NUTRITION AND POVERTY ASSESSMENT IN NAGALAND

A Case Study of Wokha District

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Dedicated to
My beloved Father and Late Mother (Chichano)

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Month ..3rd..... December Year ..2008.....

DECLARATION

I, Mr T. Zarenthung Ezung, hereby declare that the subject matter of this thesis ***"Nutrition and Poverty Assessment in Nagaland: A Case Study of Wokha District"*** is the record of work done by me, that the contents of the thesis did not form basis of the award of any previous degree to me or to the best of me knowledge to anybody else, and that the thesis has not been submitted by me for any research degree in any other University/ Institute.

This is being submitted to Nagaland University for degree of Doctor of Philosophy in Economics.

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CHAPTER I

INTRODUCTION

1.1: INTRODUCTION AND CONCEPTS:

Poverty is man's powerful and massive affliction. It is the progenitor of much pain from hunger and disease onto civil war and conflict itself[1]. Nearly half of the world populations continue to live largely under condition of subsistence agriculture and acute poverty. A poverty curtain has descended right across the face of the world, dividing it materially and philosophically into two different worlds – one embarrassingly rich and the other desperately poor. This invisible barrier exists within nations as well as between them, and it often provides unity of thought and purpose to the third world countries which otherwise have their economic, political and cultural differences. "The struggle to lift this curtain is certainly the most formidable challenge of our time"[2]. Over the ages, a culture of poverty has got transmitted from generation to generation in India. Poverty here is not a pathological deviation from the normal and normative but the state of affairs and the set of conditions under which the overwhelming majority of the people are compelled to live. "Backwardness here has often been characterized by a syndrome of collective poverty"[3]. In India planning was adopted in the early 1950's but the necessity and urge for planning was openly expressed during the later half of the previous century.[4] Leading nationalist wrote extensively on pauperization, famine and abject poverty among the masses. Thus "poverty has been our continuing preoccupation since the colonial period"[4]. Thus, it is natural to expect from our planners under the leadership of Nehru to give top priority to poverty alleviation programme from the beginning of planning.

The definition of poverty is related to people's living standard. Poverty is human condition characterized by the sustained or chronic deprivation of the resources, capabilities, choices, security and power necessary for the enjoyment of an adequate standard of living; others include civil, cultural, economic, political and social rights (World Health Organization 2004)[5]. According to Sen (1992), 'Poverty [is] the failure of basic capabilities to reach certain minimally acceptable

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[1] Galbriath, J. K. (1979), *"The Nature of Mass Poverty"*, Harvard University press, Cambridge, p 20-21.
[2] Haq, M. U. (1978), *"The Poverty Curtain: Choices for the Third World"*, Oxford University press, New York, p XV.
[3] Prasad, K. N. (1980), *"Problem of Economic Development in the Third World: With Special References to India"*, New Delhi, Sterling Publishers, p 102.
[4] Joshi, P. C. (1985), "Poverty Amelioration Perspective", *IASSI quarterly News Letter*, June 1985, p 14.
[5] WHO (2004); "Poverty, disability and community based Rehabilitation (CBR) Programme". UN ESCAP/CDPF Field Study cum Regional *"Workshop on Poverty Alleviation Among Persons with Disabilities"*, Lanzhou, China, Oct. 2004. Online [available] at www.DAR@who.int. p 4.

levels. The functioning's relevant to this can vary from such elementary physical ones as being well-nourished, being adequately clothed and sheltered, avoiding preventable morbidity, etc., to more complex social achievements such as taking part in the life of the community, being able to appear in public without shame, and so on'. Poverty exists when individuals or groups are not able to satisfy their basic needs adequately[6]. This view maintains that poverty has three aspects of want of material goods or materialistic possession: (i) those necessary to avoid suffering and needed to fulfill the requirements of hunger and shelter, that is, those needed to survive, (ii) such as are essential to meet human needs of health, that is, to get nutrition and to avoid disease, and (iii) those needed to maintain a minimum subsistence level. In simple term, this refers to minimum amount of food intake, adequate housing, clothing, education and health care[7]. A similar definition put forwarded by Dubey and Sarma (2000)[8] states that the concept of poverty is related to deprivation perceived by a civic society with respect to the basic minimum needs.

Recent quantitative assessment of poverty distinguishes between absolute and relative poverty. Poverty can be defined objectively and applied consistently only in terms of the concept of relative deprivation; Individuals families and groups in the population can be said to be in poverty when they lack the resources to obtain the types of diet, participate in the activities and have the living conditions and amenities which are customary, or at least widely encouraged or approved, in the societies to which they belong. Their resources are so seriously below those commanded by the average individual or family that they are, in effect, excluded from ordinary living patterns, customs or activities[9]. Thus, at the core of relative poverty is inequality. The relative poverty takes into account relative deprivation rather than the absolute deprivation. In this sense, relative poverty essentially compares the deprivation of the people at the lower end of distribution to those of the higher end. Therefore, in relative sense, a person might be above the socially perceived minimum level of economic welfare but she/he will be considered poor in relative sense. The direct measure of inequality look at the cumulative distribution of income or consumption and estimate the extent to which it deviates from a norm of perfect equality. "The most preferred index is Gini Index". The absolute poverty is based on socially perceived

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[6] Gross, R. (1997), "Nutrition and the Alleviation of Absolute Poverty in Communities: Concepts and Measurement", *Symposium on "Nutrition and Poverty" with a special emphasis on South Asia*, 24th Session of the ACC/, Nepal on 17-21 March 1997, p 2.

[7] Ahuja, R. (1992), "*Social Problems in India*", Rawat Publication, New Delhi, p 30.

[8] Dubey, A. and Sarma, A. (2000), "Poverty Measurement and Mobility Issues", *Discussion paper*, Center for Development and Community Consulting. GOI, p 3.

[9] Townsend .P. (1979), "Poverty in the United Kingdom", p31, Online [available] at www.archiveshub.ac.uk.

deprivation, where one or more members of the population in a predefined universe fail to fulfill their minimum basic needs. The common approach in measuring absolute poverty is to specify a bundle of goods and services deemed necessary to meet basic consumption needs. "The most widely used estimates use food requirements to define basic consumption needs"[10]. "Poverty breeds malnutrition and, in turn, malnutrition increases poverty, a vicious circle" states Horwitz (1997)[11]. Thus, poverty also means malnutrition, hunger and food poverty. Hunger is "a craving or need for food" and malnutrition is "faulty or imperfect nutrition"[12]. Hunger Task Force (2003)[13], defines hunger as a condition in which people lack the basic food intake to provide them with the energy and nutrients for fully productive lives. Dasgupta (1993)[14] states that hunger is measured in terms of availability, access or intake of calories relative to caloric requirements that vary principally by age, sex and activity levels. Friel (2004)[15] defines food poverty as the inability to access a nutritionally adequate diet and related impacts on health culture and social participation. Thus, the interlink age between poverty and nutrition cannot be ignored. Nutritional intake and status is both the effect and a cause of income earning opportunities of the individuals and households. As an out come, the nutritional status of individuals is influenced, among other things, by the amount and type of food that is consumed. A given level of income may be distributed differently by household between food and non-food items, which, in turn, will affect the nutritional outcome of a given levels of income[16]. In India, the expert group on poverty appointed by the Planning Commission in 1993 had recommended that the definition of poverty be extended to include deprivation in basic needs such as education, health and shelter as also other basic amenities such as drinking water. However, not much progress has been made in widening the definition of poverty in India[17].

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[10] Lipton, M. and Ravillion, M. (1995), "Poverty and Policy", in J. Berhman and T. N. Srinivasan (ed.), *Handbook of Development Economics*: Vol. III, Elsevier Science, p 2551 – 52.

[11] Horwitz A (1997); "Poverty and Nutrition in South Asia", The 24th Session of ACC/SCN, Kathmandu, Nepal on 17-21 March 1997, Symposium on *"Nutrition and Poverty; with a special emphasis on South Asia". P5*

[12] Webster's New Collegiate Dictionary, 1956: G. & C. Merriam Co., Publishers, Springfield, MA. p 403.

[13] Hunger Task Force, 2003: *Halving Hunger by 2015: A Framework for Action,* Interim Report, Millennium Project, UNDP, New York. P. 33

[14] Dasgupta, P., 1993: *An inquiry into well-being and destitution,* Oxford University Press, Oxford. P 3

[15] Friel, S. (2004), "Nutrition, Poverty and Health", *National Conference*, North West Ireland, p 4. Online [available] at www.cpa.ie/downloads/publication/conference.

[16] Islam, R. (1997), "Poverty and Its Effect on Nutrition: Some Question Based on the Asian Experience", p 2. Online [available] at *www.unsystem.org*.

[17] Prabhu, S. (2001), "World Development; Destitution and the Poverty of its Politics", p 7, Online [available] at *www.linkinghub.elsevier.com*.

