Chapter 7

Mountain Agriculture and Food Security in Sikkim

Introduction

Food security is a situation pertaining to the supply of food and individual's right to use it. The term "food Security" was defined with an emphasis on supply in 1974 during World Food Conference. Moreover, food security is considered with the availability at all times the adequate food supplies with respect to basic foodstuffs in order to sustain a steady expansion of food consumption and to equalize fluctuations in production and prices**.**

As far as mountain agriculture is concerned, food grain production has not been able to meet the food requirements of mountain households. As in the case of mountain farmers, there are reports indicating the lack of attention and interest in farming, thus drastically decreasing the proportion of people indulged in agriculture. In the past multiple livelihood strategies through diversification of households' activities have been the main management strategy to meet food and other requirements. However, these options for maintaining livelihoods are becoming substandard in quality and also moving back over time.

It is more understood that gradually marginal lands have scope to ensure food security in near future in view of the limited alternatives for most mountain households. There should be changes in older approaches and newer concepts such as decentralization and use of ingenious approaches should be considered in order to diversify crop production, as the conventional high-yielding practices have meager relevance.

Subsistence agriculture is undergoing modification in several mountain places in India. With the enhancement of convenience (i.e. roads, market, and support services etc.), more and more people are taking advantage from crop diversification and cultivation of horticultural and other high value crops. However, diversification is not possible without addressing the issue of food security in terms of availability of food, purchasing power, and efficient distribution system.

Food Security in Sikkim

The most important reason of less profitability of food grains in the sloping marginal lands of the state is due to the inherent marginality of production of food grains. The sloping marginal lands are three to four times less efficient in meeting the food needs of calorie and protein

because it can hardly sustain three to four persons per ha per annum against the sustainability of nine to ten persons in a plain land. Further, intensive cropping on sloping marginal lands cannot be done continuously more than three to four years (Awasthi and Prasad; 1987 & Subba; 2008). However, development of horticulture holds great promise for this region. Horticultural products in this region may yield higher returns per unit of land than that of food grains.

India stood as second largest producer of vegetables in the world with 232 million tons in 2011-12. Sikkim being one of the least populated states of India and also the second smallest in terms of area with 7096 sq. km. of land mass is creating a mark as organic vegetable grower. The state which made national headlines by declaring that its farms are totally organic in 2016, has set its eyes on what can be called a major mission on cultivation of vegetables in India.

The officials of Horticultural Department, Government of Sikkim, were hasty to adopt and get acquainted to the central government launched scheme in 2007 i.e. 'Vegetable Initiative' at the national level under the Rashtriya Krishi Vikas Yojana. The state has been benefited from another centrally sponsored scheme particularly the Horticulture Mission for North-East and Himalayan states – which was launched during 2001-02 under the Technology Mission for North-East for integrated development of horticulture. Through this scheme, the state was granted Rs.43 crores for its annual plan, and an additional budget of Rs.3 crores for green houses and training purposes. Accordingly, as a beneficiary of the above schemes, the state has been able to extend the area under horticulture crops: under fruits by 1,093 hectares, vegetables 775 hectares, 470 hectares in the case of flowers and for aromatic plants and spices 1,252 hectares respectively.

Sikkim government initiated an action plan especially in Gangtok, East district and Namchi, the South district headquarter, for practicing the vegetable initiative scheme. Besides this, development of horticulture was also made an import component of 'Mission: Poverty-Free Sikkim' with the purpose of generating improved income for people through suitable management of crop production systems.

The state has also benefited well under various promotional schemes like National Horticulture Board, which includes commercial production, set up of cold storages, technology and market orientation. Sikkim has also more progressive beneficiaries through the National Vegetable Initiative for Urban Clusters (NVIUC) that was launched by the central government during the year of 2011-12. Horticulture crops almost cover 57 percent of gross cropped area and around 80 percent of the farmers fall under small and medium category. After the announcement and implementation of different schemes, the horticultural production has been increasing rapidly.

In Agriculture sector, the state due to its difficult terrain, practices terrace farming for food security where crops like paddy, maize, wheat, millets etc. are cultivated. Rice constitutes the staple diet for the people living in this region, but maize has been the state's major production. In the past, crops were sufficient to use within the state for domestic consumption but due to rise in population, unequal land distribution/inadequate land reform and low investment in Agriculture sector have started to become major hurdles for the state in becoming food sufficient (Chakrabarti, 2010).

Agriculture is the mainstay of majority rural population of Sikkim. The economy of the State is associated with agriculture that renders the sources of livelihood and economic security of considerable native population. The economic activity of mountainous region like Sikkim is primarily a mixed farming - agriculture, horticulture and livestock rearing, in limited cultivable land resources. According to 2011 census about 75 percent of the populations of Sikkim are living in the rural areas and the changing levels of production of different agricultural and diversified horticultural crops since 1975-76 are observed.

Agriculture pattern has been changing slowly in Sikkim with the advancement of concepts and agricultural technology. Agricultural pattern has transformed itself from shifting to subsistence and in the recent past has oriented itself towards commercial production, the reasons being the cultivation of off- season vegetables in order to sell them for generating good income.

The Food Civil Supplies & Consumer Affairs Department is the nodal department for implementing the schemes under the Targeted Public Distribution System and is entrusted with the task of providing quality food grains at subsidized prices and other essential commodities to the eligible ration card holders of the State. The department has duty of procuring, storing, and distributing food grains at rates fixed by the government as well as monitoring and enforcing regulatory orders of the government under Public Distribution System (Achievement-FCS&CA-2016).

The state is deficit in food production and thus the State Government obtains food grains such as rice 45,849 tons and wheat 636 tons annually under different Centrally Sponsored and State programme from FCI and distribute to the consumers through PDS (Subba, 2008). Economic Survey 2006-07 stated that Sikkim continues to remain a highly food deficit State. The deficits are seen more remarkably in oilseeds and pulses production.
During 2007 the state submitted a proposal to the Union Ministry of Consumer Affairs, Food and Public Distribution for a special package of 5000 metric tons of rice as a buffer stock as a precaution against exigency during the monsoon.

In his Presidential address to the parliament on 4thJune, 2009 on Food Security the President of India opined that: "My Government proposes to enact a new law, the National Food Security (NFS) Act that will provide a statutory basis for a framework which assures food security for all. Every family below the poverty line in rural as well as urban areas will be entitled by law, to 25 kg of rice or wheat per month at Rs. 3 per kg. This legislation will also be used to bring about broader systemic reform in the public distribution system."

According to Prof. M.S. Swaninathan, food security legislation would be the most significant among the laws enacted by parliament. It would mark the fulfillment of Mahatma Gandhi's call for a hunger-free India. He further said that a sustainable food security system could be developed only with homegrown food, not imports. The Food Security Act promised change to save nearly 40 percent of India's population from the hunger trap (Sikkim Express-2010).

In a bid to make Sikkim food secure, the following schemes were announced by the state on the eve of Independence Day, 2009.

1) *Mukhya Mantri Pousta Ahaar Yojana* – monthly free distribution of 4 kg mixed deal to BPL families.
2) *Mukhya Mantri Jeevan Rakshyak Kosh*.

It was acknowledged by the state authorities that within the aerial distance of 115 km there are five climate zones from tropical to alpine making Sikkim an ideal place for cultivation of wide range of crops and food products. Therefore, production under agriculture, horticulture, floriculture sectors and harnessing the rich pool of medicinal plants and herbs and activities under animal husbandry sector can be the road to prosperity. The statistics (2010) in terms of demand-supply statement in the domestic market of Sikkim were as follows:

1. The annual requirement of fruits and vegetables in the state was 18,254 tons and 60,134 tons respectively.
2. There was a shortfall of 2050 metric tons of beef per annum against the annual demand of 2095 MT (metric tons).
3. There was a total shortfall of 380 metric tons of pork per annum against the annual demand of 750 MT.
4. There was a total shortfall of 135.24 lakh eggs per annum against the annual demand of 150.00 lakh.
5. There was a total shortfall of 1000 metric tons chicken per annum against the annual demand of 1500 MT. The Chief Minister encouraged the people to go for commercial venture in the production of cash crops, vegetables and fruits (Sikkim Express-2009).

Sikkim produces around 1 lakh metric tons of food grain and imports around 60,000 metric tons of food grains annually. In this state storage capacity is limited and due to repeated landslide communication is frequently disrupted. As per the Annual Progress Report 2010-11 of Food Security and Agriculture Department, Government of Sikkim it is estimated that over

80 percent of the rural population depends on agriculture and allied sectors for economic, food, and nutritional security as well .The net cropped area has decreased due to change to non-agricultural uses like development of crucial infrastructure. There is a deficit of nearly 72,000 MT in food grain, 12,500 MT in pulses, and 3,500 MT in oilseeds respectively.

Poverty Level

In India the percentage of people living below the poverty line has fallen to 26.1 as per poverty estimates meant for the year 1999-2000. This means a sizeable drop of nearly 10 percent from the poverty estimates of 36 percent as in 1992-93. The percentage of population living below poverty line in Sikkim in the year 2006 was 19.33. But for the year 2011-12 it fell to 8.19. This means a considerable go down of nearly 11 percent from the poverty estimates percentages as in 2011-12. Sikkim has higher percentages of below poverty line during 2011-12 than other states like Goa (5.09 %), Kerala (7.05%) and Himachal Pradesh (8.06 %) respectively. This means that the incomes of about 8-10 percent of people are not in a position to buy sufficient food. The state is trying to reduce the level of poverty through different schemes/programmes by improving social security vis-a-vis food security.

According to SSEC (State Social-Economic Census) 2006, it was found that out of 1,11,830 households 21,618 households were found to be BPL (Below Poverty Line) which constituted 19.33 percent of the total households of the state. Moreover, there were 43,428 BPL families and 4, 30,547 APL (Above Poverty Line) card holder in the state. Further, the state was allotted 43,400 quintals of rice every month under APL and BPL scheme and 2,450 quintals of wheat. An amount of 35kgs of rice was provided to every BPL family per month as per the Food & Civil Supplies Department through 1,414 fair price shops in the state (Sikkim Express, 11.05.2010).

Individual Food Security and Nutrition

Food and nutrition security essentially means that all people at all times have access to safe and nutritional food and maintain health and active life. The need for food and nutrition security arises primarily due to the fluctuation in food production and non-availability of sufficient quality food from domestic sources (Kalita et.al. 2006).

The nutritional effectiveness of resources in the household mainly depends on a number of inter-related components like income control and allocation of resources within the household. Since the capability to utilize food to their maximum benefits is prejudiced by aspects like child care, access to health and approving sanitary environment receive due importance. Insufficient food intake by adults in household could be seen in low body mass indices and in children by levels of anthropometric traits.

In a holistic approach of household food security analysis, the nutritional status of every individual in the household is crucial. Three factors influence an individual's food and nutritional security: adequacy, equity and efficiency. Adequacy of nutrition of individuals in conditions of nutrient intake (calorie and protein) is determined to examine the relative position of individuals according to age and sex.

Nutritional Status

Nutritional adequacy is the comparison between the nutrient requirement and the intake of a certain individual or population. In population groups, the prevalence of nutrient inadequacy can be assessed by the probability approach or using the Estimated Average Requirement (EAR) cut-point method (www.ncbi.nlm).

World Health Organization (WHO) stated that nutritional adequacy as the level of intake that will balance energy requirements and make sure that individual body size and work and level of physical activity regularly with good health that allow the performance of economically and socially desirable tasks for longer term.

Like actual food intake, calorie intake by individuals also reflects their nutritional security position. The quantity of calorie requirement by individuals, however, depends on the body weight, nature of work, age, sex, and climate. The Indian Council of Medical Research (ICMR) has recommended a per capita daily norm of 386 gm of cereals (Radhakrishna, 1991 & De, 2006). There is a standard norm of per capita 2,400 calories and 2,100 calories per day for rural and urban areas respectively (De, 2006).

Table 7.1: India: Average Intake and Requirement of Food Items (grams/day/capita) 2005-06

Food Items	Average intake 2005-06				Requirement (Mean ± S.D.)	Standard Error
	Men (Mean ± S.D.)	Standard Error	Women (Mean ± S.D.)	Standard Error		
Cereals	418.00 ±18.7723	7.6637	365.00 ±25.7526	10.5134	300.00 ±68.9260	28.1389
Pulses	31.00 ±18.8148	7.6811	27.00 ±15.1261	6.1752	60.00 ±24.5519	16.0233
Vegetables	85.00 ±23.0130	9.3950	81.00 ±26.3590	10.7610	300.00 ±68.9260	28.1389
Milk & milk products	94.00 ±25.8224	10.5419	80.00 ±25.6359	10.4658	300.00 ±68.9260	28.1389
Fruits	27.00 ±15.1261	6.1752	26.00 ±16.3340	6.6683	100.00 ±25.3456	10.3473

Sugar	15.00 ±10.1980	4.1633	14.00 ±10.7888	4.4045	20.00 ±14.0854	5.7503
Meat	12.00 ±9.0553	3.6968	10.00 ±5.6213	2.2949	30.00 ±21.4569	8.7597
Fats	16.00 ±12.8841	5.2599	13.00 ±9.9196	4.0496	20.00 ±14.0854	5.7503

Source: NNMB Report 2005-06; R.C. Tiwari 2010 p. 266.

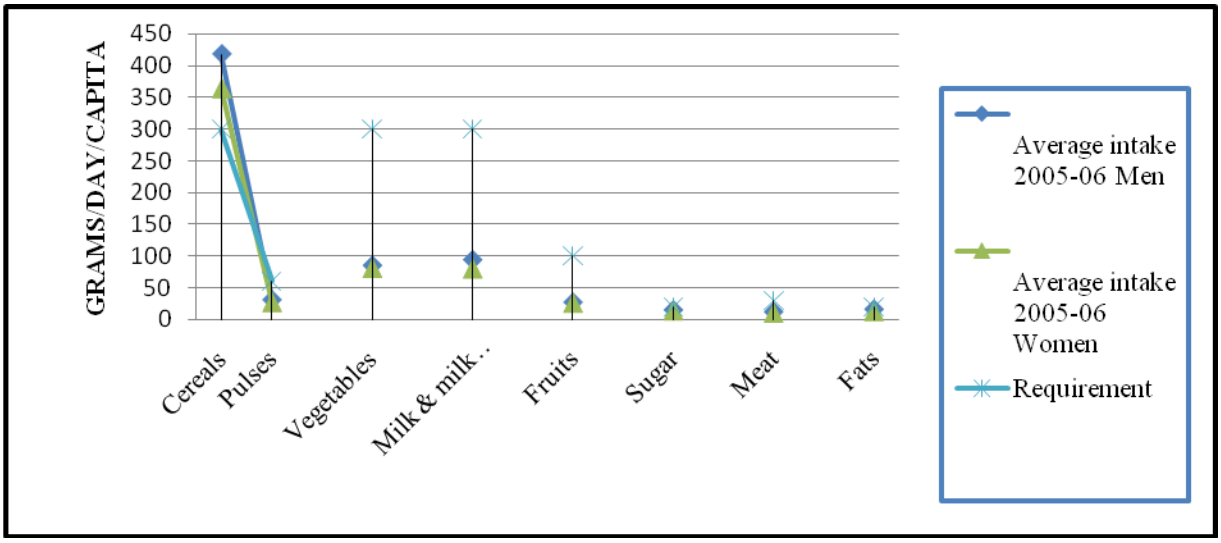

Figure 7.1: Average Intake and Requirement of Food Items (grams/day/capita) 2005-06 (India)

The table 7.1 indicates average intake and requirement of food items (grams/day/capita) of India during 2005-06 and a comparative data of different food items like cereals, pulses, vegetables, milk & milk products, fruits, sugar, meat and fats and average intake among men and women and their requirement in terms of the significant mean ±S.D. and standard error. It is found that the highest number of average intake of cereals by men and women as per the daily requirement and their corresponding mean ±S.D. are (men 418.00 ±18.7723), (women 365.00 ±25.7526) & (requirement 300.00 ±68.9260) and standard errors calculated as 7.6637, 10.5134 and 28.1389 respectively. Likewise, milk & milk products for men and vegetables for women come under second position but it is low in terms of requirement and it shows the following significant mean ±S.D. (men 94.00 ±25.8224), (women 81.00 ±26.3590) & (requirement 300.00 ±68.9260) and standard errors are calculated as 10.5419, 10.7610 and 28.1389. But the average intake of different food items like pulses, fruits, fats, sugar and meat by men and women is below the daily requirement standard. Lastly, it is observed that except cereal food item, all other food items are below average intake requirement in India.

