

Considering Households' Occupation and Their View towards Forest Conservation

(가구 생업과 그에 따른 삼림보호 인식에 관한 고찰)

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요약 생업 및 삼림보호에 대한 시민들의 인식을 알아보기 위하여 2007년 치트완의 100가구를 대상으로 설문 조사를 실시하였다. 생업에 관한 질문에 대해 다중 응답이 가능하였고 조사 결과 대상 가구 중 98%가 농작물 수확을, 92%가 낙농업을 통해 주로 생계를 유지함을 알 수 있었다. 또한 대상 가구의 전체 수입에 대하여 37%가 농업 및 벌목에, 20%가 해외송금에 의존하고 있었다. 나아가 분석 결과는 토지소유 크기 분포에 대한 Gini 계수가 0.37이었던 반면 수입 분포에 대한 Gini 계수는 0.25로 일치함을 보여주었다. 그러나 가구당 1인의 평균 수입은 국가 기준보다 낮았고 33%의 가구가 빈곤 가구의 기준 및 빈곤 지수인 0.0945보다도 낮은 수치를 보였다. 한편 응답자의 85%가 현재 숲이 퇴화하였음을 확신하였는데 전체 가구 중 82%가 삼림관리에 대하여 낮은 인식을 가지고 있어 83%가 삼림관리를 위한 활동에 참여하고 있지 않음을 확인하였다. 이런 결과는 과거 삼림 자원이 과도하게 파괴되어 왔으며, 또한 현재 남아 있는 삼림 자산도 실제로 이용 가능한 부분이 점차 줄어들고 있음을 보여준다. 따라서 삼림에 의존하던 추세도 영세 규모 농업이나 다른 생업, 이

를 테면 지역 상업이나 서비스업으로 점차 이동하고 있다. 한편 이러한 정보는 지역 가구의 생계를 유지하기 위한 나은 대안의 계획 및 의사결정뿐만 아니라 지속가능한 삼림의 보존 전략 수립 등에 활용될 수 있으리라 본다.

키워드 : 가구 생업, 삼림퇴화, 다중 생계, 치트완, 네팔

Abstract 100 households' survey was carried out in 2007 in Chitwan to foresee the people's livelihood and their insight into the forest conservation. This analysis revealed that households' was mainly survived with multiple livelihood categories where 98% citizens belong to food crops and 92% to livestock husbandry. The households' income shared by agriculture (crop and livestock), forest and remittance was 37% and 20% respectively. Results further showed that income distribution was somehow equal with Gini coefficient 0.25 than with the 0.37 of landholdings size. But, average per capita income of households was lower than the national standard with 33% of households below the poverty thresholds and 0.0945 poverty gap index. Similarly, 85% respondents assured for the current degraded status of forest and 83% of households for not participated in forest management activities due to low awareness in 82% households. These findings shows the forest assets could be unduly degraded in the past and forest availability which is extracting from the remaining forest is also decreasing in the area. Thus, tendency of forest dependency has been shifting to the small scale farming, other livelihood sources such as local business and services. This information could be useful in planning and decision-making process in searching of better alternative for the local livelihood as well as sustainable forest conservation strategy.

Keywords : Households' Occupation, Forest Degradation, Multiple Livelihoods, Chitwan, Nepal

1. Introduction

As forest resources play an important role in people's livelihoods throughout the globe[1,2]. It is also recognized as the livelihood and economy source of national as well as local revenue in Nepal[3]. In fact, rural livelihood is maintained by agricultural based occupation where livestock rearing and small scale farming is the main in Nepal. However, forest resources are also a major component that contributes Nepalese livelihood by generating various income sources, satisfying the basic needs of rural dweller by providing fuel wood, construction materials and fodder for animal feed. With this fact, inhabitants around the Chitwan forest corridor are also largely depend on forest services while it deserves the indispensable desires of their livelihood. Moreover, due to the preferred destination of migrants to the Terai including Chitwan, population growth has been rising and pres-

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tures on the forest resources are ever increasing in recent decades. The Nepalese government has been also realizing the truth of persistent level of deforestation, forest encroachment and forest degradation in various parts of the Terai and Chitwan as well. Since long government has been also concerned about the environmental and forest degradation problem, accordingly various types of programs have been also launched i.e. Community Forestry, Leasehold Forest, Buffer zones, BISEPT-ST, Terai Arc Landscape project and so on for supporting the people's livelihood, forest resources management and biodiversity conservation purposes in Terai including Chitwan.

