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Research Article

COMPARATIVE SOCIO-ECONOMIC ANALYSIS OF PROBLEMS OF FOOD SECURITY BETWEEN RURAL AND URBAN AREAS IN DIMAPUR DISTRICT OF NAGALAND STATE OF INDIA

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Abstract- Food security essentially means that all people at all times have access to safe and nutritious food to maintain health and active life. Adequate food in terms of quantity and quality for all the people is a prerequisite condition for a sustainable growth of a nation. Lack of food leads to hunger and starvation and may even become the cause of death. There is positive relationship between food and health of an individual and for that adequate food is a necessity towards maintaining a decent living

Keywords- Food security, Socio-economic Analysis

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Introduction

India is the second fastest growing economies in the world, almost half of the Indian children are stunted and nearly 40 per cent are underweight; one-third of the Indian women are also underweight. No comprehensive study has yet been carried out at the micro level on socio-economic analysis of food security problems in Nagaland. Very little is known about the extent, problems and major factors affecting food security in Nagaland. The problem of food insecurity is embedded into the life and livelihood of the people. Therefore, it becomes necessary to unveil the nature and extent of food insecurity of Nagaland to eradicate poverty in the state to achieve our national goal as well as the goal of the state. The present study is an attempt to unearth the ground realities of Nagaland with respect to its chronic problem of food insecurity which poses a perennial constraint to the overall development of the state and provides some policy prescriptions to overcome this problem [1-10].

Material and Methods

Objective of the study

The study is based on the following specific objectives:

1. To assess the problems of food security in rural and urban areas separately.
2. To examine the extent of food expenditure in rural and urban areas separately.
3. To compare the actual availability of food constituents with recommended doses.

Selection of villages and wards

In Dimapur District, for the rural area, villages from Dhansiripar Sub-division have been selected. There are 25 villages under Dhansiripar sub-division, out of which Urra village have been selected as the nuclear village. Two adjoining villages, namely, Singrijan and Bade villages have been selected to form a cluster of 3 villages. For the purpose of comparison with the urban area, wards (Municipal Constituencies) from Dimapur sub-division have been selected. There are 23 wards (Municipal Constituencies) under Dimapur District, out of which ward no. 5 have been selected as the nuclear ward and the two adjoining wards namely ward no. 4 and 6 have been selected to form a cluster of 3 wards (Municipal Constituencies) [11-15].

Selection of sample households

In Dimapur District, for the sake of operational simplicity, one urban cluster comprising of three wards and another rural cluster comprising of three villages have been selected purposively. Then from each cluster, both rural and urban area, a list of total households has been prepared. A total of fifty (50) sample households from each of the rural and urban cluster have been selected by the process of simple random sampling without replacement. Therefore, we have altogether one hundred (100) sample households from Dimapur District having fifty (50) rural households and fifty (50) urban households [16-20].

Collection of data

The primary data have been collected following the Survey Method. At first, a primary schedule has been prepared on the basis of existing literature concerned and a pilot survey of 30 respondents has been made randomly by personally interrogating members of the sample areas in order to examine the module of the schedule. The interview schedules have been prepared covering different aspects of the study. On the basis of primary investigation, addition and alteration have been made in primary schedule, and in this way preparation of schedule has been finalised. Collection of primary data has been made by personally interviewing and interrogating the head of the sample households by visiting door to door strictly with the help of pre-tested survey schedule in the study area. Every effort has been made to detect inconsistencies and gaps, and to elicit correct information by careful probing [21-30].

Tabular analysis

For the present study, the data collected have been compiled and tabulated using simple tabular analysis. This technique of analysis is deemed to be a greater utility

and is intensively used for its inherent quality of purporting the true picture of the study area in the simplest form. Graphical representation has been also presented in the study.

Calculation of calorie, protein and fat intake

The quantities of food recorded as consumed by the sample households have been converted into the equivalent amounts of calorie, protein and fat on the basis of Nutrition Chart largely based on an ICMR publication, which gives the calorie, protein and fat contents of different foods in the Indian diet (Annexure-III). Estimates of calorie intake in the present study have been given in terms of 'per consumer unit'. Expressing calorie intake per consumer unit is aimed at adjusting for difference in calorie requirements among persons on account of age and sex differences, and thereby obtaining a sharper indicator of adequacy of intake than the per capita figures. [Table-1] represents calorie, protein and fat contents of some important food items considered in the study [31-40].

Table-1 *Calorie, Protein and Fat Contents of Some Important Food Items Considered in the Study*

