A Study on Rural Poverty Using Inequality Decomposition in Western Hills of Nepal: A Case of Gulmi District

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Abstract

Involvement of higher proportion of economically active population in agriculture and laboring among the Occupational caste resulted into higher incidence of poverty, which is also severe and deeper. This resulted into as high as 71% incidence of poverty in Banjhkateri, a purely remote village. The incidence, depth and severity of poverty are the highest among large family size households, illiterate households, and small land and livestock holding households. Share of income from agriculture, remittance, and salaried job is the most significant one, contributing 46.1%, 23.3% and 19.0% of total income, respectively. However, income from salaried job and remittance has income disequalizing effect and also has higher factor inequality weight acting as the source of income inequality. Agriculture and laboring, upon which huge proportion of economically active population is engaged and entry is also not restricted, however has income equalizing effect. This suggests the need for the promotion of labor-intensive agriculture as a better rural development policy in rural Nepalese context. In the context of lack of well-defined working hours as well as minimum wage rate, such rural development policies should be supplemented by formulation and effective enforcement of labor policy.

1. Introduction

Poverty being widespread and rampant has always been in the forefront of development agenda in Nepal. Poverty reduction thus remained at the top of the priority in the development plan since 1974, Fifth Five Year Plan (Regmi,

1997) to date Tenth Five Year Plan (Poverty Reduction Strategy Paper) under the auspices of several governmental and non-governmental, bilateral and multilateral foreign aid agencies. However, several poverty studies made in the country starting from 1976/77, when it was measured 32.9%, suggest the wide variation in poverty incidence. A poverty incidence was reported as high as 70% by the World Bank in 1992 to as low as 30.8% by National Living Standard Survey II (NLSS II) 2003/2004 (CBS, 2005a; and Bista, 2004).

Most of these poverty analyses, except World Bank studies, are based on the absolute poverty measure where poverty line is established to meet the cost of basic needs for an individual on annual basis. Regarding the consistency in poverty measures, two phases of NLSS in 1995/96 and 2003/04 revealed significant declines in poverty from 42% in first phase to 30.8% in the second, within the period of eight years. This decline, however, is marked by the rise in overall income inequality, which is mainly due to the increased contribution of remittance in the national economy (CBS, 2005a), the serious consequences of which have been well discussed in several literatures such as Nissanke and Thorbecke (2005), Cornia (2004), and Zhou and Wan (2003). These discussions increased the interest of researchers on empirical studies on the sources of inequality. Such empirical studies provide the dynamism of various sources of income on poverty, thereby providing insightful information useful for policy makers in designing and implementing inequality reducing policies vis-a-vis poverty reduction (Wan, 2001; and, Adams and He, 1995).

Therefore, this paper analyzes poverty based on various socioeconomic variables. The study also pinpointp similar issues of poverty and the source of inequality through income inequality decomposition analysis in rural Western Hills of Nepal.

2. Methodology

2.1 Study site

Gulmi district selected for the study is the rural Western Hills district of Nepal. Within the area of 1,149km^2 the district shares boundary with Pyuthan, Baglung, Parbat, Syangja, Palpa and Arghakhanchi, all of which are hilly districts. Agriculture is the main source of livelihoods on which more than 82% of the economically active populations are engaged (CBS, 2005b). However, only 18.4% of its total land is cultivable. The district with Human Development Index (HDI) of 0.467 falls under the districts having medium HDI ranks. However, in terms of Human Poverty Index (HPI), the district falls under the lower HPI ranks with per capita income of only $760 PPP, together with relatively higher dependency ratio, i.e., 0.61 higher compared to the national figure of 0.58 (CBS, 2005b; and UNDP, 2004).

Thanapati and Banjhkateri, two Village Development Committees[1] (VDCs) were selected purposefully to reflect the real rural settings of the district. Thanapati is the ordinary subsistence VDC having connection with the motorable road and availability of social services like drinking water, communication, and electricity. In contrast to this, Banjhkateri is purely remote VDC having no connection to the motorable road and is accessible only through foot trails. This resulted into isolation of the local people residing in Banjhkateri from any development opportunities allocated for the district.

2.2 Data collection

This study is based on the in-depth household survey, which was undertaken after the general survey of all the households. General survey was conducted during the year 2001 and a sample survey was conducted during the year 2001-2002. The general survey revealed that 662 and 674 households were residing in Thanapati and Banjhkateri, respectively. Bahun was the most dominating caste group comprising around 46% of the total households in both VDCs. Bahun was followed by Occupational caste, Chhetri, Magar and Newar in Thanapati. However, in Banjhkateri, Bahun is followed by Chhetri, Occupational caste, and Magar. Using the information obtained from general survey, all

Figure 1. Map of Gulmi district showing sample VDCs

the households in both VDCs were stratified on different strata based on caste/ethnic group and resource possession of the household, specially land holding. Based on this, 10% of the households were selected as the sample in both VDCs applying stratified random sampling techniques. However, complete information was obtained only from 64 households in Thanapati and 59 in Banjhkateri VDC.

2.3 Data analysis

Literature on poverty can be traced by the significant jump on the notion of poverty. The conventional notion of poverty views poverty as deprivation or lack of essential goods and services most often measured in terms of income below some minimum threshold to meet the basic needs. However, as the poverty also encompasses non-income dimensions such as education, health, gender equality, and access to basic social services notion, of poverty now is much more broadened. Thus, poverty in the present context is viewed as a pronounced deprivation in well being as well as capabilities to function in the society where they live (Chuhan, 2006; and Sen, 1996). All these non-income dimensions of poverty are also directly related to the income poverty, which justifies the use of income poverty based on income poverty line by the huge number of poverty analysis in poverty literature. Moreover, even the HDI, which is regarded as the broader measure of poverty, puts one third of weight on income poverty in its calculation besides health and education (UNDP, 2004). In addition, current notion of poverty also consider the inequality, i.e. the gap between the poor and the rich.

