CHAPTER IV

DESCRIPTION OF THE STUDY SITE

Kailali district is one of the food sufficient districts in the country. Administratively, the district is divided into 42 Village Development Committees (VDCs) and two municipalities. Among 42 VDCs, seven VDCs lie on the foot hill and rest are in the *Tarai* (Plain area). The total area of this district is 3,235 square kilometers.

Most the district area is under plain topography. Moreover, mostly sandy soil mixed with gravels is the soil structure of the northern part of the district. However, as moving from the North to the South sandy loam type of soil can be found in the middle portion of the district. But, as moving further toward further southern part of the district alluvial fertile soil can be found.

4.1 Climate of district

Kailali district lies in the *Tarai* region of far western south of country. The elevation of the district ranges from 179 meters to 1,975 meters from mean sea level. The temperature ranges from 5^0 C in the winter to 43^0 C in the summer. Mostly subtropical climate can be found in the district. The average annual rainfall recorded in the district headquarters as following (Table 4.1).

Table 4.1 Average annual rainfall taken in the district headquarter of Kailali district (1997 to 2001).

Year	Amount of annual rainfall (mm.)
1997	1,984
1998	2,385
1999	1,757
2000	2,132
2001	1,485

Source: CBS, 2003

4.2 Location and population in VDCs

The locations of the district and the selected VDCs are presented on the map (Figure 4.1 and 4.2). Among three VDCs, *Geta* is in the far west, whereas other two VDCs viz. *Darakha*, *Chaumala* are in the middle part of the district. The total number of households in VDC was found 1,651, 2,372 and, 1,850 in *Darakha*, *Chaumala* and *Geta* VDCs repectively. While comparing the population among three VDCs, *Chumala* has the highest followed by *Darakha* and then *Geta*. The population of the *Chumala* comprises about 2.83 percent of the total population of the district. Similarly, *Darakha* comprises about 2.40 and *Geta* has merely 1.73 percent of the total population of the district (Table 4.2).

Table 4.2 Number of households and population of selected VDCs.

VDCs	Number of households	Percentage of total households of district	Population	Percentage of total population of district
Darakha	1,651	1.87	12,197	2.40
Chaumala	2,372	2.69	14,367	2.83
Geta	1,850	2.09	8,810	1.73

Source: DDC, 2003

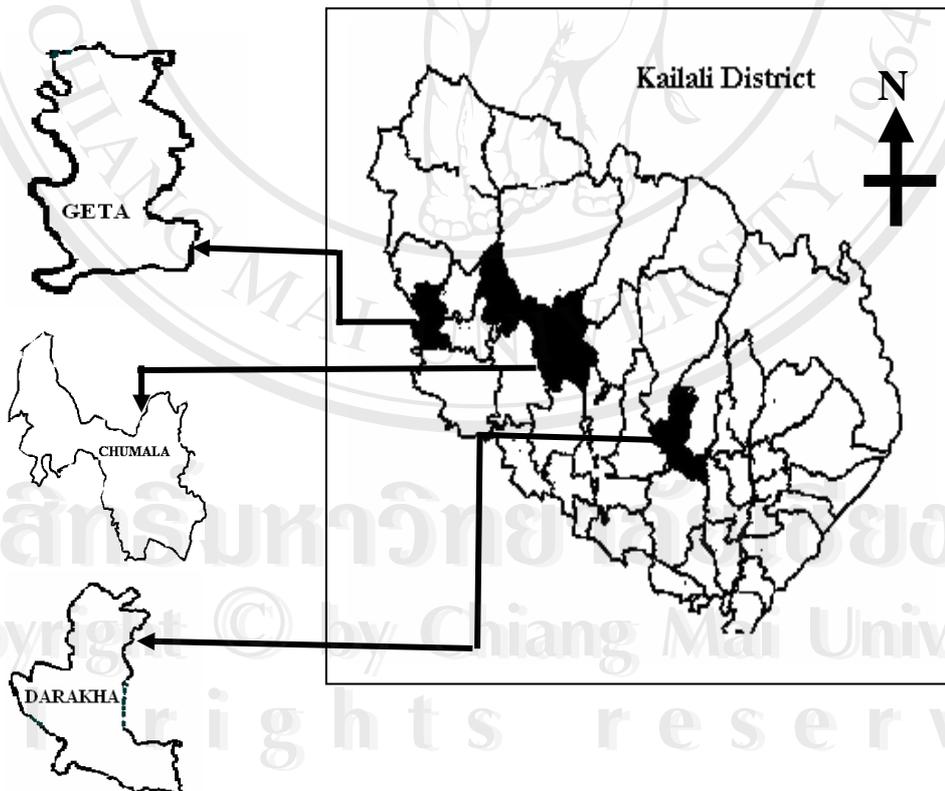Figure 4.1 Map of Nepal showing Kailali district.

Figure 4.2 Location of sampled VDCs of Kailali district.

4.3 Demography and caste/ethnicity

4.3.1 Demography

The total population of the district was about 0.61 million and 94,430 households in the year 2001. The population aged between 10 to 59 years, which is considered as most economically active group, constitutes about 67 percent of the total population (Table 4.3). The cultivated area of the district is 85,750 hectares. With this cultivated land, the per capita land turns out to be 0.14 ha. per person. But, by dividing total cultivated area with most economically active member (age between 10 to 59 years) then it turn out to be 4.8 persons per hectare. This figure justifies the population pressures on land. The household size of this district was found 6.53 members per family, whereas the national average was just about 5.44 members per family (CBS, 2002).

Table 4.3 Population of Kailali district classified by age group.

Year range	Total	Percentage
0-9 years	175,019	28.4
10-59 years	411,922	66.8
>60 years	29,756	4.8
Total	616,697	100.0

Source: CBS, 2003

4.3.2 Caste/ethnicity

Nepalese society was ethnically diverse and complex ranging in phenotype (physical characteristics) and culture from the Indian to Tibetan origin. The genesis of the caste system in Nepal can be traced more accurately from the reign of King Jayasthiti Malla (1380-1394) in the context of Kathmandu valley and with the introduction of the Old Legal Code of 1854 in the context of Nepal as a whole. King Jayasthiti Malla classified the population of the Kathmandu valley into 64 castes, each with different functional and occupational categories (Dahal *et al.,* 2002).

Basically, major ethnic groups have three main origins: Indo-Nepalese, Tibeto-Nepalese, and indigenous Nepalese. Based on those origins in Nepal there are about 103 caste/ethnic groups (CBS, 2003). Mainly, caste system can be found on prominently in Indo-Nepalese origin. However, in other origins also there are subcategories. But their socio-economic status is more or less similar across the different sub-categories in the caste/ethnic group. Conversely, in Indo-Nepalese origin, the caste system is clearly visible and there is significant difference in term of socio-economic status among those castes. Basically, there are major four broad categories of caste in this origin viz. *Brahmin* (priestly)*, Chhetri* (ruler), *Baisya* (farmers/traders) and *Sudra* (social helpers such as blacksmith, goldsmith, cobbler, tailor). These all castes are identified by their family names.

Among these castes, *Sudra* (also known as *dalit* or untouchable caste) are the underprivileged group in the society. Historically, they were socially and economically discriminated. Therefore, poverty becomes hereditary among the *Sudra*. Hence, the most of the members of *dalit* survive by depending upon higher caste in relation to accessing the productive resources. The relationship between the *Sudra* and the higher caste is maintained over the year due to their specialization on non-agricultural skills. This ensures some guarantee of livelihood of *Sudra*. However, with the import of manufactured goods, their produce is supplanted pushing them to unemployment and extreme poverty (Shakya and Singh, 2000).

At the national, the overall literacy rate of *Dalit* was only 23 percent (Shakya and Singh, 2000). Surprisingly, the caste-based discrimination to *Dalits* is found not only from the higher caste and the indigenous nationalities. But this kind of discrimination is also equally observed within the *Dalit* groups even today. While looking at the productive resources, the average land-owning per household among the *Dalit* group was 0.12 ha. of *khet* (irrigated land) and 0.22 ha. of *pakho* (unirrigated upland) land. Landlessness is acute among the various *Dalit* groups and this is more among the *Tarai Dalit*s. The life expectancy of *Dalit* is much lower (50.8 years) than the national average (57 years). Infant mortality is much higher (116.5 per 1000 live

births) compared to the national average of only 79 per 1000 live birth (Dahal *et al.*, 2002).

Brahmin and *Chhetri* usually constitute a significant portion of the local elites has played the most dominant role in the country administrative and political power than the others. Within the *Brahmin* and *Chhetri* there are also subcategories. Among those subcategories, socio-economic status differs from one group to another not because of caste they belongs but because of the productive resources.

Among the ethnic groups, *Newar*, is especially residing near to town and engaging in business. They have also better economic status than the others. Other ethnic groups such as *Magar*, *Gurung*, *Rai*, *Tamang* and *Limbu* are mainly originated from hills. They mostly do agriculture and some of them work on other jobs such military and security personnel in particular. Additionally, *Tharu*s are one of the most dominant ethnic group in *Tarai*. They are the original inhabitants of the *Tarai* belt. This ethnic group mostly engaged in agriculture and some off-farm jobs such as making earthen pot, netting bamboo baskets and hired laborers.

In a society, these castes/ethnic groups share their work with each other. *Tharu*s mainly work as laborer in their own field as well as to the other caste's farm for plowing, transplanting and harvesting of crops. *Sudra*s mainly do tailoring, repair agriculture tools and in some cases work as laborers in the farms of other caste especially to the *Brahmin* and *Chhetri*. *Brahmin*s and *Chhetri* mainly do teaching and other social and administrative works.

In the *Kailali* district, *Tharu*, which is the indigenous ethnic group of *Tarai*, occupies almost 41.76 percent of the total population (DDC, 2003). *Brahmin* comprises nine percent of the total population whereas *Chhetri* comprises almost 20 percent of the total population of the district (DDC, 2003). In all three sampled VDCs *Tharus* were found the most dominant followed by *Chhetri*s and *Brahmins*. However, in *Darakha* VDC, the percentage of *Brahmin*s was found higher than that of *Chhetri*. Other caste /ethnic groups were found in low proportion in the selected VDCs. Even

looking at district level, other caste/ethnic groups such as *Magar* comprises five percent and *Newar* and *Gurung* both less than one percent of the total population of the district (Table 4.4).

Table 4.4 Percentage of population in selected VDCs classified by different caste/ethnic group.

VDC	Caste/ethnic group						Total
	Brahmin	Chhetri	Newar	Gurung	Magar	Other*	
Darakha	13.7	8.7	-	0.3	1.0	76.3	100
Chaumala	19.9	29.6	0.2	-	3.2	47.1	100
Geta	22.0	22.4	-	0.2	0.2	55.2	100

Note: * In the table in other category *Tharu* and *Sudra* were included. *Tharu* is the most dominant ethnic group among all caste/ ethnic group.

Source: DDC, 2003

4.4 Characteristics of agriculture

Food was found mostly supplied by the agricultural production in the study area. Sufficient production increases the food availability at the household level and that ultimately helps in reducing the food insecurity. But the production and productivity is largely determined by the other factors such as land, labor, capital, credit, and education level. According to farmers' perception major constraints to food availability were the conflict, inadequate irrigation, higher input prices, inadequate knowledge about pest and diseases, lower prices of their outputs, inadequate supply of improved breeds, and inadequate landholding (Table 4.5). These farmers' perception of the problems related to agriculture production is stated as following with their priority.