Item code	Item	Unit	Calories per unit (Kcal)	Protein per unit (gm)	Fat per unit (gm)
(1)	(2)	(3)	(4)	(5)	(6)
1	Rice – other sources	kg	3460	75	5
2	Wheat/atta– other sources	kg	3410	121	17
3	Maida	kg	3480	110	9
4	Moong	kg	3480	245	12
5	Masur	kg	3430	251	7
6	Urd	kg	3470	240	14
8	Milk: condensed/ powder	kg	4960	258	267
9	Sugar: other sources	kg	3980	1	0
10	Edible oil: others	kg	9000	-	1000
11	Eggs	no.	100	8	8
12	Fish, prawn	kg	1050	140	20
13	Beef/ buffalo meat	kg	1140	226	26
14	Pork	kg	1140	187	44
15	Chicken	kg	1090	259	6
16	Potato	kg	970	16	1
17	Onion	kg	550	15	1
18	Cauliflower	kg	300	26	4
19	Cabbage	kg	270	18	1
20	Brinjal	kg	240	14	3
21	Lady's finger	kg	350	19	2
22	Palak/other leafy vegetables	kg	260	20	7
23	Tomato	kg	200	9	2
24	Peas	kg	930	72	1
25	Chillis: green	kg	290	29	6
26	Guava	kg	510	9	3
27	Orange, mausami	no.	50	1	1
28	Mango	kg	740	6	4
29	Pears (naspati)	kg	520	6	2
30	Apple	kg	590	2	5
31	Grapes	kg	710	5	3
32	Garlic	gm	1.45	0.06	0
33	Ginger	gm	0.67	0.02	0.01
34	Turmeric	gm	3.49	0.06	0.05
35	Black pepper	gm	3.04	0.11	0.07
36	Dry chillies	gm	2.46	0.16	0.06

Calculation of consumer unit

Consumer unit is an indicator of the energy requirement of persons with different sexes and ages. According to NSS Report No. 540, 20 to 39 years old male person is considered as 1 consumer unit, where as the female consumer unit is 0.71. [Table-2] represents number of consumer unit assigned to a person.

Results and Discussions

The [Table-4] exhibits the area-wise and food item-wise annual per consumer unit consumption of food of the sample households in Dimapur District. The table reveals that among the various food items, the percentage share of quantity of food consumed per consumer unit is the highest for cereals for both rural and urban sample households accounting for 73.45 per cent and 60.83 per cent respectively. For rural sample households, cereals are followed by vegetables (10.84 per cent), meat (2.98 per cent), sugar (2.89 per cent), pulses (2.13 per cent), fish (1.88 per cent) and spices (1.52 per cent). While, for urban the sample households, cereals are followed by vegetables (13.49 per cent), meat (4.61 per cent), sugar (4.35 per cent), pulses (3.76 per cent), fish (2.88 per cent) and spices (3.29 per cent). The eggs consumed per consumer unit are 46.23 nos. for rural sample households and 65.83 nos. for urban sample households. Tea, fruits and milk represents a lower percentage of the total quantity of food consumed. The consumption pattern shows that cereals constitute the highest percentage of food quantity consumed by both rural and urban sample households. The table reveals that the percentage share of food quantity consumed is higher for urban sample households with respect to those in rural areas for all the food items except cereals [41-50]. Per consumer unit consumption of cereals is higher in rural areas with respect to those in urban areas.

Table-2 *Number of Consumer Unit Assigned to a Person*

Age in completed years	Consumer unit	
	Male	Female
Below 1	0.43	0.43
1-3 yrs	0.54	0.54
4-6 yrs	0.72	0.72
7-9 yrs	0.87	0.87
10-12 yrs	1.03	0.93
13-15 yrs	0.97	0.8
16-19 yrs	1.02	0.75
20-39 yrs	1	0.71
40-49 yrs	0.95	0.68
50-59 yrs	0.9	0.64
60-69 yrs	0.8	0.51
Above 70	0.7	0.5

Source: NSS Report No. 540: Nutritional intake in India

Table-3 *Area-wise Difference between Recommended Doses and Present Intakes of Calorie, Protein and Fat Per Day Per Consumer Unit of the Sample Households in Dimapur District (units/day/CU) (2011-12)*

Groups	Energy (kcal)	Protein (gm)	Fat (gm)
Recommended	**2425**	**60**	**20**
Rural			
Group-1	1880.89	47.13	11.94
Group-2	2022.72	50.36	14.98
Group-3	2074.03	51.79	15.83
Group-4	2468.82	67.22	20.03
Overall	2101.95	53.44	15.81
Urban			
Group-1	2111.03	56.92	19.95
Group-2	2369.18	64.69	31.47
Group-3	2655.63	71.11	40.10
Group-4	2998.24	86.79	52.48
Overall	2342.52	63.77	29.43

The [Table-5] depicts the area-wise and item-wise annual per consumer unit expenditure on food and non-food items of the sample households in Dimapur District. The overall annual per consumer unit food expenditure in the study area is Rs. 8,609.16 (63.02 per cent) for rural sample households and Rs. 13,264.56 (49.45 per cent) for urban sample households. Among the food items, cereals and meat constitute the major portion of food consumption for both rural and urban sample households. Cereals constitute for 33.05 per cent for rural sample households and 16.17 per cent for urban sample households. Meat constitutes for 6.44 per cent for rural and 7.08 per cent for urban sample households. The overall annual per consumer unit on non-food expenditure is Rs. 5,051.76 (36.98 per cent) for rural sample households and Rs. 13,560.36 (50.55 per cent) for urban sample households. The percentage share of expenditure pattern of non-food items for urban sample households is found to be the highest for education (9.07 per cent), followed by electricity (8.28 per cent) and clothing (7.47 per cent). For rural sample households, among the non-food items, the percentage share is the

highest for electricity (7.19 per cent), followed by clothing and education (6.77 per cent each). The percentage share of overall annual per consumer unit of food and non-food expenditure for all items is found to be higher for urban sample households with respect to rural ones except for rice and kerosene. The overall grand total expenditure for rural and urban sample households is Rs. 13,660.91 and Rs. 26,824.92 respectively. It is higher for urban sample households, due to the fact that they are in a better economic position having higher income so as to spend more. It is found that rural sample households spend more on food items with 63.02 per cent compared to non-food items (36.98 per cent), where as it is just the opposite for urban sample households [51-60].

