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Comparative socio-economic analysis of problems of food security between rural and urban areas in Kohima district of Nagaland state of India

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Abstract

Percentage of annual per consumer unit consumption of food is higher for urban sample households for all the food items except cereals in Kohima District. 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. In rural areas, the percentage of annual per consumer unit expenditure is higher for food items, while it is reverse in urban areas. This holds true for Kohima District. In Kohima District, the overall calorie intake per day per consumer unit derived from the consumption of all food items is higher for urban sample households as compared to rural sample households. Overall calorie intake per consumer unit derived from the consumption of all food items is found to be lower than the recommended RDA in all group sizes for both rural and urban sample households.

Keywords: Food security, rural, urban, Nagaland, Kohima, calorie, protein, fat, RDA

Introduction

Food is essential for leading a decent life. Adequate food in terms of quantity and quality for all the people is a prerequisite condition for a sustainable growth of a nation. When all the people have access to sufficient, safe and nutritious food at all times.

In recent years, there has been a shift in policy focus towards the household level food security and the per capita food energy intake is taken as a measure of food security. India is today a food self-sufficient country, on the basis of average per capita availability of food.

Food security essentially means that, all people at all times have access to safe and nutritious food to maintain health and active life. This definition implies three dimensions to food security, namely, availability (sufficient quantities of appropriate food for the concerned population should be physically available); access (households have sufficient purchasing power or other resources to obtain adequate and appropriate food) and utilization (food is properly used through appropriate food processing and storage practices for preserving its nutrient contents; sharing food within the household to provide adequate nutrient to each members of the household for maintain them productive. The present study is an endeavor to examine the extent of food insecurity among the people of Nagaland, a North-Eastern state of India. 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.

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.

Materials and Methods

Nagaland State has been purposively selected for conducting the study. Kohima District has

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also been purposively selected for conducting the study. In Kohima District, for the rural area, villages from Jakhama sub-division have been selected. There are 7 villages under Jakhama sub-division, out of which Kigwema village have been selected as the nuclear village. Two adjoining villages, namely, Phesama and Mima villages have been selected to form a cluster of 3 villages.

For the purpose of comparison, for the urban area, wards (Municipal Constituencies) from Kohima sub-division have been selected. There are 19 wards (Municipal Constituencies) under Kohima District, out of which ward no. 16 is selected as the nuclear ward and the two adjoining wards namely ward no. 17 and 19 had been selected to form a cluster of 3 wards.

Selection of sample households

In Kohima 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. Households have been classified into 'tribal' and 'non-tribal' groups. Twenty five (25) households from the 'tribal' group and twenty (25) households from the 'non-tribal' group with 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 Kohima District having fifty (50) rural households and fifty (50) urban households. In this way, one hundred (100) sample households have been selected from Kohima District.

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.

Tabular analysis

For the present study, the data collected have been compiled and tabulated using simple tabular analysis.

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 calorie, protein and fat intake: (Table.1)

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 (Gopalan *et al.*, 1991)^[15] 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 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

Calculation of consumer unit: (Table.2)

Consumer unit is a unit used as an indicator of the energy requirement of a group of persons of different sexes and ages. Taking the calorie requirement of an average male in the age group of 20-39 doing sedentary work as the norm, the average calorie requirements of male and female of other ages are expressed as a ratio to this norm.