Table 4.5 Major problems in agriculture with their priority in the study area.

Problems	Priority
Conflict / insurgency	First
Inadequate of irrigation facility	Second
Higher input prices	Third
Inadequate knowledge about pest and diseases	Fourth
Lower prices of outputs	Fifth
Inadequate access to improved seeds/breeds	Sixth
Inadequate landholding	Seventh

Source: Group discussion, 2004

Status and conditions of these major factors that affect to the agriculture production are discussed as follows.

4.4.1 Land and landholding

Since in the district, about 88 percent of the total population depends on agriculture; therefore agriculture was found as the primary source of income and food for them. Moreover, country's 20 years Agriculture Perspective Plan (APP) also rightly identified the one of the major problem to land ownership related policy, distribution and tenure arrangements are regarded the main contributing factor to this stagnation (Chapagain, 1999). Therefore, land is one of the most important factors for agricultural production especially when farmers are facing other institutional and technological constraints. Agricultural land occupies about 28 percent of total land of the district, whereas forest covers about 66 percent of the total land (Table 4.6). Since, natural resources such as forest and natural water bodies were found very important, because some of the poor people were getting food from it. These people were mainly from *Tharu* and *Sudra* categories. Mainly mushrooms, leafy vegetable and fish were harvested from these resources. These resources were found crucial for maintaining food security.

Table 4.6 Land use classification of Kailali district.

Categories	Area (ha.)	Percentage
Forest land	2,15,850	66.5
Agricultural land	90,550	27.9
Pasture land	6,275	1.9
Other	12,115	3.7
Total	3,24,790	100.0

Source: DADO, 2003

Due to increasing population pressures landholding size per household has decreased therefore, the average holding agriculture land was found 0.90 ha. per household (Chapagain, 1999). Besides, there was a skewed distribution of land in favor of big landlords. Moreover, these landlords were living in cities without cultivating their land by themselves. In the surveyed VDCs, average holding size for *Brahmin* was found 45.2 *Kattha* (1.5 ha), whereas for *Chhetri* 29.6 *Kattha* (0.99 ha.) and for *Tharu* and *Sudra* the average size of holding was 29.2 *Kattha* (0.97 ha) and 8.8 *Kattha* (0.29 ha.) respectively (Figure 4.3). Statistically, while looking mean difference between average size of holding on selected castes, there was not significant difference between *Brahmin* and *Chhetri* and *Brahmin* and *Tharu*, whereas between *Brahmin* and *Sudra* it was highly significant at the 0.01 level of significance. Between *Chhetri* and *Sudra* also it was found significant at the less than 0.1 level of significance; however there was no significant difference between the average size of holding of *Chhetri* and *Tharu*. Additionally, there was a significant different between *Tharu* and *Sudra* at less than 0.01 level of significance.
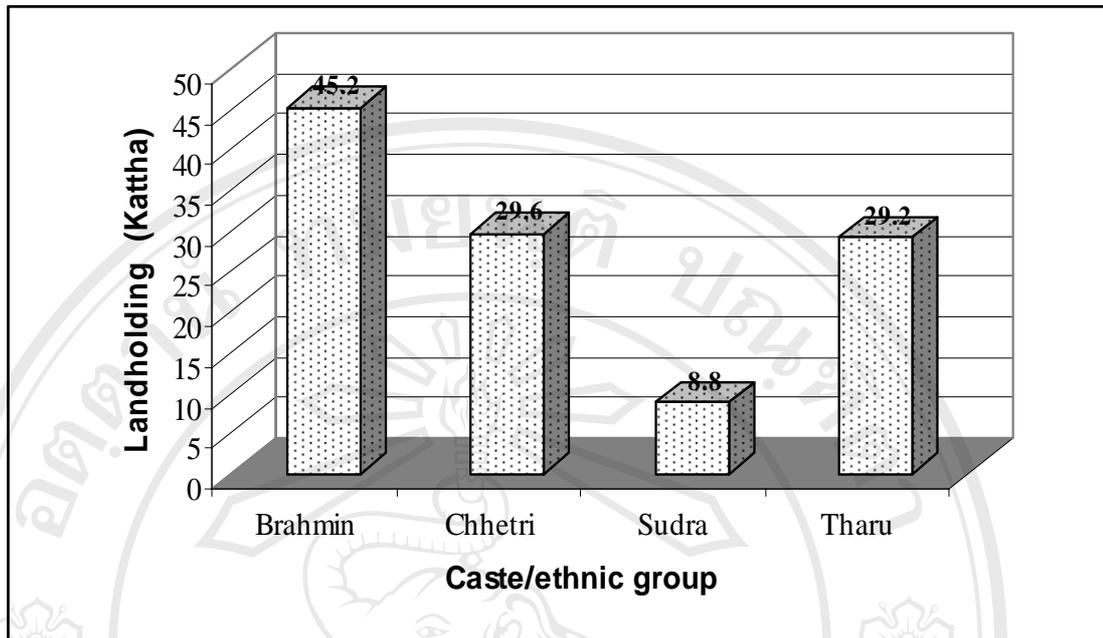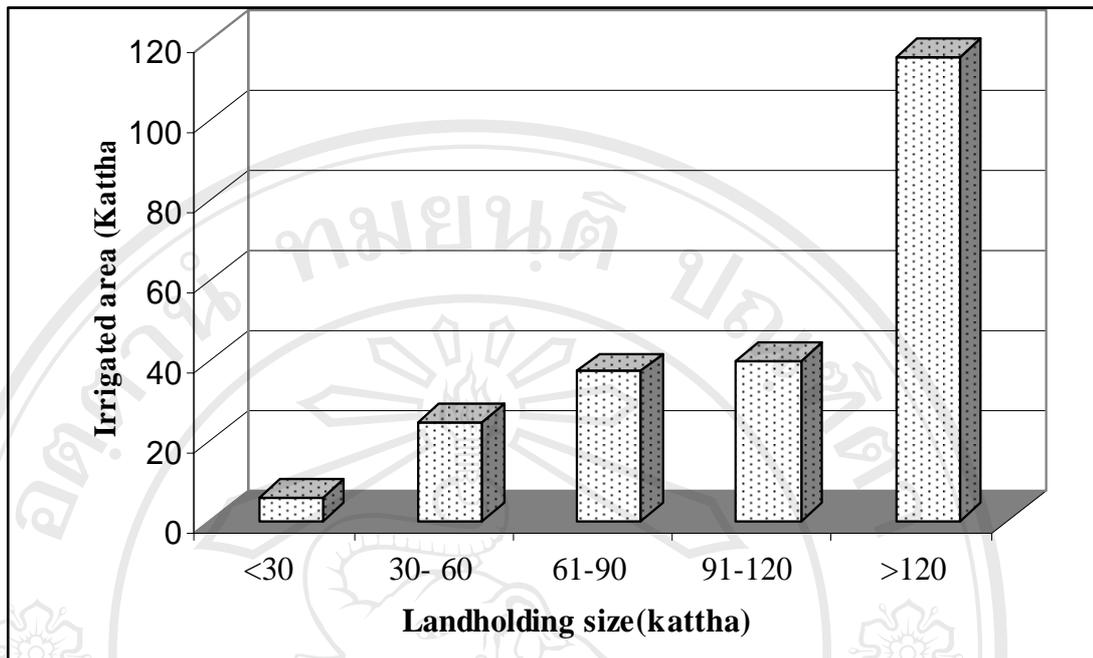
Note: 30 *Kattha* = 1 hectare

Figure 4.3 Average sizes of landholdings under different caste/ethnic group.

Source: Survey, 2004

Since, there was a tendency that big landlords live in cities and left their land mostly under sharecropping (locally known as *Adhiya*). The area under sharecropping has been increasing every year because of conflict. Tenants are the actual cultivators of the land under sharecropping arrangement, but they do not have any kind ownership right on that land. Therefore, they can be evicted at any point of time from that sharecropping arrangement. This kind of arrangement has created conditions of disincentives for further investments such as on land improvement, adoption of new technologies programs. Besides, the situation further deteriorated due to small size of holding and fragmentation. This situation has reduced the prospect of mechanization and thereby commercialization of agriculture.

As already discussed, landholding size was decreasing over the time due to population pressure. Mainly two reasons were found causing increasing pressure on land in this study area. Firstly, the household size was found bigger than the average national size. Secondly, there was migration from hill and mountain to this district. So access to the land especially for the poor is becoming difficult year after year.

Besides, the situation was more aggravated by the skewed distribution of landholding in favor of certain caste and ethnic group. Likewise, in overall situation, irrigation was also found a limiting factor. According to the District Agriculture Development Office (2002), only about 24 percent of the cultivated land was found under irrigation. Access to irrigated land is particularly important for the adoption of improved technologies that enhance the production and productivity. In other word, irrigation is inevitable for the better production and use of green revolution technologies. But, at the field level, the command area of irrigation scheme was found decreasing year after year due to the inadequate operation and maintenance of irrigation system. Like landholding size, irrigated land was also found distributed skewedly in favor of big landholdings (Figure 4.4). In the figure below, it has shown that as moving from the first category (holding size less than one hectare) to the fifth category (holding size more than four hectares), irrigated landholding size increases. This shows that households which have bigger landholding sizes have more irrigated area. Access to irrigated land is one the most important enabling conditions for the adoption of technologies including other factors such as the education level of the households, capital, institutional supports such as credit and agricultural extension services, markets (input and output) and other social variables.

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Note: 30 Kattha = one hactare

Figure 4.4 Average size of irrigated landholding under different landholding

categories.

Source: Survey, 2004

Since, big landholders possess higher irrigated land area and the previous analysis has already shown from *Brahmin* and *Chhetri*. Consequently, it can be deduced that *Brahmin* and *Chhetri* possessed the big chunk of irrigated area. But, small landholding size found widespread overall despite the caste and ethnic groups. This can be substantiated by average holding size. In sampled area, it was found that about 79 percent of the total samples has less than one hectare of land. It reflects that land is becoming limiting factor; but whatever big landholders were found they mostly were from *Brahmin* and *Chhetri*, whereas almost all households under *Sudra* category and majority households under *Tharu* have less than one hectare of land (Table 4.7).

Table 4.7 Households under different landholding categories.

