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Research Article

Food and Nutritional Security Status: Assessment Among Landless People in Chitwan, Nepal

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Abstract

Food insecurity, sadly still remains a concern with Nepal. The remote settlement of communities, harsh terrains, inequity in income generation have left millions of Nepalese experiencing some level of food insecurity mostly among marginalized population in both urban and rural settings. A pilot study was conducted within ninety households of four different locations with the purpose to assess various dimensions of food and nutritional security of the landless people living in undocumented land by purposive selection of Chitwan District of Nepal. Semi structured questionnaire was used to obtain primary data and secondary data was obtained from *Bharatpur* Municipality and *Madi* Agriculture Service Centre, Chitwan. Analysis revealed 57.77% household expressed themselves as food secured in terms of their production and source of income while 42.23% were food insecure. The most food insecure ethnic group were *Janajatis* (indigenous) (34.21%) followed by *Dalits* and *Brahmins* (15.78%). Similarly, 79.99% (36.66% male, 43.33% female) respondents were under-nutrition and 20.01% (5.56% male and 14.45% female) were nutritionally secured from calculation using Harris-Benedict principle based on net calories they obtained from their daily meal. Females were more insecure in terms of population size, education, skill, nutrition and diseases followed by males. Of those interviewed, 57.77% households lack production activity and were also food insufficient. Main source of income was off-farm work (40%) followed by remittance (35.56%). Various natural calamities were also the reason behind being landless in case of some households and they reportedly migrated from elsewhere. Still, peoples are involved in foraging and traditional farming activities with low output. Addressing agricultural production, nutrition awareness, climate change monitoring, livelihoods strengthening and disaster preparedness to ensure access to food is urgent need even in urban areas like Chitwan. Dependence on food import, shying from production activities, traditional food sources has to be addressed for Nepal's struggle against food insecurity.

Keywords: calorie; food insecurity; landless; nutrition; production activity

Introduction

Food insecurity is a daily reality for millions of people around the world. It is a significant problem in Nepal, with thousands of Nepalese experiencing some level of food insecurity mostly among marginalised population. Although its most extreme manifestations are often obvious, many other households facing constraints in their access to food are less identifiable (Webb *et al*., 2006). The

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remote settlement of communities, harsh terrains and inequity in income generation has left vulnerable population in both urban and rural settings towards food insecure condition. Nepal is a land locked and least developed country, having a population of more than 27 million. Around 31% people in the country live below poverty level (UNDP, 2009). Nepalese Constitution-2015, part 3, subdivision 36 suggests right relating to food as: (1) Every citizen shall have the right relating to food, (2) Every citizen shall have the right to be safe from the state of being in danger of life from the scarcity of food, (3) Every citizen shall have the right to food sovereignty in accordance with law (MoLJPA, 2015). Similarly, FAO (2013) explicitly states in the preamble to its constitution that one of its main aims is "ensuring humanity's freedom from hunger" by promoting greater and more efficient production and distribution of food, raising levels of nutrition, and bettering the condition of rural populations.

The concept of food security has various dimensions; food availability, food accessibility, food utilisation, stability and vulnerability (FAO and SAARC, 2008). Food security does not only mean food availability but should be nutritionally enriched. Nepal Food Security Monitoring System (2017) have enlisted Chitwan district to be minimally food insecure. However, marginalised population are severely affected in various district (NFSMS, 2017). In Siddi - 8 Chitwan, one suicide case was happened as a result of famine and food crisis (Kantipur Daily, 2009). Studies confirm that global food supplies are adequate to cure hunger and presumably, to provide sufficient relief in cases of famine. North Korean famine of 1995-98 took the lives of about one million people and obtruded inestimable amounts of suffering on its victims (Lee, 2006). So it is very necessary to undertake the solution to solve food insecurity problem.

