (5-9) family members with an average size of 7 (Table 2). The finding is consistent with the village profile prepared by Mold (1993). There was no variation in family size of adopters and non-adopters (Appendix 10).

Table 2 Demographic Features of the Sampled Households

VDC	Res. no.	Population Number of the Study Sites				Family Size
		Total (no)	Male (no)	Female (ratio)	Male/Female (avg/hh)	
VDC F	54	405	202	203	0.99	7.4
VDC M	54	376	183	193	0.95	6.4
VDC K	54	344	179	165	1.09	6.7
VDC R	54	393	199	194	1.02	7.3
Total	216	1518	763	755	1.01	7.0

Source: Survey 1993.

Majority of the farm household (hh) was composed of economically active population or adult (16-60) group. The ratio of economically active to non-active (<16 or >60) group was estimated about 0.72 while children (<16) to adult (>16) was 0.66 (Table 3). The high estimated ratio reflects greater number of dependents on farm families. The later one represents a characteristic feature of developing countries, where flow of information is not spread well (Kaopong, 1992).

Table 3 Composition of Sampled Household Population by Sex and Age

VDC (N=54)*	<16		16-<60		>60		Avg age	
	Male	Female	Male	Female	Male	Female	Male	Female
VDC F	87	76	109	115	6	12	47.0	52.5
VDC K	65	54	101	100	13	11	54.4	53.7
VDC M	70	76	103	112	10	5	47.7	41.6
VDC R	86	89	101	97	12	8	54.8	48.2
Total (216)	308	295	414	424	41	36	50.9	49.0

Source: Survey, 1993.

* Respondent number of each VDC.

<16 = Children; 16-60 = Economically active adult; >60 = Inactive adult

Table 4. Literacy Percentage in the Sampled Household by Gender

VDC (N=54)	Total Pop. no.	Educational Status				Education Level		
		Literate %		Illiterate %		PM	Sec	High
		Male	Female	Male	Female	Both (Male+Female) %		
VDC F	405	33.1	14.8	19.0	33.1	91.2	4.7	4.2
VDC M	376	37.0	20.2	5.8	37.0	74.4	13.0	12.6
VDC K	344	37.8	27.6	3.2	31.4	86.2	6.2	7.6
VDC R	393	32.8	19.4	15.0	32.8	86.4	6.8	6.8
Total	216 1518	35.0	20.3	9.6	35.1	84.4	7.7	7.9

Source: Survey 1993.

Note: Pop= Population; illet= illiterate; PM= Primary; Sec= Secondary.

Looking at the educational background, on an average over 45% of the villagers were literate. The literacy percentage of male and female population of VDC K and M were figured out higher than the national level percentage i.e. 33% for male and 18% for female (DFAMS, 1991). However, in terms of distribution of educational level, majority of the sampled households population were limited up to the primary level schooling (1-5)

and only less than 8% got opportunity for higher education (>10 class). Table 4 depicts the educational background of the study sites.

In spite of caste categorization, being Hindu Nation, majority of the communities have a strong faith in Hindu religion and culture. In VDCs' caste composition, domination was observed more or less of Brahmin caste except of VDC K where, majority of the households were Chettri caste 59.3%. However in overall Brahmin caste dominated to others by 12 or more percentage (Table 5).

Table 5. Caste Composition in Village Development Committees

VDC (N=54)	Percentage of Sampled Household			
	Brahmin	Chettri	Vaisya	Sudra
VDC F	42.6	9.3	42.6	5.6
VDC M	63.0	5.6	31.4	-
VDC K	14.8	59.3	24.1	1.9
VDC R	38.9	37.0	7.4	16.7
Total 216	39.8	27.8	26.4	6.05

Source: Survey, 1993.

3.1.3 Institutional Development

Based on the existing infrastructure of the district especially concerning to accessibility (nursery and market), Kavre district is regarded as one of the well furnished district of mid hills. Since, the district is located just 30 km far away from Kathmandu valley, all the

facilities like; schools, health centers, bank, irrigation canal, water turbines were provided. More advancement had been found in livestock developmental activities as GOs and NGOs had put more effort in this area for the promotion of quality of life of this district.

For instances, agricultural support institutes like service centers of agriculture and livestock, private and NGOs agencies (JOCV, UNICEF, BBP, FP) were established for water supply, health care, and education. Additionally a number of nurseries, milk collecting centers, chilling centers, feed and drugs diplo have been running in different areas for livestock development. However, all the VDCs are not equally well advanced in infrastructure development (Appendix 2).