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

Food items	Group-1		Group-2		Group-3		Group-4		Overall	
	Rural (n=25)	Urban (n=24)	Rural (n=16)	Urban (n=20)	Rural (n=7)	Urban (n=5)	Rural (n=2)	Urban (n=1)	Rural (n=50)	Urban(n=50)
Cereals (kg)	162.03 (79.58)	177.90 (61.63)	193.30 (75.41)	184.42 (58.07)	214.09 (74.33)	183.41 (59.53)	236.42 (70.94)	166.56 (61.54)	185.32 (76.41)	180.84 (59.84)
Pulses (kg)	4.73 (2.32)	12.95 (4.49)	6.94 (2.71)	15.33 (4.83)	7.02 (2.44)	10.62 (3.45)	7.95 (2.38)	11.36 (4.20)	6.03 (2.49)	13.62 (4.51)
Edible oil (ltr)	2.54 (1.25)	6.83 (2.36)	3.78 (1.48)	8.72 (2.75)	5.11 (1.77)	7.27 (2.36)	6.95 (2.09)	3.79 (1.40)	3.63 (1.49)	7.56 (2.50)
Spices (gm)	2.67 (1.31)	9.15 (3.17)	2.68 (1.05)	10.97 (3.45)	4.15 (1.44)	7.27 (2.36)	7.95 (2.38)	5.68 (2.09)	3.20 (1.32)	9.58 (3.17)
Tea (kg)	1.08 (0.53)	2.63 (0.91)	1.18 (0.46)	3.38 (1.06)	1.52 (0.53)	3.91 (1.27)	1.99 (0.60)	3.79 (1.40)	1.24 (0.51)	3.12 (1.03)
Sugar (kg)	3.88 (1.91)	11.68 (4.05)	7.25 (2.83)	12.02 (3.79)	7.34 (2.55)	12.30 (4.00)	9.93 (2.98)	11.36 (4.20)	5.92 (2.44)	11.88 (3.93)
Milk (kg)	1.04 (0.51)	3.62 (1.25)	1.86 (0.73)	3.76 (1.18)	2.23 (0.77)	3.36 (1.09)	3.48 (1.05)	3.79 (1.40)	1.65 (0.68)	3.65 (1.21)
Fish (kg)	2.73 (1.38)	8.23 (2.85)	6.70 (2.61)	9.32 (2.93)	7.34 (2.55)	11.18 (3.63)	3.97 (1.19)	3.79 (1.40)	4.91 (2.02)	8.86 (2.93)
Meat (kg)	5.21 (2.56)	6.76 (2.34)	6.94 (2.71)	15.78 (4.97)	6.70 (2.33)	12.86 (4.18)	7.95 (2.38)	15.14 (5.59)	6.19 (2.55)	11.45 (3.79)
Vegetables (kg)	16.48 (8.09)	44.76 (15.51)	23.33 (9.10)	49.30 (15.52)	29.03 (10.08)	48.65 (15.79)	39.74 (11.92)	35.96 (13.29)	22.15 (9.13)	46.78 (15.48)
Fruits (kg)	1.21 (0.59)	4.15 (1.44)	2.36 (0.92)	4.58 (1.44)	3.51 (1.22)	7.27 (2.36)	6.95 (2.09)	9.46 (3.50)	2.30 (0.95)	4.85 (1.60)
Total	203.60 (100)	288.66 (100)	256.33 (100)	317.59 (100)	288.04 (100)	308.11 (100)	333.28 (100)	270.66 (100)	242.54 (100)	302.21 (100)
Egg (no.)	31.63	74.31	46.04	88.53	44.67	86.11	41.72	79.50	39.23	81.68

Figures in parentheses indicate the percentages to the total

Results and Discussions

Table 3: Area-wise Frequency Distribution of the Sample Households According to Operational Size of Land Holdings in Kohima District (2011-12)

Groups	Size of holdings (Ha.)	Rural			Urban		
		Frequency	%	Average size (Ha.)	Frequency	%	Average size (Ha.)
Group-1	0 ha.	25	50	--	24	48	--
Group-2	<1 ha.	16	32	0.84	20	40	0.05
Group-3	1.01-2 ha.	7	52	1.48	5	10	0.83
Group-4	>2.01 ha	2	4	2.53	1	2	2.01
Total		50	100	0.58	50	100	0.14

The Table.3 presents the area-wise frequency distribution of the sample households according to total operational size of land holding in Kohima District. The table shows that a large majority of rural and urban sample households do not own land (50 per cent and 48 per cent respectively). This is so because 25 sample households in rural area and 24 sample households from urban area are non-tribal family who do not own land. The average size of holding for rural and urban is 0.58 ha and 0.14 ha respectively. It is evident from the table that urban sample households have smaller operational holding due to urbanisation. BPL survey data (2002) also reported that around 30 per cent of rural households had no operational holdings.

Area-wise and Food Item-wise Annual Consumption of Food of the Sample Households in Kohima District

This sub-section consists of food item-wise annual consumption of food of the sample households per consumer unit across the various size groups in rural as well as urban areas of Kohima District of the State Nagaland.

The Table.4 presents the area-wise and food item-wise annual per consumer unit consumption of food of the sample households in Kohima District. The table reveals that among the various food items, the percentage share for cereals is the highest for both rural and urban sample households accounting for 76.41 per cent and 59.84 per cent respectively. For rural sample households, cereals are followed vegetables (9.13 per cent), meat (2.55 per cent), pulses (2.49 per cent), sugar (2.44 per cent), fish (2.02 per cent) and edible oil (1.49 per cent). While for urban sample households, cereals are followed by vegetables (15.48 per cent), pulses (4.51 per cent), sugar (3.93 per cent), meat (3.79 per cent) and spices (3.17 per cent). The per consumer unit egg consumption is 39.23 nos. for rural sample households and 81.68 nos. for urban sample households. Tea, fruits and milk represents a low 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 of

food consumed is higher for urban sample households with respect to those for rural areas for all the food items except cereals. The overall total quantity of food consumed per consumer unit per annum is found to be 242.54 for rural sample households and 302.21 for urban sample households. For rural households, the total quantity (units) of food consumed is the highest in Group-4 (333.28) and the lowest in Group-1 (203.60). For urban households, total quantity (units) of food consumed is the highest in Group-2 (317.59) and the lowest in Group-4 (270.66).