Now the pertinent question that arises here is, then, what is the actual nutritional requirement or income for the people to be non-poor? Poverty is determined by the standard that exists within the society. Poverty is perceived in terms of poverty line, which is determined by the prevailing standard of what is needed for health, efficiency, nurturing of children, social participation and the maintenance of self-respect[18]. Thus, defining poverty line becomes the first step in estimating poverty. The current concept for world poverty is the number of people who live in households whose daily consumption per head is less than the purchasing power parity (PPP) equivalent of $1 a day in constant 1985 PPP dollars[19]. The Census Bureau uses a set of money income thresholds that vary by family size and composition to establish the official measure of poverty in the U.S. The poverty threshold was $9,214 in 2001 for a single person, increasing to $18,022 for a family of one adult and three related children under 18 years[20]. The food poverty line is derived from estimating the cost of food baskets in obtaining calorie requirements of individual household. Per capita household calorie requirement is defined by aggregating required calories per day of each household member with respect to their age and sex. This household calorie requirement is converted into money. Calorie cost along with non-food expenditure are aggregated and divided by the population to give the poverty line.[21] In India the definition of poverty line was attempted first in 1962 by a working group of eminent economist and social thinker after taking into account the recommendation of the Medical Research (ICMR, 1958). They recommended that the national minimum for each household of 5 persons should not be less than Rs. 100 per month in terms of 1960-61 prices or Rs. 20 per capita. This national minimum excludes expenditure on health and education, both of which are expected to be provided by the state according to the constitution and in the light of its other commitments. A poverty line dividing the poor from non-poor is used, by putting a price on the minimum required consumption level of foods[22]. The major components of food are carbohydrates, proteins, fats, vitamins and minerals. These foods give the nutritional requirement of the people measured in terms of calorie[23]. However, academic studies in the early 1970's generated a rich and extensive literature on poverty based on, or related to, the poverty line. The result was greater data availability, increasing methodological sophistication, and

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[18] Becker, H. (1996), "*Social Problems: A Modern Approach*", John Willy and Son Inc., New York, p 436.
[19] Deaton, A. (2000), "Counting the World's Poor: Problem and Solutions", p 3, Online [Available] at www.linkinghub.elsevier.com.
[20] Oberg, C. (2003), "Impact of Childhood Poverty on Health and Development", *Healthy Generation*, Vol 4, Issue 1, p 1.
[21] Government of Thailand (2002), *"Thailand Official PovertyLine"*, NESDB, p 2.
[22] GOI (1993), "*Report of the Expert Group on Estimation of Proportion and Number ofPoor*", Planning Commission, p 3.
[23] GOI (2001), "Nurtitional Intake in India", *NSS Report 471*, 1999-00, p 1.

emerging concerns and insights. Thus while deriving poverty lines, it was recognized that human existence is more than just food, and provision for other goods and services also needed to be made. Since there are no a priori norms for these, it was felt that the actual expenditure of the households should form the basis for estimating the necessary expenditure on these goods and services[24]. The task force (1979) estimated the total expenditure on both food and non-food items of the group. This expenditure levels for rural areas and urban areas became the poverty line. Since then, the methodology formulated by the task force has been used in estimating the incidence of poverty in the planning commission. The task force appointed by the government of India defined poverty line in terms of calorie intake per day by an individual. The derived official poverty line came out to be 2435 calories, which is rounded as 2400 calories per person per day for rural areas, and as 2095 calories rounded as 2100 for urban areas. Working out in terms of monetary value, the official poverty line came out to be Rs. 49.09 per month for rural and Rs. 56.64 per capita per month for urban areas at 1973-74 prices respectively[25].

Thus in India many scholars, NGO's and Governmental Organization have estimated poverty line in their own ways. One of the earliest and very comprehensive studies was made by Dandekar and Rath (1971)[26]. According to this study group, the average calorie norm is 2250 calories per capita per day for both the rural and urban areas. They suggested that whereas the planning commission accepts Rs. 20 per capita per month (Rs. 240 per annum) as the minimum desirable standard, it would not be fair to use this figure for both rural and urban areas. On the basis of the NSSO data on consumer expenditure, they revealed that, in rural area, the households with monthly per capita of Rs.14.20 at 1960-61 prices consumed on an average food with calorie equivalent to 2250 per capita per day together with such non-food items as they chose. The corresponding figures in the urban area were Rs. 22.50 per capita per month at 1960-61 prices. On average a per capita monthly expenditure of Rs. 20 (at 1960-61 prices) was deemed to be the national minimum. In the late sixties, Ojha (1970)[27] defined poverty in terms of basic minimum needs, which in turn, were expressed in terms of physical survival. According to him, the minimum calories requirement was 2250 per day per person. In terms of food grains (Pulses and Cereals) minimum calories required were 1500 and 1800 for urban and rural areas respectively. Minimum calorie intake was then expressed in terms of physical quantities of food grains. He

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[24] Sen, P. (2005), "Of Calories and Things: Reflection on Nutritional Norms, Poverty Lines and Consumption Behaviour in India", *Economic and Political Weekly*, Vol XL. No.43, 2005, p 4611.
[25] Ibid 4
[26] Dandekar, V. M. and Rath, N. (1971); "Poverty in India, Indian School of Political Economy," p 8-18 (Reprinted from *Economic and Political Weekly*, Bombay, Volume VI, Nos 1 and 2, January 2 and 9, 1971).
[27] Ojha, P. D. (1970); "A Configuration of Indian Poverty: Inequality and Level of Lining", *RBI Bulletin*, January 1970.

estimated 518 grams per day per person for rural areas and 432 grams per day per capita urban areas. He defined poverty line at Rs. 15-18 (at 1960-61 prices) per capita per month for rural population and Rs. 8-11 per capita per month for urban population. Bardhan (1973), defined poverty line to be Rs. 15 per person per month at 1960-61 prices for the rural people. He noted that 53% of the rural population were below the poverty line[28]. Minhas (1978)[29] does not split the minimum requirements to draw the poverty line between rural and urban areas. He defines poverty line in terms of minimum amount of per capita consumption expenditure. He refers to a distinguished study group constituted in july 1962 comprising D. R. Gadgil, B. N. Ganguli, P. S. Lokanathan, M. R. Masani, Asoka Mehta, Shriman Narayan, Pitambar Pant, V. K. R. V. Rao, and Anna Saheb Sahasrabudha which recommended a standard of private consumption of Rs. 240 (at 1960-61 prices) per capita per year bare minimum. For rural areas, Minhas suggested that, the poverty line may be drawn at Rs. 200 per capita per year. The World Bank in its study on India's poverty used alternative method of estimating poverty proportions applying a deflator series developed by NSS and the Indian Statistical Institute to calculate updated poverty lines in current prices. The study showed that the poverty line is Rs. 55.2 for rural and Rs. 112.2 for Urban for 1977-78 and Rs. 89 for rural and Rs. 68.6 for urban for 1983. Like wise the estimate of Datt and Ravallion[30] (1989) gave the poverty line at Rs.89 and developed the concept of poverty gap. The planning Commission constituted an Expert Group in September 1989 to consider methodological and computational aspects of estimation of proportion and number of poor in India. The poverty line recommended by the task force on projection of minimum needs and effective consumption demand, namely a monthly per capita total expenditure of Rs. 49.09 per month for rural areas and Rs. 56.64 per month for urban areas rounded respectively to Rs. 49 and Rs. 57 at all India level at 1973-74 prices. This was anchored in the recommended per capita daily intake of 2400 calories in the rural areas with reference to the consumption pattern as obtained in 1973-74[31]. Similarly, Dubey and Gangopadhyay (1998) taking the calorie intake as 2435 per capita per day for rural and 2095 per capita per day for urban areas and the poverty line of Rs. 49.09 for rural and Rs. 56.64 for urban areas as estimated by the Expert group (1993), they re-estimated the poverty line. The re-estimated rural poverty line on the basis of a uniform calorie is 2250 per capita. The rural poverty line turned out to be the Per Capita Total Expenditure (PCTE) level of Rs. 15 per month at 1960-

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[28] Bardhan, P. K (1973). "On the Incidence of Poverty in Rural India", *Annual Number*, February 1973, p 245-46.
[29] Minhas, B. S. (1970); "Rural Poverty, Land Redistribution and Development Strategy: Facts and Policy", *Indian Economic Review*, April 1970, Reproduced in Minhas, Planning and the Poor, S. Chand and Co., 1978, Chapter II.
[30] Datt, G. and Ravallion, M. (1989), "Regional Disparities, Targeting and Poverty in India", *Working Paper No. 375*, World Bank, p.37.
[31] Ibid 4

61 prices. Whereas, the urban poverty line at 1960-61 prices is reported to be Rs. 18 per capita per month[32]. As of 1990-2000, the poverty lines declared by the planning commission were Rs. 327 and Rs. 454 for rural and urban areas, respectively. The NSSO the 61st round 2004-05 estimated the calorie norms as 2047 Kcal for the rural areas and 2020 Kcal for urban areas, while the poverty line has been fixed at Rs. 558.78 at 2004-05 prices for rural areas and Rs. 1052 at the current prices for urban areas. Thus the poverty line has been changing over the time and from scholars to scholars.

1.2: STATEMENT OF THE PROBLEM:

Poverty, as the phenomenon accompanying to all economic systems, existed in all times. That 1.3 billion People, i.e. one in every five person on earth, survive on less than $1 a day and 2.8 billion people in the world live on less than $2 a day[33], this indicates that nearly half of the people in the world live in poverty. The case for public action to eradicate malnutrition and poverty is a strong one, and one that can be forcefully made using either ethical or economic arguments. But public action to reduce malnutrition and poverty is a moral imperative. However, food and nutrition are human rights enshrined in various conventions and most recently the 1989 convention on the rights of the child. Thus, the government has a duty to ensure that these dimensions of human well being are realized[34]. Following the convention, many Governments and nation have followed eradication of malnutrition and poverty as their main development objectives. The declaration of the 1st Millennium Development Goal of the World Bank has underlined the importance of eradication of poverty. The millennium Development Goals call for reducing the proportion of people living on less than $1 a day to half the 1990 level by 2015 – from 27.9 percent of all people in low and middle income economies to 14.0 percent. The Goal also calls for halving the proportion of people who suffer from hunger between 1990 and 2015[35]. Thus, eradication of poverty is taking the center stage in all nations' development agenda.