However, some weakness in government policies have been witnessed from different sectors with lacking of appropriate guidelines for successful forest management, empower the rural poor and boost up their participation in forest conservation including rural development activities in Nepal. Similarly, we also realize some hiccups and conflicts because of inadequate consultations with the grass roots level for Terai forest management, disregards of their problems and unclear policy about the resources ownership. Consequently, dispute in resources use, benefit sharing and low concerns in forest conservation are still prevailing hence massive deforestation and forest encroachment has been also increasing these days. As a result, severe forest degradation and a significant threat in rural livelihood have been also constantly observing.

Thus, this study tries to focus on the household's livelihood strategies and their view towards deforestation and forest degradation in Chitwan which may help to enhance the policy implication process by un-

derstanding the people's need, their perspectives for sustainable forest management based on their livelihood strategies and their consciousness in forest conservation approaches. The output of this research could be used as preliminary information source which may further useful in planning and decision-making process for searching alternatives to improve the local people's livelihood and sustainable forest management strategy in Nepal.

2. Methods and Materials

2.1. Study Area

Chitwan district situated in the south-central part of Nepal lies between (27° 31' to 27° 44' N and 84° 24' to 84° 31' E) (Figure 1). It covers an area of 2,218 km² and has a population of 472,048[4]. Chitwan is one of the densely populated, traffic junctions for the east and west highway and lies at the heart of one of economy zone connecting with the various cities in Terai of Nepal. Administratively, district is divided into 2 municipalities and 36 Village Development Committees as the lowest executive unit.

Agriculture activity is a major and fertile land is the symbols of district's economy in Chitwan where the average size of agricultural holdings is 1.26 ha, which is the highest in Nepal. Chitwan has rich biodiversity value while forest corridor is linking in Middle Mountain in north and Chitwan national park in south, also had comparatively dense and virgin forest than nearby other districts in the past. But, land use and land cover pattern of district has been heavily disturbed by human[5,6], hence remaining portion of Chitwan forest has been also rapidly disappearing now.

2.2. Data Use and Data Analysis

We selected altogether five study sites(3 VDCs and 2 municipalities) purposively considering the forest corridor is the one boarder of this administrative unit. 3 wards from each unit were selected purposively giving consideration to sharing boundary and nearest to the forest corridor. Such a way, 15 wards were selected and then 5 wards were selected randomly for field survey. From each selected wards 20 households means the total of 100 households were selected for interview.

Accordingly, Participatory Rural Appraisal and Rapid Rural Appraisal (RRA) tools were used to collect information in livelihood and local perceptions to-

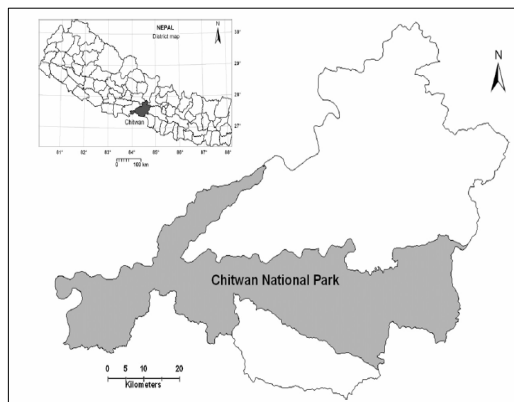


Fig. 1. Chitwan district in Nepal on the top left corner and study area Chitwan district.

wards forest resources degradation. With this, systematically designed survey questionnaire, formal and informal visits, key informant/elite person interview, consultation of meetings and small group discussions, meeting with elderly people, historical records and direct observation were also carried out during the field work.