Area-wise and Item-wise Annual Expenditure on Food and Non-food Items in Kohima District

This sub-section consists of food item-wise annual expenditure on food and non-food items per consumer unit for the sample households across the various size groups in rural as well as urban areas of both Kohima District of the State Nagaland.

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

Food items	Group-1		Group-2		Group-3		Group-4		Overall	
	Rural (n=25)	Urban (n=24)	Rural (n=16)	Urban (n=20)	Rural (n=7)	Urban (n=5)	Rural (n=2)	Urban (n=1)	Rural (n=50)	Urban (n=50)
Cereals	3,996.28 (41.19)	4,359.32 (18.51)	4,784.39 (33.39)	4,503.16 (14.33)	5,305.40 (33.10)	4,491.33 (17.13)	5,854.97 (26.72)	4,058.04 (16.35)	4,581.96 (35.29)	4,423.64 (16.29)
Pulses	307.21 (3.17)	841.66 (3.57)	450.93 (3.15)	849.95 (2.70)	456.26 (2.85)	690.59 (2.63)	516.56 (2.36)	738.17 (2.97)	392.05 (3.02)	824.88 (3.04)
Edible oil	248.43 (2.56)	679.10 (2.88)	367.84 (2.57)	864.23 (2.75)	486.57 (3.04)	726.93 (2.77)	695.36 (3.17)	378.55 (1.53)	352.71 (2.72)	751.17 (2.77)
Spices	39.99 (0.41)	137.23 (0.58)	40.20 (0.28)	164.58 (0.52)	47.86 (0.30)	109.04 (0.42)	119.21 (0.54)	85.17 (0.34)	45.64 (0.35)	143.70 (0.53)
Tea	162.03 (1.67)	421.11 (1.79)	177.37 (1.24)	541.08 (1.72)	227.33 (1.42)	626.28 (2.39)	298.01 (1.36)	605.68 (2.44)	185.46 (1.43)	499.66 (1.84)
Sugar	152.70 (1.57)	525.69 (2.23)	290.11 (2.02)	541.08 (1.72)	293.54 (1.83)	553.59 (2.11)	397.35 (1.81)	511.04 (2.06)	235.92 (1.82)	534.68 (1.97)
Milk	279.82 (2.88)	1,087.26 (4.62)	459.76 (3.21)	1,127.25 (3.59)	603.03 (3.76)	1,006.52 (3.84)	938.74 (4.28)	1,135.65 (4.58)	430.21 (3.31)	1,096.42 (4.04)
Fish	269.64 (2.78)	976.78 (4.15)	670.08 (4.68)	1,100.20 (3.50)	733.85 (4.58)	1,207.83 (4.61)	397.35 (1.81)	454.26 (1.83)	489.73 (3.77)	1,036.39 (3.82)
Meat	625.33 (6.45)	893.74 (3.80)	832.48 (5.81)	2263.53 (7.20)	804.04 (5.02)	1,800.56 (6.87)	953.64 (4.35)	2,119.87 (8.54)	742.99 (5.72)	1,601.87 (5.90)
Egg	126.52 (1.30)	371.57 (1.58)	184.15 (1.29)	442.64 (1.41)	178.68 (1.11)	430.57 (1.64)	166.89 (0.76)	397.48 (1.60)	156.93 (1.21)	408.40 (1.50)
Vegetables	247.22 (2.55)	1,118.93 (4.75)	350.02 (2.44)	1,232.46 (3.92)	435.52 (2.72)	1,048.46 (4.00)	596.03 (2.72)	899.05 (3.62)	332.27 (2.56)	1,150.86 (4.24)
Fruits	121.19 (1.25)	622.80 (2.64)	236.50 (1.65)	687.63 (2.19)	350.97 (2.19)	1090.40 (4.16)	695.36 (3.17)	1,419.56 (5.72)	229.52 (1.77)	727.84 (2.68)
Total	6,576.37 (67.78)	1,2035.19 (51.11)	8,843.83 (61.73)	1,4317.79 (45.55)	9,923.05 (61.92)	1,3782.11 (52.56)	11,629.47 (53.08)	12,802.52 (51.58)	8,175.37 (62.97)	13,199.50 (48.62)