Poverty analysis

Fairly comprehensive concept of income is used in this study, which include income received in cash as well as in kind (Adam and He, 1995). Total income is divided into five main sources of income namely, agriculture, salaried job, business, laboring and remittance. Agriculture includes poultry, animal husbandry and milking, and crop farming. Agriculture being subsistence in nature, most of the inputs are self-supplied. Labor needs are met by the mutual sharing of household members between households, seeds and manures are most often self supplied. Therefore, no money value was imputed for these items in order to prevent the double counting. Thus, income from agriculture includes gross income obtained in cash as well as in kind, i.e., both main crops and crop by-products, which are translated into monetary value using average price received by the farmers. Therefore, income from agriculture is for the household as a whole for a year. An income from salaried job includes the income obtained from the jobs like government and non-government services, teaching, army, and police for each of its member. All these are the regular source of income. Yearly income from salaried income of each of the member involved in it was summed up to total salaried income for the given household. Business income includes the net income from shops, mills, cottage industries, and contracting and it is accounted as the yearly income for the given household as a whole. Income from daily wage laboring and occupational work like blacksmithing, masonry, carpentry, tailoring and goldsmithing were categorized under labor income. Such income in an annual basis for each of the household members involved in laboring was summed up to calculate total labor income for the household. Most of the migrant works in India are involved in menial jobs, such as, laboring, watchman, bearer, cook/helper in restaurant and household work. Very few are also involved in clerical work. Therefore, remittance income mainly represents the income earned outside the country regardless of their nature of job. Like the income from salaried job and income from laboring, remittance from each of the member working abroad was also brought together to calculate total remittance for the given household. Thus, total income of the household was calculated adding income from each source for each member of the household.

Poverty analysis is based on the poverty line established by NLSS I (1995-96) and NLSS II (2003-04), both of which applied the Living Standards Measurement Survey developed by World Bank. Thus, it is the highly authenticated government document on poverty. Poverty line for the study year 2001/02 was calculated from the poverty line of Rs 5403.0 per person per year in 1995-96 and Rs 8901.5 per person per year in 2003-04 for Rural Western Hills at the current price of 2003-04 (CBS, 2005a). Therefore, the poverty line of Rs. 7857, the amount calculated for the study year is taken into consideration for the poverty analysis in this paper. Annex 1 gives the poverty line for each year between 1995-96 and 2003-04.

Magnitude of poverty was assessed through head count ratio, poverty gap index and severity index to consider both the number of poor people as well as depth and severity of poverty (Ravallion, 1992). Thus, it is considered as the combined measure of incidence, depth, and severity of poverty (equation 1 and 2). The closer the value move towards 1,

$$PGI = \frac{1}{n}\sum_{i=1}^{q=n}\left[\frac{zi - yi}{zi}\right] X\ 100 \quad \text{---------- } 1$$

$$SI = \frac{1}{n}\sum_{i=1}^{q=n}\left[\frac{zi - yi}{zi}\right]^2 X\ 100 \quad \text{---------- } 2$$

higher will be the depth of poverty.

Where,

PGI = Poverty gap index
yi = Income of ith household
q = Total number of poor households
n = Number of poor households

zi = Poverty line (Rs 7857/person/year) SI = Severity index

Inequality decomposition analysis

Gini coefficient is the most popular and the oldest inequality measure. It satisfies all of the five decomposability principles for its applicability in inequality decomposition analysis (Wan, 2001; Adams and He, 1995; Shorrocks, 1982; and Kakwani, 1977). Therefore, Gini coefficient is adopted to make the income inequality decomposition analysis.

As the first step, relative concentration coefficient of i^{th} source of income (gi) should be calculated using equation 3. Value of relative concentration coefficient (gi) determines whether the i^{th} source of income is inequality increasing or decreasing. An income source can be defined as inequality increasing or decreasing based on whether additional increment in i^{th} source of income, which if distributed in the same manner as the original units, lead to an increase or decrease in overall income inequality. If the value of gi is greater than unity, the source of income is inequality increasing and if it is less than unity, the source of income is inequality decreasing (Adams and He, 1995).

$$gi = Ri\ Gi / G \text{----------(3)}$$

Here, Gi and G is the Gini coefficient of i^{th} income source and total income, respectively. Ri is the correlation ratio, which is expressed as follows (equation 4)

$$Ri = cov\ (yi, r) / cov\ (yi, ri) = \rho i, r / \rho i, ri \text{----------(4)}$$

Where, $cov\ (yi, r)$ is covariance between income from i^{th} source and rank of total income, i.e., $\rho ir * \sigma i * \sigma r$; ρir is correlation coefficient between income from i^{th} source and rank of total income, and σi and σr are the standard deviation of income from i^{th} source and rank of total income, respectively. Similarly, $cov\ (yi, ri)$ is covariance between income from i^{th} source and rank of i^{th} income source, i.e., $\rho_{i, ri} * \sigma_i * \sigma_{ri}$; $\rho_{i, ri}$ is correlation coefficient between i^{th} income source and rank of i^{th} income source, and σ_i and σ_{ri} are the standard deviation of income from i^{th} source and rank of i^{th} income source, respectively.