Table 7.2: Average Intake of Nutrients in Sikkim (Consumption per capita per day) 1997

Nutrient	Rural (Mean ± S.D.)	Standard Error	Urban (Mean ± S.D.)	Standard Error
Energy (Kcal)	2197.00±26.5706	10.8474	2157.00±19.0473	7.7760
Protein (g)	64.50±22.2530	9.0847	70.20±22.4053	9.1469
Fat (g)	2.50±1.5504	0.6329	31.30±16.6012	6.7774
Calcium (mg)	566.20±23.2206	9.4798	560.80±17.0293	6.9522
Phosphorous (mg)	1343.00±18.0554	7.3711	1413.70±20.8326	8.5049
Iron (mg)	21.00±14.1703	5.7850	22.50±15.8619	6.4756
Vitamin A (mg)	376.10±21.1849	8.6487	322.00±20.0299	8.1772
Vitamin B1(mg)	1.50±1.0749	0.4388	1.70±1.1535	.4709
Vitamin B2 (mg)	13.00±9.9196	4.0496	1.30±.7823	.3193
Niacin (mg)	23.60±15.6588	6.3927	22.90±17.8101	7.2709
Vitamin C (mg)	64.80±26.8849	10.9757	75.40±21.4196	8.7445

Source: Department of Women and Child Development, GOI (1997) (Subba, 2008).

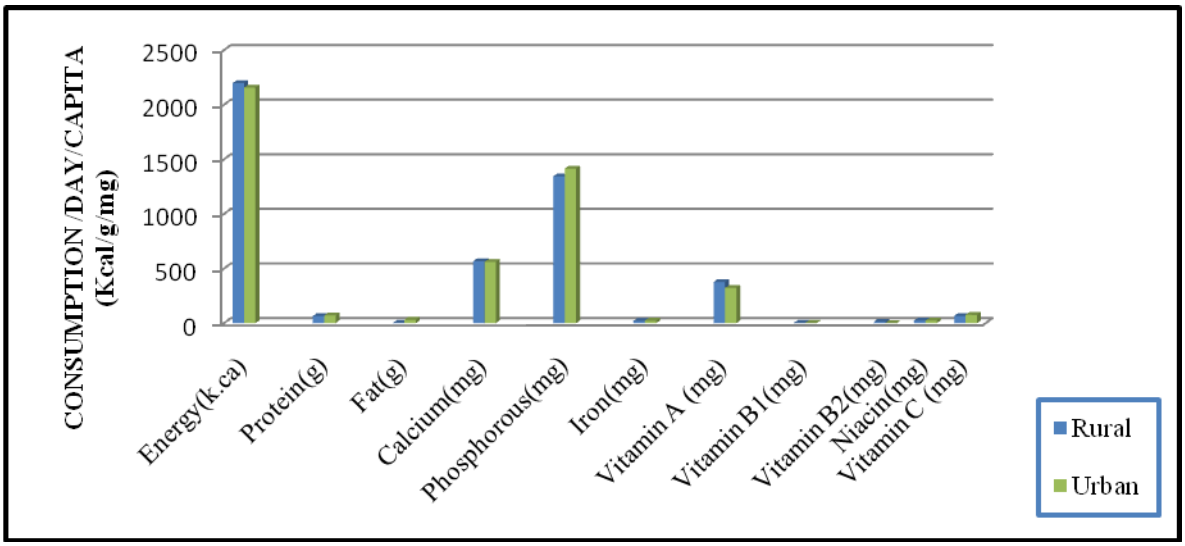

Figure 7.2: Average Intake of Nutrients in Sikkim (Consumption/capita/day) 1997

The figure 7.2 depicts the average intake of nutrients in Sikkim (Consumption per capita per day (Kcal/g/mg) and shows a comparison of Energy (Kcal) and consumption of different nutrients such as Protein (g), Fat (g), Calcium (mg), Phosphorous (mg), Iron (mg), Vitamin A (mg), Vitamin B1 (mg), Vitamin B2 (mg), Niacin (mg) and Vitamin C (mg) in the rural and urban areas of Sikkim with significant mean ±S.D. and standard error. The highest consumption of nutrient has been seen in Energy (Kcal) both in rural and urban places and the significant mean ±S.Ds. are (rural 2197.00±26.5706) and (urban 2157.00±19.0473) and their corresponding errors are calculated as 10.8474 and 7.7760. The next highest consumption of nutrient, both in rural and urban areas is of Phosphorous (mg), the significant mean ±S.D. (rural 343.00±18.0554) and (urban 1413.70±20.8326) and their corresponding errors are calculated as 7.3711 and 8.5049. Next comes Calcium (mg), consumption ratio of nutrient is almost same in both rural and urban areas: significant mean ±S.D. (rural 566.20±23.2206) and (urban 560.80±17.0293) and standard errors calculated as 9.4798 and 6.9522. Vitamin A (mg) secured fourth place both in rural and urban with significant mean ±S.D. (rural 376.10±21.1849) and (urban 322.00±20.0299) and standard errors are calculated 8.6487 and 8.1772. The consumption of other nutrients is much less.

Table 7.3: Average Consumption (g/cu/day) of different Foods in Sikkim

Sl. No.	Food Items	Average consumption Mean ±S.D.	Standard Error
1.	Cereals	465.9±19.7382	8.0581
2.	Pulses & Legumes	39.3±16.8878	6.8944
3.	Green Leafy Vegetables	49.1±17.8101	7.2709
4.	Roots & Tubers	106.6±18.8042	7.6768
5.	Other Vegetables	62.7±20.8518	8.5127
6.	Fruits	1.6±.6249	.2551
7.	Milk product	44.0±19.8897	8.1199
8.	Fats & Oils	12.5±8.9218	3.6423
9.	Sugar	7.4±5.7619	2.3523

Source: Singh et.al. 2006.

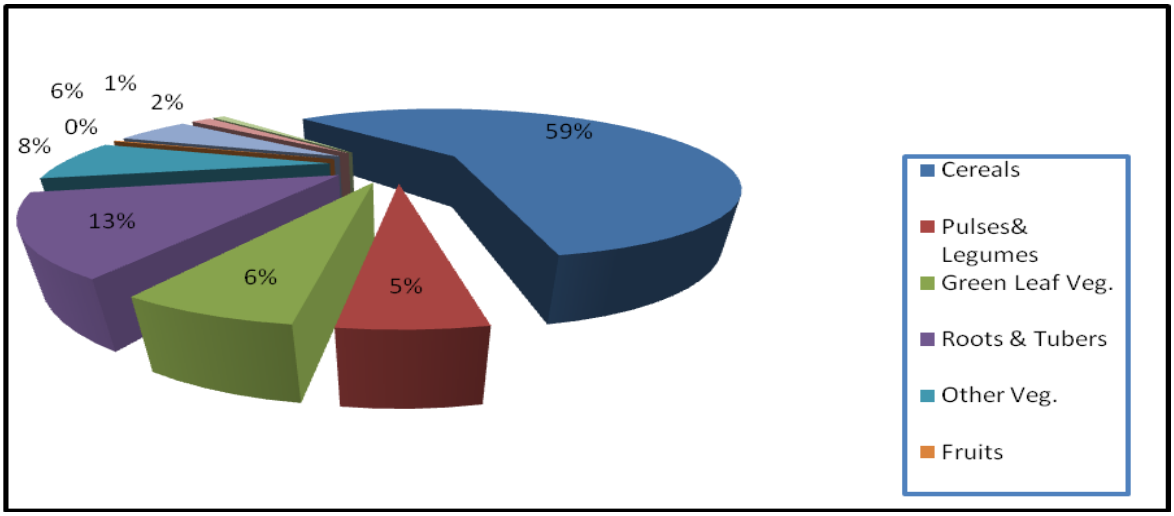

Figure 7.3: Average Consumption (g/cu/day) of different Foods in Sikkim

The figure 7.3 reveals that the average consumption (g/cu/day) of different food items in Sikkim such as cereals, pulses & legumes, green leafy vegetables, roots & tubers, other vegetables, fruits, milk product, fats & oils and sugar and the significant mean ±S.D. and standard error. It is found that the highest average consumption of food items is in cereals and the corresponding mean ±S.D. 465.9±19.7382 and standard error is calculated as 8.0581. Since rice is the staple food, its consumption is unsurprisingly high. The second highest consumption of food items has been seen in roots & tubers having considerable mean ±S.D. 106.6±18.8042 and its corresponding error is 7.6768. The other vegetables have significant role in food items and it occupies third position in average consumption and it has significant mean ±S.D. 62.7±20.8518 and standard error is calculated as 8.5127. After cereals, roots & tubers and other vegetables come green leafy vegetables (49.1±17.8101), milk product (44.0±19.8897), pulses & legumes (39.3±16.8878), fats & oils (12.5±8.9218), sugar (7.4±5.7619) and fruits (1.6±.6249) respectively.

Table 7.4: Average Intake of Nutrients (Consumption unit/day) in Sikkim

Sl. No.	Nutrients	Average Intake of Nutrients (unit/day) Mean ±S.D.	Standard Error
1.	Energy (K cal)	2191±25.7060	10.4944
2.	Protein (g)	65±19.1102	7.8017
3.	Fats (g)	26±15.5048	6.3298
4.	Calcium (mg)	565±23.1084	9.4339
5.	Phosphorous (mg)	1353±17.8213	7.2755
6.	Iron (mg)	21±13.6528	5.5737
7.	Vitamin C (mg)	66±16.3584	6.6783
8.	Vitamin A (mg)	368±21.0238	8.5829

Source: Singh et.al. 2006.

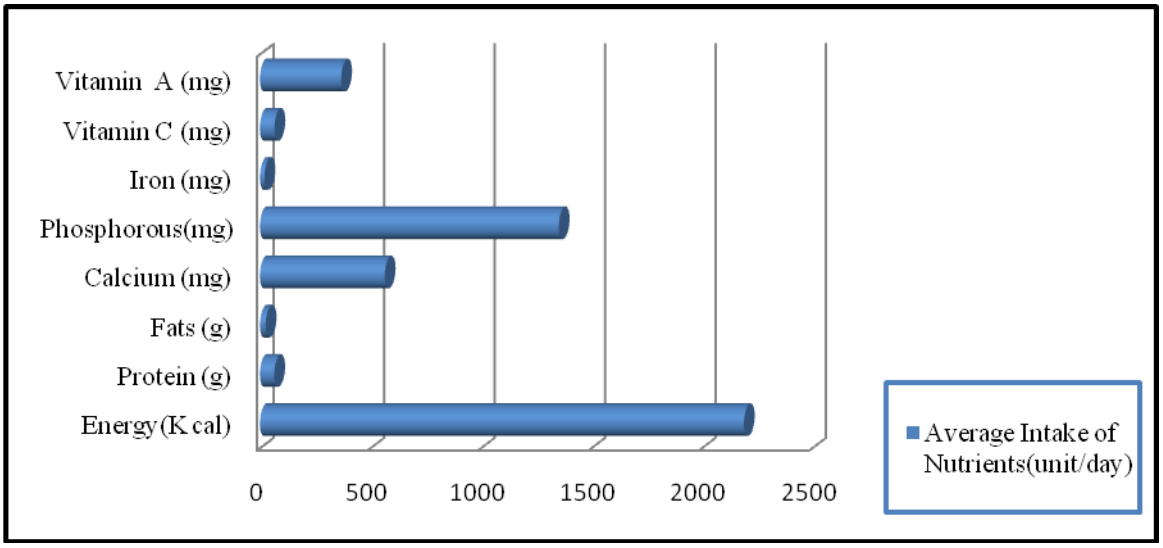

Figure 7.4: Average Intake of Nutrients (Consumption unit/day) in Sikkim

The figure 7.4 shows the average intake of nutrients in Sikkim (Consumption unit per day (Kcal/g/mg/ug) such as Energy (Kcal), Protein (g), Fat (g), Calcium (mg), Phosphorous (mg), Iron (mg), Vitamin C (mg) and Vitamin A (mg), their significant mean ±S.D. and standard error. The highest consumption of nutrient unit per day has been seen in Energy (Kcal) and the significant mean ±S.D. 2191±25.7060 and their corresponding error calculated as 10.4944. The next highest consumption of nutrient is of Phosphorous (mg) having the significant mean ±S.D. 1353±17.8213 and their corresponding error is calculated 7.2755. After Energy and Phosphorous comes Calcium (mg) and the significant mean ±S.D. 565±23.1084 and its corresponding error calculated as 9.4339. The consumption of Vitamin A (mg) secured fourth place and its significant mean ±S.D. 368±21.0238 and standard error calculated 8.5829. The consumption of other nutrients is less than Energy, Phosphorous, Calcium and Vitamin A.

Table 7.5: Per capita and Per Consumer Unit Adjusted Intake of Calorie, Protein and Fat per day of Sikkim (Rural) 2011-12

Particulars		**Mean ± S.D.**	**Standard Error**
Percentage expenditure on Food		51.70±18.0776	7.3801
Percentage expenditure on Cereals		10.90±8.0746	3.2964
Per capita/day intake of	Calorie(Kcal)	1614.00±22.5743	9.2159
	Protein (gm)	41.20±16.8878	6.8944
	Fat (gm)	36.10±17.4241	7.1133
Per consumer unit /day intake of	Calorie(Kcal)	1962.00±15.4658	6.3139
	Protein (gm)	50.10±21.6979	8.8581
	Fat (gm)	43.90±20.3960	8.3266

Source: NSS Report No. 560 Nutritional Intake 2011-12.

Table 7.6: Per capita and Per Consumer Unit Adjusted Intake of Calorie, Protein and Fat per day of Sikkim (Urban) 2011-12

Particulars		**Mean ± S.D.**	**Standard Error**
Percentage expenditure on Food		43.50±20.3960	8.3266
Percentage expenditure on Cereals		8.70±6.4187	2.6204
Per capita/day intake of	Calorie(Kcal)	1890.00±31.7867	12.9769
	Protein (gm)	49.10±19.8997	8.1240
	Fat (gm)	45.40±20.5621	8.3944
Per consumer unit /day intake of	Calorie(Kcal)	2250.00±27.2616	11.1295
	Protein (gm)	58.50±15.7607	6.4342
	Fat (gm)	54.10±23.0824	9.4233

Source: NSS Report No. 560 Nutritional Intake 2011-12.

Household food expenditure pattern is an excellent indicator of existing economic condition of a community and behaviour of variables like food consumption and calorie/protein intake in relation to the level of food expenditure is the important input of nutritional analysis (Sukhatme; 1987).

The above tables (7.5 & 7.6) illustrate per capita and per consumer unit adjusted intake of Calorie, Protein and Fat per day (rural and urban) of Sikkim with comparisons made among Percentage expenditure on food, Percentage expenditure on Cereals, Per capita/day intake of (Calorie (Kcal), Protein (gm) & Fat (gm) and Per consumer unit /day intake of (Calorie (Kcal), Protein (gm) & Fat (gm) in both rural and urban areas with the indication of significant mean ±S.D. and standard error. In the percentage expenditure on Food in rural and urban areas, it is seen that rural is little higher than urban and their significant mean ±S.D. are (rural-51.70±18.0776) and (urban-43.50±20.3960) and standard errors are 7.3801 and 8.3266. In percentage expenditure on cereals rural has higher expenditure compared to urban and the significant mean ±S.D. are (rural-10.90±8.0746) and (urban-8.70±6.4187) and corresponding errors are calculated as 3.2964 and 2.6204. But the per capita/day intake of Calorie, Protein and Fat are higher in urban area and the significant mean ±S.D. are: urban Calorie (Kcal) 1890.00±31.7867, Protein (gm) 49.10±19.8997 & Fat (gm) 45.40±20.5621) and rural Calorie (Kcal) 1614.00±22.5743, Protein (gm) 41.20±16.8878 & Fat (gm) 36.10±17.4241) and their corresponding errors are calculated as: urban Calorie (Kcal) 12.9769, Protein (gm) 8.1240 & Fat (gm) 8.3944) and rural: Calorie (Kcal) 9.2159, Protein (gm) 6.8944 & Fat (gm) 7.1133). Again it is found that per consumer unit/day intake of Calorie, Protein and Fat are higher in urban area than rural and the significant mean ±S.D. are: urban Calorie (Kcal) 2250.00±27.2616, Protein (gm) 58.50±15.7607 & Fat (gm) 54.10±23.0824) and rural Calorie (Kcal) 1962.00±15.4658, Protein (gm) 50.10±21.6979 & Fat (gm) 43.90±20.3960) and their corresponding errors are calculated as: urban Calorie (Kcal) 11.1295, Protein (gm) 6.4342 & Fat (gm) 9.4233) and rural Calorie (Kcal) 6.3139, Protein (gm) 8.8581 & Fat (gm) 8.3266) respectively.