Non-food items	Group-1		Group-2		Group-3		Group-4		Overall	
	Rural (n=25)	Urban (n=24)	Rural (n=16)	Urban (n=20)	Rural (n=7)	Urban (n=5)	Rural (n=2)	Urban (n=1)	Rural (n=50)	Urban (n=50)
Kerosene	20.00 (0.21)	14.78 (0.06)	18.92 (0.13)	22.55 (0.07)	38.29 (0.24)	25.16 (0.10)	89.40 (0.41)	56.78 (0.29)	26.42 (0.20)	20.53 (0.08)
Fuel	570.79 (5.88)	1,453.91 (6.17)	804.10 (5.61)	1,808.12 (5.75)	855.09 (5.34)	1,744.64 (6.65)	1,350.99 (6.17)	1,930.60 (7.78)	739.26 (5.69)	1,648.52 (6.07)
Electricity	727.13 (7.49)	1,801.55 (7.65)	905.01 (6.32)	2,250.00 (7.16)	1,174.16 (7.33)	2,013.05 (7.68)	1,788.08 (8.16)	1,892.74 (7.63)	919.14 (7.08)	2,013.69 (7.42)
Clothing	163.60 (1.69)	1,159.75 (4.92)	1,027.99 (7.17)	2,863.23 (9.11)	1,308.16 (8.16)	1,599.25 (6.10)	1,490.07 (6.80)	1,892.74 (7.63)	718.98 (5.54)	1,937.79 (7.14)
Medicine	155.12 (1.60)	781.84 (3.32)	225.46 (1.57)	843.19 (2.68)	350.97 (2.19)	861.14 (3.28)	993.38 (4.53)	378.55 (1.53)	256.74 (1.98)	802.80 (2.96)
Ceremonial expenses	241.16 (2.49)	895.14 (3.80)	239.65 (1.67)	1,164.83 (3.71)	414.78 (2.59)	520.04 (1.98)	794.70 (3.63)	1,514.20 (6.10)	299.44 (2.31)	985.38 (3.63)
Education	186.63 (1.92)	2,463.05 (10.46)	875.05 (6.11)	3,186.37 (10.14)	845.52 (95.28)	2,264.68 (8.64)	1,986.75 (9.07)	--	626.63 (4.83)	2,659.41 (9.80)

Others	1,061.60	2,944.41	1,387.47	4,974.95	1,116.72	3,411.00	1,788.08	4,353.31	1,220.18	3,883.05
	(10.94)	(12.50)	(9.68)	(15.83)	(6.97)	(13.01)	(8.16)	(17.54)	(9.40)	(14.30)
Total	3,126.04	11,514.43	5,483.64	17,113.23	61,03.70	12,438.96	10,281.46	12,018.93	4,806.78	13,951.17
	(32.22)	(48.89)	(38.27)	(54.45)	(38.08)	(47.44)	(46.92)	(48.42)	(37.03)	(51.38)
Grand total	9,702.40	23,549.61	14,327.47	31,431.01	16,026.75	26,221.06	21,910.93	24,821.45	12,982.15	27,150.67
	(100)	(100)	(100)	(100)	(100)	(100)	(100)	(100)	(100)	(100)

Figures in parentheses indicate the percentages to the total

n= No. of sample households

The Table.5 presents the area-wise and item-wise annual per consumer unit expenditure on food and non-food items in Kohima District. The overall annual per consumer unit food expenditure in the study area is found to be Rs. 8,175.37 for rural sample households and Rs.13,199.50 only for urban sample households. Among the food items, cereals and meat constitute major portion of food consumption for both rural and urban sample households. Cereals constitute for 35.29 per cent for rural sample households and 16.29 per cent for urban sample households. Meat constitutes for 5.72 percent for rural and 5.90 per cent for urban sample households. The rural sample households spend about 62.97 per cent of the total consumption expenditure on food items, while the urban sample households spend about 48.62 per cent on food items. The expenditure of the urban sample households on all food items is found to be higher than that of rural sample households.

The overall annual per consumer unit non-food expenditure is Rs. 4,806.78 for rural sample households and Rs. 13,951.17 for urban households. The percentage share of expenditure pattern of non-food items for urban sample households is found to be the highest for education (9.80 per cent), followed by electricity (7.42 per cent) and clothing (7.14 per cent). For rural sample households, the percentage share is the highest for electricity (7.08 per cent), followed by fuel (5.69 per cent) and clothing (5.54 per cent). The least expenditure is made on ceremonial expenses, medicine and kerosene by both rural and urban sample households. The rural sample households

spend about 37.03 per cent of the total expenditure on non-food items, while the urban spend about 51.38 per cent on non-food items. The expenditure of the urban sample households on all the non-food items is found to be higher than that of rural sample households. It is found out that urban sample households spend more on non-food items with 51.38 per cent compared to food items (48.62 per cent) due to higher income of urban sample households, whereas, it is just the opposite for rural sample households.