Table-4 *Area-wise and Food Item-wise Annual per Consumer Unit Consumption of Food of the Sample Households in Dimapur District (Units/Annum) (2011-12)*

Food items	Group-1		Group-2		Group-3		Group-4		Overall	
	Rural (n=5)	Urban (n=19)	Rural (n=23)	Urban (n=24)	Rural (n=13)	Urban (n=5)	Rural (n=9)	Urban (n=2)	Rural (n=50)	Urban (n=50)
Cereals (kg)	167.37 (75.57)	167.09 (65.07)	177.33 (74.44)	178.63 (59.85)	180.21 (72.38)	196.31 (58.44)	212.92 (72.04)	208.24 (52.98)	183.47 (73.45)	178.11 (60.83)
Pulses (kg)	4.79 (2.16)	9.88 (3.85)	5.14 (2.16)	11.02 (3.69)	5.21 (2.09)	10.30 (3.07)	6.30 (2.13)	20.82 (5.30)	5.33 (2.13)	11.00 (3.76)
Edible oil (ltr)	2.74 (1.24)	4.76 (1.85)	3.38 (1.42)	7.22 (2.42)	3.47 (1.39)	9.27 (2.76)	4.33 (1.46)	13.02 (3.31)	3.51 (1.41)	6.88 (2.35)
Spices (gm)	2.74 (1.24)	7.59 (2.96)	3.70 (1.55)	9.97 (3.34)	3.97 (1.59)	11.34 (3.37)	4.33 (1.46)	16.92 (4.30)	3.79 (1.52)	9.63 (3.29)
Tea (kg)	2.05 (0.93)	3.35 (1.30)	1.85 (0.78)	3.94 (1.32)	2.23 (0.90)	4.64 (1.38)	2.76 (0.93)	5.21 (1.32)	2.14 (0.86)	3.88 (1.33)
Sugar (kg)	6.16 (2.78)	12.88 (5.02)	6.59 (2.76)	12.21 (4.09)	7.44 (2.98)	14.94 (4.45)	9.05 (3.06)	11.71 (2.98)	7.23 (2.89)	12.75 (4.35)
Milk (kg)	1.37 (0.62)	2.87 (1.12)	1.65 (0.69)	3.67 (1.23)	2.08 (0.84)	4.64 (1.38)	2.76 (0.93)	6.51 (1.66)	1.94 (0.78)	3.64 (1.24)
Fish (kg)	3.42 (1.55)	6.00 (2.34)	4.02 (1.69)	9.19 (3.08)	4.71 (1.89)	9.79 (2.91)	7.08 (2.40)	15.62 (3.97)	4.70 (1.88)	8.44 (2.88)
Meat (kg)	6.85 (3.09)	9.88 (3.85)	7.23 (3.03)	14.96 (5.01)	7.19 (2.89)	16.49 (4.91)	8.66 (2.93)	18.22 (4.63)	7.44 (2.98)	13.50 (4.61)
Vegetables (kg)	21.92 (9.90)	28.76 (11.20)	24.28 (10.19)	41.87 (14.03)	29.25 (11.75)	51.52 (15.34)	33.45 (11.32)	65.08 (16.56)	27.08 (10.84)	39.51 (13.49)
Fruits (kg)	2.05 (0.93)	3.71 (1.44)	3.05 (1.28)	5.77 (1.94)	3.22 (1.30)	6.70 (2.00)	3.94 (1.33)	11.71 (2.98)	3.16 (1.26)	5.44 (1.86)
Total	221.48 (100)	256.77 (100)	238.22 (100)	298.46 (100)	248.97 (100)	335.94 (100)	295.57 (100)	393.06 (100)	249.77 (100)	292.78 (100)
Egg (no.)	40.41	46.76	43.89	70.87	46.60	84.50	54.71	109.33	46.23	65.83

Figures in parentheses indicate the percentages to the total
n= No. of sample households

Table-5a- *Area-wise and Item-wise Annual per Consumer Unit Expenditure for Food and Non-food Items of the Sample Households in Dimapur District (Rs./Annum) (2011-12)*