It is only in the twentieth century that poverty and the poor have come to be a matter of concern and obligation in India. After a long neglect of the poor during the British rule, the measure adopted after independence signify the recognition of poverty and the social responsibility for alleviating and reducing it. Thus, in India, poverty was with us during the colonial period and is still prevalent even after 50 years of independence. One of the objectives of the planning is to

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[32] Dubey, A.and Gangopadhyay, S. (1998), "Counting the poor: Where are the poor in India", *Sarvekshana: Analytical Report*, Department of Statistics, Goveernment of India, No. 1, 1998, p 2.
[33] Ibid 4.
[34] Haddad, L. (2002), "Nutrition and Poverty", *In Nutrition: A foundation for Development*, Geneva: ACC/SCN. p 1.
[35] World Bank (2000), "Millineium Goal for World Development" On line available at *www.ddp-ext.worldbank.org/ext/MGD/home.do*.

reduce inequalities of income and wealth and to set up a socialist society based on equality and justice and absence of exploitation[36]. But despite all the pious sentiment for the weaker sections the number of the poor continued to swell in the country. The Garibi Hatao (remove Poverty) slogan raised during the parliamentary elections of 1971 brought a sharp focus on the problems of poverty. Thus, in the fifth plan, direct attack on the problem of unemployment and under-employment were launched to end poverty[37]. There is no doubt that as a result of intensification of the poverty eradication programmes, such as, IRDP, JRY, etc., by the successive government, the poverty level has started to move in the down ward direction. However, the successive round of NSSO shows a chronic prevalence of poverty in the country with some signs of slowing down. At the national level, the 56th round of the National Sample Survey Organisation's (NSSO) household survey indicates that poverty level is 24.4 % in 2000-2001. This poverty numbers are derived from sample surveys carried out by the NSSO on consumer expenditure.

The state of Nagaland, the 16th state of Indian Union is no exception to other state when it comes to poverty. Nagaland, even after more than four (4) decades of statehood, has 32.67 percentages of people living below poverty line during 1999-00. More over, the phenomenon of poverty is dominant in the rural areas with 40.04% of people living below the poverty line as compared to 7.47% of the poor in urban areas. However, it is to be noted here that the poverty ratio of Assam is being used to measure the extent of poverty of Nagaland[38] that is not appropriate. Thus, estimating the extent and depth of poverty in Nagaland based on its own norms becomes vital. In Nagaland, no individual or government agencies have brought out the nutritional norms and poverty line for the state except the one provided by NSSO. It is for these reasons; the study of *Assessment on Nutrition and Poverty in Nagaland* becomes important.

1.3: AREA AND PERIOD OF STUDY:

Nagaland has an area of 16,597 Sq.Km with a population of 19, 88,636, out of which 82.26% live in the rural areas. It has eleven (11) districts at present, *viz*, Dimapur, Kiphire, Kohima, Longleng, Mokokchung, Mon, Peren, Phek, Tuensang, Wokha and Zunheboto. The state is mostly inhabited by tribal population having similar socio-economic conditions. Now considering all the common features of development, habits, and social life of the rural people in the state, a study of Wokha district has been taken as a representative study for the rest of the rural areas of Nagaland. Wokha district has an area of 1,628 Sq.Km inhibited by Lotha tribe with a

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[36] Datt R and Sundharam K.P.M, "*Indian Economy*", 6th edition, 2002,p155.
[37] GOI (1972), "*Towards an Approach to the Fifth Plan*", Planning Commission, New Delhi, p 7.
[38] Kapila, U. (2007), "*Indian Economy; Issues in Development and Planning and Sectoral Aspects*", "5th edition", Academic foundation, New Delhi. P 213-4.

population of 1, 61,098 that constitutes 8.1% of the state's population. Out of the total population, 76.61% consist of rural population and the urban population consists of 23.48%. The literacy rate is 73.92%[39]. The district is divided into three (3) geographical ranges, *Viz,* Lower range, Middle range and Upper range showing a total of 128 villages. Taking into account the common socio-economic features of the district, four (4) villages were selected under the present study. As a representative of their respective ranges, one village from the lower, two villages from the middle and one village from the upper range were selected. Two villages were selected from the middle ranges because this range is having the maximum number (60) of the villages while upper range has 30 villages and the lower range 38 villages. The study estimated the average calorie requirement through nutritional intake and the per capita monthly expenditure (PCTE) of the people in the villages during the period 2005-06.

1.4: OBJECTIVES:

The study has been conducted with the following objectives;

1. To study the level of socio-economic development in the study area.
2. To assess the average calorie norms per day and derive the poverty line for the sample population and compare it with national calorie norms/poverty line and state calorie norms/poverty line given by NSSO 2004-05.
3. To estimate the average calorie requirement and the inter-variation in the calorie intake for the cross section of the population (different income, age and gender, village-wise, range-wise, sex-wise and occupation-wise head of the household).
4. To assess the relationship between the calorie intake and the family size, income and PCTE.
5. To measure the extent of poverty and inequalities in calorie intake and PCTE and the relationship between the proportion of poor and the inequalities.
6. To assess the impact of governments poverty alleviation programmes undertaken in the village on the sample population.
7. To suggest policy options for poverty alleviation for the study areas.

1.5: HYPOTHESIS OF THE STUDY:

In order to achieve the objective stated above, the study tested the following hypothesis:

a. Low-income groups are vulnerable to poor diet and nutrition and thus, low per capita income/PCTE is positively correlated with higher incidence of poverty.

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[39] Government of Nagaland (2004), "*Statistical Handbook of Nagaland 2004*", Directorate of Economics and Statistics Nagaland, Kohima.

b. Higher the size of the household, lower is the per capita calorie intake.

c. Higher the extent of inequalities (measured by Gini coefficient) in income and calorie distribution, higher is the proportion of poor (measured using the sample norms/poverty line) in the society.

1.6: SCOPE OF THE STUDY:

This study throws lights on the methods of measuring poverty and brings out the required average calorie intake by different age, sex, village-wise, range-wise, sex-wise head of the household and occupation-wise head of the household for the rural areas of the state. The study provides a sample calorie norms and poverty line for the state which will be useful for the state government and NGOs. Moreover, the detail analysis on the extent, magnitudes, characteristics of poverty and the poverty line derived from the study will provide a reliable base that will assist the policy planners while formulating effective poverty-focused policies for the state of Nagaland.

1.7: METHODOLOGY:

1.7.1: The concepts and definitions used while collecting and analyzing data are given below:

(i) ***Household:*** A group of person's normally living together and taking food from a common kitchen constitutes a household. The word "normally" means that temporary visitors are excluded but temporary stay-away are included.

(ii) ***Household size:*** The size of a household is the total number of persons in the household.

(iii) ***Household consumption expenditure*:** The expenditure incurred by a household on domestic consumption during the reference period is the household's consumption expenditure. Household consumption expenditure is the total of the monetary values of consumption of various groups of items, namely food.

It is pertinent to mention here that the consumer expenditure of a household on food items relates to the actual consumption by the members of the household and also by the guests during ceremonies or otherwise. To avoid double counting, transfer payments like charity, loan advance, etc. made by the household are not considered as consumption for items, since transfer receipts of these items have been taken into account.

(iii) ***Value of consumption*:** Consumption out of purchase is evaluated at the purchase price. Consumption out of home produce is evaluated at ex farm or ex factory rate. Value of consumption out of gifts, loans, free collections, and goods received in exchange of

goods and services is imputed at the rate of average local retail prices prevailing during the reference period.

(iv) ***Monthly per capita consumer expenditure (MPCE)*:** For a household, this is the total consumer expenditure over all items divided by its size and expressed on a per month (30 days) basis. A person's MPCE is understood as that of the household to which he or she belongs.

(v) ***Reference periods*:** The reference periods used for collection of consumption data on items are for the last 30 days and 365 days. The data of households expenditure on foods, pan, tobacco & intoxicants, fuel and light, miscellaneous goods and services, including non-institutional medical care, rents and, taxes, cereals, egg, fish & meat, fruits (fresh& dry), conveyance etc. are collected over the last 30 days prior to the survey. The household expenditures data on clothing, footwear, education, medical care and durable goods which are not frequent, are collected over the last 365 days prior to the survey, thereafter, the total expenditure is divided by 12 months so as to arrive at monthly average expenditure.

1.7.2: Sources of Data:

***(i) Primary and Secondary data*:**

The study is based on both primary and secondary data. The secondary data have been collected from the published as well as unpublished sources such as, government official records, statistical hand books, census reports, journals, newspapers, etc. While the primary data were collected through sample survey using direct personal interviews and questionnaire methods.

1.7. 3: Sample design:

The primary data were collected using stratified random sampling method during 2005-06. The villages were stratified according to well defined geographical ranges in the first stage. From the three ranges of Wokha districts, four villages were selected as sample villages representing their respective ranges. Accordingly upper range is represented by Longsa, middle range by Yunchuchu and Sunglup villages and the lower range by Bhandari village.

Secondly, a total of 99 households were selected as sample household that fairly represent the universe of the study. The village-wise households samples are as follows, 68 households from Longsa that constituted 10% of the total household in the village, 9 households from Yunchuchu village that constituted 10.59% of the total households in the village, 12 households from Sunglup that constituted 10.17% of the total households in the village and 10 households from Bhandari that constituted 10.42% of the total households in the village. Thus, the sample survey covered

10% of the households from each sample villages. This includes 393 individuals that encompass 5.39% of the total sample village population. The village-wise sample populations covered by the survey are as follows, Longsa with 259 persons accounting for 4.93% of the total village population, Yunchuchu, Sunglup and Bhandari villages with 42, 38, and 54 persons respectively accounting for 4.97%, 4.32% and 17.36% of their respective village population.

Further, the data on consumption of food were collected at the individual level from the sample population. Then, the collected data were converted into calories using the nutritional chart of the NSSO report 513 (61/1.0/6). Moreover, the data of expenditure on food and non-food items and their monthly income were collected at household level from the sample household.

Lastly, the information on the household's access to government poverty alleviation programmes was also collected.