Proportionate share of i^{th} income source to total income {$w_i = \mu_i$ (mean income of i^{th} source) / μ (mean of total income)} should be calculated in the second step, and the product of g_i and w_i ($w_i\ g_i$) gives the proportion of inequality contributed by i^{th} income source to the total inequality, i.e. factor inequality weight (FIW) of the i^{th} income source.

$$\Sigma w_i\ g_i = \Sigma (\mu_i / \mu) * (R_i\ G_i / G) = 1 \text{----------(5)}$$

3. Results and discussion

3.1 Socioeconomic characteristics of households

The result shows that the occurrence of female-headed household, which is also characterized by the high incidence of poverty and food insecurity by many literatures, is quite high (Table 1) in remote rural VDC of Banjhkateri (Joshi and Maharjan, 2007; Maharjan and Khattri-Chhettri, 2006; and Khattri-Chhetri and Maharjan, 2006). In total also it exceeds 24%. In most of the cases, migration of able-bodied male member of the household in search of better economic opportunities outside the villages including India resulted into such high incidence of female-headed households in the study areas.

Bahun is the most dominating caste group in both VDCs. More than 54% of the sample households are Bahun followed

Table 1. Distribution of sample households based on socio-economic characteristics

Variables	Thanapati	Banjhkateri	Total
Gender of Household Head (HHH) *P-value = 0.36*			
Male	52 (81.2)	41 (69.5)	93 (75.6)
Female	12 (18.8)	18 (30.5)	30 (24.4)
Caste/Ethnicity *P-value = 0.13*			
Bahun	35 (54.7)	32 (54.2)	67 (54.5)
Chhetri	8 (12.5)	10 (17.0)	18 (14.6)
Magar	3 (4.7)	6 (10.2)	9 (7.3)
Occupational caste	12 (18.7)	11 (18.6)	23 (18.7)
Newar	6 (9.4)	-	6 (4.9)
Family Size category (Adult Equivalent[2]-AE) *P-value = 0.002****			
Small (1-5 members)	32 (50.0)	13 (22.0)	45 (36.6)
Medium (>5-10 members)	27 (42.2)	37 (62.7)	64 (52.0)
Large (> 10 members)	5 (7.8)	9 (15.3)	14 (11.4)
Education category of HHH *P-value = 0.16*			
Illiterate	31 (48.4)	27 (45.7)	58 (47.1)
Literate (Informal and primary)	17 (26.6)	26 (44.1)	43 (35.0)
School education (Secondary)	10 (15.6)	6 (10.2)	16 (13.0)
College Education	6 (9.4)	-	6 (4.9)
Occupation of HHH *P-value = 0.04***			
Agriculture	33 (51.6)	44 (74.6)	77 (62.9)
Salaried job	9 (14.1)	2 (3.4)	11 (8.9)
Business	1 (1.5)	-	1(0.8)
Laboring	21 (32.8)	13 (22.0)	34 (27.6)
Landholding category *P-value = 0.02***			
Small (<0.5ha)	20 (31.3)	31 (52.5)	51 (41.5)
Medium (0.5-2ha)	37 (57.8)	25 (42.4)	62 (50.4)
Large (>2ha)	7 (10.9)	3 (5.1)	10 (8.1)
Livestock holding category (LSU[3]) *P-value = 0.00****			
Small (<5 LSU)	43 (67.2)	25 (42.4)	68 (55.3)
Medium (5-10 LSU)	19 (29.7)	22 (37.3)	41 (33.3)
Large (>10 LSU)	2 (3.1)	12 (20.3)	14 (11.4)
Overall	**64 (100)**	**59 (100)**	**123 (100)**

Source: Field Survey 2001-02
Note: Figures in parentheses indicate percentage, ** significant at 5%, and *** significant at 1%

by Occupational caste and Chhetri in both VDC. Newars are reported only on relatively accessible rural VDC Thanapati, whereas Magar ethnic group is reported in both VDCs. Medium family size category households comprise the highest proportion (62.7%) in Banjhkateri as well as in overall (52.0%). But in Thanapati, small family size category constitutes the highest proportion (50.0%). The proportion of large family size category is the highest in Banjhkateri. ANOVA analysis showed that average family size is significantly higher in Banjhkateri. Illiterate and literate household heads through either informal education program or through primary education attainment constitutes almost 90% in Banjhkateri. In addition, none of the household head has attained college education in Bajhkateria. This reflects the low education status of the area.

Dependency of household in agriculture is significantly high in Banjhkateri but the dependency in salaried job is the lowest, only 3.4% of household. In both VDCs, laboring is another important source of livelihoods whether it may be in the village or outside the village. In case of Thanapati laboring was done within the village. However, in Banjhkateri, they have to leave the village for laboring.

Concentration of small landholders is significantly higher in Banjhkateri. Consequently, proportions of medium and large landholders are lower. Average land holding in Banjhkateri is relatively lower i.e. 0.76 ha compared to Thanapati (0.82 ha), but the difference is not statistically significant. In case of livestock holding, Bajhkateria has significantly higher proportion of medium and large LSU holding household, which signifies the relatively higher importance of livestock on Banjhkateri. Average livestock holding is significantly higher in Banjhkateri compared to Thanapati.

3.2 Resource distribution among households

Table 2 shows that Occupational caste is deprived of resource such as land (0.4ha) and its irrigation coverage (0%) as well as livestock (3.4 LSU), which are also the crucial asset in the rural setting where agriculture is an important source of livelihoods. Resource possession in terms of land holding, irrigation coverage, and livestock holding differ significantly among different caste groups in Banjhkateri as well as in overall. However, such differentiation in Thanapati is not significant. Dependency ratio is also high for Occupational caste households. The high dependency ratio coupled with limited resource possession reflects the economic hardship suffered by the Occupational caste. The situation is more critical in Banjhkateri with merely 0.2ha of landholding. On the other hand, Bahun households have highest average land holding together with the highest irrigation coverage as well as lowest dependency ratio. Comparing in terms of location, there is no significant difference for average land holding and dependency ratio. However, irrigation coverage, livestock holding, and family size is significantly higher in Banjhkateri.