Food items	Group-1		Group-2		Group-3		Group-4		Overall	
	Rural (n=5)	Urban (n=19)	Rural (n=23)	Urban (n=24)	Rural (n=13)	Urban (n=5)	Rural (n=9)	Urban (n=2)	Rural (n=50)	Urban (n=50)
Cereals	3,941.16	4,079.04	4,390.72	4,358.16	4,450.92	4,741.80	5,251.44	5,023.92	4,515.60	4,338.60
	(41.10)	(18.95)	(38.12)	(16.01)	(29.40)	(13.42)	(27.79)	(11.88)	(33.05)	(16.17)
Pulses	311.64	619.32	329.28	712.44	330.48	1381.20	409.32	1311.60	342.00	789.36
	(3.25)	(2.88)	(2.86)	(2.62)	(2.18)	(3.91)	(2.17)	(3.10)	(2.50)	(2.94)
Edible oil	239.76	467.52	329.64	794.04	334.68	1,004.76	432.96	1,302.00	340.20	728.28
	(2.50)	(2.17)	(2.86)	(2.92)	(2.21)	(2.84)	(2.29)	(3.08)	(2.49)	(2.71)
Spices	41.04	113.76	55.44	144.00	59.40	177.72	72.00	253.80	57.84	142.56
	(0.43)	(0.53)	(0.48)	(0.53)	(0.39)	(0.50)	(0.38)	(0.60)	(0.42)	(0.53)
Tea	256.80	555.12	276.84	627.60	316.08	700.68	390.84	832.92	306.24	620.64
	(2.68)	(2.58)	(2.40)	(2.31)	(2.09)	(1.98)	(2.07)	(1.97)	(2.24)	(2.31)
Sugar	246.60	571.68	263.64	561.12	297.48	672.36	362.04	528.00	289.08	576.72
	(2.57)	(2.66)	(2.29)	(2.06)	(1.97)	(1.90)	(1.92)	(1.25)	(2.12)	(2.15)
Milk	324.00	860.16	444.48	974.52	560.16	1,313.88	690.72	1,952.28	508.80	1,022.16
	(3.38)	(4.00)	(3.86)	(3.58)	(3.70)	(3.72)	(3.66)	(4.62)	(3.72)	(3.81)
Fish	342.48	695.16	393.84	1,081.44	471.00	1,176.00	708.48	1,874.40	466.56	993.96
	(3.57)	(3.23)	(3.42)	(3.97)	(3.11)	(3.33)	(3.75)	(4.43)	(3.42)	(3.71)
Meat	780.84	1,383.60	858.48	2,110.44	847.80	2,308.32	1,039.08	2,550.96	879.72	1,898.04
	(8.14)	(6.43)	(7.45)	(7.75)	(5.60)	(6.53)	(5.50)	(6.03)	(6.44)	(7.08)
Egg	161.64	250.56	175.56	381.96	186.36	530.64	218.88	819.96	184.92	374.52
	(1.69)	(1.16)	(1.52)	(1.40)	(1.23)	(1.50)	(1.16)	(1.94)	(1.35)	(1.40)
Vegetables	328.68	720.00	364.08	1,046.76	438.72	1,287.60	501.84	1,627.20	406.08	987.72
	(3.43)	(3.34)	(3.16)	(3.84)	(2.90)	(3.64)	(2.66)	(3.85)	(2.97)	(3.68)
Fruits	205.44	555.84	305.40	813.72	322.20	1,756.80	373.80	1,756.80	312.12	792.00
	(2.14)	(2.58)	(2.65)	(2.99)	(2.13)	(4.97)	(1.98)	(4.15)	(2.28)	(2.95)
Total	7,180.08	10,871.76	8,189.40	13,606.20	8,615.28	17,051.76	10,451.40	19,833.84	8,609.16	13,264.56
	(74.88)	(50.49)	(71.09)	(49.98)	(56.91)	(48.26)	(55.31)	(46.90)	(63.02)	(49.45)

Among the various size groups, for rural sample households, the overall grand total expenditure is the highest in Group-4 (Rs. 18,897.00), followed by Group-3 (Rs. 15,137.40), Group-2 (Rs. 11,519.64) and Group-1 (Rs. 9,588.24). For urban sample households, it is found to be the highest in Group-4 (Rs. 42,292.00),

followed by Group-3 (Rs. 35,333.40), Group-2 (Rs. 27,224.04) and Group-1 (Rs. 21,530.88).

The [Table-6] presents the area-wise and food item-wise calorie intake of the sample households per day per consumer unit in Dimapur District. The table reveals that for rural sample households, cereals provide the highest energy (kcal/day/CU) to the sample respondents (1,763.01), followed by edible oil (85.05), sugar (79.88), pulses (50.12), vegetables (42.71), milk (26.10), meat (22.72), fish (13.60), egg (12.84), fruits (5.74), tea (0.15) and spices (0.03). The corresponding percentage share of these food items are in the order of 83.87, 4.04, 3.80, 2.38, 2.03, 1.24, 1.08, 0.64, 0.61, 0.27 and 0.01 respectively. Similar pattern of contribution of energy intake from different food items is also observed for urban sample households.