Major population of Nepal are involved in agriculture. However, food is not available and accessible to every corner due to low production and weak infrastructures. Also, people are physiologically, socially, economically and politically vulnerable to food insecurity (Swindale, 2004). Most of the marginalised community living in undocumented land (called '*Sukumbasi'* in Nepalese term) that have lost their houses and land are more prone to be affected. They are directly imposed to the effect of climate change and various vulnerability situations. A person needs a sufficient energy to fulfil its Basal Metabolic Rate (BMR). Basal metabolic rate (BMR) is the energy used for preserving body functions of a living body in awake state (Doros *et al.*, 2015). Under-nutrition is the measure of food deprivation, is based on a comparison of usual food consumption expressed in terms of dietary energy (kcal) with certain energy requirement norms (Vhurumuku, 2014). If he/she is unable to fulfil even BMR requirement from daily food habit, can be considered as under-nutrition state. Distinctions and overlaps between hunger, food and nutrition insecurity and under-nutrition is shown in Fig 1(Benson, 2004).

This paper undertakes the inquiry of food and nutritional security condition of landless marginalized community living in undocumented land in Chitwan district to provide a pragmatic and basic assessment.

Materials and Methods

Study location

The assessment was conducted in Chitwan District by purposive selection of 4 different locations as per suggested by Bharatpur Metropolitan City Office, Bharatpur. (Fig.2).

Site 1: BMC Ward 1: Thimura (15 households)
Site 2: Madi Municipality: Bantauli, Madi (25 households)
} Semi-rural areas

Site 3: BMC Ward 11: KB Line (25 households)
Site 4: BMC Ward 11: Ganesthan (25 households)
} Urban areas

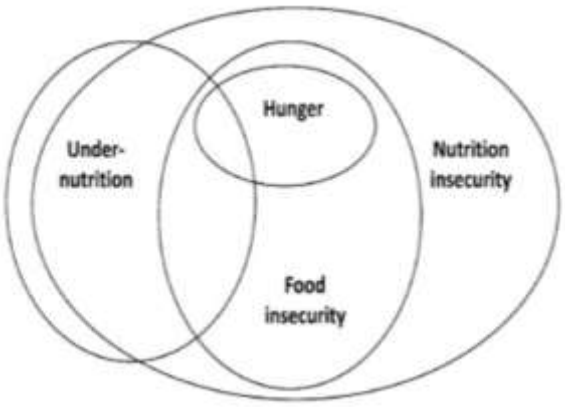

Fig. 1: Distinctions and overlaps between hunger, food and nutrition insecurity and under-nutrition (Source: Benson (2004). Reproduced by: Ghattas, H. (2014) with permission from the International Food Policy Research Institute.)

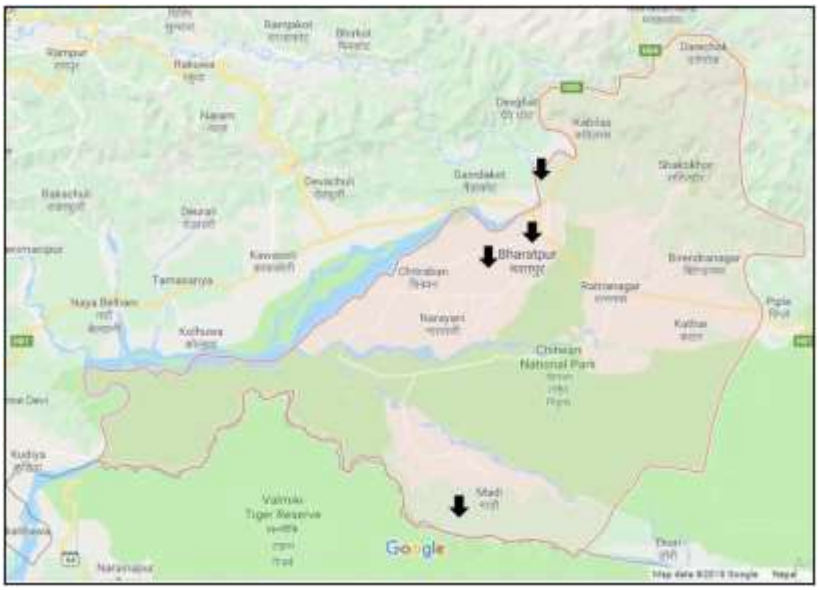

Fig. 2: Map of Chitwan showing study locations *(Source: Google Maps)*

Study Period

Study was conducted from September to November, 2017.