Both "nursery" and "market" are confined in Mahadevsthan VDC (M), located 20 km distance from the district head quarter for flows of inputs and outputs of livestock products. VDCs F, K and R are located more or less 5 km distance from the head quarter but deprived of market, nursery and both nursery as well as market respectively. In this sense, VDC R is poorly developed as the sites especially VDC F and R are not linked with road. No such developmental activities and institutional support were confined in this village except one small farmer development program (SFDP) run by Agricultural Development Bank (ADB/N). Concerned to the access of the resources (market, nursery, forest), not so much markable differences can be figured out among the VDCs. Table 6 gives the clear picture about the situation.

Table 6 Distance of the Resources from the Household (in km.)

VDC (N=54)	Nursery		Market		Forest	
	mean	range	mean	range	mean	range
VDC F	2.8	0.5-5	2.9	0.05-6	2.6	0.05-9.0
VDC M	3.1	0.25-10	2.5	0.05-6	1.8	1-4.5
VDC K	5.1	2-9	4.4	2-7	3.3	0.05-9.0
VDC R	5.4	0.5-9	3.0	0.5-9	2.4	0.5-7.0

Source: Survey, 1993

Looking at the range differences and mean distances of the resources, VDC M and F households were found more access to the nursery because of the presence of nurseries. VDC M has access of natural forest resource followed by R, F and farthest for VDC K. However, these households were deprived to take benefit from these resources as these were located either far or under the control of government (eg. forest). Concerning to the market facilities, VDC M and K were well equipped with local market of feeds, veterinary drugs, milk collecting centers as compare to VDC F and R as these were not linked with roads.

3.2 Resource Base Information

Land, livestock, farm land trees and household labor are considered as major resources of the study sites and is discussed in details as follows:

3.2.1 Land Distribution and Use

The extent of land available for the selected VDCs varies considerably, ranging from 233 ha (VDC K) to 958 ha (VDC M). However the proportion of available land used for agricultural purpose was highest in K (87%) and lowest in F (25%). The area under the forest cover was 20% 8.4% 1.7% and 0% for VDC F, R and M respectively. However, all forest lands are under the Government property (Table 7).

Table 7. Distribution of Land Use of the Study Sites

Land Use	Village Development Committee							
	F		M		K		R	
	ha	(%)	ha	(%)	ha	(%)	ha	(%)
Agriculture	136.5	25.3	600.5	62.7	202.3	87.0	329.5	65.0
Forest	110.0	20.4	16.8	1.7	-	-	42.5	8.4
Pasture	61.0	11.3	141.2	14.7	7.5	3.2	44.1	8.7
Residential	10.8	2.0	36.9	3.9	22.7	9.8	41.2	8.1
Others*	221.7	41.0	162.5	17.0	-	-	49.8	9.8
Total	540.0	100.0	957.5	100.0	232.5	100.0	507.1	100.0

Source: MOLD, 1993

Note: * land used as fallow, communal, river, rocks and ways

Farm land which is comprising of different types of land, lowland (khet) and upland (bari) is the major production area of all the study sites. Upland forest and fallow were generally used for livestock grazing and fuelwood collection. The general cropping pattern was similar in all the areas with paddy based cropping system in lowland while maize based

cropping system was followed in upland. Wheat, mustard and millet were grown as secondary crops while tomatoes and potatoes are the main cash crop of the area. The predominant cropping pattern is shown in Figure 5.