The overall grand total expenditure is higher for urban sample households with Rs. 27,150.67 than that of rural sample households (Rs. 12,982.15). Food items constitute for major portion of the total expenditure for rural sample households and non-food items for urban sample households. Among the various size groups, for rural sample households, the overall per consumer unit expenditure is the highest in Group-4 (Rs. 21,910.93) and the lowest in Group-1 (Rs. 9,702.40). For urban sample households, it is found to be the highest in Group-2 (Rs. 31,431.01) and the lowest in Group-1 (Rs. 23,549.61).

Area-wise and Food Item-wise Calorie Intake in Kohima District

This sub-section contains food item-wise calorie intake per day per consumer unit for the sample households across the various groups in rural and urban areas of both Kohima District of the State Nagaland.

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

Food items	Group-1		Group-2		Group-3		Group-4		Overall	
	Rural(n=25)	Urban(n=24)	Rural(n=16)	Urban(n=20)	Rural(n=7)	Urban(n=5)	Rural(n=2)	Urban(n=1)	Rural(n=50)	Urban(n=50)
Cereals	1,556.47 (87.34)	1,690.33 (73.36)	1,855.42 (83.72)	1,772.00 (71.07)	2,060.3 (83.37)	1,762.42 (73.15)	2,272.00 (81.25)	1,545.68 (74.45)	1,780.40 (84.86)	1,727.39 (72.39)
Pulses	45.03 (2.52)	123.37 (5.35)	66.09 (2.98)	136.66 (5.48)	66.87 (2.70)	101.38 (4.21)	75.71 (2.70)	109 (5.25)	57.46 (2.73)	126 (5.28)
Edible oil	62.10 (3.48)	170.65 (7.40)	94.59 (4.26)	218.00 (8.74)	123.63 (5.00)	181.73 (7.54)	173.84 (6.21)	94.63 (4.55)	89.40 (4.26)	189 (7.92)
Spices	0.02 (0.001)	0.04 (0.001)	0.02 (0.001)	0.05 (0.002)	0.02 (0.001)	0.04 (0.002)	0.03 (0.001)	0.02 (0.001)	0.02 (0.001)	0.05 (0.002)
Tea	0.08 (0.004)	0.19 (0.01)	0.08 (0.003)	0.25 (0.01)	0.11 (0.004)	0.29 (0.01)	0.14 (0.01)	0.28 (0.01)	0.09 (0.004)	0.23 (0.01)
Sugar	42.20 (2.36)	129.15 (5.60)	80.18 (3.61)	133.00 (5.33)	81.13 (3.28)	136.00 (5.64)	109.82 (3.92)	125.55 (6.04)	65.20 (3.10)	131.35 (5.50)
Milk	14.27 (0.80)	50.00 (2.17)	25.63 (1.15)	51.77 (2.07)	30.77 (1.24)	46.22 (1.91)	48.00 (1.71)	52.15 (2.51)	22.68 (1.08)	50.35 (2.11)
Fish	7.86 (0.44)	24.01 (1.04)	19.54 (0.88)	27.17 (1.08)	21.40 (0.86)	32.61 (1.35)	11.58 (0.41)	11.04 (0.53)	14.28 (0.68)	25.85 (1.08)
Meat	16.50 (0.92)	20.43 (0.88)	22.00 (0.99)	50.00 (2.00)	21.21 (0.85)	40.72 (1.69)	25.16 (0.89)	48.00 (2.31)	19.60 (0.93)	35.82 (1.50)
Egg	8.78 (0.49)	20.64 (0.89)	12.78 (0.57)	24.59 (0.98)	12.40 (0.50)	24.00 (0.99)	11.58 (0.41)	22.08 (1.06)	10.89 (0.51)	22.68 (0.95)
Vegetables	26.21 (1.47)	68.31 (2.96)	35.29 (1.59)	71.26 (2.85)	46.45 (1.87)	71.18 (2.95)	56.17 (2.00)	51.47 (2.47)	34.28 (1.63)	69.30 (2.90)
Fruits	2.07 (0.11)	7.14 (0.30)	4.00 (0.18)	8.24 (0.33)	6.27 (0.25)	12.05 (0.50)	11.81 (0.42)	16.71 (0.80)	4.00 (0.19)	8.45 (0.35)
Total	1,781.59 (100)	2,304.19 (100)	2,215.53 (100)	2,492.79 (100)	2,470.56 (100)	2,408.56 (100)	2,795.69 (100)	2,076.54 (100)	2,098.23 (100)	2,386.37 (100)