Data/Information collection and Sampling procedure

Primary data were collected through pretested semi-structured interview schedule with 90 respondents living in undocumented land, Focused group discussion and key informants survey for cross validation and secondary data was retrieved from Bharatpur Metropolitan City Office, Bharatpur and Madi Agriculture Service Centre, Basantapur, Madi.

Research Design

Food Security was assessed based on production sufficiency, market accessibility, affordability, calorie fulfilled, food pattern, sanitation and hygiene level. Nutritional records were obtained from 24 hour food recall basis expressed in terms of dietary energy (Calories). Sanitation and hygiene level were reported based on direct observation.

Data Analysis

Descriptive analysis method was used to analyse the basic data and frequency, mean, percentage were calculated using MS Excel.

Data was analysed using following calculations.

BMI Calculation: BMI = Weight in kilograms/ (height in meters)^2

Class	Range
Underweight	<18.50
Normal range	18.50 - 24.99
Overweight	≥25.00
Obese	≥30.00

The health risks associated with increasing BMI are continuous which directly affect Nutrition Level (WHO, 2004). Our major concern was to assess the population having daily diet below BMR (under-nutrition state) or above BMR (secured state).

Using Harris–Benedict equation (also called the Harris-Benedict principle) revaluated by Roza and Shizgal (1984);
Men: BMR (metric)
=66.47+ (13.75 * W) + (5.0 * H) - (6.75 * A)…….(1)
Women: BMR (metric)
=665.09 + (9.56 * W) + (1.84 * H) - (4.67 * A)…….(2)
where,

W = weight in kilograms (weight (lbs)/ 2.2)
H = height in centimetres (inches x 2.54)
A = age in years

Conditions for family to be food secured:

1. The family should have fulfilled the food supply from production activity (sufficiency) or his/her earnings (affordability).
2. Market accessibility
3. Vulnerability to natural disaster
4. Sanitation and hygiene

Condition for family to be nutritionally secured:

1. BMR fulfilled by the food pattern s/he had adopted using 24 hours recall and energy calculation process

Results and Discussion

Among the total 90 respondents considered under the present study, 50 (55.56%) belongs to urban area and 40 (44.49%) belongs to semi-rural areas. The socio-demographics (Table 1) and economic status (Table 2).

Table 1: Socio Demographic of the population

Variable	Urban		Semi-Rural		Total
	Frequency	%	Frequency	%	
Gender					
Male	21	23.33	17	18.89	42.22%
Female	29	32.23	23	25.55	57.78%
Ethnicity					
Brahmin	16	17.78	0	0	17.78%
Chhettri	8	8.89	2	2.22	11.11%
Dalit	5	5.56	7	7.78	13.34%
Janajati	19	21.11	2	2.22	23.33%
Thakuri	2	2.22	0	0	2.22%
Bote	0	0	19	21.11	21.11%
Chepang	0	0	9	10	10%
Kumal	0	0	1	1.11	1.11%
Family Size					
Extra Small (1-2 persons)	5	5.56	4	4.44	10%
Small (3-4)	14	15.56	16	17.78	33.34%
Medium (5-6)	20	22.22	14	15.56	37.78%
Large (7-8)	4	4.44	3	3.33	7.77%
Extra Large (9 and more)	7	7.78	3	3.33	11.11%
Education (Altogether family members)					
Male Illiterate	84		82		
Female Illiterate	87		91		
Male Basic (SLC+Intermidiate)	38		15		
Female Basic	45		11		
Male University Level	12		0		
Female University Level	8		0		
Migration Status					
Yes	21	23.33	17	18.89	42.22%
No	29	32.22	23	25.56	57.78%
Household Head					
Male	36	40	28	31.11	71.11%
Female	14	15.56	12	13.33	28.89%
Livestock Holding Unit (LSU)					
0-0.99	46		27		
1-1.99	2		6		
2-2.99	1		5		
3-3.99	1		0		
4 and above	0		2		
Meat/week					
Low (0-1 time)	12		22		
Medium (2-4 times)	33		17		
High (5-7 times)	5		1		
Fruits/ week					
Low (0-1 time)	22		27		
Medium (2-4 times)	26		13		
High (5-7 times)	2		0		