Caste/ethnic group	Landholding category (Kattha)					Total
	< 30	>30-60	>61-90	>91-120	> 120	
Brahmin	9 (47.4)	5 (26.3)	4 (21.1)	1 (5.2)	-	19 (100)
Chhetri	11 (68.8)	4 (25.0)	-	-	1 (6.2)	16 (100)
Sudra	27 (100.0)	-	-	-	-	27 (100)
Tharu	23 (85.2)	1 (3.7)	2 (7.4)	-	1 (3.7)	27 (100)
Total	70 (78.7)	10 (11.2)	6 (6.7)	1 (1.2)	2 (2.2)	89 (100)

Note: Figures in the parenthesis indicate the percentage of total sample in each caste category

Source: Survey, 2004

Since majority of the households were found agriculture based, therefore access to the land was key to have access to the calories for household members. That can be further substantiated by the trend of increasing calories per adult equivalent as the landholding size increases (Figure 4.5). This also suggests that the calories uptake by the households largely come from the agriculture. Therefore, it can be concluded that agriculture was the key to determine the fate of food insecurity/security condition of the households.
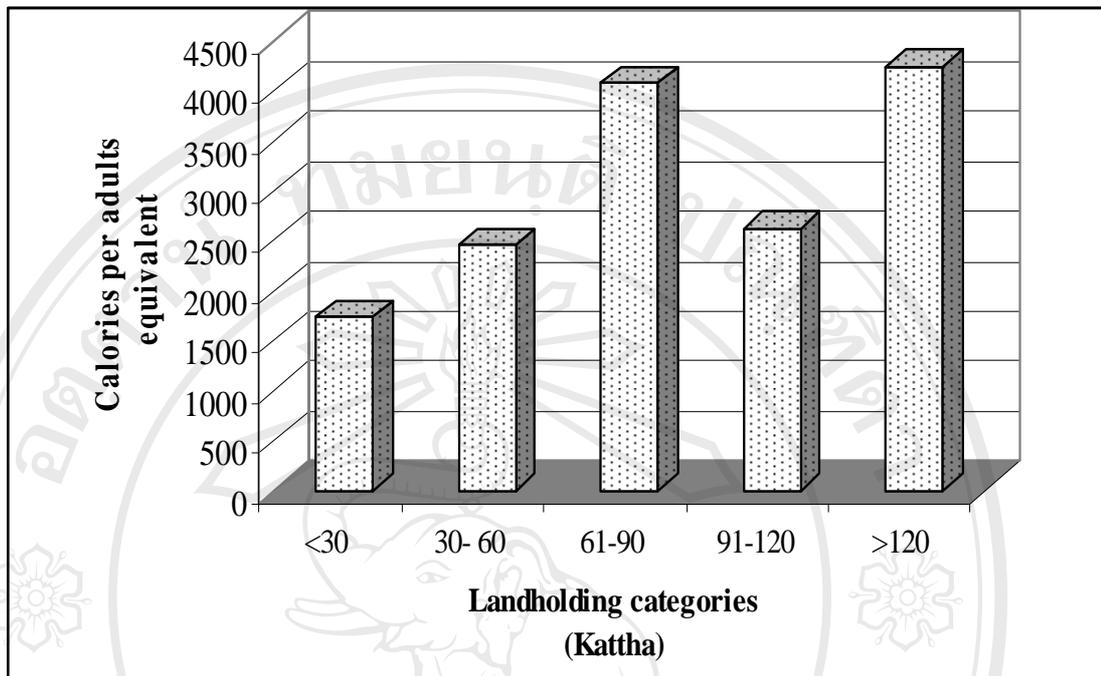
Figure 4.5 Average calories per adult equivalent under different landholding
        categories.

Source: Survey, 2004

4.4.2 Labor

        Labor is another key input for agriculture production. Assessment of labor unit can be seen from to two different angles i.e. quantitatively and qualitatively. The education level of households is one of the proxy indicators that can measure quality aspect of labor that has already been described. Therefore, here analysis concentrated only quantity side of labor force. The average number of family members for *Brahmin* and *Tharu* household was found about seven members per household; whereas in the case of *Chhetri* and *Sudra* it was found 6.1 and 5.7 members per households respectively (Figure 4.6).
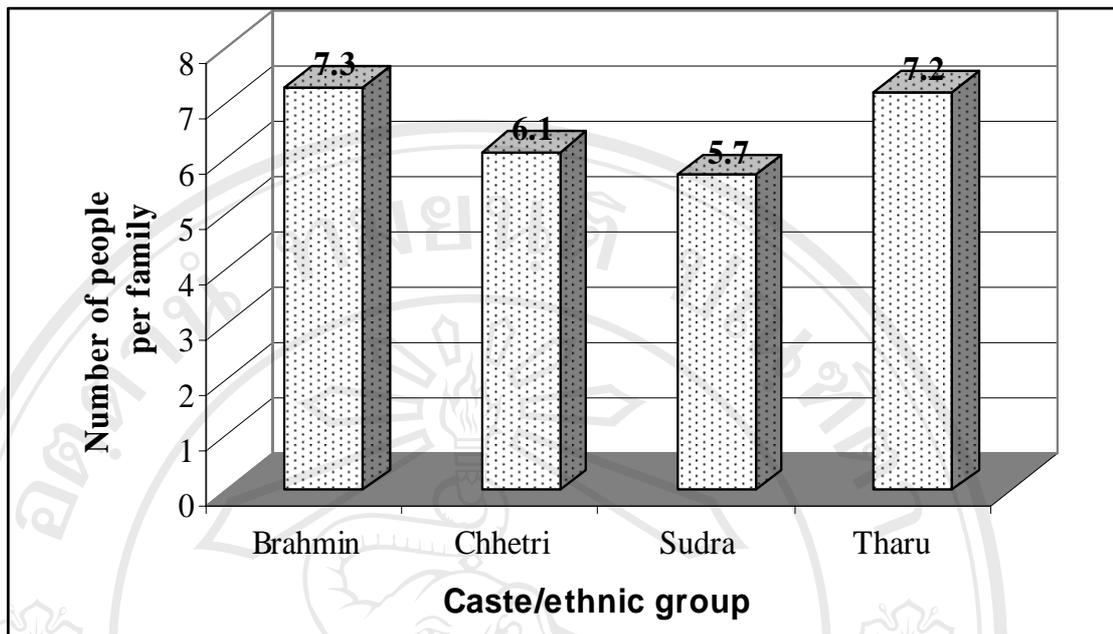
Figure 4.6 Average numbers of people in family under different castes/ethnic group.
Source: Survey, 2004

While looking at the distribution of economically active members (10 years of age and above are considered as economically active member (NHDR, 2004) in the family, *Brahmin* has the highest, which was nearly six members of economically active per household, found. But in the case of *Tharu* and *Chhetri* the average economically active members per household were 5.5 and 4.7 respectively. In *Sudra* category, 3.7 economically active members were found (Figure 4.7). The most probable reason for lower economically active members in *Sudras'* households were due to earlier family separation and most of the active members were found semi-permanently migrated for off-farm job especially outside the country.
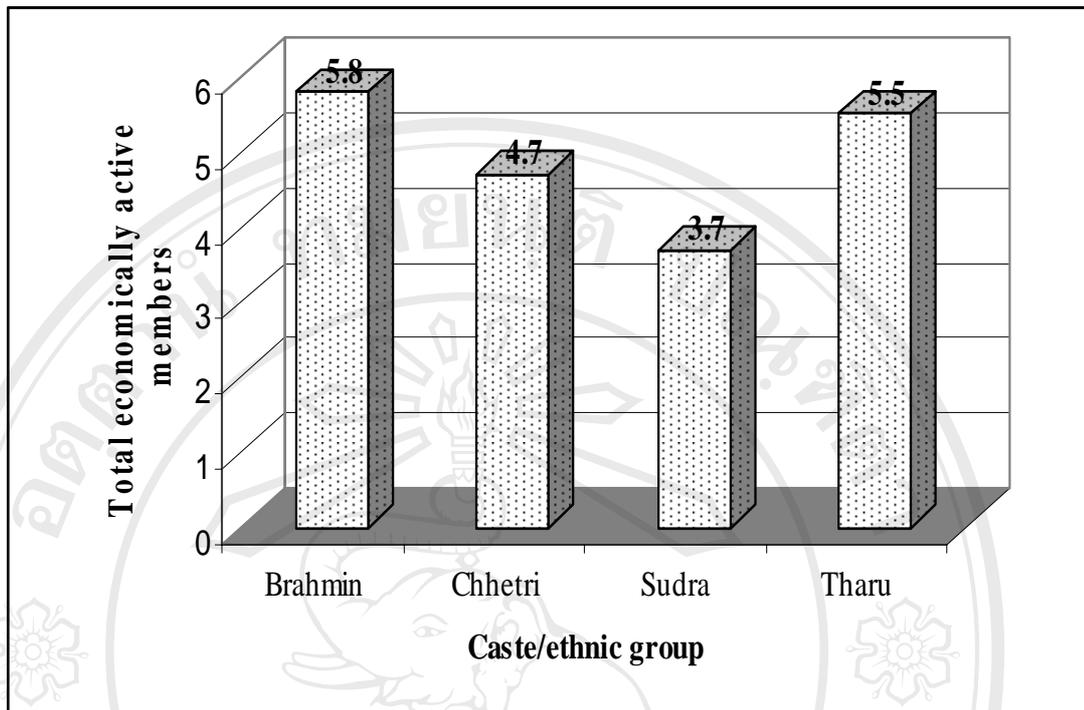
Figure 4.7 Average numbers of economically active members in household under

different caste/ ethnic groups.

Source: Survey, 2004

While looking at the gender composition of economically active members, *Tharu* and *Chhetri* have average 3 and 2.9 economically active male members per household respectively, whereas *Brahmin* has 2.8 active male members. But in case of *Sudra* only 2.1 economically active male members were found. The main reason behind less economically active male members in the household of *Sudra* was due to semi-permanently migration of male member especially to India. But, in case of economically active female members, *Brahmin* has the highest of 3.1 economically active female members per household and then followed by *Tharu*, which have around 2.5 female members per household, and then *Chhetri* and *Sudra* have 1.8 and 1.6 female members per household respectively (Figure 4.8).
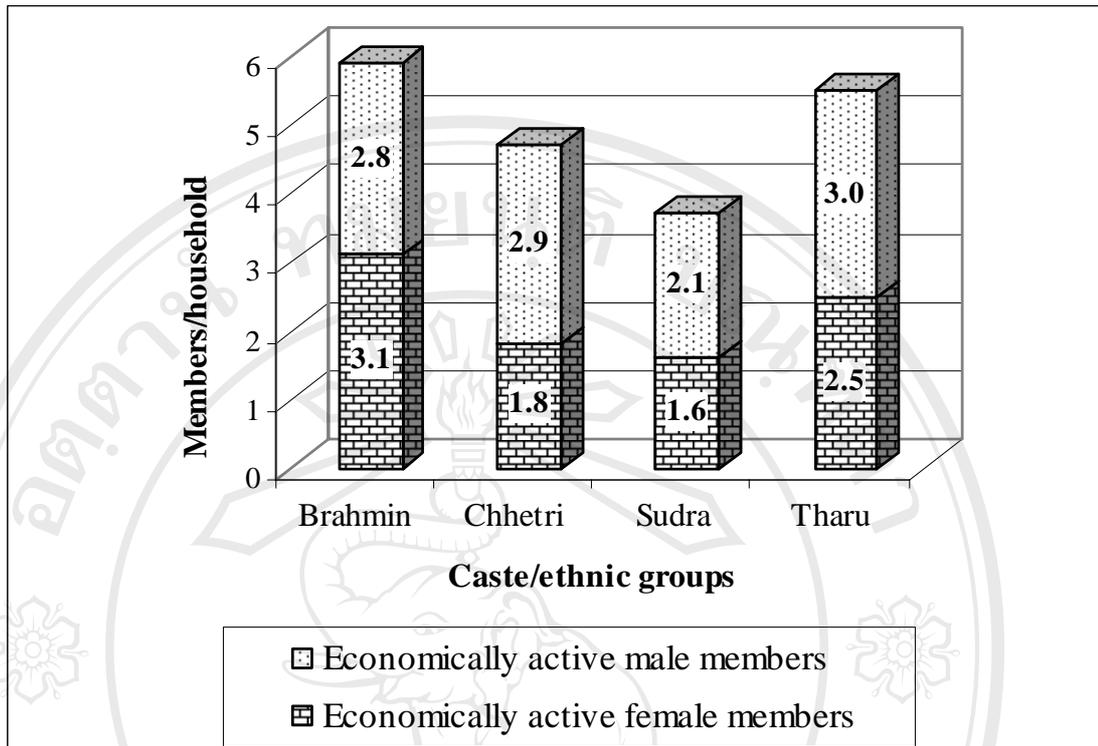
Figure 4.8 Distribution economically active male and female members under different
caste/ethnic group.