Surveyed data were processed and analyzed using simple descriptive and other statistical methods. Descriptive statistics such as pie chart, bar and line graph, percentage etc tools were mainly used to compare and analyze the data of the sample households. Poverty and inequality has greater influence in natural resource management. Most of the rural people in the third world primarily depend on the natural resources such as agriculture, forest, land and water. Thus, addressing livelihood features such as poverty, income and land inequality for their better life is the key issue in the natural resources management in developing countries like Nepal.

Hence, in this study we tried to explain the household livelihood, sources of revenue, resource utilization and consumption pattern, poverty and land equality to relate information on forest degradation process and foresee the aspects of forest resource management. So, we used Foster-Greer-Thorbacke (FGT) indices recommended by World Bank as Head Count Poverty Index and Poverty Gap Index for poverty analysis and Gini coefficient for the calculation and measurement of income/wealth and land distribution among the households.

3. Results

3.1. People's Livelihood Analysis

3.1.1. Livelihood sources strategies

About 98% households belong to food crops and 92% for livestock husbandry while response on wage labour, service sector and petty shop were 33%, 29%, and 23% respectively (Figure 2). Food crops, vegetables and livestock were raised together. The multiple livelihoods showed that the dominance of livelihood strategy was crop and livestock farming (92%) which is also directly associated with forest resources in terms of grazing and fodder collection. Crop, livestock and service category accounted 29% while crop, livestock and wage labour; crop, livestock and foreign labour; crop livestock and petty shops accounted of 26%, 23%, and 20% respectively (Figure 3).

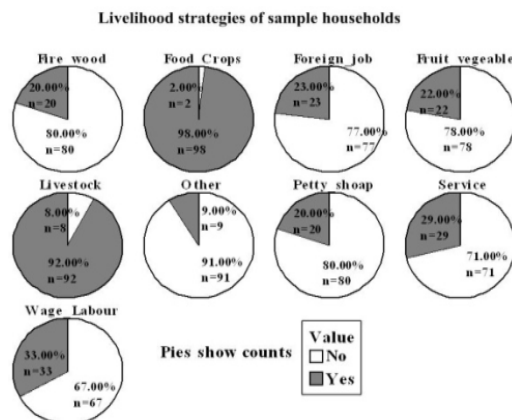


Fig. 2. Households responses on livelihood sources

Response of households on multiple categories of livelihood sources

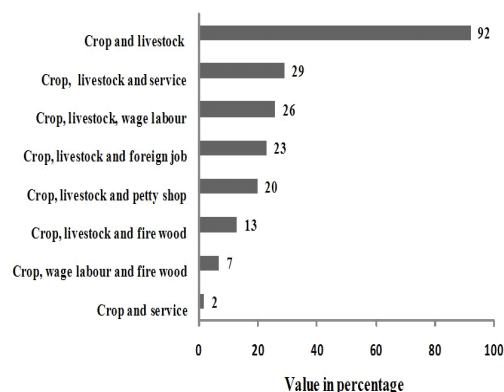


Fig. 3. Household responses on multiple livelihood

3.1.2. Agricultural Productivity

The total cropped area was 136.60 ha and out of which paddy shared the highest in both total cropped area (35%) and total production (56%). Similarly, maize and oilseeds shared about 32% and 15% respectively in total area and about 23% and 5% production. Vegetables shared about 5% of total cropped area whereas almost >10% shared in total production.

The cropping intensity of the study area was 208% but the productivity of the food crops and vegetables were not promising though the productivity of paddy is considerably good and it yielded 3.3mt/ha. Yet, 63% of households' production do not support to feed their families and among them about 74% (47.6% for <3 months and 26.89% for 3-6 months) of household couldn't support to feed their families more than 6 months.