1.7.4: Data Analysis:

The collected data were analysed at the households and individual levels using the following statistical tools, such as,

***(i) Mean*:** It is obtained by dividing the sum of values of observations by the number of observations. It is easy to compute and understand. The formula is given below

$$x = \frac{\sum x}{N}$$

x is the Arithmetic means, $\sum x$ is the sum of the variables and N is the number of observation.

***(ii) Standard Deviation*:** Standard deviation is also known as root mean square deviation for reason that it is the square root of the mean of the squared deviation from the arithmetic mean. The greater the standard deviation, the greater will be the magnitude of the deviations of the values from their mean. A smaller standard deviation means a high degree of uniformity of the observation as well as homogeneity of a series; a large standard deviation means just the opposite. It is represented by sigma and is given below;

$$\sigma = \sqrt{\sum fd^2/N - (\sum fd/N)^2} \times i$$

Where i is the class interval.

(iii) Coefficient of Variation: The relative measure of dispersion is known as coefficient of variation. The series for which the coefficient of variation is greater is said to be more variable or less consistent. On the other hand, the series for which coefficient of variation is less is said to be less variable or more consistent. It is given as,

C.V = σ/Mean x 100

(iv) Variance: The variance of a set of number is the square of the standard deviation. It is given as,

Variance = σ^2

(vi) Correlation: If the change in one variable affects a change in the other variable, the variables are said to be correlated. If the variables deviate in the same direction, correlation is said to be positive. But if they constantly deviate in the opposite directions, correlation is negative. It is useful in determining the dependency of one variable with the other. The formula is as follows;

$$R = \frac{N\sum dxdy - \sum dx \sum dy}{\sqrt{N\sum dx^2 - (\sum dx)^2}\sqrt{N\sum dy^2 - (\sum dy)^2}}$$

(vii) Probable Error: The probable error of the coefficient of correlation helps in interpreting its value. With the help probable error it is possible to determine the reliability of the value of the coefficient in so far as it depends on the conditions of random sampling. The probable error of the coefficient of correlation is obtained as follows;

$$P.E._r = 0.6745 \frac{1 - r^2}{\sqrt{N}}$$

Where r is the coefficient of correlation and N is the number of pairs of observation.

a) If r is less than the probable error, there is no evidence of correlation, i.e., the value of r is not significant.
b) If r is more than six times the probable error, the coefficient of correlation is practically certain, i.e., the value of r is significant.

(viii) Regression: Regression analysis is a mathematical measure of the average relationship between two or more variables in terms of the original units of data. In regression there are two variables. The variable whose value influenced or is to be predicted is called dependent variable and the variable which influences the values or is used for prediction is called independent variable. Regression equation of y on x is as

$$y = a + bx$$

Where a is the intercept, y is the dependent variables, x is the independent variables and b is the regression coefficient.

$$b_{yx} = \frac{N\sum YX - (\sum Y)(\sum X)}{N\sum X^2 - (\sum X)^2}$$

(ix) Standard Error Estimates: The measure which indicates how precise the prediction of y is, based on x or conversely or how inaccurate the prediction might be is called the standard error of estimates. The standard error of regression of y values from y_c is given as

$$S_{yx} = \frac{\sqrt{\sum Y^2 - a\sum Y - b\sum XY)}}{N}$$

The smaller the value of standard error estimates, the closer will be the dots to the regression line and the better the estimates based on the equation of this line. If the standard error of the estimates is zero, then there is no variation about the line and the correlation will be perfect.

(x) Measures of Poverty and Inequality: In order to measure poverty and the extent of relative inequality in the area under study, the following measures have been applied.

(a) Head Count Ratio (H): This measures gives the proportion of the total population deemed to be poor (i,e, those below poverty line). Let Z be the poverty line and Y be the income/calorie intake of the person with income/calorie intake arranged in ascending order so that $Y_i \leq Y_{i+1}$ for all I, let 'n' denote the total number of people in the community and 'q' the number of people below poverty line.

The Head Count Ratio (H) is then.

$$H = q/n$$

But Sen observed in 1976 that head count Ratio (H) is very crude index. This index is highly insensitive to the extent of the aggregate short fall of the income from the poverty line as well as to the distribution of income amongst the poor.

(b) Poverty Gap Index (PG): This is an indicator which measures the depth of poverty. It depends on the distance of the poor below the poverty line (Z) the Poverty Gap. Where Z = Poverty line, Yi = income/calorie intake of the poorest poor.

$$PG = \frac{1}{n}\sum_{i=1}^{q}(Z - Y_i / Z)$$

PG could also be defined as the mean proportionate poverty gap across the whole population (zero gaps for non-poor). PG also has an interpretation as an indicator of the potential for eliminating poverty by targeting transfer to poor. The minimum cost of eliminating poverty using targeted transfers simply the sum of all the poverty in a population. One drawback of the poverty gap measure is that it ignores the number actually in poverty[40].

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[40] Anand, S. (2002), "The Definition and Measurement of Poverty", In Subramanian S (ed) 2002, *Measurement of Inequality and Poverty*, p 250.

(c) Lorenz Curve: Income/calorie intake inequalities in different groups have been examined with the help of Lorenz Curve. The Lorenz Curve shows the percentage of income/calorie intake received by X percent of population, X varying from 0 to 100. The advantage of Lorenz Curve comparison is that we can say something about the comparative levels of social welfare without specifying anything very particular about the exact welfare function. The degree to which a line Lorenz Curve deviates from the line of equal distribution is a measure of inequality of distributions of incomes/calorie intake. The further the Curve moves away from this line the greater is the inequality. The degree of this inequality at any stage is indicated by the distance from the equal distribution line. But sometimes distribution does not have this property. Thus in the study on the distribution of income/calorie intake, references is frequently made to the Gini-Co-Efficient measure.

(d) Gini-Coefficient (G_p): Gini-Coefficient is used to attach some absolute measures to the degree of inequality or gives some idea whether the inequality is large or small. Gini-Coefficient is not purely statistical and it embodies implicit judgment about the weight to be attached to inequality at different points on the income scale. This co-efficient may be interpreted in two ways. First, it may be seen geometrically in terms of Lorenz Curve.

$$\text{Gini Coefficient} = \frac{\text{Area between Lorenz Curve and Diagonal}}{\text{Total Area under Diagonal}}$$

The co-efficient may be seen to range from zero when income/calorie intake is equal (The Lorenz Curve follows the Diagonal) to one and at the other extreme (The Lorenz Curve have > shape). Secondly, it may be computed mathematically using Rao's definition[41] as follows. Area between Lorenz Curve and Diagonal (G) is given by;

$$G = \sum_{i=1}^{n-1} (F_i Q_{i+1} - F_{i+1} Q_i)$$

(e) Sen Index (P): The measure of poverty proposed by Sen incorporates the number of poor, the income/calorie short fall of the calorie norms/poverty line and the transfer of income/calorie from the poor to the very poor. The Index is given as,

$P = q/n \,.\, 1/z\,[z\text{-}v + q/q{+}1\; vG_p]$

n = Total population.

q = Total number of poor.

z = Calorie norms/income requirement.

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[41] Anand, S (2002), "Measurement of Income Inequality", In Subramanian S (ed) 2002, *Measurement of Inequality and Poverty*, p 91.

v = Mean calorie intake/income of the poor people.

yi = Calorie intake/income of a poor person.

Where z is the poverty line and v is the mean income of the poor. The index P lies in between 0 to 1. It assumes the value 0 when everyone's income/calorie intake is above the calorie norms/poverty line z and the value 1 when everyone has zero income/calorie intake implying everyone is below the calorie norms/poverty line. One serious limitation of Sen Index is it is not decomposable. The poverty index suggested by Foster, Greer and Thorbecke takes care of this problem.

(f) Foster, Greer and Thorbecke Measure (P^F): This measure is decomposable and takes care of the limitation of Sen Index. This is an indicator which is used to measure how income/calorie intake is distributed below the calorie intake/poverty line and takes into account the intensity and severity of poverty. It is given by;

$$(P^F) = \frac{1}{n}\sum_{i=1}^{q}(Z - Y_i/Z)^2$$

This could be defined as the mean squared proportionate poverty gaps (Ravallion, M. 1992).

1.8: CHAPTERISATION:

The analysis of the study area is organized and presented in the following chapters' as follows;

Chapter I: Introduction.

Chapter II: Review of Literatures.

Chapter III: Socio-Economic Profile of the Study Area.

Chapter IV: Assessment of Nutritional Intake and the PCTE.

Chapter V: Measurement of Poverty and Inequalities.

Chapter VI: Findings and Conclusion.

CHAPTER II

REVIEW OF LITERATURES

In the vast literature of economics, poverty is a well researched and well debated topic. From measurement issues to drawing the poverty lines, many works had been done to resolve the issues according to economic situation and the scholar concern. Further, literature on nutrition and poverty has been taking the center stage, as the inter linkage between the two has been found by a number of researchers and government agencies to be vital in eradicating poverty. Moreover, many literatures explain the working of government agencies, programmes and NGO's in eradicating poverty.

In this section, the work done by the scholars and agencies (Government and NGO's) regarding poverty and its issues are being discussed.

2.1: POVERTY LINE AND THE EXTENT OF POVERTY:

To know who is poor and who is not, one has to draw the line that divides the two. Thus, fixing of poverty line becomes the very bases of defining poverty. In the literature of economics' these topics have been vastly debated and examined by many scholars and government agencies.

Deaton (2000) analysed the World Bank Report 2000 estimates of poverty line basing on 1993 purchasing power parities at $ 1.08 a day per person, but is still conveniently referred to as the $1 a day poverty line. The World Bank's worldwide count of the poor starts from a common international poverty line and counts the number of people in each country whose consumption lies below it. The international poverty line, at $1-or $2-a-day is converted into domestic currencies using purchasing power parity exchange rates. But he is of the view that, although the $1-a-day common line has much to recommend it, its dependence on purchasing power parity exchange rates has a number of drawbacks. Thus he suggested that, a better procedure for the future would be to hold fixed (in real terms) the current domestic poverty lines, and not to revise them along with changes in PPP exchange rates induced by updating of base years.