Source: Survey, 2004

4.4.3 Capital

Capital is also important input and mainly used for increasing the efficiency of production. In this analysis, tractors, threshers, plows, sprayers, etc were included as capital goods. The values of these capital assets are converted into present value in order to make them comparable. In the samples, it was found that *Brahmin* households have average capital stock NRs.6,728 per household and followed by *Chhetri* NRs.3,348 per household. For *Tharu* the average capital stock was found NRs.3,523 per household and for *Sudra* it was just only NRs. 915 (Figure 4.9).

Statistically, there was not significant difference between average size of capital holding between *Brahmin* and *Chhetri*, *Brahmin* against *Tharu* and *Chhetri* against *Tharu*. However, there was significant difference between *Brahmin* against

Sudra at the 0.01 level of significance. Additionally, there was significant difference between *Chhetri* and *Sudra* and *Tharu* and *Sudra* but at the 0.1 level of significance.
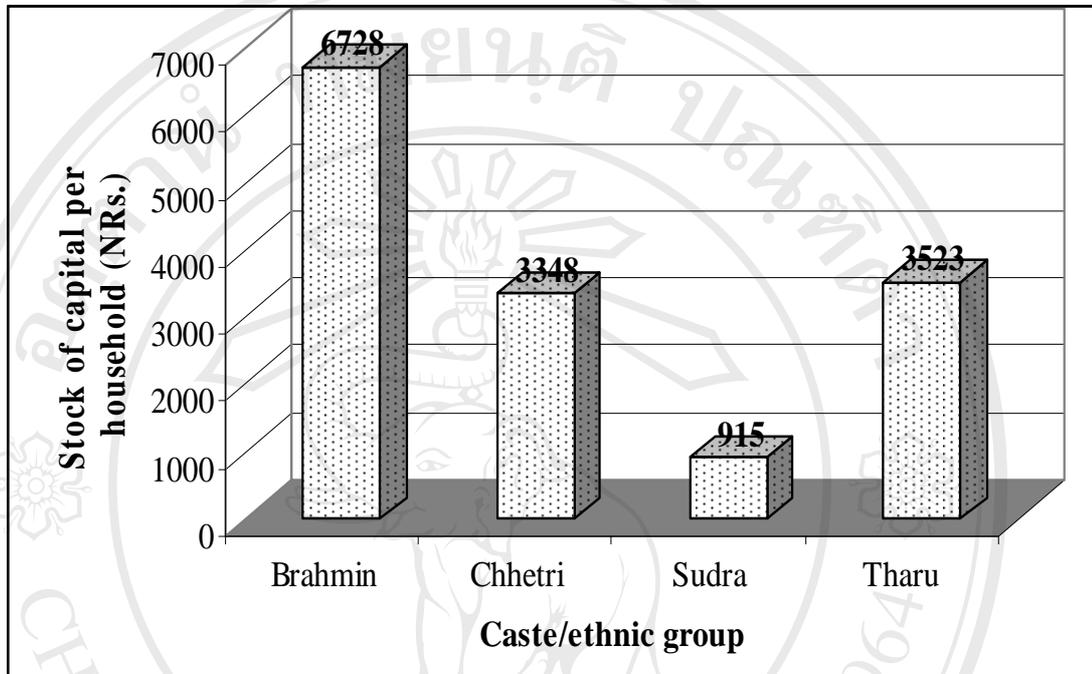

Figure 4.9 Average stock of capital under the households' of different caste/ethnic
groups after removing the outliers.

Source: Survey, 2004

4.4.4 Credit

Credit is important for investment and investment is needed for the application of improved technologies. The average amount of loan taken by *Brahmin* was found NRs.25,289 and for *Chhetri* it was NRs.4,075 per year per household. Similarly, the average amount NRs.4,359 was found for *Tharu* and NRs.993 for *Sudra* per year per household (Figure 4.10). Statistically, the average amount of loan taken by *Brahmin* was found significantly greater than that for all other caste/ethnic groups at the 0.05 level of significance. The difference between the *Brahmin* and *Sudra* was found highly significant even at the 0.01 level of significance. However, the average amount of loan was found significantly higher for *Chhetri* than *Sudra* at the 0.1 level significance. But there was not significant difference between *Chhetri* and *Tharu*.

Conversely, the average amount was found significant at the 0.1 level of significance between *Sudra* and *Tharu*.
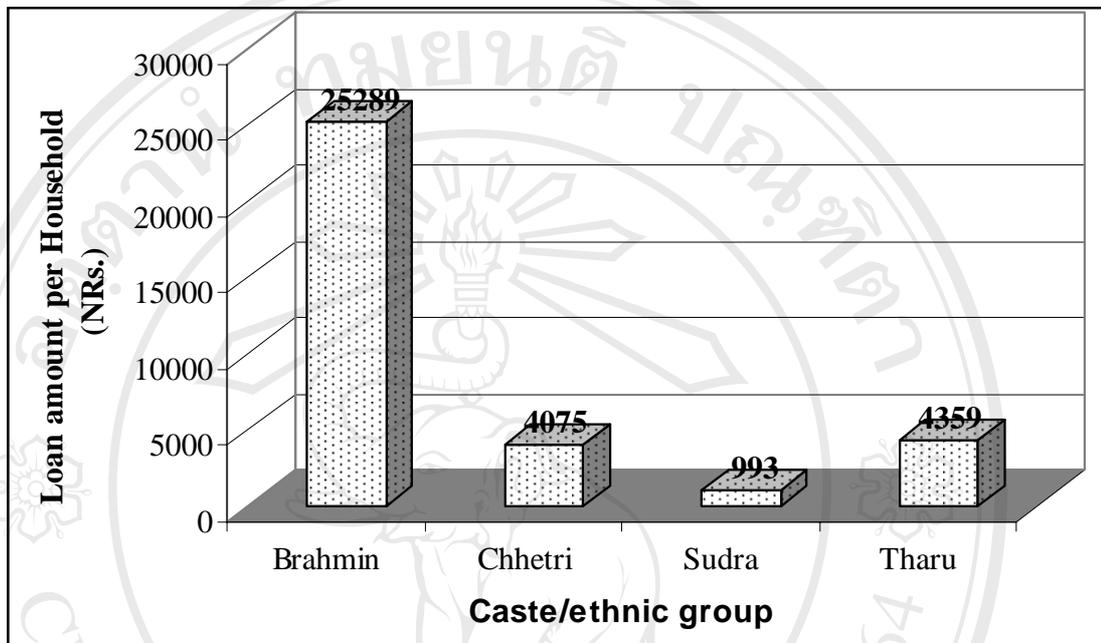

Figure 4.10 Average amount of loan taken by the different caste/ ethnic group.
Source: Survey, 2004

Different lending sources were supplying credit in the sampled area. But, it was found that *Brahmin*s usually have more access to the formal sector; whereas households of *Sudra* and *Tharu* had taken credit form informal sector (local moneylender, friends, relatives) (Table 4.8). In most of the cases, if the loan was taken from friends and relatives, the rate of interest was found lower than formal institutions. But, interest rate was found exorbitant as high as 60 percent (most prevalent rate was found 36 percent) among the local money lenders. The reason shown behind why *Sudra* and *Tharu* did not take loan from formal institution was because of collateral problem, lending criteria do not meet their requirement. Besides, people think that they require having good educational background to do paper work.

Table 4.8 Number of households classified by sources of loan under different caste/
ethnic groups.

Castes/ ethnic group	Loan Source					Total
	Not taken	Formal	Informal	Both sources	Farmer's group	
Brahmin	5 (26.3)	8 (42.1)	5 (26.3)	1(5.3)	-	19 (100)
Chhetri	7 (43.8)	3 (18.8)	6 (37.4)	-	-	16 (100)
Sudra	16 (59.3)	-	11(40.7)	-	-	27 (100)
Tharu	12 (44.4)	2 (7.4)	10 (37.0)	-	3 (11.2)	27 (100)
Total	40 (44.9)	13 (14.6)	32 (36.0)	1 (1.1)	3 (3.4)	89 (100)

Note: Figures in the parenthesis indicate the percentage of total sample in each caste category.

Source: Survey, 2004

4.4.5 Education of farm household heads

Education is another factor that affects the calorie availability at household level. Educated household heads do better production decisions or it makes household members to be eligible for the highly paid off-farm jobs that ultimately help to have better food access. In the sampled households, the general tendency has shown that the higher the education level the higher calorie availability (Figure 4.11). In the samples, it can be clearly seen that as household heads have higher levels of education the calories have increased. This finding is consistent with earlier findings. According Ribar and Hamrick (2003), completing high school education is consistently found to increase the chances of leaving food insufficiency. Most of the educated households were found under the *Brahmin* and *Chherti* categories than that of *Tharu* and *Sudra*.
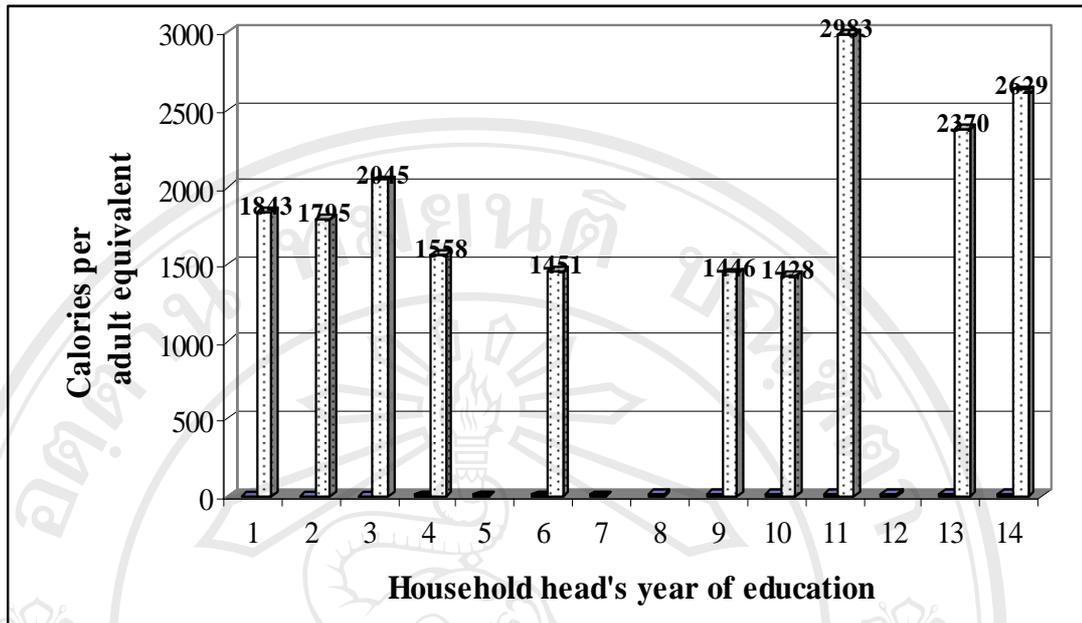
Figure 4.11 Average calories per adult equivalent by the households head's years of
education.