Figures in parentheses indicate the percentages to the total

n= No. of sample households

The Table.6 presents the area-wise and food item-wise calorie intake per day per consumer unit of the sample households in Kohima District. The table reveals that for rural sample households, cereals provide the highest energy (kcal/day/CU) to the sample respondents (1,780.40), followed by edible oil (89.40), sugar (65.20), pulses (57.46), vegetable (34.28), milk (22.68) and meat (19.60). The corresponding percentage share of these food items are in the order of 84.86 per cent, 4.26 per cent, 3.10 per cent, 2.73 per cent, 1.63 per cent, 1.08 per cent and 0.93 per cent respectively. However, for urban sample households, pattern of intake of energy per consumer unit from the above food items remains same except that milk and vegetables which have interchanged their position. The total energy derived from the consumption of all food items is higher for urban households (2,386.37 kcal/day/CU) as compared to rural households (2,098.23 kcal/day/CU). The

overall total calorie intake per consumer unit for rural households is the highest in Group-4 (2,795.69) and the lowest in Group-1 (1,781.59). For urban households, overall total calorie intake is the highest in Group-2 (2,492.79) and the lowest in Group-4 (2,076.54). The percentage of calorie intake among the food items is the highest for cereals (84.86 per cent) for rural households and it is 72.39 per cent for urban households.

Area-wise and Food Item-wise Protein Intake in Kohima District

This sub-section contains food item-wise protein intake per day per consumer unit for the sample households across the various groups in rural and urban areas of both Kohima District of the State Nagaland.

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

Food Items	Group-1		Group-2		Group-3		Group-4		Overall	
	Rural (n=25)	Urban (n=24)	Rural (n=16)	Urban (n=20)	Rural (n=7)	Urban (n=5)	Rural (n=2)	Urban (n=1)	Rural (n=50)	Urban (n=50)
Cereals	34.48 (78.69)	38.63 (64.15)	41.04 (73.83)	40.12 (59.10)	45.48 (75.17)	39.69 (61.26)	50.15 (75.15)	35.22 (60.02)	39.39 (76.00)	39.22 (61.44)
Pulses	3.30 (7.53)	8.90 (14.78)	4.84 (8.71)	8.90 (13.11)	4.89 (8.08)	7.40 (11.42)	5.54 (8.30)	7.82 (13.33)	4.21 (8.12)	8.70 (13.62)
Sugar	0.01 (0.02)	0.03 (0.05)	0.02 (0.04)	0.03 (0.04)	0.02 (0.03)	0.03 (0.05)	0.03 (0.04)	0.03 (0.05)	0.02 (0.04)	0.03 (0.04)
Milk	0.74 (1.69)	2.59 (4.30)	1.33 (2.39)	2.69 (3.96)	1.60 (2.64)	2.40 (3.70)	2.49 (3.73)	2.71 (4.62)	1.18 (2.28)	2.62 (4.10)
Fish	1.05 (2.40)	3.20 (5.31)	2.61 (4.70)	3.62 (5.33)	2.85 (4.71)	4.35 (6.71)	1.55 (2.32)	1.47 (2.51)	1.90 (3.67)	3.45 (5.40)
Meat	2.71 (6.18)	4.86 (8.07)	3.60 (6.48)	8.21 (12.09)	3.31 (5.47)	6.69 (10.34)	4.13 (6.19)	7.87 (13.41)	3.19 (6.15)	6.55 (10.26)
Egg	0.70 (1.60)	1.65 (2.74)	1.02 (1.83)	1.97 (2.90)	0.99 (1.64)	1.91 (2.95)	0.93 (1.39)	1.77 (3.02)	0.87 (1.68)	1.82 (2.85)
Vegetables	0.81 (1.85)	0.28 (0.46)	1.10 (1.98)	2.28 (3.36)	1.30 (2.15)	2.25 (3.47)	1.83 (2.74)	1.67 (2.85)	1.04 (2.01)	1.37 (2.15)
Fruits	0.02 (0.05)	0.09 (0.15)	0.02 (0.04)	0.05 (0.07)	0.05 (0.08)	0.07 (0.10)	0.09 (0.13)	0.12 (0.20)	0.03 (0.06)	0.07 (0.11)
Total	43.82 (100)	60.22 (100)	55.59 (100)	67.88 (100)	60.50 (100)	64.79 (100)	66.73 (100)	58.68 (100)	51.83 (100)	63.83 (100)

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

The Table.7 presents the area-wise and food item-wise protein intake of the sample households per day per consumer unit in Kohima District. The table reveals that for rural sample households, cereals provide the highest protein intake to the sample households (39.39 gm/day/CU), followed by pulses (4.21), meat (3.19), fish (1.90), milk (1.18), vegetables (1.04), egg (0.87), fruits (0.03) and sugar (0.02). For urban households, cereals also provide the highest protein intake to the sample households (39.22), followed by pulses (8.70), meat (6.55), fish (3.45), egg (1.82), vegetables (1.37), fruits (0.07) and sugar (0.03).