Table 2: Economic Status of the population

SN	Variable	Variation				Remarks
		Urban		Rural		
a	***Source of Income***					
	Agriculture	5		23		
	Livestock	2		6		
	Remittance	16		16		
	Job	18		2		
	Business	14		2		
	Off farm labour	19		17		
	Pension	3		0		
b	Families having Multiple Source of Income	24 households		25 households		
c	Average family expenditure per month	3000-15000		1000-20000		For agriculture production, rural have high expenditure
d	***Loan***	**frequency**	**%**	**frequency**	**%**	**Total %**
	Yes	36	40	25	27.77	67.77%
	No	14	15.56	15	16.67	32.23%
e.	***Foraging Practice***					
	Yes	11	12.22	25	27.78	40%
	No	39	43.33	15	16.67	60%

Table 3: Affordability and Sufficiency of food production status

Affordability (Sufficient Earning)	Total households	Sufficiency from Production	Total households
6 months	18	Not even 1 month	52
8 months	25	2 months sufficient	11
10 months	31	4 months sufficient	4
12 months	16	6 months sufficient	4
		8 months sufficient	3
		10 months sufficient	6
		12 months sufficient	0

Taking Average Weight from total male and female respondents:

Male = 59.73 kgs

Female = 59.71 kgs

Average age for both male and female = 25 years

From calculation using Equation (1) and (2);

Average Nepalese male BMR= 1534 Cal

Average Nepalese female BMR = 1396.63 Cal

Interpreting the data of production sufficiency, market accessibility, affordability, calorie fulfilled, sanitation and hygiene level, the level of food and nutrition security is listed in Tables 5 and 6.

Table 4: Population classification based on Body Mass Index (BMI)

Class	Frequency
Underweight	7
Normal range	46
Overweight	33
Obese	4

Table 5: Food and Nutrition Security of households based on biological gender

Security Level	Male		Female	
	frequency	percentage	frequency	percentage
Food				
Secured	28	31.11	24	26.66
Insecured	10	11.11	28	31.12
Nutrition				
Under-Nutrition	33	36.66	39	43.33
Secured	5	5.56	13	14.45

Table 6: Food and Nutrition Security of households based on level of urbanization

Security Level	Urban		Semi- Rural	
	frequency	percentage	frequency	percentage
Food Security				
Secured	23	25.55	29	32.23
Insecured	27	30.00	11	12.22