Table 7.7: Percentage of Total Adjusted Intake of Calorie and Protein Derived from Different Groups of Food Items for Households of Sikkim (Rural) 2011-12

Category	Items	Mean ± S.D.	Standard Error
Percentage of total intake of calorie from	Cereals	61.10±26.2526	10.7175
	Other Food	38.80±19.5550	7.9833
Percentage of total intake of protein from	Cereals	55.00±26.2678	10.7238
	Pulses	7.80±4.2426	1.7320
	Milk & Milk Products	17.40±13.5351	5.5257
	Egg, Fish & Meat	8.60±5.0990	2.0816
	Other Food	11.20±8.2219	3.3565

Source: NSS Report No. 560 Nutritional Intake 2011-12.

Table 7.8: Percentage of Total Adjusted Intake of Calorie and Protein Derived from Different Groups of Food Items for Households of Sikkim (Urban) 2011-12

Category	Items	Mean ± S.D.	Standard Error
Percentage of total intake of calorie from	Cereals	51.60±22.2261	9.0737
	Other Food	48.40±23.1516	9.4516
Percentage of total intake of protein from	Cereals	47.40±22.2979	9.1031
	Pulses	7.90±5.0990	2.0816
	Milk &Milk Products	16.10±12.8374	5.2408
	Egg, Fish & Meat	11.00±8.0249	3.2761
	Other Food	17.60±13.9283	5.6862

Source: NSS Report No. 560 Nutritional Intake 2011-12.

The above tables (7.7 & 7.8) reveal the percentage of total adjusted intake of Calorie and Protein derived from different groups of food items for households of Sikkim and a comparison amongst percentage of total intake of Calorie from cereals and other food, and percentage of total intake of Protein from cereals, pulses, milk & milk products, egg, fish & meat and other food in both rural and urban areas with their significant mean ±S.D. and standard error. The percentage of total intake of Calorie from cereals is higher in rural areas compared to urban and the significant mean ±S.D. are: rural 61.10±26.2526, standard error calculated as 10.7175 and urban 51.60±22.2261 and standard error calculated as 9.0737. The Calorie from Other Food intake is higher in urban area than rural and the significant mean ±S.D. are: urban 48.40±23.1516 and standard error calculated as 9.4516 and rural 38.80±19.5550 and standard error calculated as 7.9833. The percentage of total intake of Protein from cereals, pulses, milk & milk products, egg, fish & meat and other food shows that Cereals contribute highest Protein in both rural and urban areas and their significant mean ±S.D. are: rural 55.00±26.2678, standard error calculated as 10.7238 and urban 47.40±22.2979, standard error calculated as 9.1031. Other items having Protein content are

pulses, significant mean (rural 7.80±4.2426 and urban 7.90±5.0990), milk & milk products (rural-17.40±13.5351 and urban-16.10±12.8374), egg, fish & meat (rural-8.60±5.0990 and urban-11.00±8.0249) and Other Food (rural-11.20±8.2219 and urban-17.60±13.9283) respectively.

Table 7.9: Percentage Break-Up of Calorie Intake over Different Food Groups and Average Intake of Calorie, Protein and Fat per Consumer Unit per Day for Households in Different Ranges of Calorie Intake (per consumer unit per day) in Sikkim (Rural) 2011-12

Particulars		Mean ± S.D.	Standard Error
No. of consumer units per HHs		2.95±1.6260	.6638
Percentage of calorie for food group	Cereals	57.29±24.3967	9.9599
	Roots & Tubers	1.35±.6892	.2813
	Sugar & Honey	4.48±3.0331	1.2382
	Pulses, Nuts & Oilseeds	8.05±5.0990	2.0816
	Veg. & Fruits	2.15±1.0858	.4432
	Meat, Eggs & Fish	1.32±.7293	.2977
	Milk & Milk Products	6.80±4.6043	1.8797
	Oils & Fats	8.66±6.4187	2.6204
	Misc. Food etc.	9.90±6.4807	2.6457
	All	100.00±25.3456	10.3473
Average intake per consumer unit per day of	Calorie(Kcal)	2404±28.6007	11.6761
	Protein (gm)	60.90±23.6050	9.6367
	Fat (gm)	48.70±20.3174	8.2945

Source: NSS Report No. 560 Nutritional Intake 2011-12.

Table 7.10: Percentage Break-Up of Calorie Intake over Different Food Groups and Average Intake of Calorie, Protein and Fat Per Consumer Unit Per Day for Households in Different Ranges of Calorie Intake (Per Consumer Unit Per Day) in Sikkim (Urban) 2011-12

Particulars		Mean ± S.D.	Standard Error
No. of consumer units per HHs		2.78±1.3084	.5341
Percentage of calorie for food group	Cereals	50.06±19.4190	7.9278
	Roots & Tubers	1.50±.8371	.3540
	Sugar & Honey	4.85±3.0331	1.2382
	Pulses, Nuts & Oilseeds	8.10±5.9665	2.4358
	Veg. & Fruits	2.59±1.2649	.5164
	Meat, Eggs & Fish	1.62±1.0295	.4203
	Milk & Milk Products	8.86±6.4187	2.6204
	Oils & Fats	9.82±5.8309	2.3804
	Misc. Food etc.	12.60±6.3245	2.5819
	All	100.00±25.3456	10.3473
Average intake per consumer unit per day of	Calorie(Kcal)	2456±15.8113	6.4549
	Protein (gm)	63.50±23.4691	9.5812
	Fat (gm)	58.00±21.2037	8.6564

Source: NSS Report No. 560 Nutritional Intake 2011-12.

The tables (7.9 & 7.10) show the percentage break-up of Calorie intake over different food groups and average intake of calorie, protein and fat per consumer unit per day, separately for households in different ranges of Calorie intake (per consumer unit per day) with comparisons made among percentage of calorie for food groups (cereals, roots & tubers, sugar & honey, pulses, nuts & oilseeds, vegetables & fruits, meat, eggs & fish, milk & milk products, oils & fats, misc. food etc.) and average intake per consumer unit per day of Calorie (Kcal), Protein (gm) and Fat (gm) in rural and urban areas of Sikkim. The number of consumer units per HHs is higher in rural areas than urban and their significant mean ±S.D. are: rural 2.95±1.6260 and urban 2.78±1.3084, and standard errors are calculated as .6638 and .5341. The percentage of calorie for food group like cereals, the calorie content is higher than other food groups. The average intake of Calorie content per day per consumer is higher in rural than urban areas in the case of cereals and the significant mean ±S.D. are: rural 57.29±24.3967 and (urban 50.06±19.4190 and standard errors calculated as 9.9599 and 7.9278. The significant mean ±S.D. in other food group Roots & Tubers are: rural 1.35±.6892, urban 1.50±.8371, Sugar & Honey: rural 4.48±3.0331, urban 4.85±3.0331), pulses, nuts & oilseeds: rural 8.05±5.0990, urban 8.10±5.9665, vegetables & fruits: rural 2.15±1.0858, urban 2.59±1.2649, meat, eggs & fish: rural 1.32±.7293, urban 1.62±1.0295, milk & milk Products; rural 6.80±4.6043, urban 8.86±6.4187, oils & fats: rural 8.66±6.4187, urban 9.82±5.8309, miscellaneous food: rural 9.90±6.4807: urban 12.60±6.3245. The average intake per consumer unit per day of Calorie (Kcal), Protein (gm) and Fat (gm) is higher in urban area than rural and their considerable mean ±S.D. are: calorie (Kcal) rural-2404±28.6007, urban 2456±15.8113, Protein (gm), rural 60.90±23.6050, urban 63.50±23.4691 and Fat (gm) rural 48.70±20.3174, urban-58.00±21.2037 and their corresponding errors are calculated as: Calorie (Kcal) rural11 .6761, urban 6.4549, Protein (gm) rural 9.6367, urban 9.5812 and Fat (gm) rural 8.2945, urban-8.6564) respectively.

Table 7.11: India & Sikkim: Per Capita Intake of Calorie, Protein and Fat (2011-12)

Regions	**Calorie (kcal/day)**		**Protein (gm/day)**		**Fat (gm/day)**	
	Rural	Urban	Rural	Urban	Rural	Urban
India	2233	2206	60.7	60.3	46.0	58.0
Sikkim	1614	1890	41.20	49.10	36.10	45.40

Source: NSS Report No. 560 Nutritional Intake 2011-12.

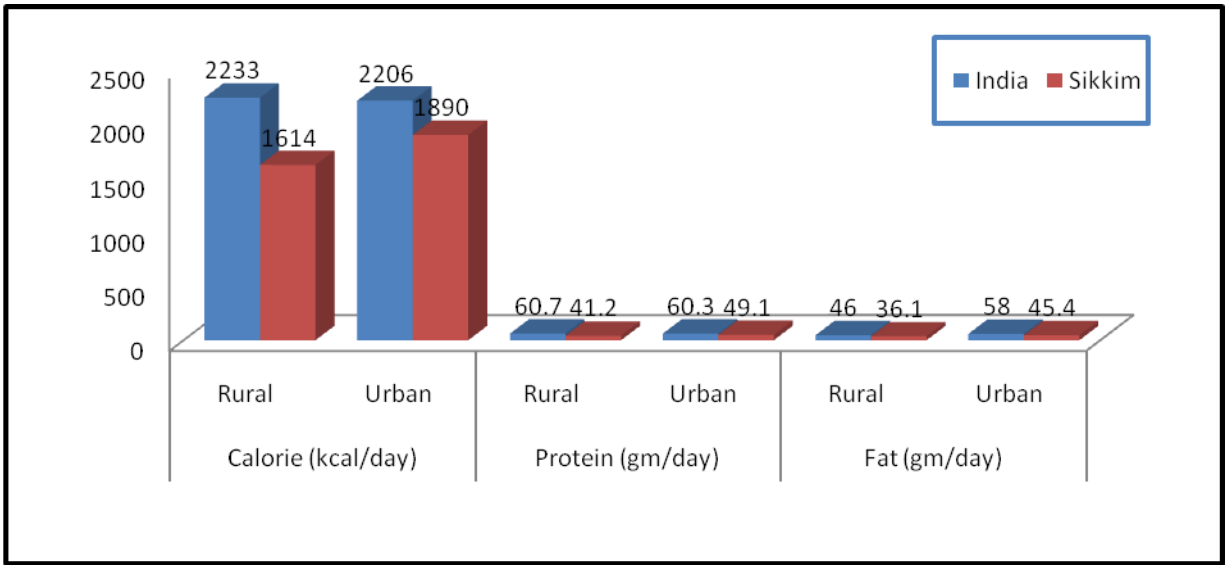

Figure 7.5: India & Sikkim: per capita intake of Calorie, Protein and Fat

The figure 7.5 shows the per capita intake of Calorie, Protein and Fat derived from different groups of food items for rural and urban households of India and Sikkim. It is found from the above data that in Sikkim per capita intake of Calorie, Protein and Fat in both households either in rural or in urban is low compared to national intake. The Calorie (Kcal/day) intake of India rural is 2,233 and urban 2,206 in India, but in Sikkim it is only 1,614 in rural and 1,890 in urban areas. Likewise, Sikkim has low per capita intake of Protein and fat as compared to India in both rural and urban areas.

Role of Public Distribution System in Food Security

Public distribution system (PDS) provides food grains at reasonable prices and is one of the imperative rudiments of the Government's Food Security system. It has been considered as a mechanism for ensuring availability of necessary food commodities at affordable prices to the citizens of the country. Moreover, it has also become an important plan for poverty eradication and run under the joint venture of the Central as well as State Governments. The main task of Central Government is responsibility for purchasing/obtaining, storage, transportation and mass allocation at subsidized prices of definite essential items such as rice, wheat, sugar and imported edible oils. The State Governments control their distribution to the consumers through a set-up of Fair Price Shops at different places.

Ensuring Food Security

In view of the increasing poverty and higher incidence of hunger (absence of two meals a day) as perceived by the households in the region (NER), ensuring food security becomes a challenging task. There are two aspects of achieving this objective: one, to ensure adequate supply of food and two, to help households to have enough income to buy adequate food (Dubey & Kharpuri; 2003).

Public Distribution of Food at Subsided Prices

The Department of Food and Public Distribution is responsible for the management of the food economy of the nation. It undertakes various activities such as procurement of food grains, building up and maintenance of food stocks, their storage movement and delivery to the distributing agencies. A close watch is kept on production and efforts are made to ensure their adequate availability at reasonable prices in different parts of the country (Sharma; 2005).

Expansion and Coverage of Major Food Security Initiatives: At a Glance

Public Distribution System has been considered as the most important food based safety net introduced by the government of India. The basic objects of the PDS in India is to provide essential consumer goods at cheap and subsidized price to the consumers so as to insulate them from the impact of rising prices of these commodities and maintain the minimum nutritional status of our population. In addition to food grains, PDS has been used in India for the distribution of edible oils, sugar, coal, kerosene and cloth. The most important item covered under PDS in India have been rice, wheat, sugar and kerosene. Together these four items have accounted for 86 percent of the PDS sale: pulses, which constitute an important source of protein for the poor, have a share of less than 0.2 percent in total PDS sale. PDS in India covers the whole population as no means of direct targeting are employed. PDS distributes commodities worth more than Rs 30,000 crores annually to about 160 million families and is perhaps the largest network of its kind in the world. The Central Issue Price (CIP) fixed by the government remained unaltered till 1997, then a dual praising structure was introduced under the Targeted Public Distribution System (TPDS), in which the issue price for families below the poverty line (APL) were fixed at 50 percent of economic cost. For making the PDS system more efficient, the government reduced the issue price of APL families by 70 percent during (Kurukshetra Journal; 2012).

History of the Public Distribution System

- During 1964 FCI set up a solitary central agency for procurement, storage, transportation and distribution of food commodities viz, rice, wheat, sugar edible oils, kerosene and coal.
- Period between 1964 – 1978 drought of 1965/67 and 1972/73 provided strong movement for the expansion of PDS.
- Within the periods of 1978 – 1991 Food grain distribution through PDS falls considerably to 14MT in 1994 stock accumulate. Between 1991 and 1994 PDS process doubles. The poor are priced out. Sales drop. Stocks build up. In this period because global prices are temporarily high, export has taken place at the cost of nutrition in India.
- Targeting introduced in 1997.

- For Above Poverty Line (APL) prices of different commodities were increased by 85 % (wheat) and 61% (rice) and BPL prices by 66% and 62% respectively during 1998 – 2001.

To make the public Distribution System more effective and 'poor oriented' the Targeted Public Distribution System (TPDS) was introduced in the year 1997. The schemes under the system have been introduced to ensure availability of food grains to the poor at affordable prices. It is an attempt of the government to guarantee at least a minimum quantity of food grains at specially subsidized prices to people living below the poverty line (Achievement-FCS&CA-2016).

The central and state governments along with joint venture dedicated to implement this Public Distribution System (PDS) for the greatest help of the beneficiaries. The Rural Management and Development Department of the state has formed Social Audit-cum-Vigilance Committees in each Gram Panchayat Unit and also has given power to watch over the efficiency, the transparency and the accountability of the Public Distribution System in the state.

In Sikkim the Department of Food, Civil Supplies and Consumer Affairs, Government of Sikkim deals with the procurement and distribution of essential commodities like rice, sugar, wheat (atta), kerosene oil and petroleum mainly through Fair Price Shops.
According to verdict of Supreme Court of India on 17.11.2004 the following agenda had been passed in order to implements the following schemes:

1. Sampoorn Grameen Rozgar Yojana
2. Mid Day meal scheme
3. Antyodaya Anna Yojana.

Among them the 3rd is imperative and it is mainly for poor families:
This scheme is meant for the poorest of the poor. A person allowed to benefit under this scheme is issued a red card. The red card holders are entitled to obtain grain and rice from the dealer through Public Distribution System (PDS) at a highly subsidized rate like Rs. 2 per kg of wheat and Rs.3 per kg for rice.

The Public Distribution System (PDS) mainly focus on the poor in an effort to transform the macro-level self-sufficiency in the food grains into micro-level i.e. make sure the availability of food for the poor. The work of TPDS is a lot of responsibility on the state government in identifying and issuing special cards to those belonging to below the poverty line and confirm that the food grains provided by the centre to the states are actually taken from the go-downs of FCI, transported to the shops and from there distributed to the actual card holders. Along with other states, TPDS was also introduced in Sikkim in order to distribute food items to the poor families through fair price shops.