Table 2. Resource distributions among different caste/ethnic group

Resources	Caste/ethnicity					Total	P-value
	Bahun	Chhetri	Magar	Occupational caste	Newar		
Thanapati							
Total Land holding (ha)	0.9	0.8	1.1	0.4	0.6	0.8	0.28
Irrigation coverage (%age)	13.4	14.4	0	0	8.5	11.3	0.46
Livestock holding (LSU)	4.1	4.5	6.2	3.4	4.6	4.2	0.53
Family size (Adult equivalent)	5.6	5.9	5.3	4.8	5.8	5.4	0.68
Dependency ratio	0.5	1.1	0.8	0.9	0.8	0.8	0.20
Banjhkateri							
Total Land holding (ha)	1.0	0.6	1.0	0.2	-	0.76	0.04**
Irrigation coverage (%age)	16.9	8.8	15.6	0	-	14.8	0.00***
Livestock holding (LSU)	7.3	5.1	7.6	3.2	-	6.2	0.01***
Family size (Adult equivalent)	7.3	6.6	7.8	6.3	-	7.1	0.66
Dependency ratio	0.8	0.8	0.9	0.8	-	0.9	0.81
Overall							
Total Land holding (ha)	1.0	0.7	1.0	0.4	0.6	0.8	0.02**
Irrigation coverage (%age)	15.1	11.8	10.3	0	8.5	12.9	0.03**
Livestock holding (LSU)	5.6	4.8	7.1	3.3	4.6	5.2	0.02**
Family size (Adult equivalent)	6.4	6.3	7.0	5.4	5.8	6.2	0.53
Dependency ratio	0.7	0.9	0.9	0.9	0.8	0.8	0.46
P-value							
Total Land holding (ha)	0.94	0.41	0.97	0.20	-	0.68	
Irrigation coverage (%age)	0.07*	0.28	0.04**	0.98	-	0.10*	
Livestock holding (LSU)	0.00***	0.68	0.67	0.82	-	0.00***	
Family size (Adult equivalent)	0.02**	0.62	0.10*	0.02**	-	0.00***	
Dependency ratio	0.19	0.75	0.20	0.91	-	0.42	

Source: Field Survey 2001-02

Note: *significant at 10%, **significant at 5%, and ***significant at 1%

Table 3. Relationship of income source with various socioeconomic variables in overall

Variables	Income source					Total	Employment rate
	Agriculture	Salaried job	Business	Laboring	Remittance		
Gender *P-value for difference in employment rate = 0.80*							
Male	97 (40.2)	48 (19.9)	4 (1.7)	38 (15.8)	54 (22.4)	241 (100)	83.3
Female	183 (91.5)	4 (2.0)	3 (1.5)	6 (3.0)	4 (2.0)	200 (100)	88.6
Ethnicity *P-value for difference in employment rate = 0.09**							
Bahun	167 (70.5)	33 (13.9)	6 (2.5)	9 (3.8)	22 (9.3)	237 (100)	79.2
Chhetri	37 (58.7)	8 (12.7)	-	3 (4.8)	15 (23.8)	63 (100)	90
Magar	21 (60.0)	4 (11.4)	-	6 (17.2)	4 (11.4)	35 (100)	83.3
Occupational caste	42 (51.9)	2 (2.5)	-	22 (27.1)	15 (18.5)	81 (100)	97.5
Newar	13 (56.5)	5 (21.8)	1 (4.3)	4 (17.4)	-	23 (100)	95.6
Family size category *P-value for difference in employment rate = 0.015***							
Small	71 (61.7)	14 (12.2)	3 (2.6)	19 (16.5)	8 (7.0)	115 (100)	95.0
Medium	149 (62.9)	29 (12.2)	3 (1.3)	23 (9.7)	33 (13.9)	237 (100)	87.5
Large	60 (69.0)	9 (10.3)	1 (1.1)	2 (2.3)	15 (17.3)	87 (100)	72.5
Education category *P-value for difference in employment rate = 0.024***							
Illiterate	141 (77.9)	1 (0.6)	1 (0.6)	27 (14.9)	11 (6.0)	181 (100)	100
Literate	89 (59.7)	10 (6.7)	2 (1.3)	15 (10.1)	33 (22.2)	149 (100)	86.1
School education	48 (54.5)	26 (29.5)	2 (2.3)	2 (2.3)	10 (11.4)	88 (100)	56.3
College education	2 (9.5)	15 (71.5)	2 (9.5)	-	2 (9..5)	21 (100)	50.0
Land holding category *P-value for difference in employment rate = 0.033***							
Small	98 (59.0)	17 (10.2)	2 (1.2)	24 (14.5)	25 (15.1)	166 (100)	90.0
Medium	157 (66.5)	32 (13.6)	4 (1.7)	17 (7.2)	26 (11.0)	236 (100)	86.5
Large	25 (67.6)	3 (8.1)	1 (2.7)	3 (8.1)	5 (13.5)	37 (100)	63.8
LSU holding category *P-value for difference in employment rate = 0.00****							
Small	136 (62.4)	26 (11.9)	2 (0.9)	27 (12.4)	27 (12.4)	218 (100)	93.2
Medium	102 (62.2)	19 (11.6)	5 (3.0)	16 (9.8)	22 (13.4)	164 (100)	86.8
Large	42 (73.7)	7 (12.3)	-	1 (1.7)	7 (12.3)	57 (100)	64.0
Overall	**280 (63.8)**	**52 (11.8)**	**7 (1.6)**	**44 (10.0)**	**56 (12.8)**	**439 (100)**	**85.7**

Source: Field Survey 2001-02

Note: Figures in parentheses indicate percentage, *significant at 10%, **significant at 5%, and ***significant at 1

3.3 Employment situation

In this section, we considered the number of the individual from the total sample households involved in economic activity. In the study areas, out of 512 individuals who are of economically active age group, 439 individualps are involved in economic activity that comprised 85.7% of economically active age group. Thus, employment rate[4] is lower in Banjhkateri, which is also statistically significant (Annex 2 and 3). The highest proportion of female individuals are engaged in agriculture in both VDCs. Distribution of gender by occupation shows the similar trend in both VDCs, where involvement of female on other occupation is negligible. Involvement of Occupational caste individual is the lowest, 51.9% in agriculture, but their involvement in laboring is the highest, i.e., 27.1% (Table 3). The destitution among the Occupational caste makes them ready to do whatever type of work to generate cash income, resulting into the highest employment rate among these caste/ethnic group, which is also true in case of illiterate individual, small land holders and small LSU holders.