Table-5b- *Area-wise and Item-wise Annual per Consumer Unit Expenditure for Food and Non-food Items of the Sample Households in Dimapur District (Rs./Annum) (2011-12)*

Non-food items	Group-1		Group-2		Group-3		Group-4		Overall	
	Rural (n=5)	Urban (n=19)	Rural (n=23)	Urban (n=24)	Rural (n=13)	Urban (n=5)	Rural (n=9)	Urban (n=2)	Rural (n=50)	Urban (n=50)
Kerosene	30.84 (0.32)	13.20 (0.06)	24.12 (0.21)	13.68 (0.05)	22.20 (0.15)	24.00 (0.07)	17.64 (0.09)	19.44 (0.05)	24.00 (0.18)	15.00 (0.06)
Fuel	698.64 (7.29)	1,178.64 (5.47)	752.40 (6.53)	1,843.20 (6.77)	907.20 (5.99)	2,102.40 (5.95)	1,109.88 (5.87)	2,655.60 (6.28)	854.40 (6.26)	1,677.60 (6.25)
Electricity	432.00 (4.51)	2,041.20 (9.48)	709.80 (6.16)	2,244.00 (8.24)	1,184.88 (7.83)	2,396.40 (6.78)	1,641.60 (8.69)	2,863.20 (6.77)	981.72 (7.19)	2,220.00 (8.28)
Clothing	137.04 (1.43)	1,014.60 (4.71)	519.24 (4.51)	2,414.40 (8.87)	1,214.40 (8.02)	2,731.20 (7.73)	1,909.20 (10.10)	3,384.00 (8.00)	924.60 (6.77)	2,004.00 (7.47)
Medicine	61.68 (0.64)	522.24 (2.43)	117.36 (1.02)	864.96 (3.18)	126.72 (0.84)	978.96 (2.77)	220.44 (1.17)	1,431.60 (3.39)	132.60 (0.97)	784.56 (2.92)
Ceremonial expenses	75.36 (0.79)	580.56 (2.70)	132.00 (1.15)	597.12 (2.19)	427.56 (2.82)	927.48 (2.62)	558.84 (2.96)	1041.24 (2.46)	285.48 (2.09)	652.68 (2.43)
Education	342.48 (3.57)	1,940.40 (9.01)	384.00 (3.33)	1,994.40 (7.33)	1,760.40 (11.63)	4,225.20 (11.96)	1,260.00 (6.67)	5,857.20 (13.85)	924.96 (6.77)	2,432.40 (9.07)
Others	630.12 (6.57)	3,368.28 (15.64)	691.32 (6.00)	3,646.08 (13.39)	878.76 (5.81)	4,896.00 (13.86)	1,728.00 (9.14)	5,206.08 (12.31)	924.00 (6.76)	3,774.12 (14.07)
Total	2,408.16 (25.12)	10,659.12 (49.51)	3,330.24 (28.91)	13,617.84 (50.02)	6,522.12 (43.09)	18,281.64 (51.74)	8,445.60 (44.69)	22,458.36 (53.10)	5,051.76 (36.98)	13,560.36 (50.55)
Grand total	9,588.24 (100)	21,530.88 (100)	11,519.64 (100)	27,224.04 (100)	15,137.40 (100)	35,333.40 (100)	18,897.00 (100)	42,292.20 (100)	13,660.92 (100)	26,824.92 (100)

Figures in parentheses indicate the percentages to the total; n= No. of sample househol

Table-6 *Area-wise and Food Item-wise Calorie Intake per Day per Consumer Unit of the Sample Households in Dimapur District (kcal/day/CU) (2011-12)*

Food items	Group-1		Group-2		Group-3		Group-4		Overall	
	Rural (n=5)	Urban (n=19)	Rural (n=23)	Urban (n=24)	Rural (n=13)	Urban (n=5)	Rural (n=9)	Urban (n=2)	Rural (n=50)	Urban (n=50)
Cereals	1,608.56 (85.51)	1,605.33 (76.04)	1,704.11 (84.23)	1,716.23 (72.44)	1,731.63 (8.34)	1,886 (71.00)	2,046.07 (82.87)	2,000.35 (66.72)	1,763.01 (83.87)	1,711.14 (73.03)
Pulses	45.68 (2.42)	93.54 (4.43)	48.31 (2.38)	104.79 (4.42)	48.41 (2.33)	98.54 (3.71)	60.00 (2.43)	193.38 (6.45)	50.12 (2.38)	104.3 (4.45)
Edible oil	60.00 (3.18)	116.89 (5.53)	82.50 (4.07)	193.59 (8.17)	83.60 (4.03)	251.18 (9.45)	108.23 (4.38)	325.37 (10.85)	85.05 (4.04)	179.73 (7.67)
Spices	0.02 (0.001)	0.07 (0.003)	0.03 (0.001)	0.09 (0.004)	0.03 (0.001)	0.11 (0.004)	0.04 (0.002)	0.16 (0.005)	0.03 (0.001)	0.09 (0.004)
Tea	0.12 (0.01)	0.25 (0.01)	0.13 (0.01)	0.29 (0.01)	0.15 (0.01)	0.32 (0.01)	0.19 (0.01)	0.39 (0.01)	0.15 (0.01)	0.28 (0.01)
Sugar	68.15 (3.62)	142.40 (6.74)	73.00 (3.60)	135.00 (5.69)	82.21 (3.96)	165.19 (6.21)	100.07 (4.05)	129.50 (4.31)	79.88 (3.80)	141.00 (6.01)
Milk	18.00 (0.95)	39.50 (1.87)	22.71 (1.12)	50.18 (2.11)	28.58 (1.37)	60.34 (2.27)	35.24 (1.42)	89.66 (2.99)	26.10 (1.24)	49.52 (2.11)
Fish	10.00 (0.53)	17.24 (0.81)	11.50 (0.56)	26.79 (1.13)	13.73 (0.66)	28.55 (1.07)	20.66 (0.83)	45.55 (1.51)	13.60 (0.64)	24.52 (1.04)
Meat	21.30 (1.13)	30.11 (1.42)	22.22 (1.09)	47.01 (1.98)	22.09 (1.06)	52.21 (1.96)	25.84 (1.04)	57.70 (1.92)	22.72 (1.08)	42.17 (1.79)
Egg	11.22 (0.59)	14.00 (0.66)	12.20 (0.60)	21.21 (0.89)	13.00 (0.62)	29.48 (1.10)	15.19 (0.61)	45.55 (1.51)	12.84 (0.61)	20.8 (0.88)
Vegetables	33.84 (1.79)	44.83 (2.12)	40.43 (1.99)	61.00 (2.57)	44.75 (2.15)	71.23 (2.68)	50.27 (2.03)	88.63 (2.95)	42.71 (2.03)	57.82 (2.46)
Fruits	4.00 (0.21)	6.87 (0.32)	5.58 (0.27)	13.00 (0.54)	5.85 (0.28)	12.48 (0.46)	7.02 (0.28)	22.00 (0.73)	5.74 (0.27)	11.15 (0.47)
Total	1,880.89 (100)	2,111.03 (100)	2,022.72 (100)	2,369.18 (100)	2,074.03 (100)	2,655.63 (100)	2,468.82 (100)	2,998.24 (100)	2,101.95 (100)	2,342.52 (100)