Sikkim State Cooperative Supply and Marketing Federation Ltd. (SIMFED) under the policy of State Government has been delivering consumer goods to the rural primary cooperatives. The Department had also provided services of three utility Vehicles to SIMFED for smooth delivery of consumer goods and the vehicle on return from the rural cooperatives shall carry back marketable surplus of the members for onward marketing. All the overhead cost incurred by SIMFED has been reimbursed by the Department under the scheme. The State Government, under its policy, has been supporting SIMFED in its role to provide all consumer goods on F.O.R. from society's go-downs in the State on wholesale rate basis and for this purpose SIMFED is maintaining a central go-down at Rangpo Regulated Market yard/Jorethang/Mangan for dispatching consignments to various destinations on prepaid demand basis (Sikkim; 15 Triumphant Years of Democracy (1994-2009).

Targeted Public Distribution System (TPDS) and Antodaya Anna Yojana (AAY): (Seventh Report of the Commissioners to the Supreme Court)

The Public Distribution System (PDS) is considered as one of the oldest food subsidy programmers in the country. The British Government Rationing was introduced in 1939 and the basic structure for the PDS was flattened up in 1942. Since then, many changes have been seen in this programme along with the most recent change being the prologue of the Targeted Public Distribution System (TPDS) in 1997, having made a difference between households below the poverty line and above poverty line and provided for a major amount of the subsidy to be transferred only to those households who fall below the poverty line (BPL). Food grains are also given to those families of Above Poverty Line (APL) but the subsidy is very low as compared to that for the BPL families.

Under the Targeted Public Distribution System (TPDS) introduced in 1997, the Government of Sikkim made an attempt to provide rice at highly subsidized rates to the poor families. The task was carried out under the supervision of the respective District Collectors in order to identify 43,450 BPL families in the state. The state government under this scheme started issuing 35 kg of rice per family at Rs. 4 per kg per month since the commencement of the programme.

Different programmes have been introduced to uplift the poor families. The programmes/schemes being implemented by the state government up to December 2015 are as below:

1. ***Below Poverty Line***

Under this scheme, in the case of Sikkim, 26,914 families were fully benefited after getting highly subsidized rate of rice at Rs. 2 per kg. The beneficiaries were allowed to get 35 kg of rice per month. From April 2002, the department was issuing this quantity and for this, the state was allotted 942 MT of rice under this scheme every month.

2. ***Mukhya Mantri Antodaya Annadan Yojana***

Through this scheme, the poorest among the BPL families have been further identified for the Antodaya Annadan Yojana Scheme. Under this scheme a poor family is allowed to acquire 35 kg of rice per family per month at Rs. 3 per kg. The state government of Sikkim has renamed this scheme as Mukhya Mantri Antodaya Annadan Yojana from 23rd August, 2003 and under this scheme 9.914 beneficiaries are allotted with 35 kg of rice free of cost. The financial cost of 3.46 per kg is being burdened by the state government. Under this scheme 347 MT (Metric Tons) of rice was distributed every month.

3. ***Mukhya Mantri Khadya Surakshya Abhiyan (MMKSA)***

The instruction of central government was to provide subsidized rice to 43,450 people who are living below the poverty line under the TPDS scheme in the state. The state government introduced scheme called 'Mukhya Mantri Khadya Surakshya Abhiyan' and around 26,000 economically marginal families' and indigenous tribes are further provided rice at the subsidized rate of Rs.4 per kg. In this scheme the department purchases rice at Rs.830 per quintal and issues it at rate of Rs.370 per quintal. The subsidy of Rs.4.60 per kg is being borne by the state government.

The State Government under this scheme provided 35 kg of rice to marginal and economically backward families at a subsidized rate of Rs. 2/- per kg. These beneficiaries were marginal BPL families who had been left out in the BPL list. 872.3 MT of rice was allocated under this scheme every month (Achievement-FCS&CA-2016).

4. ***Antodaya Annadan Yojana***

Under this scheme of the central government, rice is being issued at Rs.3 per kg to 6,600 very poor beneficiaries selected from the BPL list. The 578 MT of rice was being allocated by the Central Government under the scheme of AAY out of which 347 MT of rice was distributed to MMAAY scheme and the remaining 231 MT of rice was distributed to 6,600 families under this scheme. As per this scheme the beneficiaries were allotted 35 kg of rice free of cost every month.

According to the revised notification of government of Sikkim under Food and Civil Supplies and Consumer affairs Department, dated 30th July, 2013:

"In order to provide food security to priority households, the Government is pleased to revise and notify the rate of subsidized rice to be provided under the Public Distribution System as below:

1. All households previously under *Mukhya Mantri Antyodaya Annadan Yojana* (MMAAY) and *Expanded Antyodaya Annadan Yojana* (EAAY) will henceforth come under *Antyodaya Annadan Yojana* (AAY) and will be entitled to 35 kg of rice free of cost per month per household. Further, households having more than 6 (six) members will be entitled additional 15 kgs of rice free of cost per month.

2. All households previously under the Below Poverty Line (BPL) scheme and *Mukhya Mantri Khadya Suraksha Abhiyan* (NMKSA) both will come under *Mukhya Mantri Khadya Suraksha Abhiyan* (NMKSA) and will be entitled to 35 kg of rice per household per month at the rate of Rs.2 per kg. Further, households having more than 6 (six) members will be entitled additional 15 kg of rice at Rs. 2 per kg per month. The above rates will be effective from 1st August, 2013" (Sikkim Express- 03/08/2013).

The Government of India allocated the following category of rice per month to the State of Sikkim up to December 2015. The allocation of rice to BPL families was 9,420.00 qtls., to AAY families 5,780.00 qtls, and rice to APL families 19,200.00 qtls (Achievement-FCS&CA-2016).

Table 7.12: Departmental Distribution of Allocated Rice and Wheat

Sl. No.	Schemes	Qty. in qtls	CIP(Central Issue Price) in Rs. per qtls	Consumer price per kg in Rs.	Subsidy per qtl	Subsidy Amt. per month
1.	Rice AAY	5780.00	300/-	Free	Rs.335/-	Rs.1936300.00
2.	Rice MMKSA from BPL	9420.00	565/-	2.00	Rs.452/-	Rs.4257840.00
3.	Rice MMKSA from APL	8723.00	830/-	2.00	Rs.700/-	Rs.6106100.00
4.	Rice APL	10477.00	830/-	9.00	nil	nil
	Total	34400.00				12300240.00
5.	Wheat	2450.00	6.10/-	8.92 (Atta)	nil	nil

Source: FCS& CA, 2016.

The department of Food Civil Supplies and Consumer Affairs, Government of Sikkim has taken the responsibility to distribute the allocated rice and wheat to the poor families. The Central Government allocated the quantity of rice and wheat through different schemes to the state. The state government distributed the allocated commodities and ensured its reach to the beneficiaries. According to above schemes AAY has got 5,780.00 quintals of rice and the central issue price was Rs.3, but beneficiaries were getting free of cost. Actually subsidy per quintals was Rs.335 and the total subsidy amount per month was Rs.19,36,300.00. Similarly, rice under MMKSA (BPL) was granted 9,420.00 quintals of rice and the central issue price was Rs.565 per quintals but consumer price was only Rs.2.00. Likewise, subsidy per quintal was Rs. 452 and grand subsidy amount per month was Rs.42,57,840.00. Rice under MMKSA (APL) allocated 8723.00 quintals and central issue price was Rs.830 per quintal. The consumers were getting Rs.2 per kg of rice and subsidy per quintal Rs.700 and the total subsidy amount per month came around Rs.61,06,100.00. Rice for APL category allocated 10,477.00 quintals and central issue price was Rs.830 per quintal. The APL consumers had to pay higher price of rice i.e. Rs.9.00 per kg as compared to other categories and there were no

subsidy. The second commodity i.e. wheat which got 2,450.00 quintals and central issue price was Rs.6.10 per quintal. The consumer price was Rs.8.92 and there were no any subsidy.

5. ***Annapurna Scheme***

Under the Annapurna Scheme, since November 2000 the destitute senior citizens above the age of 65 years who have no one to support them and are eligible for National Old Age Pension. They are provided 10 kg of rice free of cost.

Since April 2000 beneficiaries have been provided rice under this scheme and total numbers of 2,500 beneficiaries have been covered. A Ration Card has been provided free of cost to these beneficiaries which was different from others in the state of Sikkim.

6. ***Welfare Institutions/Destitute Homes***

Inmates/residents of Welfare Institutions are provided free meals of rice at the rate of Rs. 4 per kg and the concerned department has been constantly distributing the rice immediately after receiving central allocations.

Moreover, the state of Sikkim is provided 391 MTs of levy sugar per month and 245 MTs of whole wheat. There are 1,414 approved Fair Price Shops located in different areas of the state and their main functions is distribution of PDS and other commodities at fair prices to the end consumers.

Under this scheme various welfare institutions, orphanages, monastic schools are provided with free meals from the Food Department. They are provided with 5 kg of rice per inmate per month at Rs. 4 per kg and the Central Government allocates 11.39 Mt of rice under this scheme per month. In the state 32 welfare institutions with 2,278 beneficiaries are covered under this scheme (Achievement-FCS&CA-2016).

7. ***Whole wheat***

The Government of India allocates 245 MT of whole wheat to the state. For the convenience of the public it is ground into whole meal atta and distributed to ration card holders at the scale of 1 kg per individual at Rs. 8.92 per kg per month through Fair Price Shops and other designated shops. As the quantity is not sufficient for all the ration card holders and moreover all the ration card holders do not prefer ‘atta’ to rice , the department allocate whole meal “atta” only in those Fair Price Shops where there is a demand for “atta” as the shelf life of “atta” is short (Achievement-FCS&CA-2016).

8. ***Sugar***

After the deregulation of sugar by Government of India, the state had to lift sugar from the open market at market price duly calling for tender/quotations. The State procures 182 MT of sugar per month and makes sugar available to beneficiaries selected under AAY, MMAAY, MMKSA & BPL schemes of Department. Sugar was made available at Rs. 13.50 per kg at the

scale of 500 grams per individual or 2.50 kg per family whichever is lesser per month from the Fair Price Shops. The State lifts the allotted quota by engaging an agent directly from various sugar mills of Uttar Pradesh which quotes the lowest price. It is then transported by road to Siliguri and further transported to different Food go-downs in the State of Sikkim (Achievement-FCS&CA-2016).

To ensure safe storage and effective distribution of food grains, the department has established many new food go-downs at Chungthang, Pakyong, Ravangla, Chongrang and Dentam.
For the implementation of different schemes and policies, the Food Civil Supplies and Consumer Affairs Department, Government of Sikkim operates a total of 27 Food godowns in the State which are under supervision of the District Food and Civil Supply Official. From these godowns essential commodities such as rice, sugar, salt and 'atta' are distributed through Fair Price Shops registered with the Food & Civil Supplies Department. There are two FCI godowns each at Jorethang (South) and Rangpo (East) Sikkim. 27 Food Godowns are located in different places within the four districts of Sikkim viz. Chungthang, Dikchu, Mangan (North) Gangtok, Pakyong, Ranipool, Rhenock, Rongli, Singtam, Rangpo, Makha (East) Namchi, Jorethang, Ravangla, Temi, Yangang, Namthang, Melli, Bermoik, (South) and Dentam, Gyalshing, Kaluk, Legship, Sombaria, Soreng, Thingling, Chongrong (West). There are sub-godowns in Lachung and Lachen.

Fair Price Shops

Under the Food Civil Supplies and Consumer Affairs Department a number of Fair Price Shops are registered in order to distribute essential commodities like rice, sugar, wheat (atta) etc. which are procured by the Department. These Shops are directly under the control of the Department of Food and Civil Supplies and they are required to distribute essential items as per the prerogative scale and price which are already fixed and communicated by the Department. A number of Cooperative Societies are also registered in the same Department for providing essential commodities to the people.

As against the existing 35 Multi-Purpose Cooperative Society (MPCS), the department under the State policy is required to establish one MPCS in each GPU. The state has established 166 MPCS in the State and provided Government equity participation of Rs.30, 000/- and Financial assistance of Rs.47, 000 to each GPU MPCS (Sikkim; 15 Triumphant Years of Democracy (1994-2009).

The department has issued license to 1,538 shops including Cooperative Societies to run as Fair Price Shops all over the state. Of the total Fair Price Shops, 152 are inactive and as of 20th July 2016, there was a total of 1,409 Fair Price Shops which were operational in the state (Achievement-FCS&CA-2016).

Integrated Child Development Services (ICDS)

Integrated Child Development Services (ICDS): the ICDS Scheme is one of the centrally sponsored schemes that was launched in 1975 with an aim to develop the nutritional and health position of children who falls below the age of six years and inclue the pregnant as well as lactating mothers. This scheme is fully implemented in Sikkim.

Mid Day Meal Scheme

Mid Day Meal Scheme is one of the successful programmes launched on 15th August 1995. Within this scheme food grains are provided free of cost at the rate of 100 gram per child per school day and cooked hot meal is served with a minimum content 300 calories and 8-12 gram of protein each day of school for a minimum of 200 days and total of 3 kg per student per month covers around 9-11 months in a year. This scheme includes students (class v) of Government primary schools or primary schools aided by Government and the primary schools by local bodies. In drought affected places, the mid-day meal is distributed during the summer vacations also. Of late, this scheme has been revised and it is extended up to junior high school .i.e. up to VIII standard. All Government junior high schools in Sikkim have been benefitted by this scheme.

Mahatma Gandhi National Rural Employment Guarantee Act (MGNREGA)

The Central Government launched this new programme in 2005. The Mahatma Gandhi National Rural Employment Guarantee Act (MGNREGA) is considered as the first ever law internationally that guarantees wage employment at an unprecedented scale. The main aim is to reach livelihood security of households particularly in rural areas of the country by providing at least one hundred days of guaranteed wage to the adult members who volunteer to do unskilled manual work.

National Food Security Act (NFSA)

The National Food Security Act, 2013 was enforced by an act of Parliament after receiving the assent of the President on the 10th September, 2013. The Act provides coverage of up to 75 % of the rural population and up to 50% of the urban population for receiving subsidized food grains under Targeted Public Distribution System (TPDS), thus covering about two thirds of the population (Achievement-FCS&CA-2016).

Earlier while implementing NFSA, there were chiefly three types of ration cards issued by State Governments such as APL, BPL and Antyodaya (AAY) ration cards which are distinguished by distinct colours decided by concerned State Govt. According to NFSA 2013, APL and BPL groups have re-categorized into two: Priority and Non-Priority. Thus NFSA prioritizes household's needs taking into account not only their income but other socio-economic disproportion in the society.

Priority Categories

Priority House Hold (PHH): A large section of ration card holders comes under this category. In order to eradicate poverty, National Food Security Act (NFSA) claims right to collect food grains at subsidized prices by persons falling in eligible household that is Priority House Holds (PHH) under Targeted Public Distribution System (TPDS). In this sector every person falling under priority households, shall be allowed to receive five (5) kg of food grains per person per month at subsidized prices from the ration shops not exceeding Rs. 3 per kg of rice, Rs. 2 per kg of wheat and Rupee 1 per kg for coarse grains for a period which is fixed by the Central Government and above price may be fixed from time to time by the Central Government.

1. ***Antyodaya Anna Yojana (AAY) Ration Card:*** It is basically for the poor people that Antyodya Anna Yojana has been preserved. It is projected that 5 percent of the people who are unable to get two meals a day on a sub-standard basis throughout the year. The person who belongs to this category and whose purchasing power is so low that they are unable to buy food grains round the year, even at BPL rates. About 5 crore people or around 1 crore families makes the target group of Antyodya Anna Yojana. On 1st March 2001 AAY scheme was introduced in the State. This scheme reflects the pledge of the Government of India to ensure security for all paving the way for a hunger free India in the coming next five years and to transform and improve the distribution system so as to provide supply to the poorest of the poor in rural and urban areas. Under this scheme (AAY) households provide 35 kg of food grain per household per month. Wheat and rice are being issued at the range of 15 kg and 20 kg per family per month at Rs. 2 and Rs. 3 per kg respectively.

2. ***Annapurna Yojna (AY) Ration Card***

Annapurna Yojna (AY) Ration Card is considered as a special type of ration card issued only to those elderly poor people whose age is above 65 years. They are provided 10 kgs of foodgrain on a monthly basis by the government.

3. ***State Priority Ration Card (SPHH)***

State priority cards are one of the special card that is issued only to a member who needs treatment due to serious illness but it comes directly to non-priority household ration card. State priority card holder is ineligible to obtain articles from ration shops. Providing this type of ration card is the sole responsibility of concerned state and purely depends on ruling State Govt. and its policies.