In Thanapati, salaried job is accommodating higher proportion of economically active population after agriculture. In Banjhkateri, however, it is remittance followed by laboring. In overall, agriculture accommodates the highest proportion of economically active population followed by remittance (12.8%), salaried job (11.8%), laboring (10%), and business (1.6%), respectively (table 3).

Table 4. Average annual income from different income sources

Income source	Agriculture	Salaried job	Business	Laboring	Remittance	Total	P-value
Thanapati							
Average income (NRs)	10,850	27,189	16,133	8,765	32,503	15,437	0.00***
Standard deviation	20184.2	24945.8	5455.5	7479.8	25535	40133.0	
Frequency	129	34	5	28	25	218	
Banjhkateri							
Average income (NRs)	8,264	23,281	12,000	4,480	20,349	10,410	0.01***
Standard deviation	15748.5	15360.4	2221.5	3861.9	28647.4	38147.7	
Frequency	151	18	2	19	31	221	
Overall							
Average income (NRs)	9467	26031	15100	7158	26323	13018	0.00***
Standard deviation	18130.1	21397.1	4245.3	7830.2	27050.2	40333.3	
Frequency	280	52	7	44	56	439	
P-value	0.19	0.06*	0.04**	0.00***	0.00***	0.00***	

Source: Field Survey 2001-02
Note: *significant at 10%, **significant at 5%, and ***significant at 1%

3.4 Average income from different sources

Average income of an individual in Banjhkateri is only two third of that in Thanapati, i.e. significantly lower (Table 4). Average income from all the sources in Thanapati is higher compared to Banjhkateri. In Thanapati, average income received, as remittance is the highest followed by salaried job. Average income from each sources of income differs significantly. A salaried job is able to derive the highest average income in case of Banjhkateri followed by the income received as remittance. Average income received from laboring is the lowest in both VDCs. Average incomes from all the sources is higher in Thanapati. However, average income from laboring and remittance is significantly higher in Thanapati even at 1% level of significance. Thus, average income from all sources of income except agriculture is

Table 5. Income from different sources (in NRs) and its share to total income by poor and non-poor households

Poverty	Income source					Total	P-value
	Agriculture	Salaried Job	Business	Laboring	Remittance		
Thanapati							
Poor	3137 (57.8)	621 (11.4)	181 (3.3)	1262 (23.3)	228 (4.2)	5429	0.00***
Non poor	5229 (37.9)	3302(24.0)	408 (3.0)	1496 (10.9)	3341 (24.2)	13777	0.00***
Overall	4739 (40.1)	2674 (22.6)	355 (3.0)	1441(12.2)	2612 (22.1)	11821	0.00***
Banjhkateri							
Poor	2656 (70.0)	147 (3.9)	0	294 (7.7)	699 (18.4)	3796	0.00***
Non poor	7784 (49.6)	2777 (17.7)	258 (1.6)	191 (1.2)	4681 (29.8)	15691	0.02**
Overall	4134 (57.2)	905 (12.5)	74 (1.0)	265 (3.7)	1846 (25.6)	7224	0.00***
Total							
Poor	2783 (65.9)	272 (6.4)	48 (1.1)	549 (13.0)	575 (13.6)	4227	0.00***
Non poor	5887 (41.3)	3167 (22.2)	370 (2.6)	1160 (8.1)	3686 (25.8)	14270	0.00***
Overall	4449 (46.3)	1825 (19.0)	220 (2.3)	877 (9.1)	2244 (23.3)	9615	0.00***
P-value							
Poor	0.4	0.1*	0.02**	0.00***	0.1*	0.00***	
Non poor	0.1*	0.6	0.7	0.1*	0.5	0.5	
Overall	0.5	0.00***	0.1*	0.00***	0.4	0.00***	

Source: Field Survey 2001-02

Note: Figures in parentheses indicate percentage, *significant at 10%, **significant at 5%, and ***significant at 1%

significantly higher in Thanapati.

3.5 Share of income from different sources

The share of different income sources to total household income is calculated for the poor and non-poor household. For this, household with per capita income below the poverty line of Rs. 7857 is categorized as the poor household. Share of agricultural income in the total income is significantly higher, both in Thanapati and Banjhkateri. The share, however, is higher in remote rural VDC, Banjhkateri. The share of all other sources of income is higher among the non-poor households, except for the share of agriculture and laboring which is high in case of poor households. This higher share of agricultural income for poor households shows the importance of agriculture for the poor households in the typical remote VDC. However, difference in average income from agriculture to poor household in two VDCs is non significant. Similarly, differences in average income from salaried job, business, and remittance for two VDCs are also non significant. In overall, also average income of non-poor households in both VDCs does not differ significantly. But in case of Banjhkateri, differences in average income from all income sources of poor households except agriculture are significantly higher in Thanapati.

3.6 Poverty analysis

Incidence of poverty is significantly higher (p-value<0.01), with the poverty incidence of 71.2%, in typical rural VDC of Banjhkateri compared to the incidence of poverty in ordinary subsistence rural VDC of Thanapati and Rural Western Hills, where incidence is 23.4% (Table 6) and 37.4%, respectively (CBS, 2005a). In terms of each variables considered for the study, incidence of poverty is significantly higher in Banjhkateri, except for the large family size, large landholding and large LSU holding category of households. Overall, 46.3% of sample households are under poverty line i.e. poor. Incidence of poverty is significantly higher among female-headed households, Occupational caste, large family size category, literate and illiterate headed households, household heads involved in laboring, and small landholding and medium LSU holding category.