Oberg (2003) explained how poor are being defined. He shows that, the Census Bureau uses a set of money income thresholds that vary by family size and composition to establish the official measure of poverty line in the U.S. Thus, the poverty line was fixed at an annual income of $9,214 in 2001 for a single person, $12207 for family of two, $14269 for family of three, $18,022 for family of four, $20812 for family of five, $23221 for family of six, $25462 for family of seven, $28893 for family of eight and $34238 for family of nine. With the poverty line, he analysed the trends of the overall poverty rate in the U.S. from 1959 to 2001. His analysis shows that, in 1960,

35% of the population —over 5 million people—were poor, with the elderly comprising the largest segment. Since then, there has been a significant reduction in the number of elderly persons living in poverty to a rate of 10.1% in 2001. After 1975, the rate continued a steady decline for those over 65 years, while it increased for children. The poverty rate for children rose to an all time high of 22% in 1982 and again in 1993 equaling the rates observed in the 1960s. Despite a reduction in the childhood poverty rate since 1993, in part due to the strong economy of the 1990s, children remain disproportionately represented among poor Americans, with a rate of 16.3% in 2001.

The National Economic and Social Development Board (NESD) of Thailand in 2002 have estimated poverty line for the country using calorie requirement and calories obtained per Baht. Using the official method for the year 1988-2002, the board have estimated that the poverty line in Thailand were equivalent of 473 baht per person per month in 1988, and 922 baht per person per month in 2002. It also showed that poverty incidence have decline from 32.6 percent of the total population in 1988 to 9.8 percent in 2002.

Government of Sri Lanka, on March 2004, conducted workshop on the methodological issues surrounding the estimation of poverty. Based on the recommendation that emerged from the workshop, the department of Census and Statistics chooses the absolute poverty line approach in fixing the poverty line. The calorie requirement per person per day thus estimated to be 2518 Kcal. Using the age division method of NSSO India, the paper shows the various calorie requirement by different age groups. The national official poverty line for 2002 was fixed at Rs. 1423 per person per year.

Poverty line in the context of India was first mooted by the Indian Labour Conference in 1957. A distinguished working group of eminent economist and social thinker set up by the Planning Commission, Government of India, in 1962, to deliberate on the question of what should be regarded as the nationally desirable minimum level of consumer expenditure. The working group after taking into account the recommendation of the Medical Research (ICMR, 1958) came to the view that in order to provide the minimum nutritional diet in terms of calorie intake, the national minimum per capita consumption expenditure should be Rs. 20 per month at 1960-61 prices.

A Task Force (1979) constituted by the Perspective Planning Division of Planning Commission adopted derivation of poverty line in the normative minimum calorie intake. This group accepted the calorie intake norms recommended by the Nutrition Expert Group (1968), according to fourteen age-sex-activity categories, This provided the age-sex-activity-specific composition of the rural and urban populations. The specific calorie norms were then weighted by

the corresponding compositions of the rural and urban populations separately, to derive the rural and urban average calorie norms. The daily calorie requirement per person was worked out, on average, to 2435 and 2095 calories in rural and urban India, respectively (GOI, 1979). Thus if the people living in rural and urban areas can afford to consume on average at least 2435 and 2095 calories of food per day, respectively, they are said to be above the poverty line. Further, the Planning Commission has also estimated the total expenditure of the food and non-food items for urban and rural areas: these expenditure levels became their respective poverty lines. At 1973 prices, the poverty lines for rural and urban areas stood at Rs 49 and Rs 57 per person per month respectively (GOI 1979). Currently, these figures stand at approximately Rs 368 and Rs 559 per person per month for rural and urban areas respectively (GOI 1993).

In a study conducted by Dandekar and Rath in 1971, an intake of 2250 calories per capita per day was assured as adequate under the Indian condition both in rural and urban areas. On the basis of National Sample Survey data on consumer expenditure, the study revealed that an average annual per capita expenditure of Rs. 170.8 or Rs. 14.2 per capita per month at 1960-61 prices would suffice to meet this calorie requirement in the rural areas. The corresponding figures in the urban areas were Rs. 271.7 and Rs. 22.6 at 1960-61 prices. Referring to the working group of 1962 set up by the Planning Commission, it was observed that the rural minimum determined by them was considerably below that amount proposed by the group, while urban minimum determined by them was little above that amount recommended by the group. In view of this, they decided to revise their rural minimum slightly upwards to Rs. 180 per annum or Rs. 15 per month. Similarly, they rounded off the urban minimum to Rs. 270 per annum or Rs. 22.5 per month, both at 1960-61 prices. On the basis of their estimates for the 16 major states in India, it was found that in 1960-61, 135 million rural people or about 38 percent of the total rural population and 42 million urban people or about 54 percent of the total urban population were living below the poverty line.

A study conducted by Ojha in 1970, defined poverty in terms of minimum needs which, in turn, were expressed in terms of physical survival. According to him, the minimum calories needed were 2250 per capita per day. In terms of food grains (pulses and cereals) minimum calories required per person per day were 1500 and 1800 for urban and rural areas respectively. Minimum calorie intake was then expressed in terms of physical quantities of food grains, as 518 grams per day per person for rural areas and 432 grams per day per person for urban areas. He defined poverty line at Rs. 15-18 (at 1960-61 prices) per capita per month for rural population and Rs. 8-11 (at 1960-61 prices) per capita per month for urban population. On this basis, he found that in 1960-61, 190 million people (44% of the total population) lived below the poverty line. For rural India it

was 184 million (51.8% of the rural population) and 6 million in urban areas (7.6% of the total urban population).

Bardhan (1973) defined poverty line to be monthly per capita consumption of Rs. 15 at 1960-61 prices for the rural people. He noted that 220.5 million rural people (constituting 53% of the rural population) were below the poverty line. A few years later, Bardhan in 1973, considered the agricultural labour price index as more appropriate because GNP deflator was taken to be a biased measure since it included both agricultural and manufactured commodities, whereas the share of manufactured commodities in the typical budget of the rural poor is much below the national average. On this basis, he estimated that 38 percent of the rural population lived below the poverty line in 1960-61. Incidence of poverty, he says, increased from 38 percent in 1960-61 to 54 percent in 1968-69. In absolute numbers, this means a rise from about 135 million to about 230 million rural people below the minimum level during the corresponding period.

Minhas (1970) does not split the minimum requirements to draw the poverty line between rural and urban areas. He rather defined poverty line in terms of minimum amount of per capita consumption expenditure. He refers to a distinguish working group of 1962 set up by the Planning Commission which recommended a standard of private consumption of Rs. 240 (at 1960-61 prices) per capita per year as a bare minimum. On the contrary Minhas opines that the poverty line for rural areas is Rs.200 per capita per year. In comparison with the working group estimates, he has shown that by taking Rs. 200 as the minimum level of living, the number of people below the poverty line was worked out to be considerably lower. Taking Rs. 240 at 1960-61 prices as the minimum level of living, the proportion of people living below poverty line has come down from 65.0 in 1956-57 to 50.6 in 1967-68. But with Rs. 200 at 1960-61 prices of Minhas estimates, the proportion has come down from 52.4 in 1956-57 to 37.1 in 1967-68.

Ahluwalia (1977) studied the trends in the incidence of rural poverty in India for the period 1956-57 to 1973-74. He used the expenditure level of Rs. 15 in 1960-61 prices for rural areas and Rs. 20 per person for urban areas as the poverty line. His study is marked by fluctuation over time in the extent or incidence of rural poverty. The proportion of rural poverty declined initially from over 50 percent in 1956-57 to 44.5 percent in 1963-64, but rose to 46.1 percent in the 1973-74.

The World Bank in its study on India's poverty used alternative method of estimating poverty proportions applying a deflator series developed by NSS and the Indian Statistical Institute to calculate updated poverty lines in current prices. The study showed that the poverty line is Rs. 55.2 for rural areas and Rs. 68.6 for urban areas for 1977-78 and Rs. 89 for rural areas and Rs. 112.2 for urban areas for 1983. On this basis the proportion of population below poverty line for

1970, 1983 and 1988 has been worked out. The result shows that, the proportion of population below poverty line in rural areas declined from 53% in 1970 to 44.9% by 1983 and falls further to 42% by 1988. However, in terms of absolute number, the rural poor was about 237 million in 1970 and it rose to 252 million in 1983 and was around 252.2 million in 1988.

Datt and Ravallion (1989) gave the poverty line at Rs.89 and developed the concept of poverty gap. According to their study, on an average, 43.9% of the populations were living below the poverty line in 1983. While, 40% of the urban populations and 45% of the rural populations were living below the poverty line in the same year.

The Planning Commission (1989) constituted an Expert Group in September to consider methodological and computational aspects of estimation of proportion and number of poor in India. The poverty line recommended by the Task Force on projection of minimum needs and effective consumption demand, namely a monthly per capita total expenditure of Rs. 49.09 for rural areas and Rs. 56.64 for urban areas, rounded respectively to Rs. 49 and Rs. 57 at all India level at 1973-74 prices. This estimate reveals that rural poverty ratio has decline from 56.4% in 1973-74 to 39.1% in 1987-88. As compare with this, there is relatively smaller decline in the urban poverty ratio which has come down from 49.2% in 1973-74 to 40.1% in 1987-88.The overall poverty ratio has declined from 54.9% in 1973-74 to 39.3% in 1987-88.