Non-Priority Categories (NPHH)

The households that remain after populating and selecting priority list will go to Non-Priority category. Non-Priority Households (NPHH) are not eligible to acquire subsidized food grains under NFSA system. As per the NFSA, 25 % of the rural population and 50 % of urban

population will move away from the ambit of receiving subsidized food grains under Targeted Public Distribution System (TPDS). They may possess a ration card but no subsidized food grains. In contrary the priority ration card (PHH) holders remain eligible to acquire subsidized food grain and thereby become benefitted through the scheme.

Table 7.13: The quantity allotted by the Ministry under NFSA from January 2016

Allocation Category	Rice	Wheat	Total	Central Issue Price Rice/kg	Central Issue Price Wheat/kg	Consumer Issue Price /kg	Scale of Issue
AAY	577.50	0.00	577.50	Rs.3.00	Rs.2.00	Rs.3.00	35 kg/family
Priority	1,614.17	0.00	1,614.17	Rs.3.00	Rs.2.00	Rs.3.00	5 kg/member
Total	2,191.67	302.24	2,493.91				
Tide over	1,200.00	302.24	1,502.24	Rs.8.30	Rs.6.10	Rice Rs.11.00 & Wheat Rs.10.90 /kg	Rice 8.05 & wheat 1.74 kg/ individual

Source: FSC& CA, 2016.

The Food, Civil Supplies and Consumer Affairs Department implemented the National Food Security Act (NFSA) from the month of January 2016. As per the government report at present the beneficiaries under NFSA (Rice) AAY = 16,500 households, PHH = 3,22,834 individuals and OPHH is 1,46,899 individuals. Distributions of food grains to these families are done through 1,409 Fair Price Shops within the four districts of Sikkim.

Price of Essential Commodities

Rice

Table 7.14: Wholesale and Retail price of Rice under NFSA

Sl. No	Commodity/Scheme	Wholesale rate per qtl	Retail sale per kg	Scale
1.	Rice AAY	Rs. 114.00	Rs.3.00	35kg/Family
2.	Rice PHH	Rs.114.00	Rs.3.00	5 kg/Family
3.	Rice OPHH	Rs.914.00	Rs.11.00	8.05kg/Individual

Source: FSC& CA, 2016.

From the above table it is understood that under NFSA, the schemes like AAY, PHH and OPHH have fixed different wholesale and retail price for rice for the beneficiaries. For the AAY scheme wholesale price of rice was fixed at Rs.114 per qtl, retail price at Rs. 3.00 per kg and a scale of 35 kg per family per month. Similarly, under PHH scheme wholesale price of rice was fixed at Rs.114 per qtl., retail price at Rs. 3.00 per kg and a scale of 5 kg per family per month and under PHH scheme wholesale price of rice at Rs.914 per qtl., retail price at Rs. 11.00 per kg and a scale of 8.05 kg per individual per month.

Wheat

Wheat is one of the important essential items distributed by the state government which is allocated by the Government of India. However in Sikkim, the allocated wheat is ground to make 'Atta' (wheat flour) and then distributed. Wheat allotted from the Ministry up to December 2015 was 2,450.00 qtl and the same have been allotted to: a) M/s Rangeet Associates Pvt. Ltd. at 1,800.00 qtl per month and b) M/s Kailash Flour Mills Ltd. at 650.00 qtl per month. The whole wheat allotted to the above two mills are distributed by the Department in the form of atta after grinding as per the direction of the Department. The CIP (Central Issue Price) of wheat is Rs.610.00 per qtl and the retail sale rate of Atta is Rs. 8.92 per kg (Achievement-FCS&CA-2016).

The revised allocation of wheat under NFSA from the month of January 2016 is 3,022.40 qtl and the same is allotted to the above mentioned mills.

Sugar

Sugar is considered as an essential commodity distributed by the department of Food Civil Supplies and Consumer Affairs, Government of Sikkim. The total amount of sugar distributed from July 2013 to May 2015 was 1,820.00 qtl. Total AAY beneficiaries till 31st December 2015 was 16,514 households (family) and MMKSA beneficiaries was 51,837 households (family). Grand total beneficiaries of both AAY and MMKSA are 68,351 beneficiaries (households).

After deregulation of sugar w.e.f. April 2013-14, under the new system the state governments are required to procure sugar from open markets for the Targeted Public Distribution System. The Government of India had constituted a Committee headed by Dr. C. Rangarajan, Chairman, Economic Advisory Council to the Prime Minister to look into all aspects related to regulation in the sugar sector. As per recommendation of the Committee, the Central Government had decided to remove the levy obligation on sugar mills and the regulated release mechanism. The state government accepted the mechanism and approved to provide sugar to 3,62,260 beneficiaries under Public Distribution System at the price of Rs. 13.50 per kg by purchasing from the open market at the factory price of Rs.32.00 per kg. The difference between the purchase price and issue price was Rs. 18.50 per kg which was borne by the Government of India and the remaining Rs.7.53 per kg was borne by the State Government. This was in the year October 2014 (Achievement-FCS&CA-2016).

Scale of sugar distribution is 2.5 kg per month per family up to December 2015 and the scale has been refixed at 2.4 kg per family per month from January 2016 due to increase of Ration Cards from 1,54,992 to 1,60,604. The subsidized sugar is provided to all the ration card holders irrespective of their category (Achievement-FCS&CA-2016).

Table 7.15: Scheme wise Rate and Scale of Essential Commodities till 31st December, 2015

Sl. No.	Schemes	Rate of Rice	Scale
1.	Antodaya Anna Yojana (AAY)	Free	35 kg/household/month
2.	Below Poverty Line (BPL)	2/kg	35 kg/household/month
3.	Mukhya Mantri Khadya Suraksha (MMKS)	2/kg	35 kg/household/month
4.	Above Poverty Line (APL)	9/kg	2kg/person

Source: FSC& CA, 2016.

According to old schemes such as Antodaya Anna Yojana (AAY), Below Poverty Line (BPL), Mukhya Mantri Khadya Suraksha (MMKS) and Above Poverty Line (APL) till 31st December, 2015, price of rice was different for different schemes. Those beneficiaries who fall under Antodaya Anna Yojana (AAY) scheme were getting 35 kg per household per month free of cost rice. But schemes like Below Poverty Line (BPL) and Mukhya Mantri Khadya Suraksha (MMKS), beneficiaries had to pay Rs. 2 per kg and the quantity was confined to 35 kg per household per, month only. However, if the beneficiaries required more than 35 kg of rice, then they had to pay more. Those belonging to Above Poverty Line (APL) category had to pay Rs.9 per kg of rice and were allowed to acquire only 2 kg per person per month.

Table 7.16: Scheme wise Rate and Scale of Essential Commodities from 1st January 2016

Sl. No.	Scheme/Commodities	Rate in Rs.	Scale
1.	Antodaya Anna Yojana (AAY)	3/kg	35 kg/households/month
2.	Priority Households (PHH)	3/kg	5kgs/households/month
3.	Other Priority Households (OPH)	11/kg	8.053 kg/person/month
4.	Whole Meal Atta	10.90/kg	1.713kg/person/month (In lieu of rice entitlement)
5.	Sugar	27.14/kg	2.4kg/household/month
6.	Kerosene Oil	15.25 to16.20/ litre	1.25ltre/person/month (Rural area) 1.00ltr/person/month (Urban area)

Source: FSC& CA, 2016.

As per revised schemes such as Antodaya Anna Yojana (AAY), Priority Households (PHH) and Other Priority Households (OPH), the rate and scale of commodities are different compared to older schemes. The Antodaya Anna Yojana (AAY) beneficiaries are getting Rs. 3.00 per kg of rice and are entitled for 35 kg per household per month. Similarly, Priority Households (PHH) beneficiaries are getting Rs. 3.00 per kg of rice, but they are only enjoying 5 kg per household per month. Likewise, Other Priority Households (OPH) categories had to pay little more i.e. Rs. 11.00 per kg and were entitled to receive only 8.053 kg per person per month. Moreover, the rate and scale were set different for three commodities like Whole Meal Atta (rate Rs.10.90/kg & scale 1.713kgs/person/month (in lieu of rice entitlement), Sugar (rate Rs. 27.14/kg & scale-2.4kgs/household/month) and Kerosene Oil (rate Rs.15.25 to

Rs.16.20/litre & scale- 1.25ltre/person/month (Rural area) and 1.00ltr/person/month (Urban area) applicable for all beneficiaries.

Table 7.17: Latest Policy Master of the Food Civil Supplies and Consumer Affairs Department (2016)

Schemes	**Rice**		**Wheat**		**Sugar**		**Kerosene**	
	Quantity Allocated (Kg)	Price (Rs.) per Kg	Quantity Allocated (Kg)	Price (Rs.) per Kg	Quantity Allocated (Kg)	Price (Rs.) per Kg	Quantity Allocated (litre)	Price (Rs.) per litre
AAY	35 kg per card	3.00	-		2.40 per card	27.14	Rural: 1.25 per unit Urban:1.00 per unit	16.85 to 17.00 per litre
PHH	5 kg per unit	3.00	-		2.40 per card	27.14	Rural: 1.25 per unit Urban:1.00 per unit	16.85 to 17.00 per litre
OPHH (G)	8.053 kg per unit	11.00	1.738kg per unit	10.90	2.40 per card	27.14	Rural: 1.25 per unit Urban:1.00 per unit	16.85 to 17.00 per litre
OPHH(S)	8.053 kg per unit	11.00	1.738kg per unit	10.90	2.40 per card	27.14	Rural: 1.25 per unit Urban:1.00 per unit	16.85 to 17.00 per litre
NPH		-	-		2.40 per card	27.14	Rural: 1.25 per unit Urban:1.00 per unit	16.85 to 17.00 per litre

Source: FSC& CA, 2016.

The Food Civil Supplies and Consumer Affairs Department, Government of Sikkim has recently developed a master policy in order to cover all schemes as well as provide essential commodities to the beneficiaries as per the subsidized rates. The schemes include AAY, PHH, OPH and NPH, but the OPH is further divided into OPHH (General) and OPHH (Special). In these schemes the basic commodities such as rice, wheat, sugar and kerosene are covered. As per the different schemes beneficiaries are allotted rice, wheat, sugar and kerosene at different rates. Under the AAY scheme the quantity of rice allotted was 35 kg per card at the rate of Rs.3.00 per kg , sugar 2.40 kg per card at the rate of Rs. 27.14 and kerosene for Rural: 1.25 per unit & for Urban:1.00 per unit at the rate of Rs. 16.85 to17.00 per litre. Similarly, under PHH scheme quantity of rice allotted was 5 kg per card at the rate of Rs.3.00 per kg , sugar 2.40 kg per card at the rate of Rs. 27.14 per kg and kerosene for Rural: 1.25 per unit & for Urban:1.00 per unit at the rate of Rs. 16.85 to17.00 per litre. Likewise, OPHH (General) and OPHH (Special) were alloted 8.053 kg per unit of rice at the rate of Rs.11.00 per kg, wheat 1.738 kg per unit at the rate of Rs. 10.90. Sugar and kerosene rates and scales were same for

all beneficiaries. The NPH beneficiaries are getting only sugar and kerosene at same rate and scale as other beneficiaries were getting.
The total number of beneficiaries as on 1st January, 2016 is as under:

i) AAY -- 16,500 households
ii) PHH – 3,22,834 individuals against the target of 3,24,081
iii) OPH – 1,19,240+25,007 (left out) OPH (General) +2,652 OPHH

Over the time these data base have undergone changes due to the detection of sizeable number of duplicate beneficiaries. The duplication detected is because of duplicate entries of family members or because of double establishments. The figure as on 11th May 2016 is as under:-

i) AAY – 16,509 households against 16,500
ii) PHH – 3,24,814 individuals against 3,24,081
iii) OPHH (General) -- 1,19,726 individuals
iv) OPHH (Special) -- 2,652

The changes are due to ongoing process of deleting duplicate entries and replacing them with new entries of genuine left out beneficiaries (Achievement-FCS&CA-2016).

National Food Security Bill

National Food Security Bill stated that there should be homogeneous benefits to 75 percent of the population in rural areas and 50 percent in the urban areas as entitled for 5 kg of food grain per person per month.

It had further stated that priority households may be allowed to receive 7 kg food grains per person per month at variable prices according to essential commodities not exceeding Rs. 3/2/1 per kg for rice, wheat, coarse grains correspondingly. The general households may be allowed to get not less than 3 kg of food grains per person at prices not 50 percent of Minimum Support Price.

The standing committee on food, consumer affairs and public distribution submitted their report to Lok Sabha speaker Meira Kumar, further suggested that state governments may be given the provision to expand coverage beyond the stipulations from their own resources. According to the committee report, there should be a single category system of inclusion with uniform entitlement of 5 kg per person per month and distribution of food grains to states according to 2011 population estimates which possibly will be revised in every 10 years gap.
Vilas Muttemwar, chairman of committee described the National Food Security Bill as "revolutionary" and he further said that "Considering the current levels of production and procurement of food grain, the committee agrees to the proposed coverage of 75 percent population in rural areas and 50 percent in urban areas to be identified as a uniform entitlement at the 5 kg per person per month under the bill. Nearly 83 crore population of the country will be covered".

The Food Security Bill was introduced in the Lok Sabha in December 2011 which was then handed over to the standing committee in January 2012. The original bill had planned to cover 75 percent of rural population (at least 46 percent belonging to priority households) and up to 50 percent of the urban population (with at least 28 percent belonging to priority households) under the Targeted Public Distribution System (TPDS).

After the extensive discussions in the parliament session finally the Food Security Bill was passed on 27th August 2013, hoping it may feed the mouth of every poor families of the country.

Salient Features of the National Food Security Bill

Food Security Bill brings more benefits for the poor people of the country. The following features have been taken into consideration:-

- A beneficiary can get rice at Rs.3/kg, wheat at Rs.2/kg and coarse cereals at Rs.1/kg.
- The scheme offers a homogeneous monthly entitlement of 5 kg grains for up to 75 per cent of the rural population and up to 50 per cent of the urban population.
- The entitlement of Antodaya Anna Yojana households - the poorest of the poor will, however, continue at 35 kg per month.
- The right cannot be applicable if there is a war, flood, drought, fire, cyclone or earthquake affecting supplies.
- The prices of the grains will continue the same for the period of three year after that it may change. The government can in future look at schemes of cash transfers or food coupons to beneficiaries in place of the grain entitlement.
- Pregnant women and lactating mothers, in addition being entitled to nutritious meals as per the prescribed nutritional norms, will also receive at least Rs.6,000, as one of the maternity benefits.
- Children in the age group between 6 months to 14 years will be entitled to take home ration or hot cooked food as per prescribed nutritional norms.
- Not less than 3 kg of essential grain per person per month for general household at prices not exceeding half the Minimum Support Price (MSP) for wheat and coarse grains and not exceeding half the derived MSP of rice.
- At least one free meal every day for the destitute.
- Affordable meals at comity kitchens for the homeless people.
- Two free meals a day for up to three months for the disaster victim.

Reform of PDS

The need of the hour is PDS reforms to ensure that public distribution functions the way it is intended. Technology based reforms are suggested.

The different types of reforms undertaken by different states are:

- Adhaar Linked and Digitized Ration Cards: This allows online entry and verification of beneficiary data. It also enables online tracking of monthly entitlements and off-take of food grains by beneficiaries.
- Computerized Fair Price Shops: Fair Price Shops automated by installing 'Point of Sale' device to swap the ration card. It authenticates the beneficiaries and records the quantity of subsidized grains given to a family.
- Direct Benefit Transfer (DBT): Under the Direct Benefit Transfer scheme, cash is transferred to the beneficiaries account in lieu of food grains subsidy component. They will be free to buy food grains from anywhere in the market. For taking up this model, pre-requisites for the States/UTs would be to complete digitization of beneficiary data and seed Adhaar and bank account details of beneficiaries.
- Use of GPS technology: Use of Global Positioning System (GPS) technology to track the movement of trucks carrying food grains from state depots to FPS which can help to prevent diversion.
- SMS-based monitoring: Allows monitoring by citizens so they can register their mobile numbers and send/receive SMS alerts during dispatch and arrival of TPDS commodities.
- Use of web-based citizens' portal: Public Grievance Redressal Machineries, such as a toll-free number for call centres to register complaints or suggestions (www.clearies.com).

As compared to old reforms of PDS system the new are very much digitized and attached with the beneficiaries.