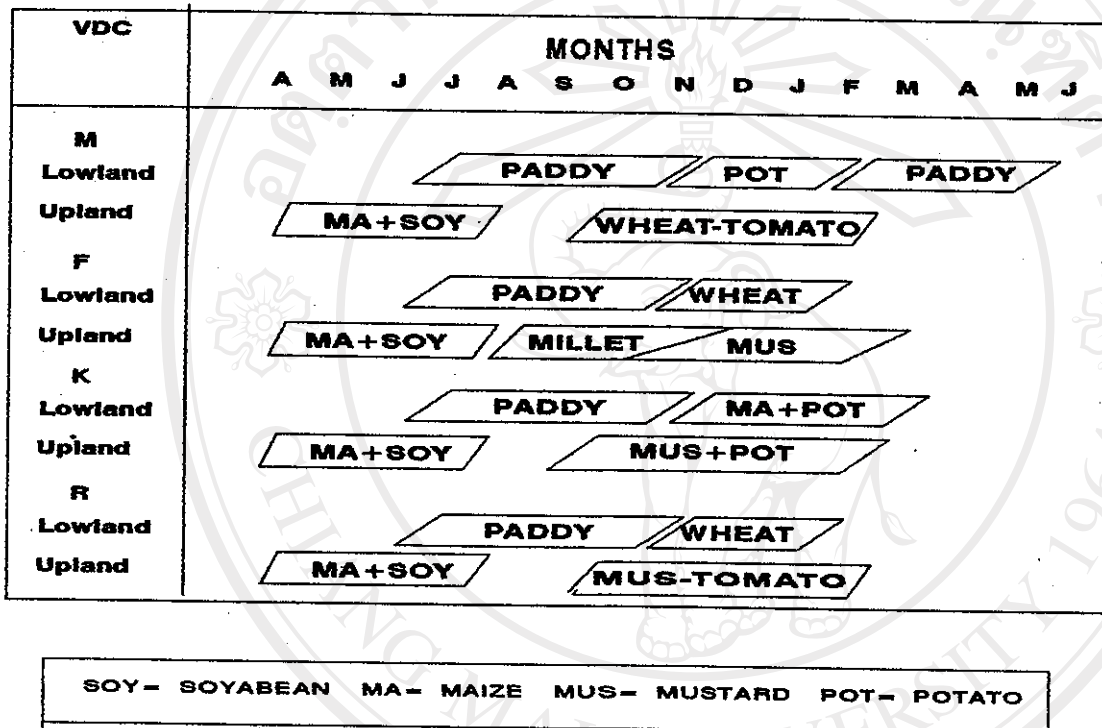


Figure 5 Dominant Cropping Pattern of the Study Sites
 Source: Survey, 1993

3.2.2 Animal Raising

Livestock was one of the other important resource for income generation and livelihood of the Kavre community. All types of livestock ruminants and non ruminants were raised in the study sites. According to the Kavre study report carried out by PLBP (DLS/PLBP, 1992) around 50% of the ruminant herd was of goat population which was followed by Cattle (32.9%) and 17.8% of buffalo. While in non-ruminant sector pig constituent was quite low, less than 1% in all the VDCs (Table 8). Similar type of herd composition was prevalent in individual VDC. The reason behind such composition of holding was mainly due to the influence of social religious taboos rather than other things (Interview, 1993).

Table 8 Livestock Population in the Study Sites

VDC	Total Number		Percentage of Ruminants and Non-Ruminants				
	Ruminants	Non-Ruminants	Cattle	Buffalo	Goat	Pig	Poultry
VDC F	11,792	28,200	32.4	14.2	53.4	0.71	99.3
VDC K	1,291	1,068	33.4	11.0	55.6	-	100.0
VDC M	4,192	2,872	33.3	27.6	39.1	0.63	99.4
VDC R	11,987	4,543	33.2	18.7	48.1	0.50	99.5
Total	29,262	36,683	32.9	17.8	49.3	0.70	99.3

Source: PLBP, 1992.

3.2.3 Tree Species

Tree species especially, fodder trees of the farm land of the study sites had a significant contribution in supporting the lives of

human as well as livestock. Both indigenous (natural grown) as well as planted species were confined on the bunds, terrace wall and risers of the upland. In terms of species composition, density coverage and level of production, a wide diversification was observed in all the sites. In over all around 78% of the farmers own fodder trees on the farm land. However there was a wide range in owning number and production among the VDCs (Table 9).

Table 9 Density Cover and Production of Fodder Trees* per Household

VDC	Average no.		Production (kg) Farmer with Fodder Trees			
	Mean	Range	Mean	Range	no.	%
VDC F	18.9	0-182	404	0-12300	44	81.5
VDC M	364.7	0-3760	3277	0-25950	52	96.3
VDC K	12.2	0-189	206	0-3480	26	48.1
VDC R	11.8	0-91	330	0-1200	45	83.3
Total 216	398.7	0-3760	1054	0-25950	169	78.3

Source: Survey, 1993.

Note*: Included natural grown and adopted fodder trees

VDC M has higher number of fodder trees (19699) with domination of improved (exotic) species like ipil and kimbu, followed by VDC F (1025) with *kutmiro*, *kimbu* and *koiralo* as dominating species. Conversely, the other two VDC K and R have greater domination of indigenous species like *gogan*, *panyu*, *bakina* and *panyu*, *kutmiro*, *bakina* respectively. However, in all the VDCs except K, *kutmiro* was popular and spread dominantly (Table 10, Appendix 3).