Source: Survey, 2004

4.4.6 Types of farming system

Since, *Tarai* is considered as a "granary" of Nepal. Mainly cereal and cash crops such as paddy, wheat, rape seed, lentil and sugarcane are mainly grown in the district. At the aggregately level, paddy based farming system was found as a dominant in the district. Since landholding size is smaller; paddy was mostly grown for home consumption. Few households under irrigated conditions grow paddy for sale in the market. In unirrigated conditions, maize was found more dominant than other crops. Under this condition, maize – rape seed+lentil – fallow cropping system covers about 42 percent and then followed by maize – fallow- fallow which covers 20 percent of the total area under unirrigated condition. Paddy- rape seed +lentil- fallow and maize- rape seed - fallow covers about 13 and 11 percent respectively (DADO, 2003). In irrigated condition, paddy – wheat – fallow, which covers about 67 percent of the total area, was found the most dominant cropping pattern in the district. Paddy-lentil – fallow and paddy – potato –fallow cropping pattern was the second and third

dominant pattern, which covers about 12 and 11 percent of the total land under this category (DADO, 2003). Cropping pattern such as paddy- vegetable – fallow and paddy – vegetable –vegetables can also be found in some irrigated condition but these patterns occupy only about 4 and 2 percent respectively. In partially irrigated condition, paddy based cropping pattern was found the most dominant. During the rainy season, farmers grow paddy especially for home consumption. Immediately after rice harvest, they plant rape seed or lentil or both as mixed. So, under partially irrigated condition paddy – rape seed + lentil – fallow cropping pattern was the most dominant pattern; which occupies about 71 percent of the total area under this category. Paddy – wheat – fallow and banana, pigeon pea, sugarcane were also other dominant cropping pattern under partially irrigated condition in the district (Table 4.9).
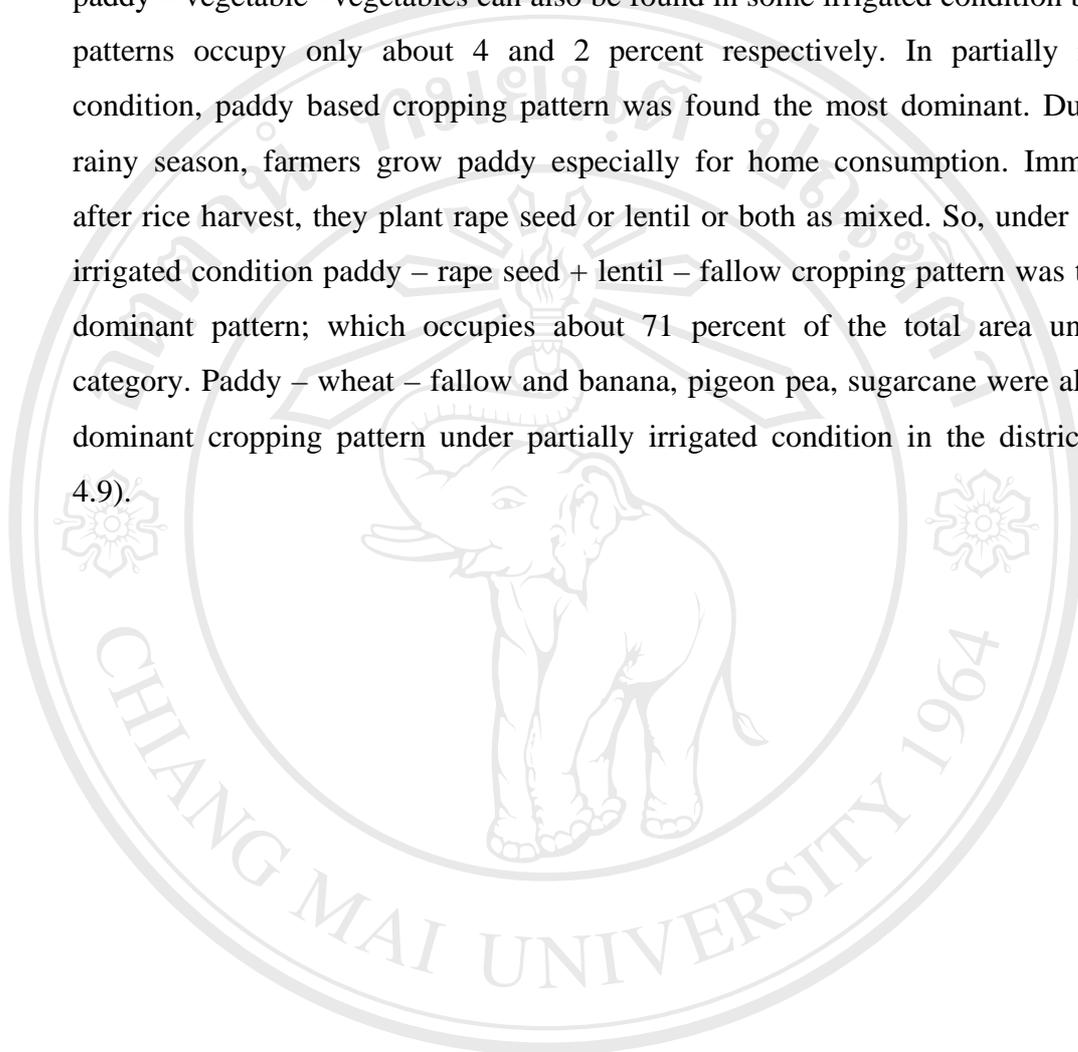
Table 4.9 Major cropping systems under different condition of Kailali district.

Land type	Cropping system	Area (%)
Unirrigated (*Pakho*)	Maize - Rape seed + Lentil – Fallow	42.2
	Maize - Fallow- Fallow	19.6
	Paddy - Rape seed +Lentil- Fallow	13.4
	Maize - Rape seed- Fallow	10.8
	Maize - Wheat – Fallow	2.4
	Maize + Black gram –Rape seed - Fallow	2.4
	other (including fruits)	9.2
Irrigated (*Khet*)	Paddy - Wheat - Fallow	66.9
	Paddy - Lentil - Fallow	12.3
	Paddy - Potato - Fallow	10.5
	Paddy - Vegetable - Fallow	4.3
	Paddy - Vegetable -Vegetables	1.5
	Paddy - Rape seed + Lentil - Vegetables	1.5
	Others	3.0
Partially Irrigated	Paddy - Rape seed + Lentil - Fallow	71.2
	Paddy - Wheat - Fallow	15.3
	Banana, Pigeon pea, Sugarcane	8.6
	Paddy - Fallow –Fallow	2.6
	Paddy –Rape seed -Fallow	2.0
	Other	0.3

Source: DADO, 2003

4.4.7 Ethnicity and farming system

Consumption habit of caste/ethnic group and access to resources were found the most important that determine the particular types of crops and livestock of a particular household. Consumption pattern were found determined by the tradition, values and beliefs. While looking at the overall farm resource access as earlier analysis has shown that *Brahmin* and *Chhetri* possess more than other castes. Specifically in the sample survey, *Brahmin* not only possess the highest holding size

and but also they have more access on irrigated area and animal equivalent unit than other castes/ethnic group. Similarly, after *Brahmin*, *Tharus* were found better in term of landholding size and even in irrigated land and animal equivalent and then followed by *Chhetri*. *Sudra*s have less access on landholding and irrigated land than that of all other caste/ethnic group (Table 4.10).

Table 4.10 Comparison of average size of landholding (in Kattha) and animal
equivalent units.

Caste/ethnic group		Landholding size	Irrigated	Unirrigated	Animal equivalent unit
Brahmin	Mean	45.2	18.4	26.7	4.9
	N	19.0	19.0	19.0	19.0
	S.D.	32.9	17.4	26.7	3.2
Chhetri	Mean	29.6	15.8	13.8	3.7
	N	16.0	16.0	16.0	16.0
	S.D.	40.6	21.9	23.9	2.3
Sudra	Mean	8.8	2.3	6.4	1.4
	N	27.0	27.0	27.0	27.0
	S.D.	8.3	3.9	6.1	1.4
Tharu	Mean	29.1	18.1	11.1	4.8
	N	27.0	27.0	27.0	27.0
	S.D.	36.9	33.7	14.1	3.8
Total	Mean	26.2	12.8	13.3	3.5
	N	89.0	89.0	89.0	89.0
	S.D.	33.1	23.1	19.2	3.2

Note: 30 Kattha = one hectare.

Mean landholding size among the caste/ethnic group is significant at 1 % level of significance.

Mean of Irrigated landholding size among the caste/ethnic group is significant at 7% level of significance.

Mean size of unirrigated landholding between the groups is significant at 1 % level of significance.

Mean size of animal equivalent unit between the groups is significant at 1 % level of significance.

Source: Survey, 2004

Despite the fact that subsistence farming was found dominant in the sample, but still there was variability in farming characteristics among the different caste/

ethnic group. Some of *Brahmins* and *Chhetris* and very few *Tharu*s were found of having commercial objective of farming. But, almost all *Sudra*s have subsistence farming. Input such as fertilizer, FYM, pesticides, improved seeds were less used by the *Tharu*s and *Sudra*s, whereas *Brahmin*s and *Chhetri*s have used moderately (Table 4.11).

Table 4.11 General farm characteristics under different caste/ethnic group.

Characteristics	Brahmin	Chhetri	Sudra	Tharu
Fertilizer use	Higher than *Sudra* and *Tharu*	Higher than *Sudra* and *Tharu*	Almost not	Less to moderate
FYM use	Low to moderate	Low to moderate	Very low	low
Pesticide use	Moderate	Moderate	Very low	Very low
Improved seed	Moderately used	Moderately used	Rarely	Very low
Livestock types	Cow, Buffaloes, Goats	Cow, Ox, Buffaloes, Goats, Chicken	Chicken, Rarely Ox	Ox, Chicken, Pigs,
Improved livestock breed kept	Low to moderate	Very low to low	Almost not	Very low
Vegetable cultivation	Kitchen gardening	Kitchen gardening	Low	Low to moderate
Fruit cultivation coverage	Moderate (mango, guava, papaya, lime, banana etc)	Low to moderate (mango, guava, papaya, lime, banana etc	Almost not grown	Moderate (mango, guava, banana etc.)
Capital used	Moderate	Moderate	Low	Low
Sale of farm output	Moderately	Moderately	Almost not	Rarely

Source: Group discussions, 2004

While looking types of livestock raised by the different castes, *Brahmin* kept the mostly big size animals such as cows and buffaloes for milk and sometimes goat for meat purpose; whereas *Chhetri*s keep cow, ox, buffaloes, goats, chicken and *Tharu*s keep ox for draught and chicken and pigs for meat purpose. But *Sudra*s keep

only small animals like chicken and sometimes ox for the draught. Very few households in the study area were found to have improved livestock breeds and when they were found to have these, they were mostly under *Brahmin* and *Chhetri* castes. Besides, some of the households under *Brahmin* and *Chhetri* were found cultivating vegetable and fruit in their own farmland. Occasionally, some of the households under these castes sell their vegetables to the nearby market especially during the peak season (winter) though they also buy vegetables in other seasons. In case of *Tharu*, very few households sell vegetables. However, in case of *Sudra* none of the households have found selling vegetables in the market.