Livelihood Security

The perception of people towards livelihood security indicates that 88.72 percent people are concerned with livelihood matter whereas 11.28 percent people are less bothered.
According to observations, people of Sikkim cannot sustain their family members if the Government stops the import of food grains. The state of Sikkim cannot produce essential commodities as per the demand of food grains due to the following reasons:-

i) Hilly region/rugged topography

ii) Water scarcity

iii) Infertility of soil

iv) Constraints of land

v) Less production in agricultural field

vi) Growing population

vii) Frequent landslides during rainy season, etc.

The agricultural sector plays a crucial role as source of livelihood activities and it also provides direct admittance to food. The primary source of food supply is a combination of aspects like home production, open market, Fair Price Shop, Public Distribution System etc. Accordingly, connection between food production and food security depends on the food stocks available at the household level.

Table 7.18: Sources of Food Items

Sl. No	Sources of Food Items	Percentage Mean ± S.D.	Standard Error
1.	Own farm Production	20.29±13.0690	5.3354
2.	Food purchased from market	30.66±18.1769	7.4206
3.	Supply from relatives/friends	1.07±.8941	.3650
4.	Government ration	26.09±13.3865	5.4650
5.	Fair Price shop	17.65±10.8258	4.4196
6.	Open market	1.89±1.2096	2.4938
7.	Storage at home	2.35±1.9241	.7855
	Total	100.00±25.3456	10.3473

Source: Field Survey 2015-16.

The table 7.18 shows the sources of food items in the study area and also a comparative data on variables like own farm production, food purchased from market, supply from relatives/friends, Government ration, Fair Price shop, open market and storage at home and their significant mean ±S.D. and standard error. The highest percentage is observed in food purchased from market which shows the significant mean ±S.D. is 30.66±18.1769 and standard error is calculated as 7.4206. Government ration comes under second position which has significant mean ±S.D. of 26.09±13.3865 and standard error is calculated 5.4650. The own farm production holds third position among other sources of food items and its significant mean ±S.D.is 20.29±13.0690 and standard error is calculated as 5.3354. People also depend on Fair Price shop for food items and the considerable mean ±S.D.is 17.65±10.8258 and standard error is calculated as 4.4196. The remaining sources such as open market, supply from relatives/friends and storage at home are less compared to other sources. Only 20 percent of food items can be hardly produced in the fields and remaining 80 percent requirement depends on other sources.

Food Habits

Food habits of people in different parts of the world can be impacted by environmental conditions. According to Vidal de la Blache, "among the connections that tie man to a certain environment, one of the most tenacious is the food supply; clothing and tools are more subject to modification than the dietary regime, which experience, has shown to be best suited to human needs in a given climate" (Hussain, 2004).

The physical environment of a region must be taken into account by its inhabitants in deciding to produce particular foods suitable to the climate and soil. Basically, environment plays a crucial role to determine the food habits of human kind in any region of the world. Food habits are strongly influenced by cultural traditions, derived from events and conditions in the physical milieu. People in many folk societies believed that everything in nature has a distinctive characteristic, based on its looks and natural properties. Consequently, certain foods are desired or avoided in response to perceive the beneficial or harmful natural characteristics.

Food habits and dietary customs are inevitably affected by the availability of indigenous products, but people do not simply eat what is available in their particular environment. Food habits are strongly influenced by cultural traditions, derived from events and conditions in the physical environment (Hussain; 2004).

The food habits of people vary from location to location, depending upon proximity of sea, land, hill, desert, etc. People are conditioned over a time depending upon geographical, climatic and social condition as well as their innate tendency to satisfy the needs and requirement based on availability of local resources, its proximity, accessibility and adequate availability of items in extreme seasons. The North-East Region of India is no exception as it is dominated by the tribal population, and agriculture for the production of food grains in the region is highly dependent upon the custom, tradition, culture and food habit of the tribal people. Despite diversity in food habits among different communities, rice and wheat provide the staple diet for most of the people in the region, though pulses, vegetables, fruits, fish, meat, egg and milk are also taken by them to some extent along with the rice (Datta & Pradhan; 2006).

Sikkim has its own unique dietary culture with specific cuisine and food recipes. Like anywhere else in the world, food habits here have evolved as the result of traditional wisdom and empirical experiences of generations. Today in many parts of the world these traditional foods have entered commercial production, and their recipes have become popular among people of different ethnic origin. In the Sikkim Himalayas traditional foods are an integral part of the dietary culture of the various ethnic groups of people consisting of the Nepalese, Bhutias and Lepchas. Rice is the staple food. Meat and dairy products are also consumed

depending on availability. Besides these, various traditional fermented foods and beverages, which constitute about 20 percent of the basic diet for centuries are prepared and consumed.

The dietary culture of this region is mostly reflected in the pattern of food production. Depending on the altitudinal variation finger millet, wheat, buckwheat, barley, vegetable, potato, soybeans, etc. are grown. Some of the common traditional cuisine that are integral to the dietary culture of Sikkim are *momo, thukpa, kinema, gundruk & sinki soup, chhurpi, mesu, tama, kalo dal, sidra ko achar, selroti, shimi ko achar, pakku, kodo ko roti, phapar ko roti, silam ko achar, phulaurah, chambray, ti ko alu, sishnu soup, mohi, dahi, jaanr/chaang, kodo ko jaanr, bhaate jaaanr, makai ko jaanr, gahun ko jaanr, jahun ko jaanr, simal tarul ko jaanr, kodo ko jaanr* and *raksi.*

Sikkim has a blend of culture and traditions of Nepal, India, Bhutan and Tibet. So, does the cuisine of this state. The bizarre combination of various cuisines has resulted into one specific cuisine, which is now called as cuisine of Sikkim. Today, Sikkim boasts of its own dietary culture that comprise of different food habits and some special recipes. These recipes and habits emerged with the traditional wisdom and experiments of generations. The traditional food of Sikkim, is gaining popularity among the masses. In the present day, Sikkim cuisine has entered the kitchens of the world (www.bharatonline.com).

Food culture of Sikkim is directly related to the pattern of food production in the State. It has evolved as a result of traditional wisdom and experiences of generations over a period of time. It has been based on agro-climatic conditions suitable for cultivation of different crop species such as cereals, pulses, oilseeds, fruits, vegetables, spices and availability of wild edible plants, ethnic, regional, and cultural practices. Traditional foods have an important bearing in the dietary habits of the people of Sikkim. (Tamang, 2005:1-2 & Subba, 2008).

.

Consumption of Rice

Rice is the staple food of Sikkim. It is seasonal and most important cereal crop of the South district next to maize. It is cultivated in the lower altitude especially in the river valleys of Teesta and Rangit. Besides, it is also cultivated in the gentle slope with the help of terrace farming.

In South district maximum paddy cultivation has been seen in lower areas. The production of paddy is not very large in volume and it is mostly consumed by farmers themselves. Sometimes due to economic problems, villagers sell the paddy/rice in villages as well as in local markets in limited quantity. Most farmers store some of the produce in order to maintain food security.

Table 7.19: Average Monthly Purchase of Rice From the Market/Household (in kgs)

Sl. No.	Rice purchased from the market (in Kg/month)	Percentage Mean ± S.D.	Standard Error
1.	Below 15	2.33±1.6456	.6718
2.	15-30	11.04±8.9442	3.6514
3.	30-45	13.58±10.9178	4.4572
4.	45-60	48.41±20.1494	8.2259
5.	Above 60	24.64±15.2315	6.2182
	Total	100.00±25.3456	10.3473

Source: Field Survey 2015-16.

The table 7.19 represents the Average Monthly Food items (Rice) purchased from the market per household in the study area with significant mean ±S.D. and standard error. For most of the households, monthly rice purchased from the market ranges between 45-60 kg with significant mean ±S.D. 48.41±20.1494 and standard error is calculated as 8.2259. The households purchasing rice above 60 kg per month hold the second place with mean ±S.D. of 24.64±15.2315 and its corresponding error is 6.2182. The third position is occupied by households purchasing 30-45 kg of rice from the market for the family members and the significant mean ±S.D. is 13.58±10.9178 and its corresponding error calculated as 4.4572.

Table 7.20: Consumption of Rice/Day/Family

Sl.No.	Consumption of rice in gm/day	Percentage Mean ± S.D.	Standard Error
1.	Below ¼kg (250 gm)	7.21±5.5497	2.2656
2.	½ kg (500 gm) - ¾ kg(750 gm)	8.14±5.9665	2.4358
3.	¾kg (750 gm) – 1kg (1000gm)	19.54±15.6588	6.3972
4.	1kg (1000gm) - 2 kg (2000gm)	47.28±22.6450	9.2448
5.	2+ kg (above 2000gm)	17.83±13.7113	5.5976
	Total	100.00±25.3456	10.3473

Source: Field Survey 2015-16.

The table 7.20 reveals the average consumption of rice (gm) per day per family with significant mean ±S.D. and standard error. The highest number of households is found in the category of average consumption rate between 1kg (1000gm) to 2kg (2000gm) and the corresponding mean ±S.D. is 47.28±22.6450 and standard error is calculated as 9.2448. The second highest number of families is found to have consumption of rice between ¾kg (750 gm) to 1kg (1000gm) with considerable mean ±S.D. 19.54±15.6588 and its corresponding error is calculated as 6.3972. Families with consumption rate of 2kg+ (above 2000gm) come third having significant mean ±S.D. of 17.83±13.7113 and standard error is calculated as 5.5976.

Table 7.21: Percentage of Families Able to Feed Themselves if Allottment of Rice is Withdrwan

Sl. No	Response of villagers	Percentage
1.	Yes	36.26
2.	No	63.74
	Total	100.00

Source: Field Survey 2015-16.

The above data makes the perception of people clear towards rice. If alloted rice is withdrawan by the government there will be problems of feeding for 63.74 % of the sample families. However, 36.26 % say that they will not be affected.

Consumption of Maize

Maize is considered as one of the important crops grown in almost all parts of study areas. As for South district, maize is a dominant crop in the entire district.

Table 7.22: Average Production of Maize (in kg)

Sl. No.	Production in kg	Percentage Mean ± S.D.	Standard Error
1.	Below 50	8.03±6.4187	2.6204
2.	50-100	19.09±13.9857	5.7096
3.	100-150	29.76±16.7690	6.8459
4.	150-200	26.08±13.7113	5.5976
5.	Above 200	17.04±12.9460	5.2852
	Total	100.00±25.3456	10.3473

Source: Field Survey 2015-16.

The table 7.22 shows the average production of maize (kg) by the households in the study area with the significant mean ±S.D. and standard error. Most of the households produce between 100-150 kg and has significant mean ±S.D. 29.76±16.7690 and standard error is calculated as 6.8459. The second position is occupied by households producing 150-200 kg with considerable mean ±S.D. is 26.08±13.7113 and its corresponding error as 5.5976. A significant number of households produce 50 kg to 100kg while some others produce more than 200kg. There are few households that produce below 50 kg.

Table 7.23: Consumption Status of Maize

Sl. No.	Consumption status	Percentage
1.	Self-Consumed	87.63
2.	Quantity Sold	12.37
	Total	100.00

Source: Field Survey 2015-16.

Maize is one of the chief cereal crops cultivated in Sikkim. It is grown by every farming family. As far as the consumption of maize is concerned, 87.63 percent is self-consumed. Sometimes people sell maize if produced in surplus or during the time of emergencies.

Consumption of Wheat

Wheat is the third important cereal crop and the most important rabi crop in the Ssouth district. Wheat is cultivated as part of mix cropping with mustard in the low altitude in dry area and maize in higher altitude with cool weather condtions. It is sown in October, November and harvested in March-April. It is observed that the cultivation of wheat is done in lesser degree in the study area.

Table 7.24: Average Monthly Food Items (Wheat-Maida/Atta) Purchased from the Market/Household (in kg)

Sl. No.	Wheat (Maida/Atta) purchased from the market in kg/month	Percentage
1.	1-2	2.95
2.	2-3	17.03
3.	3-4	65.44
4.	4-5	14.58
	Total	100.00

Source: Field Survey 2015-16.

The table 7.24 shows the average monthly food items (wheat- in kgs) purchased from the market per household in the study area. The data indicates that maximum number of households purchase between 3-4 kg of wheat from market per month followed by the households with monthly purchase of 2-3 kg and 4-5 kg of wheat.

Table 7.25: Consumption of Wheat (in gm)/Day/Family

Sl. No.	Consumption of Wheat (Maida/Atta) gm/day	Percentage
1.	Below 250 gm	78.17
2.	½ kg (500 gm) - ¾kg (750 gm)	12.71
3.	¾kg (750 gm) – 1kg (1000 gm)	7.46
4.	1kg (1000 gm) – 2kg (2000 gm)	1.66
5.	2+ kg (above 2000 gm)	0.00
	Total	100.00

Source: Field Survey 2015-16.

The table 7.25 illustrates the average consumption of wheat (gm) per day per family. The data indicates the highest average consumption of wheat per family is below 250gm.

Consumption of Millet

Very less cultivation of millet has been seen in the study areas. The production of millet ranges from 20 kg to 200 kg. Millet is consumed by the villagers themselves in order to make local alcohol and other dishes.

Consumption of Buckwheat

Table 7.26: Consumption Status of Buckwheat

Sl. No.	Consumption status	Percentage
1.	Self-Consumed	33.33
2.	Quantity Sold	66.67
Total		100.00

Source: Field Survey 2015-16.

Buckwheat is grown widely in Sikkim in the marginal farmlands as a subsidiary crop. As per the table 7.26, the quantity sold is higher than consumed. Only one-third of the total produce is consumed by the growers while two-thirds are sold in the market.

Consumption of Pulses

A variety of pulses are grown in Sikkim. Pulses are one of the important food crops which supplement income as well as dietary protein. It contains 24 percent protein and considerble amount of phosphoric acid. South district is one of the important areas of the state for the production of pulses.

Table 7.27: Average Production of Pulses (in kg)

Sl. No	Production in kg	Percentage Mean ± S.D.	Standard Error
1.	Below 5	18.01 ±13.9570	5.6979
2.	5-10	19.13 ±14.3666	5.8651
3.	10-15	25.38 ±17.7426	7.2433
4.	15-20	22.69 ±17.9777	7.3393
5.	Above 20	14.79 ±11.5758	4.7258
	Total	100.00 ±25.3456	10.3473

Source: Field Survey 2015-16.

Table 7.28: Average Monthly Purchase of Pulse From the Market/Household (in kg)

Sl. No.	Pulses purchased from the market in kg/month	Percentage
1.	1-2	8.48
2.	2-3	67.15
3.	3-4	21.36
4.	4-5	3.01
	Total	100.00

Source: Field Survey 2015-16.

Table 7.29: Consumption of Pulses (in gm)/Day/Family

Sl. No.	Consumption of pulses in gm/day	Percentage
1.	Below 250 gm	71.49
2.	½ kg (500 gm) - ¾kg (750 gm)	19.45
3.	¾ kg (750 gm) – 1kg (1000 gm)	9.06
4.	1kg (1000 gm) – 2kg (2000 gm)	0.00
5.	2+ kg (above 2000 gm)	0.00
	Total	100.00

Source: Field Survey 2015-16.

Table 7.30: Consumption Status of Pulses

Sl. No.	Consumption status	Percentage
1.	Self-Consumed	45.99
2.	Quantity Sold	54.01
Total		100.00

Source: Field Survey 2015-16.

The table 7.30 reveals the consumption status of pulses. As per the above data it is found that selling of pulses is higher than consumed.

Consumption of Oilseeds

Sikkim grows mustard, rye and a variety of oilseeds in small quantities. The production of oilseeds in the state is insufficient.

Table 7.31: Average Production of Oilseeds (in kg)

Sl. No	Production in kg	Percentage
1.	Below 5	30.09
2.	5-10	54.24
3.	10-15	9.41
4.	Above 15	6.26
	Total	100.00

Source: Field Survey 2015-16.

Table 7.32: Consumption Status of Oilseeds

Sl. No.	Consumption status	Percentage
1.	Self-Consumed	99.99
2.	Quantity Sold	0.01
	Total	100.00

Source: Field Survey 2015-16.

The table 7.32 shows the average consumption status of oilseeds. The data indicates that almost all oilseeds are consumed. The average purchase of oilseed/mustard oil from the market is 5 litres per family per month.

Consumption of Vegetables: Beans

Table 7.33: Average Production of Beans (in kg)

Sl. No	Production in kg	Percentage Mean ± S.D.	Standard Error
1.	Below 5	31.02±19.2249	7.8485
2.	5-10	39.09±21.4289	8.7483
3.	10-15	8.13±6.8121	2.7810
4.	15-20	14.71±11.4017	4.6547
5.	Above 20	7.05±5.9329	2.4221
	Total	100.00±25.3456	10.3473

Source: Field Survey 2015-16.