Together with the poverty incidence, poverty gap index (p-value = 0.0051) and severity index (p-value = 0.0053) is also

Table 6. Incidence of poverty among different socio economic variables

Variables	Poverty incidence			P-value
	Thanapati	Banjhkateri	Overall	
Gender				
Male	19.2%	65.8%	39.8%	0.00***
Female	41.7%	83.3%	66.7%	0.02**
Caste/Ethnicity				
Bahun	20.0%	62.5%	40.3%	0.00***
Chhetri	12.5%	50.0%	33.3%	0.02**
Magar	33.3%	65.3%	47.2%	0.00***
Occupational caste	41.7%	100.0%	69.6%	0.00***
Newar	16.7%	-	16.7%	-
Family Size category				
Small	25.0%	46.5%	31.1%	0.02**
Medium	15.0%	78.4%	53.1%	0.00***
Large	20.0%	88.9%	64.3%	0.14
Education category				
Illiterate	29.0%	59.3%	43.1%	0.00***
Literate	29.4%	53.8%	44.2%	0.00***
School education	10.0%	33.3%	18.8%	0.04**
Occupation				
Agriculture	24.2%	66.7%	48.0%	0.00***
Salaried job	0%	25.0%	7.7%	0.00***
Laboring	33.3%	100.0%	58.8%	0.00***
Land holding category				
Small	40.0%	80.6%	64.7%	0.00***
Medium	16.2%	64.0%	35.5%	0.00***
Large	14.3%	33.3%	20.0%	0.31
LSU holding category				
Small	23.3%	84.0%	45.6%	0.00***
Medium	26.3%	77.3%	46.3%	0.02**
Large	0%	33.3%	28.6%	0.14
Total	**23.4**%	**71.2**%	**46.3**%	**0.00****

Source: Field Survey 2001-02
Note: **significant at 5%, and ***significant at 1%

significantly high in Banjhkateri, the remote VDC. However, despite the high incidence of poverty among the female-headed households, poverty gap and severity is higher among male-headed poor households (Table 7). Migration of the able bodied male resulted into relatively higher proportion of female-headed households. Thus, income from remittance can be related to the gender of household head. The higher average income from remittance contributed to the lower poverty gap and severity index among the female- headed households in Thanapati. However, lower average income from remittance together with larger proportion of households having larger family size, involved in laboring, and high illiteracy among the female headed households contributed to higher poverty gap and severity index among the female headed households in Banjhkateri. In overall, poverty gap and severity index is lower among the female-headed households. Depth as well as severity of poverty is higher among the Occupational caste households, large family size category households, households headed by illiterate member, household head involved in laboring, and small landholding and LSU holding households. Measures of all incidence, depth and severity of poverty suggest that poverty is more prominent in typically remote Banjhkateri.

Table 7. Poverty Gap and Severity by socio-economic variables

Variables	Thanapati		Banjhkateri		Overall		P-value	
	Poverty Gap index	Severity index	Poverty Gap index	Severity index	Poverty Gap index	Severity index	Poverty Gap index	Severity index
Gender								
Male	32.9	15.0	41.5	22.9	48.8	30.7	0.32	0.31
Female	27.0	8.7	70.0	51.9	33.9	13.3	0.00***	0.00***
Caste/Ethnicity								
Bahun	24.2	9.0	42.6	23.7	39.3	20.4	0.16	0.14
Chhetri	33.7	11.1	40.1	21.8	40.6	22.2	0.00***	0.00***
Magar	37.2	13.8	56.8	30.9	45.5	32.6	0.01***	0.04**
Occupational caste	43.5	21.0	69.0	52.4	64.2	43.5	0.02**	0.02**
Newar	6.0	0.4	-	-	6.0	0.4	-	-
Family Size category								
Small	35.2	15.3	58.9	42.2	49.0	31.5	0.06*	0.03**
Medium	24.1	9.5	47.3	28.3	43.9	25.5	0.04**	0.07*
Large	37.2	13.8	60.4	39.5	56.9	35.6	0.33	0.33
Education category								
Illiterate	31.8	13.6	52.5	34.7	48.6	29.9	0.05**	0.04**
Literate	31.3	13.3	51.8	32.8	46.6	28.5	0.1*	0.1*
School education	20.7	4.3	45.1	26.1	38.5	19.2	0.54	0.59
Occupation								
Agriculture	28.4	11.0	47.5	28.1	44.8	22.5	0.01***	0.01***
Salaried job	-	-	20.7	4.3	21.4	4.6	-	-
Laboring	33.1	14.6	63.0	46.6	51.3	34.4	0.00***	0.00***
Land holding category								
Small	49.2	25.7	58.1	40.0	50.5	32.9	0.00***	0.00***
Medium	33.7	14.0	46.9	26.3	44.1	23.6	0.23	0.22
Large	24.6	9.0	6.7	0.6	28.4	13.2	0.07*	0.1*
LSU holding category								
Small	47.3	24.0	64.0	46.5	51.1	34.2	0.00***	0.00***
Medium	22.7	7.3	44.1	24.5	45.4	24.7	0.7	0.9
Large	-	-	29.8	11.1	30.5	11.5	-	-
Total	**30.9**	**12.9**	**51.7**	**33.2**	**46.7**	**28.2**	**0.01*****	**0.00*****

Source: Field Survey 2001-02
Note: *significant at 10%, **significant at 5%, and ***significant at 1%