Figures in parentheses indicate the percentages to the total; n= No. of sample households

The total energy derived from the consumption of all food items is higher for urban households (2,342.52 kcal/day/CU) as compared to those for rural households (2,101.95 kcal/ day/CU). The overall total calorie intake for rural households is the highest in Group-4 (2,468.82) and the lowest in Group-1 (1,880.89). For urban households, total calorie intake is the highest in Group-4 (2,998.24) and the lowest in Group-1 (2,111.03). The percentage of calorie intake among the food items is the highest for cereals (83.87 per cent) for rural households and it is 73.03 per cent for urban households. There is a positive correspondence between size

group and total calorie intake both in rural and urban areas.

The [Table-7] presents the area-wise and food item-wise protein intake of the sample households per day per consumer unit in Dimapur District. The table reveals that for rural sample respondents, cereals provide the highest protein intake to the sample households (39.03 gm/day/CU), followed by meat (5.23), pulses (3.66), fish (1.81), milk (1.36), vegetables (1.26), egg (1.03), fruits (0.04) and sugar (0.02). For urban households, cereals also provide the highest protein intake to the sample households (38.94), followed by meat (7.86), pulses (7.49), fish (3.27), milk (2.58), vegetables (1.86), egg (1.66), fruits (0.07) and sugar (0.03).

Table-7 *Area-wise and Food Item-wise Protein Intake per Day per Consumer Unit of the Sample Households in Dimapur District (gm/day/CU) (2011-12)*

Food items	Group-1		Group-2		Group-3		Group-4		Overall	
	Rural (n=5)	Urban (n=19)	Rural (n=23)	Urban (n=24)	Rural (n=13)	Urban (n=5)	Rural (n=9)	Urban (n=2)	Rural (n=50)	Urban (n=50)
Cereals	35.46 (75.24)	36.38 (63.91)	37.60 (74.66)	38.94 (60.19)	38.44 (74.22)	43.53 (61.22)	45.51 (67.70)	46.31 (53.35)	39.03 (73.03)	38.94 (61.06)
Pulses	3.34 (7.09)	6.80 (11.95)	3.52 (7.00)	7.49 (11.58)	3.53 (6.82)	7.14 (10.04)	4.38 (6.52)	13.49 (15.54)	3.66 (6.85)	7.49 (11.74)
Sugar	0.02 (0.04)	0.04 (0.07)	0.02 (0.04)	0.03 (0.05)	0.02 (0.04)	0.04 (0.06)	0.03 (0.04)	0.03 (0.03)	0.02 (0.04)	0.03 (0.05)
Milk	0.93 (1.97)	2.05 (3.60)	1.18 (2.34)	2.61 (4.03)	1.49 (2.87)	3.14 (4.42)	1.83 (2.72)	4.66 (5.36)	1.36 (2.54)	2.58 (4.04)
Fish	1.33 (2.82)	2.30 (4.04)	1.53 (3.04)	3.57 (5.52)	1.83 (3.53)	3.81 (5.35)	2.76 (4.11)	6.07 (6.99)	1.81 (3.39)	3.27 (5.13)
Meat	4.11 (8.72)	6.83 (11.99)	4.38 (8.69)	8.30 (12.83)	4.01 (7.74)	8.56 (12.04)	9.92 (14.75)	9.46 (10.90)	5.23 (9.79)	7.86 (12.33)
Egg	0.90 (1.91)	1.11 (1.95)	0.97 (1.93)	1.70 (2.63)	1.04 (2.01)	2.36 (3.32)	1.22 (1.81)	3.64 (4.20)	1.03 (1.92)	1.66 (2.60)
Vegetables	1.01 (2.14)	1.36 (2.39)	1.12 (2.22)	1.96 (3.03)	1.39 (2.68)	2.44 (3.43)	1.54 (2.29)	2.96 (3.41)	1.26 (2.36)	1.86 (2.92)
Fruits	0.03 (0.06)	0.05 (0.08)	0.04 (0.07)	0.08 (0.12)	0.04 (0.07)	0.08 (0.11)	0.04 (0.06)	0.14 (0.61)	0.04 (0.07)	0.07 (0.11)
Total	47.13 (100)	56.92 (100)	50.36 (100)	64.69 (100)	51.79 (100)	71.11 (100)	67.22 (100)	86.79 (100)	53.44 (100)	63.77 (100)