4.4.8 Crop production

The average productivity of paddy of the district is higher than the national average productivity from year 1997/98 to 2001/02 except in the year 2000/01. The area of wheat has constantly decreased from year 1997/98 to 2001/02 despite increase in the productivity. In the case of potato and sugarcane, the area and productivity has increased significantly during the five years' period. In case of oil seed, area and productivity increased moderately during the five-year's period (Table 4.12).

Table 4.12 Area, production and yield of major cereals and cash crops in Kailali
District.

Area in ha.
Production in mt.
Yield in mt/ha.

Crops		1997/98	1998/99	1999/00	2000/01	2001/02
Paddy	Area	54,770	55,000	56,700	56,700	57,000
	Production	135,800	145,750	151,021	138,915	172,118
	Yield	2.48	2.65	2.66	2.45	3.02
Wheat	Area	19,240	17,000	17,000	16,500	16,000
	Production	31,200	37,400	37,500	36,000	35,200
	Yield	1.62	2.20	2.21	2.18	2.20
Maize	Area	12,210	12,000	12,500	12,810	12,500
	Production	23,440	22,800	18,250	19,100	19,500
	Yield	1.92	1.90	1.46	1.49	1.56
Potato	Area	1,000	1,250	2,010	2,015	2,030
	Production	8,400	10,625	18,100	18,405	19,800
	Yield	8.40	8.50	9.00	9.13	9.75
Oil seed	Area	20,000	22,500	22,500	23,000	23,500
	Production	12,500	15,750	19,125	20,470	21,032
	Yield	0.63	0.70	0.85	0.89	0.89
Sugarcane	Area	1,450	2,000	2,000	2,300	2,300
	Production	42,560	80,000	80,000	97,290	97,290
	Yield	29..3	40.0	40.0	42.3	42.3

Source: CBS, 2003

4.4.9 Livestock production

Livestock was mainly kept as a complementary in the existing farming system
especially for plowing and for manure. Small animals such as chickens, pigs and
goats were kept to meet the demand of meat and eggs especially during religious
festivities. While looking at the population livestock, population of goat has
significantly increased from the year 1997/98 to 2002/03. Conversely, the population

of duck as decreased significantly over the year from 1997/98 to 2002/03. Other animals like cattle, pig, and fowl has decreased slightly; whereas population of buffaloes and sheep has increased slightly over the five year period (Figure 4.12).
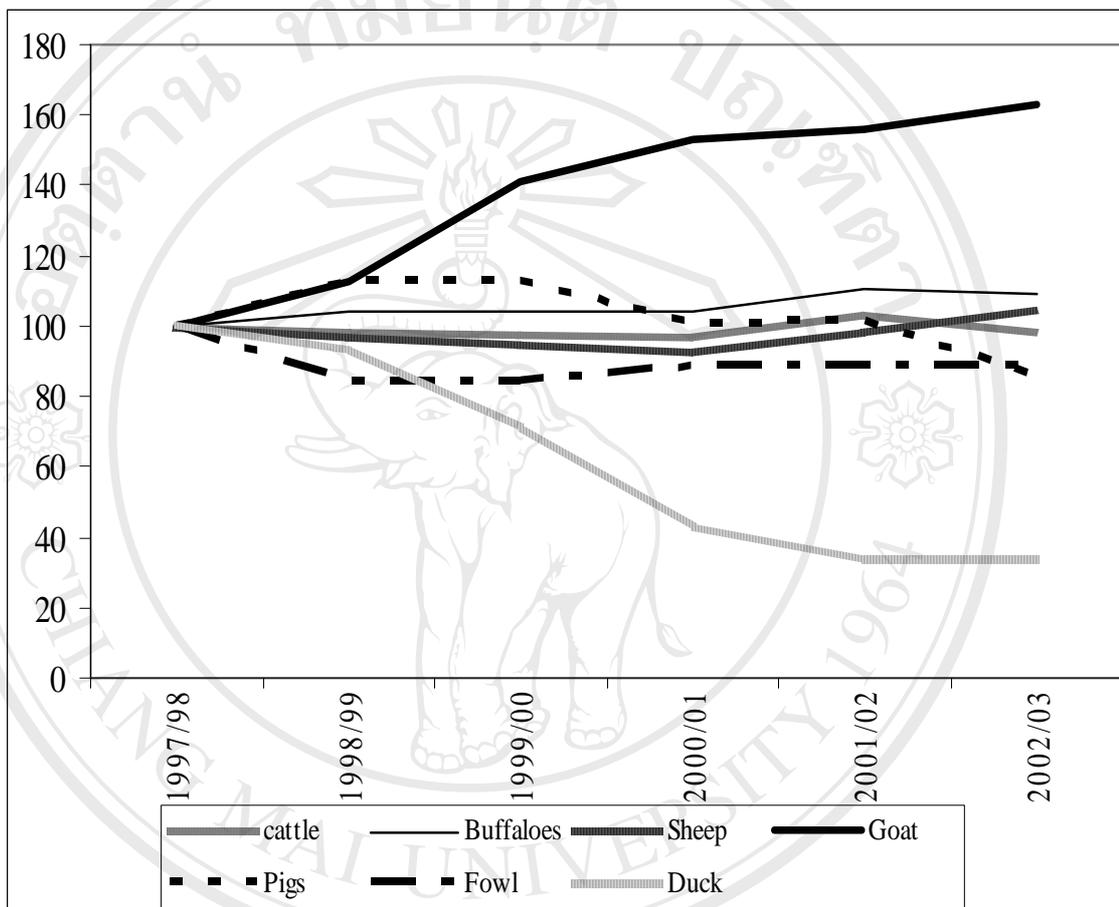

Figure 4.12 Indices of different types of livestock population in Kailali district.
(1997/98 to 2002/03).

Source: MoAC, 1997/98 to 2002/03

While looking at the trend livestock products, the production of eggs was lower than that of base year 1997/98. But, the production of meat was only slightly increased; whereas milk production has increased more than the other products over the five year period of time (Figure 4.13).
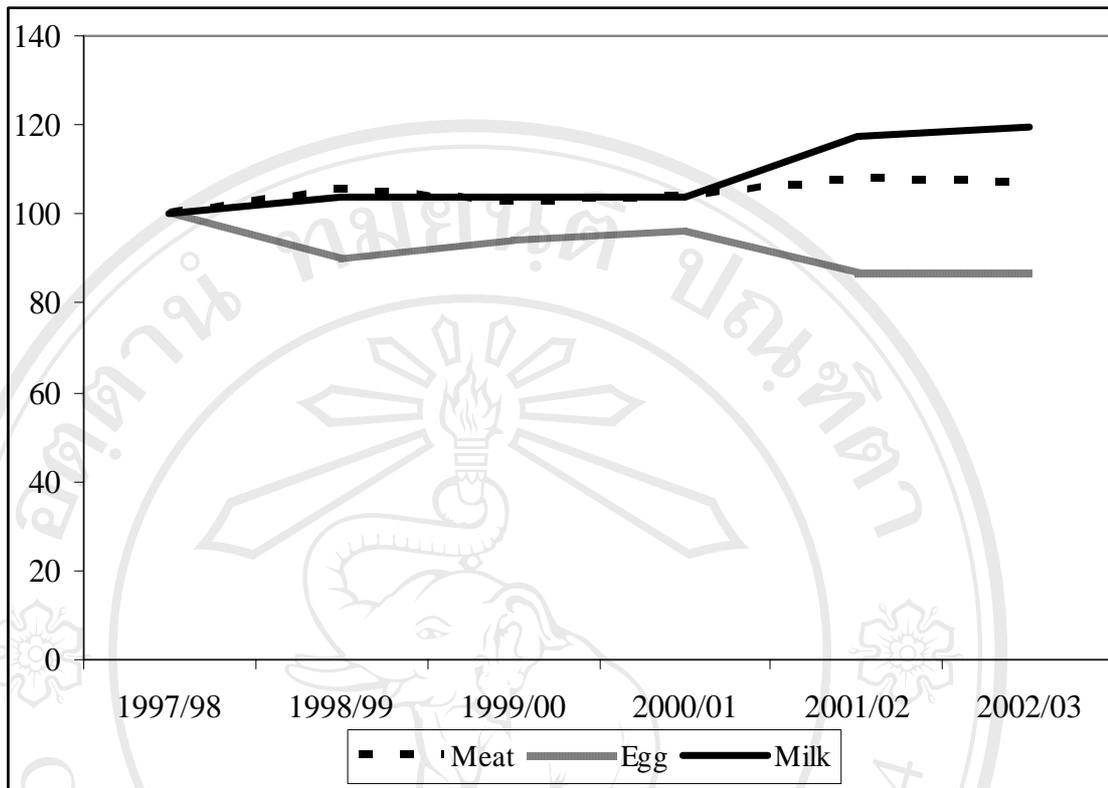
Figure 4.13 Indices of meat, egg and milk production in Kailali district (1997/98 to 2002/03).

Source: MoAC, 1997/98 to 2002/03

The types of livestock that were reared in the households differ from one household to another based on their ethnicity. It was found that *Brahmin*s to large extent *Chhetris* never keep pigs in their households. Largely, chicken are also not kept by *Brahmin*s, but this tradition is not as strict as not keeping pig. Gradually, few *Brahmin*s have started to keep chicken in their households. Besides, *Brahmin*s usually keep cows, buffaloes and few other animals like goats and very rarely chicken. *Chhetris* usually keep the same types of animals like *Brahmins*; but *Tharus* mainly keep ox, chickens and pigs. *Tharus* usually prefer to keep ox instead of cows; even if they keep it, they usually do not keep it for milking purpose. However, *Brahmins* mostly keep cows for milking purpose. *Brahmins* do not keep ox because they do not usually plow the land. In the sampled area, the distribution of animal equivalent unit or livestock unit (LU) was also found slightly skewed in favor of *Brahmin* and *Tharu,* whereas *Sudra* has least LU (Figure 4.14). Statistically, there was not significant

different between the average animal equivalent among the households' of *Brahmin,
Chhetri* and *Tharu*. However, the size of LU was highly significant (at the 0.01 level
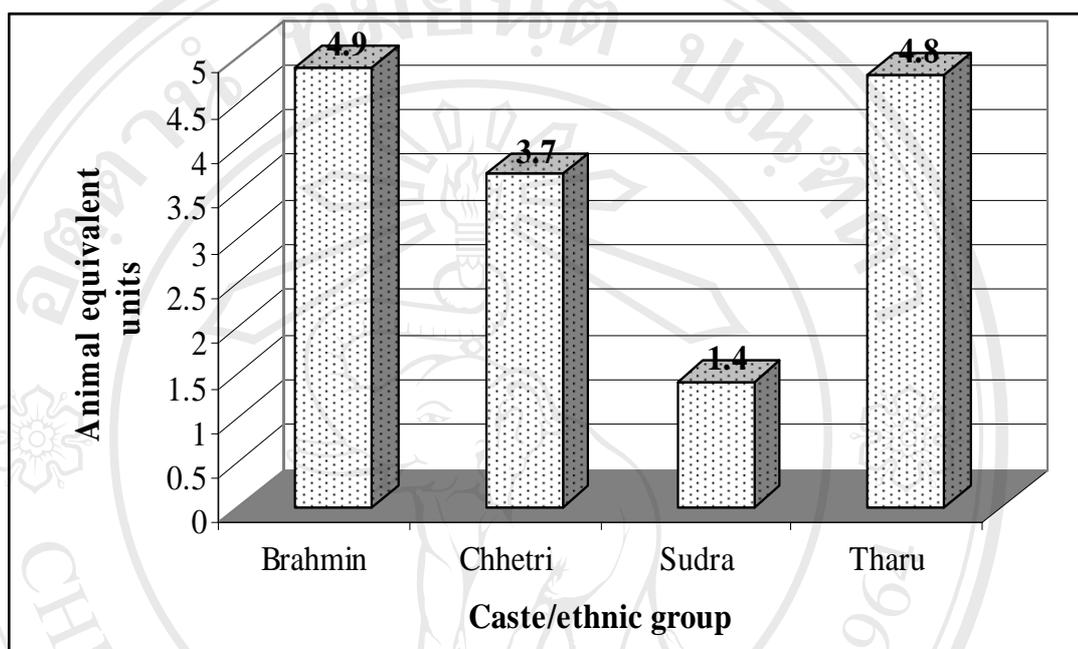of significance) between *Sudra* with *Brahmin, Chhetri* and *Tharu* individually.