Dubey and Gangopadhyay (1998) calculated the incidence of poverty by taking into account the price variation faced by different households across different expenditure categories within and across the states. While adjusting the cost of living index, they used all the commodities for which the price data were collected unlike the expert group of the Planning Commission, which used only four groups of commodity. Comparing with the official poverty line set by the Task Force (1979) and their alternate poverty line, it shows that their result is lower than the official line. The official poverty line for rural and urban areas stood at Rs 49 and Rs 57 per person per month at 1973-74 prices respectively, whereas, their estimate was Rs 42.68 per person per month for rural and Rs, 49.87 per person per month for urban at 1973-74 prices. Using the alternate poverty line, they estimated the poverty trend in India from 1973-74 to 1993-94. The result shows that the rural poverty declined from 56.44% in 1973-74 to 37.27 in 1993-94 for rural areas. For urban areas the number of poor, which was 49.01% in 1973-74 declined to 35.97% in 1993-94. The overall trend during the period shows a declining trend from 54.88% to 35.97%.

2.2: MEASUREMENT OF POVERTY:

Now, the pertinent question that arises here is, then, what are the methods used in deriving this required calorie intake and poverty line. Many works and studies have been done on the

measurement of poverty, some of which are worth mentioning here. Datt (1998) in his work introduces some relatively simple computational tools for estimating poverty measures from the data that are typically available from published sources. The work addresses the central question as how do construct poverty measures from grouped data. Two broad approaches were examined in this regard; they are simple interpolation methods and methods based on parameterized Lorenz curves. Interpolation methods essentially involve fitting a distribution function to the grouped data. To estimate the head-count index, the distribution function is typically fitted over the class interval containing the poverty line. Linear and quadratic interpolations are good examples of this method. However, there are two basic limitations in using interpolation methods as pointed out by him. First, they tend to provide relatively inaccurate predictions of the distribution function at selected points. This is particularly true of linear interpolation. Quadratic interpolation predicts more accurately, but can sometimes give rise to negative densities (when the slope of the distribution function becomes negative). Second, the calculation of distributionally sensitive poverty measures using interpolation methods can be cumbersome and inexact. An alternative methodology suggested by him for estimating poverty measures is based on parameterized Lorenz curves. This methodology is preferred both for its relative accuracy and the ease with which it helps perform a number of poverty simulations.

Aturupane, Glow and Isenman (1994) examined whether income or other broader set of objective should measure poverty or development progress. They showed that the World Bank agrees on the importance of non-income objectives in measurement, particularly those measured by basic social indicator. Their findings were that income growth, while important, is not the primary determinant of improvement in social indicator, they strongly stress on the importance of non-income objectives. Thus they recommend that changes, rather than levels, of social indicators should be emphasized and also illustrate how these changes can be measured.

Demery and Marchant (2002) explain about the challenges that are to be met while measuring poverty by analyzing the World Development Report 2000/1. The World Bank's 2000/1 World Development Report, Attacking Poverty, estimated that 1.2 billion people are currently living on less than $1 a day, and 2.8 billion people are living on less than $2 a day that constitute almost half the entire worlds population. Recent UN global development conferences are united in advocating a world free of poverty which is the key development goal for the 21st century, and a group of poverty reduction targets (the International Development Goals) has gained currency. However, they are of the view that, setting such targets without appropriate strategies for poverty reduction and without the necessary monitoring systems would clearly be something of a sterile

exercise. The WDR 2001 is built on the now well-accepted view that poverty encompasses multiple dimensions, going beyond material deprivation. It broadens the notion of poverty by including vulnerability, insecurity, voicelessness and powerlessness, which is the present's significant challenge. First, it increases the dimensions of wellbeing that need to be measured. Second, it raises questions about the relative weight of each dimension. Third, it requires that accounting of the qualitative aspects, which by their very nature can be quite difficult to measure. Many people who consider themselves as poor might not be judged so in quantitative analysis, and discrepancies often arise between objective measures of trends in poverty and perceptions on the ground. Thus, they suggested that mixing of these approaches in measuring poverty will yield a better result.

In 1998, a Panel of National Academy of Sciences comprising Thesia I. Garner, Kathleen Short, Stephanie Shipp, Charles Nelson, and Geoffrey Paulin has made recommendation for revising poverty measure. The reason being that, with the change of social and economic condition in the United States over the years, there are more working mothers, families are smaller, there are wider varieties of goods and services, expectations about what it takes to meet one's needs are greater than in the past, and beliefs about what are necessities have changed. Geographic variations in housing and the increasing importance of government programs also have influenced families' appraisals of the value of their disposable incomes. With these and related changes have brought about whether the measures and data used to produce poverty in the country are still meaningful. They recommended that, the poverty thresholds should represent a budget for food, clothing, shelter (including utilities), and a small additional amount to allow for other needs (such as household supplies, personal care, and non work-related transportation). A threshold for a reference family type should be developed using actual Consumer Expenditure Survey data and updated annually to reflect changes in expenditures for food, clothing, and shelter over the previous 3 years. The reference family threshold should be adjusted to reflect the needs of different family types and to reflect geographic differences in housing costs. Family resources should be defined—consistent with the threshold concept—as the sum of money income from all sources, together with the value of near-money benefits (such as food stamps) that are available to buy goods and services in the budget, minus expenses that cannot be used to buy these goods and services. Such expenses include income and payroll taxes, child care and other work-related expenses, child support payments to another household, and out-of-pocket medical care costs, including health insurance premiums.

Tarozzi (2002) developed a procedure to estimate poverty counts in India from the 55th Round of the National Sample Survey (NSS), a large household survey run in 1999-2000. The proposed procedure requires only the existence of a set of auxiliary variables whose reports are not affected by the different survey design, and whose relation with the main variable of interest is stable across the surveys. The estimator, instead, does not require specific functional form assumptions on the relation between the main variable of interest and the auxiliary variable. In the context of NSS data, they identify a set of variables whose reports are not systematically affected by the changes implemented in the survey design, and provided evidence of the stability over time of the distribution of per capita total expenditure conditional on these variables. Thus using their estimator, they calculated the adjusted estimates for poverty in India using data from the 1999-2000 NSS Survey. The result shows that, a poverty count in India is now close to 30 percent in rural areas, and 25 percent in urban areas. The evidence suggests that a change in the survey design caused the reports on household expenditure to change to an extent that it is impossible, without adjustments, to compare poverty estimates from this survey with those obtained from previous NSS Rounds.

Bernstein and Sherman (2006) pointed out the flaws that are contained in the new measurement of poverty used by the National Academy of Sciences (USA) reports 1995. Their finding suggest that, unlike past Census reports on alternative measures of poverty, the report does not include a set of poverty measures that follow the recommendations of an expert panel of the National Academy of Sciences (NAS) and that are more complete than either the official poverty rate or the new measures. Poverty rates under the NAS measures are generally higher than the official poverty rate. Moreover, the new measures are flawed (and biased downward) because, among other reasons, they do not account for families' expenses for child care and medical care and attribute major new categories of income (such as potential income from home equity) to families without making the adjustments to the poverty threshold necessary to create a consistent measure of well-being.

Jitsuchon (2003) in his case study on Changwat in Thailand shows the country as one that experienced a rapid reduction of the poverty incidences over the past fifty years. For example, the headcount ratio in 1960s was in the range of 60-80%. The incidence dropped continuously and dramatically to around 11% in 1996, rose slightly to around 15% two years later after the economic crisis of 1997, and is now resuming its course of declining to less than 10% in 2002. But, such a rapid reduction of poverty ratios makes it now difficult to locate the poor. One of the approaches taken recently to tackle the poor targeting problem is to identify the geographic areas

where the poor population is concentrated. Thus, he constructed poverty maps for Thailand using the methodology provided by the World Bank. The method basically tries to 'predict' the level of household income and/or expenditure of every household in some large-scale, often the census, data set, for which the true income/expenditure information is not collected. To do this, the methods rely on the relationship between the household income/expenditure and some other 'explanatory variables' that appear in both the census and the smaller, survey type data set (almost always the household surveys). These relationships, or the income/expenditure model, will then be applied to the census data to get the predicted income/expenditure. Their finding suggests that of all the 'target villages' (14,218 villages out of around 16,000 villages), around two-third was not poor with the World Bank approach. Also, among the remaining 52,077 rural villages, 12,296 were poor according to the WB approach.

Pradhan and Ravallion (1998), showed how subjective poverty lines can be derived using simple qualitative assessments of perceived consumption adequacy based on a household survey. By identifying the subjective poverty line without the usual "minimum income question" their approach offers wide applications to developing country settings. They implement it using survey data for Jamaica and Nepal. Respondents were asked whether their consumptions of food, housing and clothing were adequate for their family's needs. The implied subjective poverty lines are robust to alternative methods of dealing with other components of consumption. The results suggest a larger difference in poverty measures between urban and rural areas than found by more 22 conventional objective approaches based on a concept of basic and absolute consumption needs. People in poor areas perceive themselves to be even poorer than objective comparisons suggest. So their results do not suggest the Subjective Poverty Line behaves more like a "relative poverty line" (which rises with average income) than an "absolute poverty line" (which does not).

Pritchett, Suryahadi and Sumarto (1999) shows that many households, while not currently "in poverty" recognize that they are vulnerable to events that could easily push them into poverty such as, bad harvest, a lost job, an unexpected expense, an illness, an economic downturn. Most operational measures define poverty as some function of the shortfall of current income or consumption expenditures from a poverty line, and hence measure only poverty at a single point in time. Thus they propose a simple expansion of these measures to quantify "vulnerability" to poverty. They define vulnerability as a probability; the risk a household will experience at least one episode of Poverty in the near future. A household is defined to be vulnerable if it has 50-50 odds or worse of falling into poverty. Using these definitions they calculate the "Vulnerability to Poverty Line" as the level of expenditures below which a household is vulnerable to poverty. This

Vulnerability to Poverty Line allows the calculation of "Headcount Vulnerable Rate," the proportion of households vulnerable to poverty, which is the direct analogue of the "Headcount Poverty Rate." They implement this approach using two panel data sets from Indonesia. After setting the poverty line, they showed that the headcount poverty rate is 20 percent; the proportion of households that are vulnerable to poverty is around 30 to 50 percent. So in addition to the 20 percent that are currently poor (hence are by definitions vulnerable to poverty), an additional 10 to 30 percent of the population is at substantial risk of poverty.