Figures in parentheses indicate the percentages to the total
n= No. of sample households

The overall total protein nutrient derived from the consumption of all food items is higher for urban households (63.77 gm/day/CU) as compared to those for rural households (53.44 gm/day/CU). The overall total protein intake for rural households is the highest in Group-4 (67.22) and the lowest in Group-1 (47.13). For urban households, overall total protein intake is the highest in Group-4 (86.79) and the lowest in Group-1 (56.92). The percentage of protein intake among the food items is the highest for cereals (73.03 per cent) for rural households and it is 61.06 per cent for urban households. There is a positive correspondence between size group and total protein intake both in rural and urban areas in a broader sense.

The [Table-8] presents the area-wise and food item-wise fat intake of the sample households per day per consumer unit in Dimapur District. The table reveals that for rural sample households, edible oil (9.45 gm/day/CU) provides the highest amount of fat to the sample households, followed by cereals (2.71), milk (1.41), egg (1.03), meat (0.64), fish (0.26), vegetables (0.17), pulses (0.11) and fruits (0.04). Similar pattern of contribution from different food items is also observed for urban households.

Table-8 *Area-wise and Food Item-wise Fat Intake per Day per Consumer Unit of the Sample Households in Dimapur District (gm/day/CU) (2011-12)*

Food items	Group-1		Group-2		Group-3		Group-4		Overall	
	Rural (n=5)	Urban (n=19)	Rural (n=23)	Urban (n=24)	Rural (n=13)	Urban (n=5)	Rural (n=9)	Urban (n=2)	Rural (n=50)	Urban (n=50)
Cereals	2.43	2.63	2.60	2.82	2.68	3.23	3.18	3.47	2.71	2.83
	(20.35)	(13.18)	(17.36)	(8.96)	(16.93)	(8.05)	(15.88)	(6.61)	(17.14)	(9.62)
Pulses	0.09	0.22	0.10	0.31	0.10	0.24	0.13	0.70	0.11	0.290
	(0.78)	(1.08)	(0.69)	(0.98)	(0.66)	(0.60)	(0.65)	(1.33)	(0.68)	(0.97)
Edible oil	6.66	12.99	9.16	21.51	9.30	28.00	12.00	36.15	9.45	19.97
	(55.77)	(65.11)	(61.11)	(68.35)	(58.72)	(69.83)	(59.91)	(68.88)	(59.78)	(67.86)
Milk	0.97	2.13	1.22	2.70	1.54	3.25	1.90	4.83	1.41	2.67
	(8.08)	(10.66)	(8.15)	(8.58)	(9.72)	(8.10)	(9.49)	(9.20)	(8.89)	(9.06)
Fish	0.19	0.33	0.22	0.51	0.26	0.54	0.39	0.87	0.26	0.47
	(1.59)	(1.64)	(1.46)	(1.62)	(1.66)	(1.35)	(1.95)	(1.65)	(1.64)	(1.59)
Meat	0.55	0.31	0.53	1.55	0.68	2.02	0.93	2.23	0.64	1.20
	(4.59)	(1.57)	(3.52)	(4.93)	(4.30)	(5.04)	(4.64)	(4.24)	(4.07)	(4.08)
Egg	0.90	1.11	0.98	1.70	1.04	2.36	1.22	3.64	1.03	1.66
	(7.52)	(5.58)	(6.51)	(5.39)	(6.54)	(5.89)	(6.09)	(6.94)	(6.50)	(5.65)
Vegetables	0.13	0.18	0.14	0.28	0.19	0.38	0.21	0.45	0.17	0.27
	(1.11)	(0.92)	(0.95)	(0.89)	(1.19)	(0.95)	(1.05)	(0.85)	(1.06)	(0.91)
Fruits	0.03	0.05	0.04	0.09	0.04	0.08	0.05	0.15	0.04	0.07
	(0.21)	(0.23)	(0.25)	(0.27)	(0.25)	(0.20)	(0.25)	(0.28)	(0.24)	(0.25)
Total	11.94	19.95	14.98	31.47	15.83	40.10	20.03	52.48	15.81	29.43
	(100)	(100)	(100)	(100)	(100)	(100)	(100)	(100)	(100)	(100)

Figures in parentheses indicate the percentages to the total
n= No. of sample households

Table-9 *Extent of Food Security among the Sample Households in Dimapur District w.r.t Core Food security Model*