The overall total protein nutrient derived from the consumption of all food items is higher for urban households (63.83 gm/day/CU) as compared to rural those in households (51.83 gm/day/CU). The overall total protein intake for rural

households is the highest in Group-4 (66.73) and the lowest in Group-1 (43.82). There is a positive correspondence between size group and total protein intake in rural areas. For urban households, overall total protein intake is the lowest in Group-4 (58.68) and the highest in Group-2 (67.88). The percentage of protein intake among the food items is the highest for cereals (76.00 per cent) for rural households and it is 61.44 per cent for urban households.

Area-wise and Food Item-wise Fat Intake in Kohima District

This sub-section contains food item-wise fat intake per day per consumer unit for the sample households across the various groups in rural and urban areas of both Kohima District of the State Nagaland.

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

Food items	Group-1		Group-2		Group-3		Group-4		Overall	
	Rural (n=25)	Urban (n=24)	Rural (n=16)	Urban (n=20)	Rural (n=7)	Urban (n=5)	Rural (n=2)	Urban (n=1)	Rural (n=50)	Urban (n=50)
Cereals	2.44 (20.64)	2.85 (10.41)	2.89 (16.67)	2.89 (8.24)	3.15 (14.95)	2.83 (9.37)	3.46 (12.37)	2.60 (12.74)	2.77 (17.20)	2.86 (9.33)
Pulses	0.09 (0.76)	0.32 (1.17)	0.13 (0.75)	0.38 (1.08)	0.14 (0.66)	0.21 (0.69)	0.15 (0.54)	0.30 (1.47)	0.12 (0.75)	0.33 (1.08)
Edible oil	6.90 (58.37)	18.97 (69.31)	10.51 (60.61)	24.22 (69.06)	13.74 (65.21)	20.19 (66.83)	19.32 (69.07)	10.52 (51.54)	9.93 (61.68)	21.00 (68.52)
Milk	0.77 (6.51)	2.69 (9.83)	1.38 (7.96)	2.79 (7.96)	1.66 (7.87)	2.49 (8.24)	2.58 (9.22)	2.81 (13.77)	1.22 (7.58)	2.71 (8.84)
Fish	0.15 (1.27)	0.46 (1.68)	0.37 (2.13)	0.52 (1.48)	0.41 (1.95)	0.62 (2.05)	0.22 (0.79)	0.21 (1.03)	0.27 (1.68)	0.49 (1.60)
Meat	0.64 (5.41)	0.11 (0.40)	0.85 (4.90)	1.93 (5.50)	0.78 (3.70)	1.57 (5.20)	0.97 (3.47)	1.85 (9.06)	0.75 (4.66)	1.08 (3.52)
Egg	0.70 (5.92)	1.65 (6.03)	1.02 (5.88)	1.97 (5.62)	0.99 (4.70)	1.91 (6.32)	0.93 (3.32)	1.77 (8.67)	0.87 (5.40)	1.82 (5.94)
Vegetables	0.11 (0.93)	0.28 (1.02)	0.16 (0.92)	0.34 (0.97)	0.17 (0.81)	0.31 (1.03)	0.26 (0.93)	0.26 (1.27)	0.14 (0.87)	0.31 (1.01)
Fruits	0.01 (0.08)	0.04 (0.15)	0.03 (0.17)	0.05 (0.14)	0.04 (0.19)	0.08 (0.26)	0.08 (0.29)	0.11 (0.54)	0.03 (0.19)	0.05 (0.16)
Total	11.82 (100)	27.37 (100)	17.34 (100)	35.07 (100)	21.07 (100)	30.21 (100)	27.97 (100)	20.41 (100)	16.10 (100)	30.65 (100)

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

The Table.8 presents the area-wise and food item-wise fat intake of the sample households per day per consumer unit in Kohima District. The table reveals that for rural sample households, edible oil provides the highest amount of fat to the sample households (9.93 gm/day/CU), followed by cereals (2.77), milk (1.22), egg (0.87), meat (0.75), fish (0.27), vegetables (0.14), pulses (0.12) and fruits (0.03). For urban households, edible oil also provides the highest amount of fat to the sample households (21.00 gm/day/CU), followed by cereals (2.86), milk (2.71), egg (1.82), meat (1.08), fish (0.49), pulses (0.33), vegetables (0.31) and fruits (0.05).