3.1.3. Income sources, land & income distribution

Data revealed that arable farming shared the highest of almost 24% households income followed by remittance 20%, Service sector, petty shops and livestock shared almost 19%, 13% and 10% respectively (Table 1). Similarly, pension and wage labour shared 5 or less than 5% households income whereas firewood sells shared only about 3%. Data further revealed that almost 37% of annual households income shared by agriculture (crop and livestock) including firewood 3% and remittance (20%).

Table 1. Sources of income at households level

S.N.	Income Sources	Mean Income (per hh/year)	Percent
1	Arable Farming	28769	23.92
2	Livestock	11500	9.56
3	Petty shops	15603	12.97
4	Wage labour	6585	5.48
5	Pension	5142	4.28
6	Remittance	23775	19.77
7	Services	22595	18.79
8	Fire wood sale	3580	2.98
9	Others	2714	2.26
Total		120262	100
Per capita income		NRs. 21117.00 (about US\$ 293.00)	

The distribution pattern of income and land holdings sizes among the households was calculated using Gini coefficient and it has revealed that income distribution showed by Lorenz curve was nearer to the perfect line with low Gini coefficient of 0.25 (Figure 4). Similarly, the Lorenz curve of land holdings size demonstrated that the distribution of arable land was moderately unequal within the sample households with Gini coefficient of 0.37 (Figure 5).

As Reddy and Chakravarty found in their study that poor households generated more than 22% of their gross income from forests services, but we found very low income nearly 3% was made by sample households from forest products sells (Table 1)[7].

However, comparatively equal income distribution showed by Lorenz curve in Figure 4 could be the result of remittance in the study area. According to the respondents, many households member are already having a job in India and other foreign countries as well.

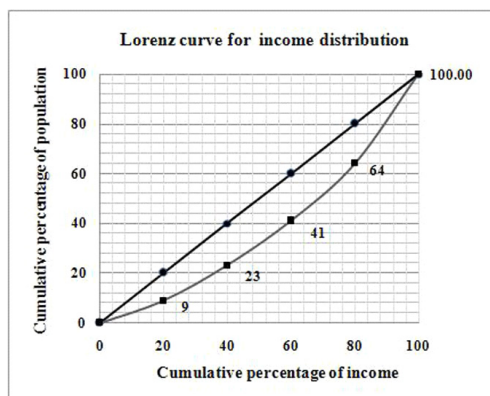


Fig. 4. Distribution of income at household

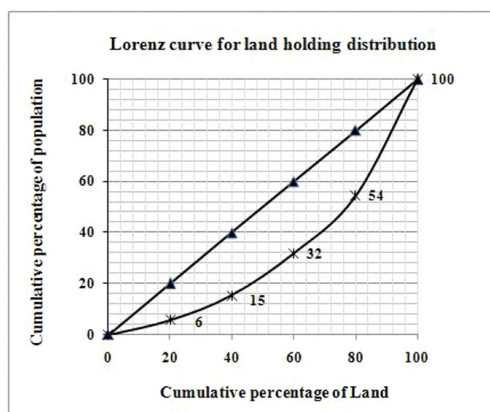


Fig. 5. Distribution of land at households

3.1.4. Poverty and resources consumption patterns

Income from different sources was calculated considering the local price of the agriculture and forest products that extracted by the villagers. HCPI and PGI was used to calculate the poverty status of the sample households considering threshold poverty line Nrs. 14,942/yr based on the per capita income US \$ 1/day and assuming 210-215 working days available for them which we generalized in whole study area. Results revealed that almost 33% of household was below the poverty thresholds (Nrs. 14,942) with poverty gap index 0.0945 (about 10% PGI). This poverty is considerably higher than the NLSS II (2003/04) which explained that almost 28% of head count poverty in rural Terai in 2003/04[8]. The largest share of households income was spent in food consumption about 53% followed by education almost 13%, cultivation about 5%, religious functions, health and clothing were about 8%, 6% and 5% respectively (Table 2).