Figure 4.14 Distribution of the average of animal equivalent units under different
caste/ethnic group.

Source: Survey, 2004

4.5 Agricultural expenditure

The average expenditure on agriculture per household per year of *Brahmin*
was found NRs.12,270 per year, NRs.8,755 per year for *Chhetr*i, NRs.4,266 per year
for *Surda* and NRs.8,773 per year for *Tharu* (Figure 4.15). Inadequate knowledge,
small size of holding, lack of access to irrigated land were the main reasons of lower
investment by the *Sudra*. Besides, the active members from this caste category usually
migrated from their village to other places for off-farm employment. Statistically,
there was not significantly different between the mean expenditure on agriculture
between *Brahmin* with *Chhetri* and *Brahmin* with *Tharu*. But, there was a significant
different at less than 0.01 level of significance between *Brahmin* with *Sudra*, *Chhetri*

with *Sudra*. Between *Tharu* and *Sudra,* it was significant at the 0.05 level of significance.
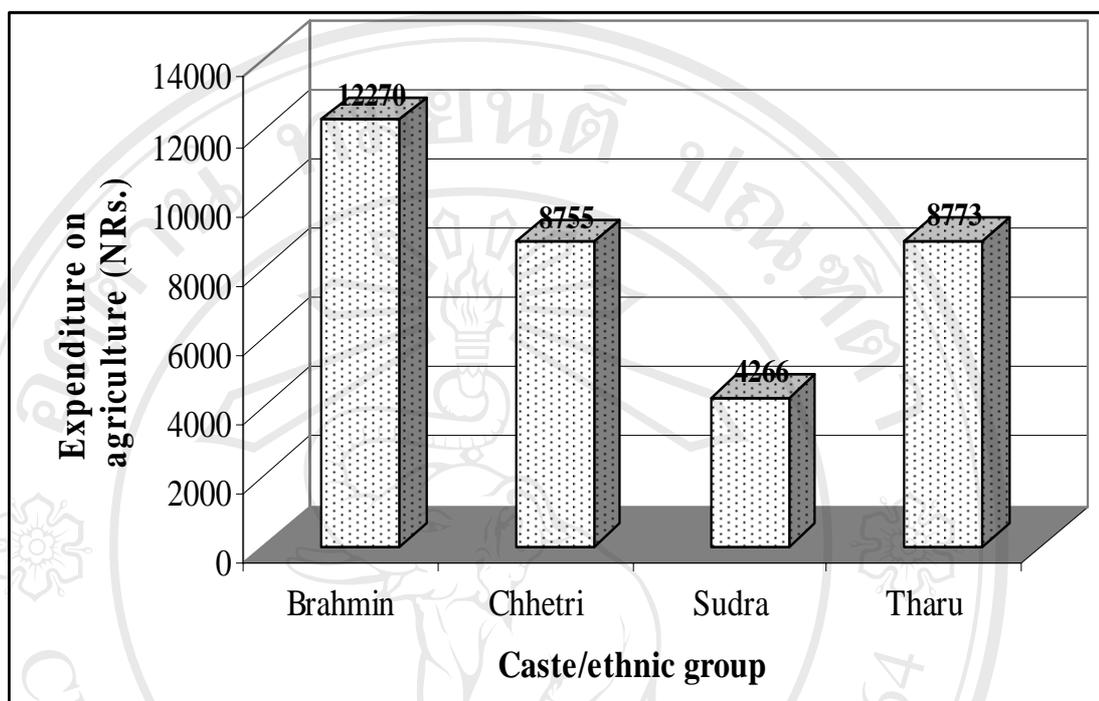

Figure 4.15 Average expenditure on agriculture by different caste/ethnic group.
Source; Survey, 2004

In fact average expenditure did not give a clear picture of real investment per unit; therefore for better meaningful analysis total expenditure was separated into two groups i.e. livestock and agriculture under different caste/ ethnic groups expressed in term of per unit expenditure. By doing so, contrary to the expectation *Sudras* have done highest expenditure in either case i.e per unit of land and per unit of livestock. It was found that per *Kattha*. *Sudra* has invested NRs.340 per year and whereas NRs.895 per unit of livestock unit (LU) per year. But, for *Brahmin* per unit land expenditure was found NRs.207 whereas NRs.562 per unit of LU. Similarly, for *Chhetri* the expenditure was found NRs.280 per *Kattha* per year and NRs.127 per LU per year and for *Tharu* NRs.274 per *Kattha* and NRs.160 per LU per year (Figure 4.16). This higher investment per unit of land could be due to the inefficiency of management of *Sudra* caste.
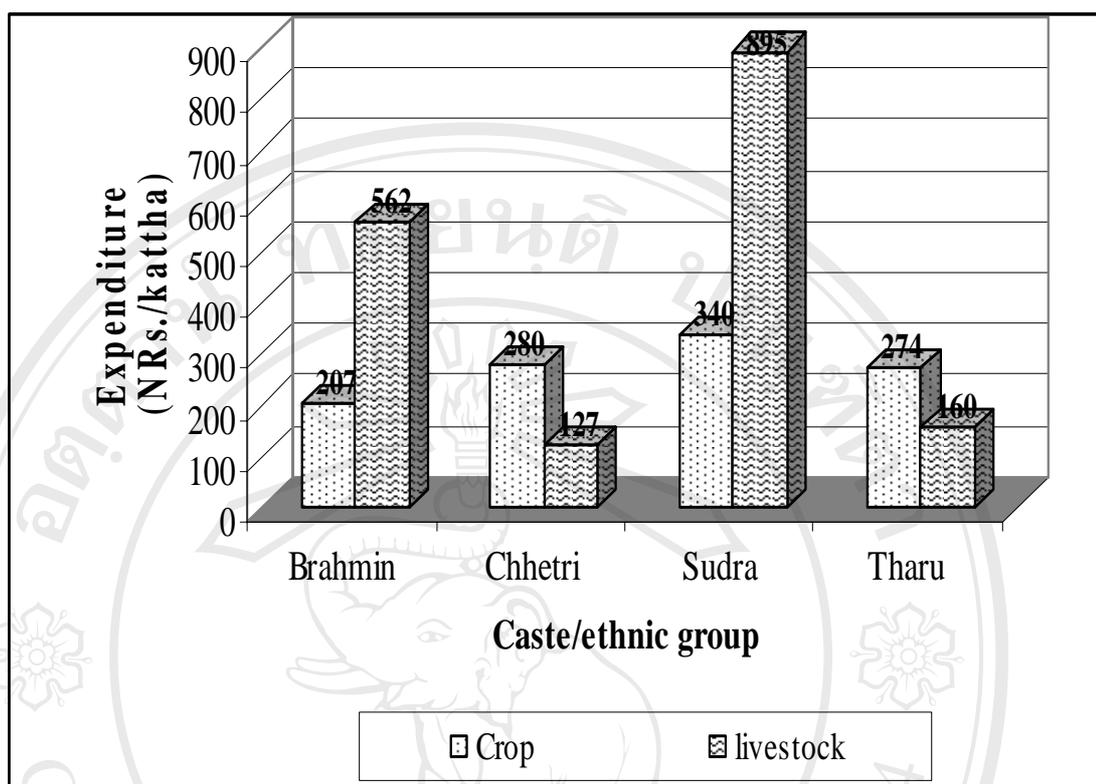
Figure 4.16 Average expenditure per unit of land and per unit of livestock unit.

Source: Survey, 2004

4.6 Food consumption and household income

Mostly, subsistence farming was found mostly dominant in the study area. Therefore, households were barely meeting the food demand for the whole year. However, few households were found sufficient production and have kept the food from last year's production in order to cope with unforeseen event in the future. While looking at each caste/ethnic group categories, 26 percent of households under *Brahmin* have kept the food from last year's production. Similarly, in case of *Tharu* and *Chhetri* 19 percent and 13 percent households have kept the food from their last year's production. But in case of *Sudra* only seven percent of households have kept the food from last year's production (Table 4.13). This analysis showed that households under *Sudras* were the most vulnerable than that of other caste/ethnic group if the crop failure would occur in the future. Moreover, the tendency of keeping food from last year's production was found higher when there are subsistence

farming, less market integration and low off-farm income opportunity conditions exists.

Table 4.13 Number of households that keep food from their last year's production.

Caste/ ethnic group	Food commodities kept from last year's production		Total
	Yes	No	
Brahmin	5 (26.3)	14 (73.7)	19 (100)
Chhetri	2 (12.5)	14 (87.5)	16 (100)
Sudra	2 (7.4)	25 (92.6)	27 (100)
Tharu	5 (18.5)	22 (81.5)	27(100)
Total	14 (15.7)	75 (84.3)	89 (100)

Note: Figures in the parenthesis indicate the percentage of total sample in each caste category.

Source: Survey, 2004

The distribution of income can be analyzed from different dimensions such as time, spatial, and caste/ethnic groups. While looking income by time dimension; a household may have sufficient income for a point of time but household might not have sufficient either in past or may be in future. According to households' head own evaluation of the study area 59 percent of households under *Brahmin*, 76 percent under *Chhetri* and 70 percent under *Tharu* households have increased their income level during the last ten years period. But in case of *Sudra*, 48 percent of the sampled households' income little increased, but 30 percent of households' income under this category remain the same over ten years of period (Table 4.14).

Table 4.14 Income state changes during last ten years under different caste/ethnic
group.

Change category	Caste/ethnic group				Total
	Brahmin	Chhetri	Sudra	Tharu	
Significantly increased	3 (15.8)	-	-	3 (11.1)	6 (6.7)
Moderately increased	8 (42.1)	12 (75.0)	13 (48.1)	16 (59.3)	49 (55.1)
Remain same	4 (21.1)	2 (12.5)	8 (29.7)	5 (18.5)	19 (21.4)
Moderately decreased	2 (10.5)	2 (12.5)	3 (11.1)	2 (7.4)	9 (10.1)
Significantly decreased	2 (10.5)	-	3 (11.1)	1 (3.7)	6 (6.7)
Total	19 (100)	16 (100)	27 (100)	27 (100)	89 (100)

Note: Figures in the parenthesis indicate the percentage of total sample in each category.