Dimapur District										
Household category	Household classification	Rural				Urban				Overall
		a (0-2)	b (3-5)	c (6-10)	Sub-total	a (0-2)	b (3-5)	c (6-10)	Sub-total	
Tribe	Without children	5	3	2	10	3	2	1	6	16
		A (0-2)	B (3-7)	C (8-18)		A (0-2)	B (3-7)	C (8-18)		
	With children	4	6	5	15	9	7	3	19	34
Sub-total		9	9	7	25	12	9	4	25	50
Non-tribe		a (0-2)	b (3-5)	c (6-10)		a (0-2)	b (3-5)	c (6-10)		
	Without children	1	7	4	12	2	1	--	3	15
		A (0-2)	B (3-7)	C (8-18)		A (0-2)	B (3-7)	C (8-18)		
	With children	2	2	9	13	11	8	3	22	35
Sub-total		3	9	13	25	13	9	3	25	50
Overall total		12	18	20	50	25	18	7	50	100

The total fat nutrient derived from the consumption of all food items is higher for urban households (29.43 gm/day/CU) as compared to those in rural households (15.81 gm/day/ CU). The total fat intake for rural households is the highest in Group-4 (20.03), followed by Group-3 (15.83), Group-2 (14.98) and Group-1 (11.94). For urban households, total fat intake is the highest in Group-4 (52.48), followed by Group-3 (40.10), Group-2 (31.47) and Group-1 (19.95). The percentage of fat intake among the food items is the highest for edible oil (59.78 per cent) for rural households and it is 67.86 per cent for urban households

The [Table-3] presents the area-wise difference between recommended doses and present intakes of calorie, protein and fat per day per consumer unit for the sample households in Dimapur District. The present calorie intake (kcal/day/CU) by each of the sample size groups is compared with the Recommended Dietary Allowance of 2425 kcal/day/CU made by the Indian Council of Medical Research, ICMR and analysed as to where the position of calorie intake of the sample households stands. For rural sample households, the present calorie intake is 2101.95 kcal/day/CU which is lower than the recommended calorie intake, by making a difference of -323.05 kcal/day/CU. Amongst the various size groups, the present calorie intake is lower than the recommended calorie intake in all the size groups except in Group-4. For urban sample households, the present calorie intake (2342.52 kcal/day/CU) is lower than the recommended calorie intake. Amongst the various groups, the present calorie intake is found to be higher than the recommended calorie intake in Group-3 (2655.63) and Group-4 (2998.24).

The overall intake of protein in the study area is 53.44 gm/day/CU for rural households, which is lower than the RDA of 60 gm/day/CU. The total protein intake is the highest in Group-4 (67.22), followed by Group-3 (51.79), Group-2 (50.36) and Group-1 (47.13). For urban sample households, the overall protein intake is 63.77 gm/day/CU, which is higher than the RDA. The total protein intake is the highest in Group-4 (86.79), followed by Group-3 (71.11), Group-2 (64.69) and the lowest in Group-1 (56.92).

Similarly, the overall intake of fat in the study area is 15.81 gm/day/CU for rural households, which is lower than the RDA of 20 gm/day/CU. The total fat intake is the highest in Group-4 (20.03), followed by Group-3 (15.83), Group-2 (14.98) and Group-1 (11.94). For urban sample households, the overall fat intake is 29.43 gm/day/CU, which is higher than the RDA. The total fat intake is the highest in Group-4 (52.48), followed by Group-3 (40.10), Group-2 (31.47) and Group-1 (19.95). Hatai *et al*., (2006) also observed that the rate of nutritional standard was found to be increasing as the farm size/income level of the household increased [61-103].

Major findings of the study have been summarized below

[1] It is found that the percentage of annual per consumer unit consumption of food is higher for urban sample households for all the food items except cereals. Cereals accounts for highest quantity among the food items consumed. Rural sample households consume more cereals due to high price of non-food grains and higher energy requirement due to heavy manual work.

1. In rural areas, the percentage of annual per consumer unit expenditure is higher for food items, while it is reverse in urban areas.
2. The present overall calorie intake per day per consumer unit of Dimapur rural and urban sample households is found to be lower than the RDA. Amongst the various groups, the present calorie intake in rural area is lower than the RDA in all the size groups except in Group-4. Amongst the various groups, the present calorie intake in urban area is found to be higher than the recommended calorie intake in Group-3 and Group-4.
3. In Dimapur District, the calorie intake per day per CU for tribal sample household is higher than RDA in all size groups except in Group-1 and Group-2, while it is the reverse for non-tribal sample households. The overall kcal/day/CU is found to be lower for both tribal and non-tribal sample households.
4. The present overall intake of protein per day per CU is lower than the RDA for rural sample households and higher for urban sample households of Dimapur District. The total protein intake in rural and urban area is the highest in Group-4 and the lowest in Group-1.
5. Similarly, the overall intake of fat per day per CU in rural area is lower than the RDA while it is higher in case of urban area of Dimapur District. The fat intake across various size groups is the highest in Group-4 and the lowest in Group-1.
6. For the tribal sample households of Dimapur District, the protein and fat intake per day per CU increases as the size of holdings increases. The overall protein and fat intake per day per CU is found to be higher than RDA for tribal sample households but lower in case of non-tribal sample households.

Conclusion

It is observed that the urban sample households consume higher quantity of all the food items than their rural counterpart. Percentage of total intake of calorie is the highest from cereals for all household categories. Percentage of total intake of protein is the highest from cereals, followed by pulses, meat, fish, milk and vegetables.

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Abbreviations: RDA - Recommended Dietary Allowance

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