Bhalla (2003) reflected the trends in the survey capture ratio and the possible sources and the magnitude of errors contained in both the household's surveys and national accounts. He analysed the different methods used in estimating the poverty in India in 1999-2000, emphasizing in particular, a method, which uses information about, increase in Household survey-measures of real wages between 1983 and 1999. His finding shows that poverty in India was less than 15 percent in 1999-2000, which is a distance away from 35 to 40 percent of the World Bank estimates and less than official estimates of 26 percent.

Ahmed (2004) presented the poverty measurement technique which is being used for giving poverty profile of Bangladesh. Using the data from two national surveys: Household Income and Expenditure Survey (HIES) and Poverty Monitoring Survey (PMS) conducted by Bangladesh Bureau of Statistics (BBS), he measured poverty line through the cost of living. His findings from the surveys indicate that the incidence of poverty has declined over the years. The Foster-Greer-Thorbecke class of poverty estimates also indicates reduction of the poverty head count ratio, poverty gap, and squared poverty gap in the recent past. The distribution of income and expenditure shows that though nominal income has increased, income distribution has become skewed with high concentration of income in the highest deciles and comparatively lower income share in the lowest deciles. The quintile distribution of income also shows similar evidence. With respect to non-income indicators, infant mortality rate has declined, life expectancy has increased, and enrollment in primary and secondary levels has increased.

Many scholars have debated the methods to be used in deriving poverty lines and have suggested their version on how poverty line should be derived in India. Saith (2005) states that even though income poverty line approach yields some pertinent information on its chosen scale, it is essentially one-dimensional and over looks the multifaceted nature of human deprivation. This can easily lead to a superficial and misleading understanding of the nature and causes of human poverty. Their finding shows that income poverty line leads to misidentification of the poor, and subsequently to the adoption of targets, monitoring and evaluation criteria which are equally

narrow, thus carrying many blind spots in the concepts of deprivation into the operational phase of interventions.

Popli, Parikh, Plamer and Jones (2005) examined whether the estimates of poverty provided by the government of India for the year 1999-2000 are appropriate or not. They examine this issue using non-parametric methods {weighted average derivative estimation methods (WADE)} and provided alternate estimate of poverty for All-India. The result of poverty estimates came out to be 27.7 and 24.7 for rural and urban areas respectively. Their findings suggest that different methods proposed for correcting poverty estimates in India does not have consensus. They showed that while the government of India suggested a decline of poverty by 10 percent in both rural and urban for the year 1993-94 to 1999-2000, Deaton's estimates suggest a decline by 7 percent for the same period. Whereas, their finding showed a decline in poverty by 5 percent for the same period.

Gruswamy and Abraham (2006), state that the definition of poverty based on nutritional norms followed by the Planning Commission for decades cannot be totally acceptable. They are of the view that, a poverty line drawn based on nutritional intake is not enough because there exist a need to go beyond and include other basic needs. Thus to define poverty, they suggested that certain basic needs are to be added along with nutritional norms and costs such as, the cost of meeting basic health needs, access to water, access to shelter and sanitation, cost of energy, clothing requirement, and the right to education and access to an all-weather road and public transport.

However, the most widely used methodology in measuring and deriving poverty line in India has been the calorie intake and calorie converted income. This absolute poverty line based on minimum normative food basket and the calorie norms have been extensively explained in the previous section.

2.3: NUTRITION AND POVERTY:

The relation between nutrition and poverty cannot be ignored. It has been widely accepted that poverty means the inability to have access to basic minimum needs, the basic minimum is perceived mostly in terms of foods and the availability of it. Thus, many literature has discussed the inter linkage between these two variables.

Behrman and Deolalikar (1987) reviewed the elasticities of calorie with respect to income. In a case study made for the rural South India, their finding shows that while food expenditure elasticities and therefore indirect nutrient expenditure elasticities based on typical food aggregates are of the order of magnitude of one, direct nutrients expenditure elasticity are not significantly

positive. Thus, their finding explains that increase in income does not result in substantial improvements in nutrient intake.

Similar literature on poverty and nutrition has been found in Behrman, Foster and Rosenzweig (1997) which reviews the income-calorie intake relationship basing on production stage, the form of income, the liquidity of assets, and the extent to which income is anticipated for the rural areas of Pakistan. Their findings suggest that distinguishing between the stages of agriculture production is critical for understanding the impact of income on calorie consumption. This is both because of the differential costs of consumption in the two stages of production and because of harvest productivity effects of calories consumed in the planting stage. Their estimates suggest that, there are small productivity effects of caloric consumption in the planting stage that are realized only in the harvest stage, and the calorie elasticity with respect to labour income in the planting stage is relatively high, particularly for households with relatively small landholdings. For low-wealth farmers the cost of an increase in calories in the planting stage approximately equals the resulting increase in profits combined with the substantial increase in their calories consumption in the harvest period suggests that these farmers face a high cost of transferring resources across stages. This implies that improving the operation of credit markets would increase both the welfare and productivity of poor relative to wealthy farmers.

Behrman, Alderman and Hoddinott (2004) analyzed the nature and measurement of hunger and malnutrition and reveals that there is a direct link between nutrition and productivity and indirect links between nutrition, cognitive development, schooling and productivity. Their findings suggest that, there is a strong correlation between maternal education and reductions in undernutrition amongst pre-school children. Secondly their findings show that improving infrastructure is important in reducing the possibilities of famine or chronic hunger. Because, famines and chronic undernutrition currently do not reflect food shortages in the aggregate so much as inadequate access to food for poorer segments of the population – either due to short-run shocks or chronic conditions. Inadequate food access, in turn, reflects limited purchasing power in the short-run or longer-run, often exacerbated by food price shocks in partially segmented markets. Another important finding is in addressing infectious diseases such as malaria and the HIV/AIDS pandemic. For example, HIV/AIDs increase hunger and malnutrition directly by reducing the income and food security of affected households and by interfering with the intergenerational transmittal of agricultural skills. In addition, young orphans and children with chronically ill caregivers risk higher rates of malnutrition. HIV also imposes a dilemma in assessing the increased risks of breastfeeding against the risks of not breastfeeding. Lastly their findings suggest that

dismantling of trade barriers is important for improving malnutrition in developing countries. The notion behind this is because, majority of hungry and malnourished people in developing countries are poor who lives in rural areas and depend directly or indirectly on agriculture for their livelihoods. Changes in the returns to agriculture in developing countries, may thus, have a major impact on hunger and malnutrition in developing countries through affecting the income of the poor and through affecting the prices that the poor pay for basic staples and other foods.

Subramaniam and Deaton (1996) estimated the relationship between economic status (as represented by income or by total expenditure) and nutritional status (as represented by calories) consumed in the rural areas of Maharastra in India. Their findings suggest total expenditure elasticity of calorie for the poorest household is .55 and .40 for the better off households. Those at the top of the distribution pay almost twice as much for their calories, with much of the switch accounted for by substitution out of cheap coarse grains. Except for very poor households, where there is evidence of quality upgrading even within coarse grain, the price per calories rises much less within both groups of food between them. This explains that as income rises, household do not buy more food and more calories.

Behrman and Deolalikar (1989) analysed the relationship between food varieties and the income level. Their finding suggests that as their income and total expenditure on food increase from very low levels, consumer behave as if they increasingly value food variety. One implication of this phenomenon is that calorie intake are likely to increase much less than expenditure on food with increased income for the poor because the poor use the additional income to purchase increase food variety. They also found out that individuals do not perceived inadequate calorie intake to be as in high priority problem as many outside observers have suggested. Thus they suggest that the policy maker interested in increasing calories intake should consider concentrating on policies rather than income generation.

Safiliou-Rothschild, (2001) in their "Food Security and Poverty: Definitions and Measurement Issues" presents the standard and evolving definitions and measures of food security and poverty at different levels, and critically evaluate the impact of development interventions, such as irrigation, on both food security and poverty alleviation. Their findings suggested that Irrigation does bring about a reduction of poverty because of increased agricultural productivity but the impact may not be spectacular, if access to water is not accompanied by any other positive interventions that increase access to agricultural inputs. Irrigation can alleviate poverty, directly through structural changes combining increased employment opportunities and agricultural

productivity and indirectly by enhancing the positive impact of other interventions such as the construction of rural roads and the establishment of micro-finance.

Meenakshi and Viswanathan (2003) in their analytical study reviews calorie deprivation in rural India for the year 1983 – 1999/2000. Their findings show that there is a decline in income poverty over the 1980's and 1990's and calorie deprivation in rural India has in fact increased. In 1983, average intakes were below 2400 calories in all but six states and were above the norm only in the northern region. By 1999-2000, intakes had declined in all states except Kerala, Orissa and West Bengal. However, the depth and severity of nutrient deprivation declined, as did the incidence of abject calorie deprivation. Using 2400 norm, their finding shows that the severity of calorie inadequacy increased only in four states, and declined in the remaining 12 states. Despite the apparent divergence between calorie- and income-poverty trends, income continues to be a powerful determinant of calorie intakes. Their estimates, based on a comparison of 1983 and 1993-94 intakes, indicated that calorie elasticities with respect to income were in the range of 0.5 to 0.7 for the poorest quintile in 1983, and were higher a decade later.