Source: Survey, 2004

Income has significantly increased by 16 percent among the households under the *Brahmin* caste and 11 percent among the households under *Tharu* category in last ten years. There were no households from *Chhetri* and *Sudra* categories under such category. In the group with moderately increasing category, *Brahmin* comprises 43 percent, *Chhetri* comprises 76 percent, *Sudra* comprises 48 percent and *Tharu* comprises 59 percent of the total household sampled under each caste/ethnic group category. While 21 percent household under *Brahmin*, 12 percent household under *Chhetri*, 30 percent household under *Sudra* caste and 19 percent under *Tharu* category were found to have their income remained the same over the ten years period. Additionally, 10 percent of *Brahmin*, 12 percent of *Chhetri*, 11 percent of *Sudra* and seven percent of *Tharu*s' households had their income slightly decreased over the ten years' period. Moreover, 10 percent of the households under *Brahmin*, 11 percent households under *Sudra* and four percent household of *Tharu* had their income significantly decreased.

To overcome food deficit situation, a household either has sufficient food at hand from its own production or it should possess the ability to buy food from the

market. Therefore, if the households possess enough income from other sources, a household would not fall into hunger even if the food is not sufficiently produced from their own land. Economically active members mainly determine the levels of off-farm income especially when there are only off-farm manual jobs as the main job options. According to CBS (2003) total economically active population constitutes about 72 percent of the total population and out of this number 37 percent was inactive due to various reasons in this district. For the skilled job which needs good education, but the district literacy is only 48 percent (DDC, 2003). Most of the household heads under *Brahmin* and *Chhetri* are more literate than those of *Tharu* and *Sudra* (Table 4.15). While looking at the whole district, among total females only 36 percent are literate whereas it was around 60 percent among maleof its total population (DDC, 2003). So, it can be deduced that the majority of better off-farm jobs were occupied by the male members of *Brahmin* and *Chhetri*.

Table 4.15 Household head's years of education under different caste / ethnic group.

| Number of years	Caste/ ethnic group				Total
	Brahmin	Chhetri	Sudra	Tharu	
Illiterate	-	4 (25.0)	10 (37.0)	4 (14.8)	18 (20.2)
1-5	10 (52.6)	7 (43.8)	17 (63.0)	21 (77.8)	55 (61.8)
6-9	2 (10.5)	1 (6.2)	-	1 (3.7)	4 (4.5)
>=10	7 (36.8)	4 (25.0)	-	1 (3.7)	12 (13.5)
Total	19 (100.0)	16 (100.0)	27 (100.0)	27 (100.0)	89 (100.0)

Note: Those who have not attended formal schooling but can just only read or read and write considered as 1 and 2 years of education respectively.
Figures in the parenthesis indicate the percentage of total sample in each caste category

Source: Survey, 2004

Additionally, these analyses revealed that majority of people were found employed as an unskilled labor (mostly on agriculture sector). More specifically, since *Brahmin*s and *Chhetri*s were found more educated than other castes and ethnic group therefore, obviously; they were likely to be higher on non-farm skilled jobs than other castes. Conversely, *Sudra* and *Tharu* were found working as laborer in

other farms in the villages or in cities or outside the country especially in India. *Brahmi*n and *Chhetri* were employed especially on non-farm jobs. In sampled households *Brahmin* has average non-farm income NRs.45,816 (US$ 646.30) per year per household; whereas for *Chhetri* and *Tharu* the average non-income was about NRs25,625 (US$361.48) and NRs.37,426 (US$527.95) per year per household respectively. But for *Sudra* the average income was found just about NRs.19,573 (US$276.10) per year per household (Figure 4.17). While comparing means between these all caste and ethnic groups; statistically there was significant different between the average off-farm income between *Brahmin* and *Sudra* at the 0.1 level of significance. However, the mean difference was found significant at the 0.05 level of significance between *Tharu* and *Sudra*.
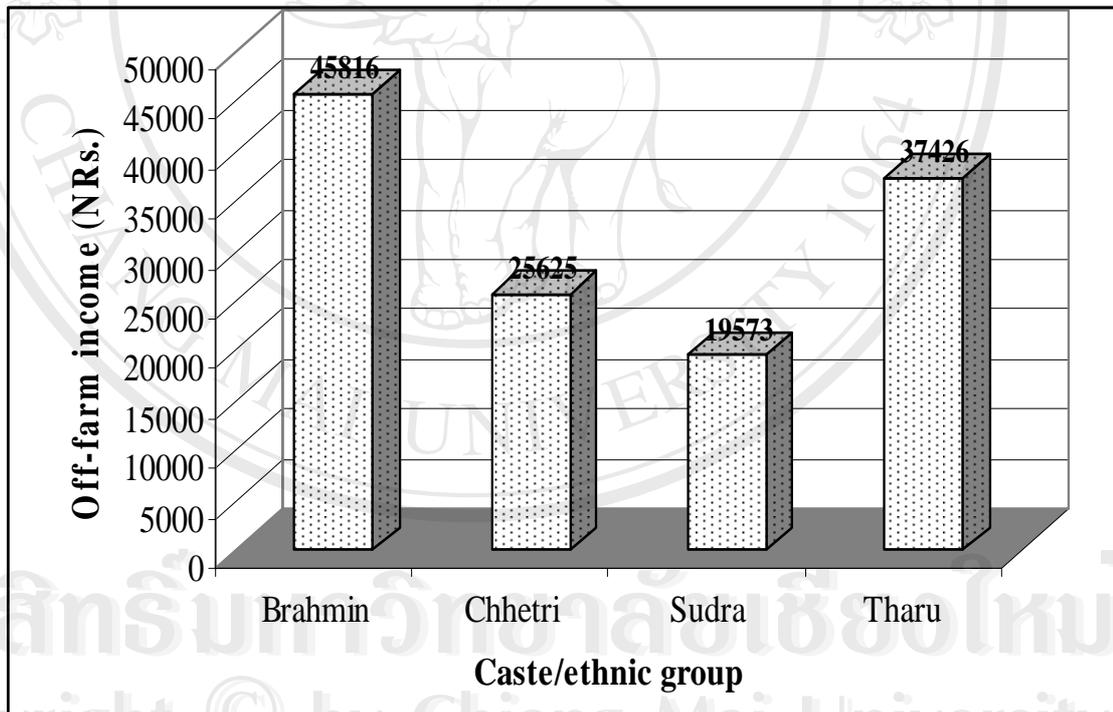
Note: US$1= 70.89 Nepalese Rupees (NRs.) (buying rate of April 20, 2004)

Figure 4.17 Average off-farm income of different caste/ethnic group.

Source: Survey, 2004

While looking overall income different sources, non-farm income contributed significantly irrespective caste and ethnic group. But the contribution was found most

significant (92 percent of the total household income) in case of *Sudra*; whereas total agriculture income contributes only 8 percent of the total income. The primary reason for more contribution of non farm income in case of *Sudra* is the inadequate resources (mainly land) available for agricultural production. In the total income from agricultural sector, crop contributes about two third of the total income whereas one third was found from livestock in case of *Brahmin* and more or less in case of *Chhetri* also. But in case of *Tharu*, about one fifth of the total agricultural came from livestock and the rest was from crop. In case of *Sudra*, around half of agricultural income was from crop and another half was from livestock (Table 4.16).

Table 4.16 Percentage contribution of income from different sources to the total income of household.

Caste/ethnic group	Income from agricultural sector (%)			Non-farm income (%)
	Crop *(%)	Livestock*(%)	Total (%)	
Brahmin	21.5	10.5	31.5	68.5
	(66.6)	(33.4)	(100.0)	
Chhetri	18.0	11.3	29.3	70.7
	(61.5)	(38.5)	(100.0)	
Sudra	4.4	3.4	7.8	92.2
	(56.8)	43.2	(100.0)	
Tharu	17.8	4.2	22.0	78.0
	(81.1)	(18.9)	(100)	

Note: * Percentage mentioned in parenthesis income contribution from crop or livestock sector to the total agricultural sector only but not the total income.

Source: Survey, 2004

4.7 Immigration and food pressure

Tharus are the traditionally inhabitant of *Tarai* region. Other castes are mostly migrated from the hills and mountains. Even in case of *Tharu*, there was migration within the district and from other districts within *Tarai* region. In the study area, it was found that about 45 percent of the total sampled households were living in the area since the last 20 years. Among the migrated people, 71 percent of them migrated

due to food deficit in their previous places. While looking at the caste level, 81 percent of the total migrated *Sudra*s migrated because of food deficit reason. Similarly, 58 percent of *Brahmin*s and 50 percent of *Chhetris* migrated mostly from hills and settled down to this study area during last 20 years period due to the food insecurity problem. In case of *Tharu*, food deficit is the only reason of migration in case of *Thrau*, therefore, all immigrated households were due to the food deficit problem (Table 4.17). Finally, it can be concluded that food insecurity is the leading cause of migration.

Table 4.17 Causes of immigration.

Caste/ ethnic group	Reason for immigration			Total
	Food deficit	For better facilities	Other reasons	
Brahmin	7 (58.3)	4 (33.3)	1(8.4)	12 (100)
Chhetri	6 (50.0)	5 (41.6)	1 (8.4)	12 (100)
Sudra	13 (81.2)	3 (18.8)	-	16 (100)
Tharu	9 (100)	-	-	9(100)
Total	35(71.4)	13 (26.5)	2 (2.1)	49 (100)

Note: Figures in the parenthesis indicate the percentage of total sample in each caste category.

Source: Survey, 2004

4.8 Government policies

Macro policy environment directly or indirectly affect to the food security or insecurity of the sampled area. In a view to commercialize the agricultural sector, the 20-year, Agriculture Perspective Plan (APP) was brought into place in 1995, but implemented from 1997/98. The main aim of this plan was to accelerate the growth of the agricultural sector through commercialization and thereby reduction of poverty (MoAC and ADB, 2002). Moreover, the effects commercialization of agriculture would be trickled down to the other sectors of the economy and thereby increase the employment opportunities in the non-agricultural sector. It has also prioritized the inputs and outputs of the agriculture. But, unfortunately the aimed growth was not

achieved especially at micro level due to inadequate public investment and other institutional constraints (MoAC and ADB, 2002). However, some positive impacts have been seen at macro level. During this plan implementation, there were two major changes done in the inputs sector. Firstly, government monopoly on the distribution fertilizer was broken down and then the private sector was allowed to participate in the distribution of fertilizers. The main aim of this policy was to ensure the abundant supply of fertilizer in the country. However, the price has gone up and private sectors were mainly concentrating near the vicinity of urban and road accessible area. After this policy, though supply has improved consequently adoption has also gone up. But the poor farmers were having difficult time to purchase the fertilizer as per their requirement. This is what the majority of poor households of the study area have reflected when they were asked about the major constraint of agricultural production.

Additionally, government has also removed the subsidy in the shallow tube wells. After the adoption of this policy, the price of the shallow tube wells has gone up and households under small landholding size were finding it difficult to have them. Besides, the price of gasoline has also gone up since the implementation of the policy.

Besides, the government has adopted group approach agriculture extension strategy for the dissemination of improved technology. This approach of dissemination has not been able to sufficiently attract the very farmers and the rich farmers of the study area. Small farmers they do not have time to be in group because they have to rely on off-farm income to fulfill the of demand food for their households. Rich farmers do not want to be in a group because of too many formalities. Due to lack of basic minimum price support to the agricultural commodities, small farmers were selling at very lower price in the market. Besides, due to the open border with India cheaper agricultural commodities were readily coming into the country. That is also hurting farmers in the study area.