The total fat nutrient derived from the consumption of all food items is higher for urban households (30.65 gm/day/CU) as compared to those for rural households (16.10 gm/day/CU). The total fat intake for rural households is the highest in Group-4 (27.97), followed by Group-3

(21.07), Group-2 (17.34) and Group-1 (11.82). For urban households, total fat intake is the highest in Group-2 (35.07), followed by Group-3 (30.21), Group-1 (27.37) and Group-4 (20.41). The percentage of fat intake among the food items is the highest for edible oil (61.68 per cent) for rural households and it is 68.52 per cent for urban households.

Area-wise Difference between Recommended Doses and Present Intakes of Calorie, Protein and Fat in Kohima District

This sub-section contains the difference between recommended doses and present intakes of calorie, protein and fat per day per consumer unit for the sample households in rural and urban areas in both Kohima District of the State Nagaland.

Table 9: Area-wise Difference between Recommended Doses and Present Intakes of Calorie, Protein and Fat per Day per Consumer Unit for the Sample Households in Kohima District (units/day/CU) (2011-12)

Groups	Energy (kcal)	Protein (gm)	Fat (gm)
Recommended (units/day/Capita)	2425	60	20
Rural (units/day/CU)			
Group-1	1781.59	43.82	11.82
Group-2	2215.53	55.59	17.34
Group-3	2470.56	60.50	21.07
Group-4	2795.69	66.73	27.97
Overall	2098.23	51.83	16.10
Urban (units/day/CU)			
Group-1	2304.19	60.22	27.37
Group-2	2492.79	67.88	35.07
Group-3	2408.56	64.79	30.21
Group-4	2076.54	58.68	20.41
Overall	2386.37	63.83	30.65

The Table.9 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 Kohima 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 (Adhikari *et al.*, 2003) and analysed as to where the position of calorie

intake of the sample households stands. For rural sample households, the present calorie intake is 2098.23 kcal/day/CU which is lower than the recommended calorie intake, making a difference of -326.77 kcal/day/CU. Amongst the various groups, the present calorie intake is lower than the recommended calorie intake in the case of Group-1 and Group-2, while it is higher in the case of Group-3 and Group-4. For urban sample households, the present calorie intake (2386.37 kcal/day/CU) is also lower than the recommended calorie intake. Amongst the various groups, the present calorie intake is found to be lower than the recommended calorie intake in all the size groups except in Group-2.

The overall intake of protein in the study area is 51.83 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 (66.73), followed by Group-3 (60.50), Group-2 (55.59) and Group-1 (43.82). For urban sample households, the overall protein intake is 63.83 gm/day/CU, which is higher than the RDA. The total protein intake is the highest in Group-2 (67.88), followed by Group-3 (64.79), Group-1 (60.22) and the lowest in Group-4 (58.68).

Similarly, the overall intake of fats in the study area is 16.10 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 (27.97), followed by Group-3 (21.07), Group-2 (17.34) and Group-1 (11.82). For urban sample households, the overall fat intake is 30.65 gm/day/CU, which is higher than the RDA. The total fat intake is the highest in Group-2 (35.07), followed by Group-3 (30.21), Group-1 (27.37) and Group-4 (20.41).

Summary and Conclusions

Major findings of the study have been summarised 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 in Kohima District. 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.
2. In rural areas, the percentage of annual per consumer unit expenditure is higher for food items, while it is reverse in urban areas. This holds true for Kohima District.
3. In Kohima District, the overall calorie intake per day per consumer unit derived from the consumption of all food items is higher for urban sample households as compared to rural sample households. The calorie intake for rural sample households was higher than the RDA in Group-3 and-4 while it is lower in Group-1 and Group-2.
4. For the urban sample households of Kohima District, calorie intake per day per CU is found to be lower than the RDA for all group sizes except in Group-2. The corresponding overall calorie intake per consumer unit derived from the consumption of all food items is found to be lower than the recommended RDA in all group sizes for both rural and urban sample households.
5. For Kohima rural sample households, the protein and fat intake per day per CU is lower than the RDA. Across the various size groups, it is found to be the highest in Group-4 and the lowest in Group-1.
6. Similarly, in Kohima urban sample households, the protein and fat intake per day per CU is more than the RDA. Across the various size groups, it is found to be the

highest in Group-2 and the lowest in Group-4.

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