Table 8. Relative concentration coefficient of different sources of income

Income source	Thanapati		Banjhkateri		Overall	
	RCC*	FIW**	RCC	FIW	RCC	FIW
Agriculture	0.8	0.31	0.83	0.34	0.73	0.33
Salaried job	1.35	0.31	1.43	0.18	1.29	0.25
Business	1.53	0.04	1.38	0.01	1.32	0.03
Laboring	0.16	0.02	-0.33	-0.01	0.60	0.05
Remittance	1.44	0.32	1.34	0.48	1.42	0.34

Source: Field Survey 2001-02

* Relative concentration coefficient ** Factor inequality weight ($W_i g_i$)

3.7 Income inequality decomposition analysis

Income inequality (Gini coefficient) is considerably higher in typical remote areas. It is 0.25 in Thanapati, but the value is 0.5 in Banjhkateri. This suggests that within the rural areas, inequality is much more chronic in typical remote areas, Banjhkateri. Maharjan and Joshi (2007) also revealed the similar result in case of Far Western Hills of Nepal. This is contrasting to the findings of NLSS I, and II, which generalized that inequality in rural areas (0.35) is lower, compared to urban areas (0.4) (CBS, 2005a). However, though the income inequality for Thanapati is even lower compared to the overall inequality in rural areas of country, the income inequality reported in Banjhkateri even exceeded the value of that in urban areas reported by NLSS II. This shows the importance of demarcation within the rural areas to deal poverty more effectively.

The first step of income inequality decomposition analysis revealed that income from salaried job, business and remittance in both VDCs have an income inequality increasing effect. This means distribution of income from any of these sources in the same manner as original units lead to an increase in overall income inequality. This is mainly due to huge mass of rural individuals being restricted for such occupation. Instead, agriculture upon which more than 63% of the economically active population are engaged in, and the laboring where there is no restriction for entry in terms of education or the capital requirement are found to have income equalizing effect.

Results of FIW revealed that contribution of remittance to total income inequality is the highest in both locations as well as in overall. Higher FIW for agriculture is due to higher contribution of agriculture on total income, which is 40% of total income in Thanapati and 57.2% in Banjhkateri. This shows that the contribution of agriculture in total inequality at present is higher, which is mainly due to the higher contribution to the total income. Salaried job also has the higher contribution to the total income inequality. The higher FIW in case of Remittance and Salaried job, however, is due to higher RCC value, i.e. income inequality increasing effect. Thus, promotion of labor-intensive agriculture activities, which also cover the huge poor mass, giving due consideration to the market management could be better option to deal with the problem of rural poverty. Minimum of simple access provided by passable dirt road was found to have positive impact on agricultural production and on incomes (Prennushi, 1999). Thus, access to market is crucial component for success of such program, which can again be feasible through use of abundant of local resources, more importantly, local labors.

Conclusion

Inability of the subsistence farming to feed its people in rural Nepal together with the very limited off-farm income opportunities in such areas is resulting into the higher incidence of out migration. This led higher proportion of female-headed households taking care of farm and family. Incidence of such female-headed households is higher in Banjhkateri, typical remote VDCs and among the resource poor households. Bahun composes more than 54% of households in both VDCs. Higher levels of resource possession, land holding, higher irrigation coverage together with lower dependency is reported among Bahun households compared to others. Similarly, higher education attainment among the Bahun resulted into dominance of this caste on salaried job.

Agriculture still remains the major source of livelihood on which more than 63% of the economically active population depends. The dependency is even higher in typical remote rural area, Banjhkateri. Besides agriculture, out migration that generates remittance and laboring are the important sources of income in such rural areas. But in relatively accessible rural areas, salaried job is important source of income after agriculture. Average income is the highest for remittance followed by salaried job and lowest for laboring. Share of agriculture in the total income is also the highest. The share is even higher in case of poor and typical rural areas. It reaches as high as 70% among the poor in

Banjhkateri. Remittance and salaried job is placed second and third in terms of its contribution to total income.

Poverty incidence is widespread in typical rural areas having incidence as high as 71% and it is common among female headed households, Occupational castes, illiterate headed households, household heads involved in laboring, and small land holding and LSU holding households. Except for the household with female-head, poverty among the household with such characteristics is also deeper and severe. But in case of female-headed households, due to contribution of remittance, poverty is less deep and severe compared to male-headed households. In addition to the higher incidence of poverty, income inequality is also high in typical rural areas.

Salaried job, business and remittance in all cases have income disequalizing effect. On the other hand, income from agriculture and laboring has income equalizing effects. Income from remittance and salaried job has the highest factor income inequality weight, which will further be aggravated under existing socioeconomic setup where access to such income source is highly restricted due to socioeconomic deprivation. Therefore, promotion of labor-intensive agriculture with formulation and effective implementation of labor policy could be the better rural development policy in the rural Nepalese context. The effect of such policies can be translated to more than 72% of economically active population engaged in agriculture and laboring. Notably, access to market is also equally crucial for success of such rural development policy in Nepal, where still very vast geography of rural area of out of connection with motorable road.