Table 7.34: Average Monthly Purchase of Beans from the Market/Household (in kg)

Sl. No.	Beans purchased from the market in kgs/month	Percentage
1.	1-2	21.19
2.	2-3	61.18
3.	3-4	17.63
	Total	100.00

Source: Field Survey 2015-16.

Table 7.35: Consumption of Beans (in gm)/day/family

Sl. No.	Consumption of Beans in gm/day	Percentage
1.	Below 250 gm	52.08
2.	½kg (500 gm) - ¾kg (750 gm)	41.47
3.	¾kg (750 gm) – 1kg (1000 gm)	6.45
4.	1kg (1000 gm) – 2kg (2000 gm)	0.00
5.	2+ kg(above 2000 gm)	0.00
	Total	100.00

Source: Field Survey 2015-16.

Table 7.36: Consumption Status of Beans

Sl. No.	Consumption status	Percentage
1.	Self-Consumed	36.81
2.	Quantity Sold	63.19
	Total	100.00

Source: Field Survey 2015-16.

The table 7.36 shows the average consumption status of beans. The data indicate that selling of beans is higher than consumed.

Chilies

Table 7.37: Consumption Status of Chilies

Sl. No.	Consumption status	Percentage
1.	Self-Consumed	24.73
2.	Quantity Sold	75.27
	Total	100.00

Source: Field Survey 2015-16.

The above table 7.37 demonstrates the average consumption status of Chilies. The data indicate that the selling of chilies is higher than what gets consumed. Production of chilies in the village ranges from 2 kgs and above. The market value of chilies depends on season as well as its time of production. The early produced chillies fetch the farmers Rs. 400 per kg whereas as the season progresses the price decreases to as low as 100 Rs. per Kg.

Brinjal, Tomato and Pumkin

The production of tomato and brinjal has been seen in different places of south district as well in study areas. The production ranges from 2 kgs to 50 kgs.

Table 7.38: Consumption Status of Brinjal, Tomato and Pumkin

Sl. No.	Consumption status	Percentage
1.	Self-Consumed	39.89
2.	Quantity Sold	60.11
	Total	100.00

Source: Field Survey 2015-16

The table 7.38 represents average consumption status of brinjal, tomato and pumkin. The data indicate that selling of brinjal, tomato and pumkin is higher than consumed. The remaining quantity of vegetables is consumed by the producers themselves.

Other Vegetables (Seasonal Vegetables)

Table 7.39: Average Monthly Other Vegetables Purchased from the Market/Household (in kg)

Sl. No.	Other vegetables purchased from the market in kgs/month	Percentage
1.	Below 3	6.78
2.	3-9	73.45
3.	6-9	14.11
4.	Above 9	5.66
	Total	100.00

Source: Field Survey 2015-16.

The table 7.39 illustrates the average monthly other vegetables purchased from the market per household in the study area. The data indicates that the highest monthly purchase of other vegetables from the market is in the range of 3-9 kg. The second highest purchase of other vegetables ranges between 6-9 kg.

Table 7.40: Consumption of Other Vegetables (Seasonal)/Day/Family

Sl. No.	Consumption of Other Vegetables (seasonal) in gm/day	Percentage
1.	Below 250 gm	36.33
2.	½kg (500 gm) - ¾kg (750 gm)	32.11
3.	¾ kg (750 gm) – 1kg (1000 gm)	21.64
4.	1kg (1000 gm) – 2kg (2000 gm)	9.92
5.	2+kg (above 2000 gm)	0.00
	Total	100.00

Source: Field Survey 2015-16.

The table 7.40 illustrates the average consumption per day per family of other vegetables (seasonal) which indicates the highest average consumption of other vegetables (seasonal) per family is below 250 gm and second highest consumption of other vegetables is in the range of ½g (500 gm) - ¾kg (750 gm). Some families consume up to 1kg of other seasonal vegetables per day.

Consumption of Fruits

As far as the consumption of fruit is concerned it is predominantly used during the following occasions - at the time of festivals, family rituals, death ceremonies, ill-health conditions, as nutritional supplements for chlildren, during marriage ceremonies etc. The montly purchase of

fruits from the markets ranges between1 kg to 5kgs. Therefore, the consumption of fruits is found to be occasional in the study areas.

Meat Consumption

Animal derived foods are the most resource intensive foods. Animal protein foods are at the top of the food chain in relation to the resources. In many developing nations, it is expected that global meat consumption will continue to rise. It has been suggested that if meat consumption patterns continue along the same path, then the consumption rates will be 72 percent higher than 2000 levels in the year 2030. Demand for meat is growing rapidly in developing countries, particularly India, China and Brazil (www.ncbi.nlm). The world average meat consumption stands at 41.90 kg per person per year (chartsbin.com>view).

Meat plays a vital role for food security in tribal communities in particular and other communities in general. Actually meat covers approximately 20 percent of the food. During the time of festivals meat consumption gets doubled. In Sikkim most of the people consumes meat during festivals, while some consume occasionally and during the weekends.

Table 7.41: Average Monthly Meat Purchased from the Market/Other Places (in kgs)

Sl. No.	Meat purchased from the market/other places in kgs/month	Percentage Mean ± S.D.	Standard Error
1.	Below 4	24.87±16.7809	6.8507
2.	4-6	68.13±22.7859	9.3023
3.	6-8	5.00±2.8816	1.1764
4.	8-10	1.09±.8898	.3632
5.	Above 10	0.61±.2160	.0882
	Total	100.00±25.3456	10.3473

Source: Field Survey 2015-16.

The table 7.41 indicates the average monthly meat purchased from the market/household (in kg) per household in the study area along with the significant mean ±S.D. and standard error. For most of the households the highest monthly purchase of meat from the market/other places is 4-6 kg and it has significant mean ±S.D.68.13±22.7859 and standard error is calculated as 9.3023. The second highest purchase of meat ranges between 2-4 kg and the corresponding mean ±S.D. 24.87±16.7809 and the standard error is 6.8507.

Table 7.42: Average Meat Consumption/Days in A Week/Household

Sl. No.	Response of villagers	Percentage Mean ± S.D.	Standard Error
1.	1 day	25.66±15.7353	6.4239
2.	2 days	43.47±17.6295	7.1972
3.	3 days	21.81±14.7918	6.0387
4.	4 days	3.96±2.1213	.8660
5.	More than 4 days	5.10±3.4641	1.4142
	Total	100.00±25.3456	10.3473

Source: Field Survey 2015-16.

The table 7.42 indicates the average meat consumption per day in a week per household and its significant mean ±S.D. and standard error. As per above data, it is found that the highest average consumption of meat per household is 2 days and the corresponding mean ±S.D. 43.47±17.6295 and standard error is calculated as 7.1972. There are many families that consume meat once in a week, while some consume meat three days a week. It has also been noticed that some families, though very few in number, consume meat even four or more days in a week.

Table 7.43: Consumption of Meat (in gm)/Day/Family

Sl. No.	Consumption of Meat in gm/day	Percentage
1.	Below 250 gm	21.69
2.	½kg (500 gm) - ¾kg (750 gm)	66.41
3.	¾kg (750 gm) – 1kg (1000 gm)	11.90
4.	1kg (1000 gm) – 2kg (2000 gm)	0.00
5.	2+kg (above 2000 gm)	0.00
	Total	100.00

Source: Field Survey 2015-16.

The table 7.43 demonstrates the average consumption of meat (gm) per day per family. As per above data, most of the families are found to consume ½ kg (500 gm) - ¾ kg (750 gm) of meat in a day.

Consumption of Eggs

Average consumption of eggs in surveyed areas ranges between 2-4 pieces per day per family, but not on regular basis.

Consumption of Milk

Table 7.44: Average Home Production of Milk Per Household/Day

Sl. No.	Response of villagers	Percentage Mean ± S.D.	Standard Error
1.	1 litre	29.66±15.3883	6.2822
2.	2 litres	51.02±15.2970	6.2450
3.	3 litres	8.27±5.9665	2.4358
4.	4 litres	6.08±4.6043	1.8797
5.	More than 4 litres	4.96±3.0331	1.2382
	Total	100.00±25.3456	10.3473

Source: Field Survey 2015-16.

The table 7.44 depicts the average home production of milk per household per day in the study area with significant mean ±S.D. and standard error. Most of the households produce 2 litres of milk with significant mean ±S.D. 51.02±15.2970 and standard error calculated as 6.2450. Very few families produce 3 litres, 4 litres and more than 4 litres per day.

Table 7.45: Daily Average of Milk Purchased and Consumed Per Household/Day

Sl. No.	Responses of villagers	Percentage
1.	1 litre	87.54
2.	2 litres	12.46
3.	3 litres	0.00
4.	4 litres	0.00
5.	More than 4 litres	0.00
	Total	100.00

Source: Field Survey 2015-16

The above table indicates that the purchase of 1 litre contributes maximum. Less number of people purchase and consume 2 litres of milk.

Consumption of Butter

Table 7.46: Average Monthly Butter (Ghee) Purchased from the Market/Household (in kg)

Sl. No.	Butter (Ghee) purchased from the market/other places in kg/month	Percentage
1.	1	87.79
2.	2	12.21
	Total	100.00

Source: Field Survey 2015-16.

The table 7.46 indicates the average monthly butter (ghee) purchased from the market/other places per household in the study area. Maximum (87.79) households purchase 1 kg butter (ghee) from the market/other places. Some households purchase up to 2 kg butter. Villages people consume butter (ghee) according to the availability, festivals, health, death rituals, during the time of worship, and arrival of guests etc.

Meals

Table 7.47: Three Items in a Meal - Rice, Dal and Vegetables Every Day

Sl. No.	Response of villagers	Percentage
1.	Yes (three items in a meal)	19.59
2.	No (three items in a meal)	31.82
3.	Only either two (dal or vegetables)	48.59
4.	Do not know	0.00
	Total	100.00

Source: Field Survey 2015-16.

As per the above data it is clear that only 19.59 percent respondents consume three items during the meal. The responses under no category are slightly higher (31.82 %) whereas the responses under only either two (dal or vegetables) category contributes maximum (48.59).

Food (Meal Time)

The people of Sikkim are basically rural, and generally take two heavy meals and two light refreshments. Unlike in the other parts of the country, people of Sikkim in the rural area prefer to eat four meals a day: Morning meal (before going to morning field-work), Mid day meal or lunch (before going for the day's field-work), Afternoon refreshment and Evening dinner. Food culture not only depends on different communities living in Sikkim but also on economic status of the people and availability of food crops especially seasonal vegetables and fruits in different season in a year. It also changes with the people , space and time (Subba;2008)

1. Morning Light Meals

   In the rural village of Sikkim the morning starts with tea or alcoholic beverage with dry-fried whole maize or soybean or beaten rice/maize or boiled potato or colocasia or any seasonal foods, and proceed for morning work of fodder/fuel-wood collection or agricultural works such as ploughing, field preparation, manuring, sowing, transplanting, weeding, harvesting, storing etc. Tea is taken with sugar or salt, with or without milk, or with a pinch of black pepper or ginger paste (Subba; 2008). Now a days people take sometimes biscuits, beaten rice etc. along with tea in the morning (6-8 am).

2. Mid-Day Meals (Lunch)

   After finishing the morning work the rural people may come for lunch at home or the lunch is served in the field depending on the nature of work. *Bhat-dal-tarkari-achar* (rice-legume soup-curry-pickle) is the basic of the Sikkimese meal corresponding to cooked rice, *dal* or vegetable mixed with potato curry, meat or milk product - *mohi* and various kinds of pickle with hot chilly (Tamang, 2005:2-3 & Subba; 2008). The rice is very often substituted by *Makai ko Bhat - Dhenro, Hariyo Makai, Kodo ko roti, Phaper ko roti, Gahun ko roti* etc. The legume soup-curry is often substituted with seasonal vegetable curry or meat curry or *mohi* (Subba; 2008). However, people do not regularly have rice+vegeatables/dal-achar, sometimes they partake dal + vegetables, otherwise they are satisfied with vegetable curry along with rice (9-11 am).

3. Afternoon Refreshment

   In the afternoon, the rural people take light refreshment with tea or alcoholic beverages. The refreshments may be of seasonal root or tuber crops (boiled cassava, potato, colocasia, greater yams, sweet potato , Iskus-chayote root or fruit etc.), dry fried maize or soybean, *phapar ko roti, kodo ko roti, gahun ko roti, chewra* (beaten rice), *murai, champa* (roasted and powdered maize, wheat, barley, gram etc.)(Subba;2008). This is not common and compulsory in villages. The nature of refreshments generally between 2 – 5 pm is based on the type of work and physical exert.

4. Evening Meals (Dinner)

   In the evening the rural people take tea or alcoholic beverages *tongba* - fermented millet beer put in bamboo or wooden cans (*Chang/Jaar/Bhati ko Jaanr*) before dinner. The dinner (6-8 pm) is also composed of the basic *Bhat-dal-tarkari-achar* as mentioned above. The rural people mostly eat cooked maize as staple food such as *Dheroh* (boiled maize rice). Rice is slowly being replaced by rot*i or chapaati* (wheat-based baked bread), even in the rural areas. (Tamang, 2005:2-3 & Subba; 2008). This change of food is also observed by the researcher in the study area. But now a days

younger generation is not interested in *Dhero and Makai Ko chamal*, but are fond of rice-vegetables-dal- achar etc.

Table 7.48: Change in Food Habits over Last 12 Months

Sl. No.	Response of villagers	Percentage
1.	Yes	24.60
2.	No	75.40
	Total	100.00

Source: Field Survey 2015-16.

The above data makes it clear that the perception of people towards change of food habits in a village is less i.e. 24.60 percent. People who have not changed their food habits constitute 75.40 percent. However, people change their food habits based on time and situations. Those who have changed their food habits are found to consume chapatis, momo, thukpa etc. as a replacement of the standard meal of rice-dal-curry.

Table 7.49: Afforded to have Balanced Meals over Last 12 Months

Sl. No.	Response of villagers	Percentage
1.	Often true	16.69
2.	Sometimes true	29.44
3.	Never true	50.87
4.	Refused	3.00
	Total	100.00

Source: Field Survey 2015-16.

The above data is the response of villagers towards balanced meals. The highest response is of never true which covers almost 50.87 percent. The second highest response comes under sometimes true i.e. 29.44 percent. The next highest response comes as often true with16.69 percent. However, 3.00 percent of the villagers refused to respond.

Table 7.50: Not Enough Money to Purchase Food

Sl.No.	Response of villagers	Percentage
1.	Yes	56.42
2.	No	38.29
3.	Do not know	4.29
4.	Refused	1.01
	Total	100.00

Source: Field Survey 2015-16

People who do not have enough money to purchase food at any time have been seen at village level in higher proportion with 56.42 percent. More than 38 percent of the respondents have said that they are able to purchase food for their family. A few refused to respond (1.1 percent).

Table 7.51: Households having Problems in Satisfying Food Needs in Last 12 Months

Sl. No.	Response of villagers	Percentage
1.	Never	16.87
2.	Seldom	39.69
3.	Sometimes	43.44
4.	Always	0.00
	Total	100.00

Source: Field Survey 2015-16.

The table 7.51 indicates the households having problems in satisfying the food needs during last 12 months. Majority of the respondents (43.44 percent) have said that they faced problems sometimes. People seldom having problems in satisfying the food needs constitute 39.69 percent. Nearly 17 percent respondents do not have problems in satisfying their food needs.

Table 7.52: Food Brought Did Not Last and Did Not Have Money to Purchase

Sl. No.	Response of villagers	Percentage
1.	Often true	25.79
2.	Sometimes true	41.35
3.	Never true	29.13
4.	Refused to answer	3.73
	Total	100.00

Source: Field Survey 2015-16.

The table 7.52 indicates the percentage of villagers who expressed their opinions on 'food brought did not last and did not have money to purchase'. The highest response was 'sometimes' true (41.35 percent). Second comes, the response 'never true' at 29.13 percent. The response 'often true' contributes 25.79 percent. Some villagers refused to respond.

Table 7.53: Family Income Spent in Buying of Food

Sl. No.	Response of villagers	Percentage
1.	Less than 1/3	8.63
2.	1/3 only	21.28
3.	More than 1/3	48.18
4.	Do not know	11.91
	Total	100.00

Source: Field Survey 2015-16.

In the table 7.53 it is observed that the highest percentage of villagers spent more than 1/3 of their budget in buying food (48.18 percent). The second highest response comes under 1/3 only (21.28 percent). People who do not know about their budget spent in food contribute 11.91 percent.