Table 10 Dominant Fodder Tree Species on Farm Land in Terms of Total Number, Production and Households Number

VDC (N=54)	Percentage of Number			Dominant Species by Production			HH Response		
	1	2	3	1	2	3	1	2	3
VDC F	C (29)	A (10)	B (8)	C (57)	L (11)	F (9)	C (64)	F (20)	L (16)
VDC M	E (52)	A (29)	C (10)	C (32)	E (28)	A (15)	C (84)	B (80)	E (40)
VDC K	G (25)	L (22)	N (11)	G (35)	L (32)	I (8)	L (30)	C (15)	N (12)
VDC R	L (27)	C (25)	N (17)	C (42)	L (18)	F (7)	C (47)	L (36)	J (26)

Source: Survey, 1993. Note: 1, 2 and 3 are the rank of species.
 C=*kutmiro*; A=*kimbu*; F=*khanayo*; L=*painyu*; E=*ipil*; N=*bakaino*; G=*gogan*;
 J=*timilo*; I=*tanki*
 Note: (See Appendix 3 for the scientific names of the species)

The findings of Amatya (1989) and Robinson (1989) supports the dominance of such natural grown fodder trees. But different in VDC M and F, where plantation on bari land had increased so densely that adopter trees number were greater than natural grown by 77% and 40% respectively.

3.2.4 Family Member in Farm and Off-Farm Activities

Farm family members, both economically active as well as non active group with two distinct sex (male and female) constitute as one of the major labor resource for carrying out farming system activities in all the research sites. Table 11, given below shows that the children and adult contributes around 15% and 85% of the total labor force (922). Calculating the time devoted by male and female groups, an overall of 3 hours variation was found in each VDC.

Table 11 Family Farm Labor Supply by Gender and Age in the sites

VDC (N=54)	Total Farm Labor	Age %		Gender %		Working period hours/day	
		Child	Adult	Male	Female	Male	Female
VDC F	242	16.9	83.1	36.4	63.6	6.1	9.8
VDC M	198	10.6	89.4	44.9	55.1	8.2	11.0
VDC K	239	12.6	77.4	43.1	56.9	4.2	7.5
VDC R	243	20.2	79.8	44.0	55.1	8.2	11.2
Total	216 922	15.2	84.8	41.4	58.6	6.7	9.9

Source: Survey 1993.

While considering the gender in farming system activities, female contribution was envisioned higher in all the activities performed. A significant demarcation of male and female could be observed in the enrollment of household followed by livestock and crop (Table 12). Apart from the farm and non farm activities, some of the family members were also engaged in off-farm activities. Especially in VDC K, 67% of the respondent have got opportunity of off-farm employment with greater (63%) in job (service and teaching). This findings coincides with the higher literacy percentage in VDC K. Table 13. provides the details of findings.

Table 12 Division of Family Labor in Farming System Activities by Gender

VDC	Crop (%)			Livestock (%)			Household (%)		
	Male	Female	Total	Male	Female	Total	Male	Female	Total
VDC F	12.6	18.4	31.0	13.3	21.5	34.8	10.5	23.7	34.2
VDC K	17.0	17.4	34.4	17.1	19.2	36.3	9.0	20.3	29.3
VDC M	15.9	16.9	32.8	16.8	18.2	35.0	12.2	20.0	32.2
VDC R	16.4	17.5	33.9	16.2	18.6	34.8	11.4	19.9	31.3
Total	15.5	17.5	33.0	15.8	19.4	35.2	10.8	21.0	31.8

Source: Survey, 1993

Table 13 Number and Percentage of Farmers in Occupational Activities

	VDC M		VDC F		VDC K		VDC R	
	no.	%	no.	%	no.	%	no.	%
1. Agriculture	44	81.4	33	61.0	18	33.3	35	64.8
2. Agri + Teaching	3	5.6	1	1.9	26	37.0	2	3.7
3. Agri + Service	3	5.6	6	11.1	1	26.0	5	9.3
4. Agri + Business	4	7.4	5	9.3	2	3.7	4	7.4
5. Agri + labor	0	0	9	16.7	0	0	8	14.8
Total	54	100.0	54	100.0	54	100.0	54	100.0

Source: Survey, 1993

3.3 Highlights

The general characteristics of the study site comprises temperate agro-climatic settings, reflecting the mid hills of Nepal. Revealing the socio-economic and demographic status, ratio of male to female coincides with national level estimation (1:1) but the literacy percentage in the study site is higher by 2% in both male and female than the national average. However, in terms of institutional development VDC M is well equipped with and accessible of nursery, market and forest. Similarly, in case of resource holdings especially, land and tree VDC M has got the highest holding of 938 hectare and 19699 trees respectively. Furthermore exotic species of fodder trees like ipil and mulberry are found in VDC M and F where, nursery is exist. Significantly less labor involvement in farm activities (approximately 2 hours) and consequently higher in off-farm activities (66.7%) in VDC K reflects the role of market. VDC R in all these aspects are deprived with and therefore poorly developed.