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Annex 1. Yearly poverty line based on the annual growth rate* from year 1995-96 and 2003-04

Year	Poverty line	Change
1995/96	5403	
1996/97	5750.9	+ 347.9
1997/98	6121.3	+ 370.3
1998/99	6515.5	+ 394.2
1999/2000	6935.0	+ 419.6
2000/01	7380.6	+ 446.6
2001/02	**7857**	**+ 475.4**
2002/03	8362.9	+ 505.9
2003/04	8901.5	+ 538.6

Source: CBS, 2005a

* Annual growth rate of 6.4% calculated by authors based on 1995-96 and 2003-04 data

Annex 2. Relationship of income source with various socioeconomic variables in Thanapati

Variables	Income source						
	Agriculture	Salaried job	Business	Laboring	Remittance	Total	Emp rate
Gender							
Male	32 (28.1)	33 (29.0)	3 (2.6)	21 (18.4)	25 (21.9)	114 (100)	89.8
Female	97 (93.3)	1 (1.0)	2 (1.9)	4 (3.8)	-	104 (100)	92.0
Ethnicity							
Bahun	76 (64.4)	23 (19.5)	4 (3.4)	7 (5.9)	8 (6.8)	118 (100)	81.9
Chhetri	15 (51.7)	3 (10.3)	-	2 (6.9)	9 (31.1)	29 (100)	88.9
Magar	6 (50.0)	2 (16.7)	-	2 (16.7)	2 (16.7)	12 (100)	85.7
Occupational caste	19 (52.8)	1 (2.8)	-	10 (27.8)	6 (16.6)	36 (100)	98.2
Newar	13 (56.5)	5 (21.7)	1 (4.4)	4 (17.4)	-	23 (100)	97.2
Family size category							
Small	46 (55.4)	12 (14.5)	2 (2.4)	16 (19.3)	7 (8.4)	83 (100)	97.6
Medium	62 (60.8)	16 (15.7)	2 (1.9)	9 (8.8)	13 (12.8)	102 (100)	96.2
Large	21 (63.6)	6 (18.2)	1 (3.0)	-	5 (15.2)	33 (100)	67.3
Education category							
Illiterate	66 (76.7)	1 (1.2)	1 (1.2)	15 (17.4)	3 (3.5)	86 (100)	100
Literate	36 (55.4)	6 (9.2)	2 (3.1)	8 (12.3)	13 (20.0)	65 (100)	64.7
School education	27 (49.1)	17 (30.9)	1 (1.8)	2 (3.6)	8 (14.6)	55 (100)	64.2
College education	-	10 (83.3)	1 (8.3)	-	1 (8.3)	12 (100)	62.8
Land holding category							
Small	32 (55.2)	9 (15.5)	1 (1.7)	12 (20.7)	4 (6.9)	58 (100)	96.7
Medium	80 (60.2)	22 (16.5)	3 (2.3)	12 (9.0)	16 (12.0)	133 (100)	98.5
Large	17 (63.0)	3 (11.1)	1 (3.7)	1 (3.7)	5 (18.5)	27 (100)	60.0
LSU holding category							
Small	79 (59.4)	21 (15.8)	2 (1.5)	17 (12.8)	14 (10.5)	133 (100)	98.5
Medium	45 (59.2)	10 (13.2)	3 (4.9)	8 (10.5)	10 (13.2)	76 (100)	89.4
Large	5 (55.6)	3 (33.3)	-	-	1 (11.1)	9 (100)	47.4
Overall	**129 (59.1)**	**34 (15.6)**	**5 (2.3)**	**25 (11.5)**	**25 (11.5)**	**218 (100)**	**90.8**

Source: Field Survey 2001-02

Note: Figures in parentheses indicate percentage

Annex 3. Relationship of income source with various socioeconomic variables in Bajhkateri

Variables	Income source						
	Agriculture	Salaried job	Business	Laboring	Remittance	Total	Emp rate
Gender							
Male	65 (52.4)	15 (12.1)	1 (0.8)	16 (12.9)	27 (21.8)	124 (100)	76.4
Female	86 (88.7)	3 (3.1)	1 (1.0)	3 (3.1)	4 (4.1)	97 (100)	85.5
Ethnicity							
Bahun	91 (76.5)	10 (8.4)	2 (1.7)	2 (1.7)	14 (11.7)	119 (100)	76.8
Chhetri	22 (64.7)	5 (14.7)	-	1 (2.9)	6 (17.7)	34 (100)	79.1
Magar	15 (65.2)	2 (8.7)	-	4 (17.4)	2 (8.7)	23 (100)	75.0
Occupational caste	23 (51.1)	1 (2.2)	-	12 (26.7)	9 (20.0)	45 (100)	97.8
Family size category							
Small	25 (78.1)	2 (6.3)	1 (3.1)	3 (9.4)	1 (3.1)	32 (100)	88.9
Medium	87 (64.4)	13 (9.6)	1 (0.8)	14 (10.4)	20 (14.8)	135 (100)	81.8
Large	39 (72.2)	3 (5.6)	-	2 (3.7)	10 (18.5)	54 (100)	76.1
Education category							
Illiterate	75 (79.0)	-	-	12 (12.6)	8 (8.4)	95 (100)	98.1
Literate	53 (63.1)	4 (4.8)	-	7 (8.3)	20 (23.8)	84 (100)	80.8
School education	21 (63.6)	9 (27.3)	1 (3.0)	-	2 (6.1)	33 (100)	50.8
College education	2 (22.2)	5 (55.6)	1 (11.1)	-	1 (11.1)	9 (100)	42.9
Land holding category							
Small	66 (61.1)	8 (7.4)	1 (0.9)	12 (11.1)	21 (19.4)	108 (100)	81.8
Medium	77 (74.8)	10 (9.7)	1 (1.0)	5 (4.9)	10 (9.7)	103 (100)	81.1
Large	8 (80.0)	-	-	2 (20.0)	-	10 (100)	76.9
LSU holding category							
Small	57 (67.1)	5 (5.9)	-	10 (11.7	13 (15.3)	85 (100)	86.7
Medium	57 (64.8	9 (10.2)	2 (2.3)	8 (9.1)	12 (13.6)	88 (100)	84.6
Large	37 (77.1)	4 (8.3)	-	1 (2.1)	6 (12.5)	48 (100)	68.6
Overall	**151 (68.3)**	**18 (8.1)**	**2 (0.9)**	**19 (8.6)**	**31 (14.0)**	**221 (100)**	**81.2**

Source: Field Survey 2001-02
Note: Figures in parentheses indicate percentage