All the villagers are very much conscious about the rise in price of essential food items which does affect family's intake of food. If the price of commodities suddenly increase then people suffer and as a result they are unable to manage the monthly and yearly expenses too. Villagers/people get worried for not being able to purchase their next meal.

Table 7.54: Family Members Remain Hungry Sometimes Being Unable to Buy Food

Sl. No.	Response of villagers	Percentage Mean ± S.D.	Standard Error
1.	Yes	1.46±1.0583	.4320
2.	No	95.22±20.5231	8.3785
3.	Once in a year	0.00±.0000	.0000
4.	Sometimes	2.97±1.4240	.5813
5.	Do not know	1.35±.9633	.3932
	Total	100.00±25.3456	10.3473

Source: Field Survey 2015-16

The table 7.54 demonstrates that the family members remain hungry sometimes because they are unable to buy food. The data suggest that the highest percentage of villagers do not remain hungry with considerable mean ±S.D. 95.22±20.5231 and standard error calculated as 8.3785. The villagers sometimes remain hungry because of not being able to buy food and its corresponding mean ±S.D. 2.97±1.4240 and standard error is .5813. The people who do not experience any starvation in their life have a significant mean ±S.D. 1.35±.9633 and standard error as .3932. Very few people in the villages have experienced acute hunger in their life.

Table 7.55: Sleep without Food at Night

Experience of sleeping without having food	Percentage
Yes	1.06
No	98.94
Total	100.00

Source: Field survey 2015-16.

Some of the elderly people as well as the farmer's family members had experiences of starvation during night time in their earlier days due to unavailability as well as lack of purchasing power of food. In village areas still some people are found to be sleeping without having food.

Table 7.56: Main Reasons for Food Shortage in a Household

Sl. No.	Response of villagers	Percentage Mean ± S.D.	Standard Error
1.	Low agricultural production	52.31±23.4264	9.5638
2.	Inadequate supply (due to heavy rainfall roads remain blocked)	5.46±3.8987	1.5916
3.	Lack of purchasing power	29.84±16.2480	6.6332
4.	Storage problems	11.33±9.0553	3.6968
5.	Large family	1.06±.6723	.2744
	Total	100.00±25.3456	10.3473

Source: Field Survey 2015-16.

The above data indicate the perception of people on food shortage in a household. The food shortage seems to be higher due to low agricultural production with significant mean± S.D. 52.31±23.4264 and the corresponding error calculated as 9.5638. The next strong reason is indicated as lack of purchasing power with significant mean± S.D. 29.84±16.2480 and the standard error calculated as 6.6332. Storage problems come next, but to a lesser extent with considerable mean± S.D. 11.33±9.0553 and the standard error calculated as 3.6968. Sometimes, inadequate supply of food due to heavy rainfall and road block could be the reason for food shortage in a household with significant mean± S.D. 5.46±3.8987 and standard error as 1.5916. Hunger situatin occurs more in monsoon during long periods of rainfall. Large family has less percentage compared to others with the significant mean± S.D. 1.06±.6723 and its corresponding error is .2744. Food is made available for every family member in a household, if they have enough purchasing power. People depend mostly on markets for the purchase of essential commodities. Basically in the hill areas of Sikkim landslide is the major problem during rainy season i.e. June to September. As such production and supply of food grains is not adequate during this period.

Table 7.57: Young Generations Involved in Agriculture Sector

Sl. No	Response of villagers	Percentage
1.	Yes	9.91
2.	No	90.09
	Total	100.00

Source: Field Survey 2015-16.

According to respondents, high percentages of youths are not interested in agricultural activities. Some of the plausible reasons on why younger generations are not indulged in agricultural activities are indicated as follows:

1. Water scarcity
2. Rugged topography

3. More interested in obtaining educational degrees for better life and prospects
4. They are nowadays educated and do not want to spend their life in agricultural field
5. Everyone is interested to work in offices or in other field rather than agricultural field.
6. Agricultural production is not satisfactory

Population Growth and Food Production

According to Malthus theory there is reciprocal relationship between population growth and other demographic changes on one hand and socio-economic changes on the other.

While developing his principle he assumed two postulates: first, that food is necessary for the existence of man; second that the passion between the two sexes is necessary and will remain nearly in this present stage. Having assumed these two postulates, he asserted that the power of population to reproduce is indefinitely greater than the power in the earth to produce subsistence for man. Further he said that, population, if goes uncontrolled, increases in a geometrical ratio (1,2,4,8.16,32,64,128,…) on the other hand, subsistence increases only in an arithmetic ratio (1,2,3,4,5,6,7,8,…). Malthus measured the unit of time in which a population could double, if it were not checked by lack of subsistence, to be about 25 years (Chandna, 2014).

Further widening of the gap between population and subsistence will increase man's propensity to push upon the means of subsistence. As a result, society gets divided into two sections of people i.e. the rich (haves) and the poor (have nots). Moreover, the increasing gap between the population and resources shall ultimately lead to the point where gloom and poverty shall become unavoidable. The following tables show the concept of Malthus theory with respect to population growth and production of food grains in Sikkim. While population increases in lakhs, production is increasing in thousands metric tons only. Thus there is always a gap between two aspects and it is for this reason we are unable to say that we are food secured.

Table 7.58: Total Population and Production of Food Grains in Sikkim (1971 to 2011)

Year	Total Population	Year	Production of Food grain (MT)
1971	2,09,843	1975-76	47,550
1981	3,16,385	1980-81	53,990
1991	4,06,457	1990-91	83,410
2001	5,40,851	2000-01	1,03,211
2011	6,10,577	2010-2011	1,03,410

Source: Census of India (1981-2011) and FS & AD, 2010-11 &Gazetteer of Sikkim.

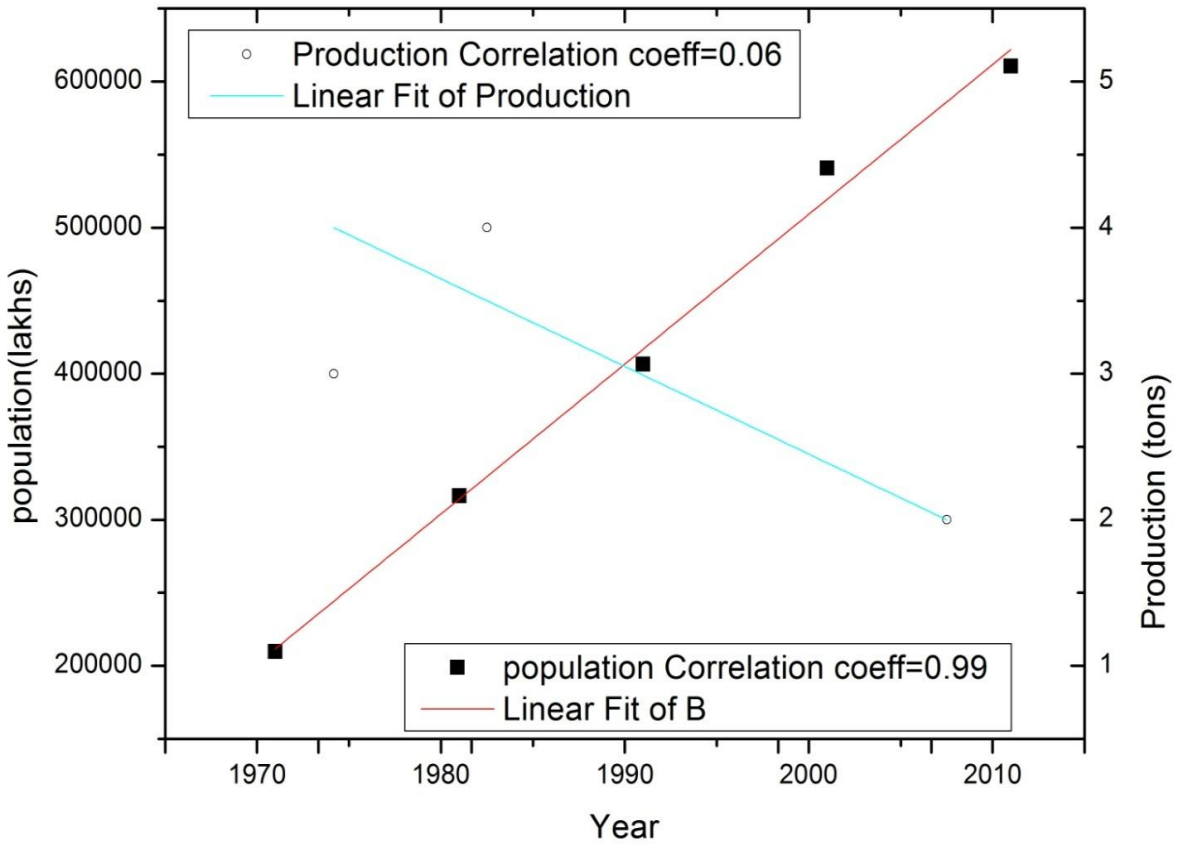

Figure 7.6: Population Growth and Production of Food grain of Sikkim (1971 to 2011)

As per above figure, it is found that, the correlation coefficient of population growth is 99 percent, but the production correlation coefficient is only 0.06 i.e. 6 percent. Hence, a very poor correlation has been observed between the two variables. Therefore, people of Sikkim depend on other states for different commodities.

As per the above figure it is clearly seen that population growth is higher than production, therefore the lack of subsistence or food security.

Growth rate of population has outweighed the growth of food grain production and has transformed Sikkim from food surplus state to a food deficient state (Chakrabarti; 2012).

Sikkim like any other mountainous area is a food-deficit State. The food grains produced in the state can feed its population only for three and half months, therefore food grains have to be brought from other states for feeding its population for seven and half months every year. Yet about 89 percent of the people living in the rural areas are directly or indirectly dependent on agriculture, horticulture and livestock rearing, as they have no other options for earning their livelihood. In Sikkim, mixed farming is the only means of livelihood for food and nutritional security of the people who depend on agriculture production, diversification of the food basket, availability of low cost and environmentally safe food products, and equitable distribution and management. It involves efforts to generate purchasing power for physical and economical access to food by all people at all times (Subba; 2008).

In the study areas it is found that there are three categories of food scarcity i.e. low, medium and high. The low food scarcity has been seen in the months of January, August, September, October, November and December. Medium food scarcity has been found in the months of February, June and July but high scarcity of food has been seen in the months i.e. March and April. The analysis suggests that every month there is some scarcity of food in Sikkim.

References

Baby, K. 2012. "Food Security and Public Distribution System; Issues and Concerns," *Kurukshetra*' Ministry of Rural Development, Vol. 60 No.5 (March):22-23.

Chandna, R.C. 2014. *Geography of Population; Concepts Determinations and Patterns*. New Delhi: Kalyani Publishers: 531-532.

Chakrabarti, A. 2012. "Food Security in Sikkim: A Critical Review" In *Politics, Society and Development* edited by M.Yasin and D.P. Chhetri. Delhi: Kalpaz Publications: 214.

Choudhury, Maitreeye. 2004. "State of Agriculture in Sikkim" In *The Himalayan Miscellany*, Vol.15. CHS, University of North Bengal: 25-34

Datta, P.C. and Pradhan, B.C. 2006. "Nutrition and Food Insecurity –A Problem of New Millennium" In *Agriculture Food Security Nutrition and North –East India,* North-East India: 263.

De, K. U. 2006. "Food Security and the Related Issues-some Reflections on the State of Tripura" In *Agriculture Food Security Nutrition and Health in North East India*, edited by Debashis Basu, B.Francis Kulirani and B. Datta Ray, 154, Delhi: Mittal Publication: 154.

Dhar, B. 2006. "An Aspect of Food Security on the High Altitude Region of the Eastern Himalayas-A Case Study on the Thingbu-pas of Arunachal Pradesh," In *Agriculture Food Security Nutrition and Health in North East India*, edited by Debashis Basu, B.Francis Kulirani and B. Datta Ray, 169-70, Delhi :Mittal Publication:169-70.

Dubey,A and Kharpuri,O. 2003. "Hunger and Poverty in North-eastern States: Implications for Food Security," In *Towards A Food Secure India,* edited by S.Mahendra Dev, K.P. Kannan and Nira Ramachandran, 165, New Delhi: Institute for Human Development: 165.

GoI (Government of India). 1981-2011. *Census of India* (1981-2011). GoI.

GoS (Government of Sikkim). 2009. *Sikkim; 15 Triumphant Years of Democracy (1994-2009); A Call to Action.* Gangtok Sikkim: Department of Information and Public Relations, GoS: 110-111.

----------2011. *Annual Progress Report* 2010-2011. Krishi Bhawan , Tadong, Gangtok: Development of Food Security and Agriculture, GoS.

----------2013. *Gazetteer of Sikkim*. S. Kharel, and J.W. Bhutia, (eds.). Gangtok Sikkim: Department of Home, GoS.

----------2016. *Achievement-23 Years of Ensuring Food Security*. Department of Food & Civil Supplies & Consumer Affairs, GoS: 12-42.

----------2013. *Gazetteer of Sikkim*. S. Kharel, and J.W. Bhutia, (eds.). Gangtok Sikkim: Department of Home, GoS.

Husain, Majid.2004. *Human Geography*. New Delhi: Rawat Publications: 225-226.

Kalita, et.al. 2006. "Food and Nurtition Security"- An Overview," In *Agriculture Food Security Nutrition and Health in North East India*, edited by Debashis Basu, B.Francis Kulirani and B. Datta Ray, 237, Delhi: Mittal Publication: 237.

NSSO (National Sample Survey Office), 2014. *Nutritional Intake in India, 2011-12*, Report No. 560, NSS 68th Round, October, 2014. *New* India: National Statistical Organisation, Ministry of Statistics and Programme Implementation, Government of India.

Radha, V. 2009. *Women and Rural Households Food Security*. New Delhi: Serials Publications:116.

Sharma, A. 2005. *Environmental Studies*. Delhi: Surjeet publications.

Singh, R.K.P. et.al. 2006. "Food and Nutritional Security in the North-Eastern States-An Analysis" In *Agriculture Food Security Nutrition and Health in North East India*, edited by Debashis Basu, B.Francis Kulirani and B. Datta Ray, 129, Mittal Publication.

Subba, J.R. 2008. *History, Culture and Customs of Sikkim*. New Delhi: Gyan Publishing House: 86-129

Sukhatme. 1987. "Economics of Nutrition", *Indian Journal of Agricultural Economics*, Vol.32, No.3.

Swaminathan, M. S. 2001. "Food Security and Sustainable Development," *Current Science*, Vol.81, No.8. , 25th October.

Tiwari, R. C. 2010.Geography *of India.* Allahabad, India: Prayag Pustuk Bhawan: 266-269.

Tulachen, Pradeep M. 2001. "Mountain Agriculture in the Hindukush-Himalaya; A Regional Comparative Analysis" In *Mountain Research Development*, ICIMOD, Vol. 21, No. 3.

Vyas, Vijay S. 2005. *Food Security in Asian Countries in the Context of Millennium Goals* (ed.), New Delhi: Academic Foundation:30.

World Health Organisation (WHO) .1985. "Energy and Protein Requirements", In *Report of a Joint FAO/WHO/UNI/ Expert Consultation*, Geneva : Technical Report Series No.724.

Newspapers

Sikkim Express (Local Paper). 2009. "Chief Minister's Independence Day Message to the People of Sikkim," *Sikkim Express*, 18th August.

Sikkim Express (Local Paper). 2010. "DESME tags 21,618 BPL households; Food & Civil Supplies Distribution rice to 43,428 BPL families," *Sikkim Express*; 11th May.

Sikkim Express (Local Paper). 2010. "Distribute, Procure, Store and Sow," *Sikkim Express*, (17.09.2010- Local Paper).17th September.

Sikkim Express (Local Paper). 2013. "Secretary- Department of Food Civil Supplies & Consumer Affairs," *Sikkim Express*; 3rd August.

Web Link

www.visitsikkim.com/food-&-drinks-visit-sikkim-india.html-date (Accessed on March 28, 2015).

www.bharatonline.com/sikkim-tours/heritage-tour.html (Accessed on March 28, 2015).

14.139.206.50>jspui>handle (Accessed on September 24, 2016).

https:// www.clearies.com>public-distribtuion (Accessed on January 02, 2018).

www.ncbi.nlm.gov (Accessed on January 08, 2018).

chartsbin.com>view/12730 (Accessed on January 08, 2018).

www.foodandenvironment.com (Accessed on January 20, 2018).

www.fao.org (Accessed on January 27, 2018).

www.ncbi.nlm.nih.gov>articles (Accessed on January 27, 2018).