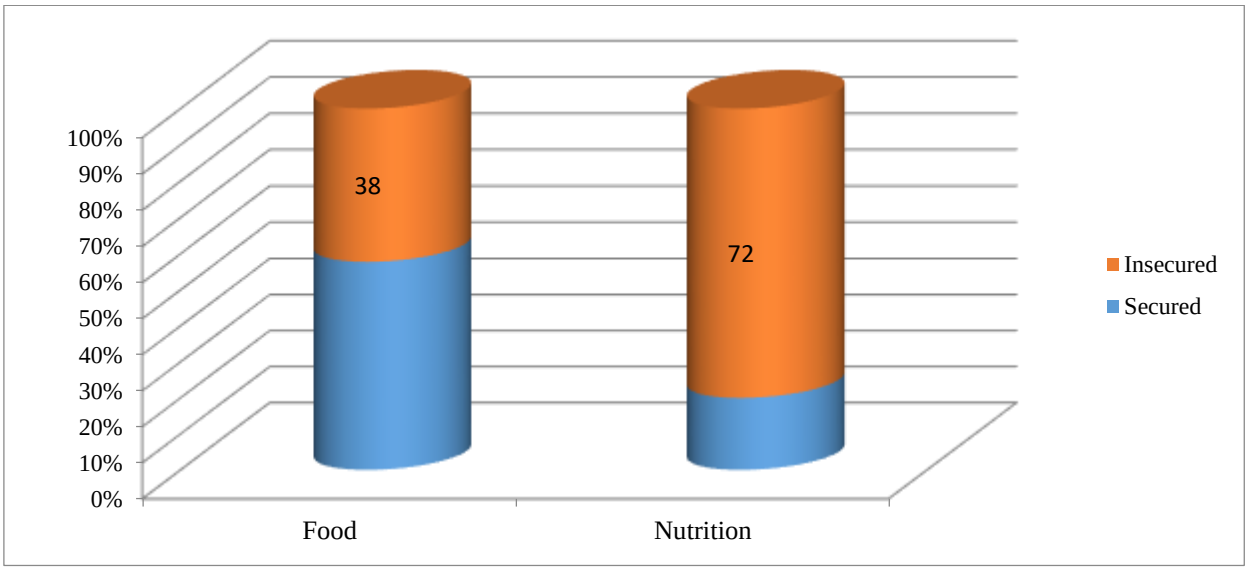

Fig. 3: Showing food and nutrition security of population living in undocumented land

From the calculation of BMI, 33 respondents were found to be overweight followed by 7 underweight might be the effect of food insecurity. Velasquez-Melendez *et al.* (2011) reported significant effect of food insecurity on obesity in Brazilian women. Even most of those populations are not able to fulfil their basal metabolic need and cannot afford for food sources. Findings of Regmi (2016) revealed that 19% population of Nepal comes under food inadequate status while 13% are undernourished. The prevalence rate is decreasing from decade. However, the rate is quiet high in case of marginalised population. Study of IPC (2014) suggests that 54% population falls under Chronic Food Insecurity. Even with significant development efforts, Nepal is a highly food insecure country as it is estimated that about 38 percent of the country's population have energy deficiency (NPC and CBS, 2013). Similarly, Prevalence of low kilocalorie intake at district level ranges from 18.2% (Jhapa) to 53.2% (Humla), with a standard deviation of 7.2% as indicated in findings of small area estimation of food insecurity and under- nutrition in Nepal (Haslett *et al.*, 2014). WFP and UNICEF (2015) reported 45% of households in the Kamroja region of Uganda are currently food insecure (moderately or severely), with poor performance on key food security indicators.

The most food insecure ethnic group were *Janajatis* (34.21%) followed by *Dalits* and *Brahmins* (15.78%). Similarly, 79.99% (36.66% male, 43.33% female)

respondents were under-nutrition and 20.01% (5.56% male and 14.45% female) were nutritionally secured based on net calories they obtained from their daily meal (24-hour recall basis). 57.77% households that were not found involved in production activity and also food insufficient. This implies that most of the households involved in agricultural production and animal husbandry are food sufficient. Various natural calamities were also the reason behind being landless in case of some households and they reportedly migrated from elsewhere. Still, peoples are involved in foraging (40%) and traditional farming activities with low output. This most likely reflects lack of infrastructures in marginalised areas but also variations in income, lack of investment can be foremost cause for low output (FAO, 2016).

Most of the population in semi-rural area are involved in local alcohol production. It depends basically on ethnic community.

From the direct interview following main reasons for food insecurity were enlisted as.

i. No land access for crop cultivation in case of respondents
ii. Poor natural resource management along with high pre and post-harvest loss
iii. Daily loss of food and misused as various ethnic community are involved in alcohol preparation.
iv. Lack of proper consumption habit; 33 out 90 reported use of river water followed by government tap and well.
v. Dependent on similar food pattern daily.
vi. Weak sanitation (reported 46 out of 90) and weak hygiene (reported 49 out of 90)
vii. High disaster frequency like wild animals attack followed by flood.
viii. Weak and unstable government, frequent strikes extremely ruin the condition of off farm labour.

Conclusions

The main cause of food insecurity was lack of access at the household level because of weak purchasing power and insufficient household production. Still, peoples living in periphery of metropolitan city are facing insecurity signifies the sad scenario of human development. Most of the districts of Nepal have such type of population who are living in undocumented land as marginalised community predominantly in river basins, harsh terrains and nearby forest areas. Addressing agricultural production, trainings, women empowerment, nutrition awareness, climate change monitoring, livelihoods strengthening and disaster preparedness to ensure access to food by all population groups is urgent need even in urban areas like Chitwan. Dependence on food import, shying from production activities, traditional food sources has to be addressed for Nepal's struggle against food insecurity.

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