About 3.2% and 2.6% was only spent for transportation and energy respectively. Surprisingly, the share of income in total energy consumption was only 2.62 % (Nrs. 234/hh).

Table 2. Share of average annual household income

S.N.	Items	Aveg. Consum (HH/ month)	% of total income
1	Food	4781.00	53.37
2	Health	551.00	6.15
3	Education	1140.50	12.73
4	Clothing	452.50	5.05
5	Religious functions	684.00	7.64
6	Transportation	291.00	3.25
7	Energy Total	234.50	2.62
7.1	Electricity	106.80 (45.54)*	(1.19)**
7.2	Kerosene	30.90 (13.18)*	(0.34)**
7.3	L.P. Gas	67.50 (28.78)*	(0.75)**
7.4	Firewood purchase	29.30 (12.49)*	(0.33)**
8	Cultivation	455.50	5.08
9	Others(Water, Telephone etc.)	368.25	4.11
Total		8958	100

Note : *figures in parentheses denotes the % of sub total

** figures in parentheses denote the % of total consumes

3.2. Households' Perception Regarding Forest Conservation

85% of the respondents stated that the current status of Chitwan forest is undoubtedly degraded. The reason of forest degradation assured by respondents were over exploitation (100%), socioeconomic factors (95%), low awareness (82%), inability of law enforcement (75%) and illegal forest products transaction by official (75%). Respondent also do not participated in: plantation (87%), enrichment planting (100%) and silvicultural operations (70%). However, 75% respondents are interested in forest protection against illegal cutting and 63% of respondents were realized the effective management of forest is needed for local needs.

4. Discussion and Conclusion

Thoms stated that forest services are important because they provide indirect livelihood benefits for the well-being of people while it contribute directly to livelihoods combine with other key components of poverty reduction strategies[9,10]. It was observed that almost 37% of households income was shared by agriculture (crop & livestock), forest and remittance (20%) (Table 1), which explores the fact of high de-

pendency on agriculture and forest resources in the study area. However, the productivity of agriculture crops except paddy was also very low which indicates the agriculture only could not support their livelihoods. Data also revealed that income distribution was somehow more equal than the distribution of landholdings size, possibly the reason of remittance outcomes in the region. It was also widely assumed that the poor and marginalized farmers are also the main cause of deforestation and forest degradation in Nepal[11]. The households average per capita income was only Nrs. 21,117 (about US \$ 293) (Table 1) which indicates the lower income than the national per capita GDP (US \$ 383 in 2006/07). Similarly, almost 33% of households were below the poverty thresholds (Nrs. 14,942/yr) with the poverty gap index 0.0945 (about 10%). In Nepal, the proportion of the population living below the poverty line was 36% in 1978, 41.5% in 1985, 42% in 1996 and 42% in 1999 and somehow lowered by 31% in 2001[4]. These people were assumed to be heavily relying on forest for their livelihood and are frequently blamed as the root cause of forest degradation[11]. However, this study showed that the traditional dependency on forest has been shifting towards the small scale farming, business and services. This could due to shrinking forest resources in terms of availability which also indicates the forest in Chitwan was heavily degraded in the past and even in the present hence the persistent forest degradation has been occurring in the district which has confirmed with satellite image analysis[12].

50% of the cooking energy is shared by firewood and 98 households were using firewood for cooking and other purposes in the area. This indicates that large amount of firewood is still extracted from the forest for their needs. Confront with, forest resources of Chitwan has disproportionately reduced and livelihood of the local people as well as biodiversity conservation are also threatened. 85% of the respondent out of 100 mentioned that the present status of the forest is degraded in Chitwan district. The output of this research is intended to support in planning and decision making process of the concern institutions and authorities. Finally, the paper suggest by addressing the implications of these findings for the implementation of bottom level livelihood supportive programs, intervention of alternative energy sources and livestock rearing options which may reduce the degree of forest dependency in Chitwan and elsewhere in Nepal.

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