Lorant, Thomas, Deliege and Tonglet (2001) investigated whether the relationship between mortality and socio-economic deprivation is affected by the spatial autocorrelation of ecological data. A simple model is used in which mortality (all-ages and premature) is the dependent variable, and deprivation, morbidity and other socio-economic indicators are the explanatory variables. Their finding indicates that all mortality and morbidity variables have significant, positive, and moderate-to-high spatial autocorrelation. Thus the spatial autocorrelation has a significant impact on the relationship between mortality and socio-economic variables.

Deolalikar and Dubey (2003) examined both the incidence of hunger-poverty – as measured by the inadequacy of calorie intake – among Indian metropolitan cities (urban agglomerations) in 1999-2000 as well as the change in hunger-poverty between 1993-94 and 1999-2000. The recent evidence from India suggests a divergent trend in the incidence of consumption-poverty and hunger-poverty; while the headcount index of consumption poverty has steadily declined since the 1970s, the incidence of hunger-poverty is reported to have increased. The studies states that this divergence is due to two reasons. First, the normative calorie norm that has been used to calculate hunger-poverty has remained the same since the 1970s (2,100calories per person per day). Second, urban areas – comprising both small towns with a population of 5,000 person's population and large cities with over ten million populations – are treated as a single entity by all the empirical studies. Dubey et al. (2001) have reported that the incidence of poverty in metropolitan cities is only about one-half of that in the smaller towns.

World Bank Report (2001), shows that malnutrition afflicts an estimated 62 million children in all States. Estimates, during the mid-1990s shows that more than half of the children belonging to age group of 1-5 years old in rural areas in 12 out of the 14 larger Indian States are undernourished, with more girl children tending to suffer severe malnutrition. Chronic energy deficiency also persists among adults. In several large states, over 40-50% of adults suffer from chronic energy deficiency. The results of the National Sample Survey Organization 1993-94 quinquennial consumer expenditure survey, used to roughly approximate nutritional intake, suggest that the poorest 25% of the rural population consumed on average 1,900 calories or less per day, in contrast to the average recommended daily allowance (RDA) of 2400 calories. The poorest 25% of the urban population consumed on average 1,700 calories per day or less, compared to the average recommended daily allowance (RDA) of 2,100 calories. The report showed that this is due to inefficiency in implementing programmes that are meant for the poor as well as the inefficiency of the public distribution system.

FAO 2005, evaluated the availability of basic food and accessibility to those foods and to basic nutritional elements in rural India. The crucial findings of this paper revealed that as the farm size decreases, calorie intake per person decreases. They also showed us that junk of the poor are in the marginal and sub-marginal holding of farm. As regards to under nourishment, the paper clearly showed that sub-marginal farm household contributed for 46.9% of the total undernourishment of the rural farm household.

Deolalikar (1988) using data of rural south India, analysed the estimation of a fixed-effects on individual wage equation and farm production function which have calorie intake and nutritional status of workers. He found out that neither farm output nor market wages are observed to be responsive to changes in the daily energy intake of workers. However, both are highly elastic with respect to weight for height. These result suggest that, while the human body can adapt to inadequate nutrition in the short run, it cannot adapt readily to chronic malnutrition that eventually results in loss of weight for height. The other way of interpreting the result is that weight for height is a better indicator of nutrition than average daily calorie intake.

Bhargava (1997) estimates the activity patterns of adult men and women in approximately 110 Rwandese households surveyed four times in 1982-83. Dynamic models are separately estimated for men and women for the time spend for sleeping and resting, performing heavy activities, doing house work, on agriculture. The models postulate simultaneity between men and women's activities and investigate the differential feedbacks. The main findings are that low income and high food prices reduce the households' energy intakes, thereby forcing the adult to

spend additional time resting and sleeping. Second, both men and women share the work lot inspite of the poor nutritional status. Third, for women, there is substitution between house work and agriculture, the former tasks being relegated to other household members. Lastly, energy intakes of twice the basal metabolic rate seem inadequate for the sustenance of active adults.

Nandy, Irving, Subramanian and Smith (2005) using anthropometric data of 24396 children in India examined the prevalence of under nutrition. Their findings showed that 45% of children were stunted and 47% of the children were under weight. Moreover, morbidity is also quite high among the children who are under weight and stunted. They suggested that in order to reduce under nutrition, morbidity and mortality, reduction of poverty and improving the standard of living through improving quality of homes and increasing access to clean drinking water and adequate sanitation becomes a must.

Buvinic and Lycette (1989) studied "Women Earning and Child nutrition" in Africa and their findings suggest that children are actually nutritionally better off in the household headed by women. This is largely because when income and resources are controlled by women, it is more likely that more income and resource are likely to be allocated to family food expenditure. Similarly, in Kenya, female-headed households allocate a greater proportion of income towards supplying high-calorie foods than do male-headed households.

Datt and Ravallion (1998) analysed the differences in ranking poverty rate among Indian states for 1960's and 1990's. The analysis showed that rural poverty ranking of Indian states in 1990's was very different from those of 1960's. This unevenness in progress leads them to study the causes of poverty in developing rural economy. They model the evaluation of various poverty measures using pooled state-level data for the period 1957-91. Their finding shows that differences in trend rate of poverty reduction is due to different growth rate of a farm yield per acre and different initial conditions; states starting with better infrastructure and human resources saw significantly higher long-term rates of poverty reduction. Any deviations from this trend are attributed to inflation and shocks to farm and non-farm output.

Webb 2002, in his study on the nutrition and poverty in South East Asia shows that most food insecure households continue to live in rural areas and generally depend on the agricultural sector for their incomes. Thus he opine that growth which stems from farm productivity, increase directly or indirectly the incomes of smallholders and landless labourers, which becomes a vital importance for reducing poverty in Southeast Asia. But a renewed trajectory of macroeconomic growth alone will neither rapidly reduce income and food insecurity in the region, nor protect the vulnerable from inevitable shocks associated with globally integrated markets and natural

disasters. The latter may increase in number and severity in coming decades, while the adaptive capacity of both human and ecological communities may become increasingly constrained as a result of urbanization, pollution and macro-level shifts in food and biotic systems. Thus they suggest that policymakers must reduce national and household vulnerability and cope with uncertainty more directly, not through isolationist policies that seek to attain self-sufficiency in all domains, but through direct investments in poor people and poorer places such that the poor can also contribute to capitalizing on new market, technological, and financial opportunities.

Morduch (1994) studies the relationship between vulnerability of income and consumption of poor households. His finding suggests that vulnerability does not just result from poverty, but it can also re-inforce the income processes which lead to poverty and further diminish the expected welfare of the poor. Thus, to overcome this problem he suggested for proper implementation of antipoverty programmes, as these anti poverty programmes not only address poverty directly but also increase the income of the people. He further suggested for strengthening employment guarantee schemes because it can help reduce poverty through providing wages directly to the people.

Bhargava and Ravallion (1993) tested the hypothesis that consumption evolves over time as a martingale process based on the panel of household data for three villages in South India. The estimated coefficients of lagged consumption are generally smaller than unity and a number of the lagged income and wealth variables are statistically significant. Thus their results were inconsistent with the proposition that consumption equals permanent income.

Navaneetham and Jose (2005) examined the conditions of poverty and morality in South Asia. Their findings suggest that poverty leads to inadequate care for Children and Women, inadequate access to food and insufficient health services and healthy environment. These all things combine leads to malnutrition and sickness. They also showed that stunted growth in adolescent are due to malnutrition. Stunted adolescent will become a malnourished mother, thereby, producing low birth weight. These leads to stunted children and to stunted older people. About child mortality, their studies show that, infant and under five years mortality rates in South Asia are 69.8 and 101.6 in 1998 respectively. These figures are lower than the Sub-Sahara Africa but higher than East Asia and Pacific regions.

Mishra and Lyngskor (2005) studied poverty, dietary imbalance and sickness among casual labourer in Shillong, India. Their findings show that average per capita (per month) income and consumption expenditure are Rs. 516.61 and Rs. 392.13 respectively. The poverty line as estimated by them in urban areas of Meghalaya came out to Rs. 395.6. From these they showed

that 38.4 percent of the total populations surveyed were under poverty. The average energy intake among the Below Poverty Line (BPL) households is 1307.66 calories per person per day. The result of their finding regarding sickness was that, 77.78 percent are in the poverty.

2.4: POVERTY AND INEQUALITIES:

One of the causes of poverty is the inequality that exist in the society; the inequality in the distribution of income and wealth, in terms of opportunities and education etc. thus, many studies have been done to evalute the relationship between poverty and inequalities.

Barro (1999), analyzed the effects of income inequality on macroeconomic performance, as reflected in rates of economic growth and investment. Much of his analysis is empirical, using data on the performance of a broad group of countries. His findings from a broad panel of countries show little overall relation between income inequality and rates of growth and investment. For growth, there is an indication that inequality retards growth in poor countries but encourages growth in richer places. Growth tends to fall with greater inequality when per capita GDP is below around $2000 (1985 U.S. dollars) and to rise with inequality when per capita GDP is above $2000.

Milanovic (1998) tested the hypothesis that median voter plays an important role in countries distribution of income. He tested it on 79 observations drawn from household budget surveys from 24 democracies. He found out that the data strongly support the hypothesis that countries with more unequal distribution of factor income redistribute more in favor of the poor—even when we control for the share of the elderly in the population, or for pension transfers. He also found that the middle income groups gain more/or lose less through redistribution in countries where initial (factor) income distribution is more unequal, but this regularity evaporates only when pensions are dropped from social transfers and focus solely on the more redistributive social transfers.

Alam, Murthi, Yemtsov, Murrugarra, Dudwick, Hamilton, and Erwin Tiongson (2005) examine the impact of growth on poverty and inequality in Eastern Europe and the Former Soviet Union during 1998–2003. They update the World Bank's previous study on poverty, entitled "Making Transition Work for Everyone", which appeared in 2000. To measure poverty, an absolute poverty line of $2 a day1 was used, comparing it with household consumption per capita. This line was a closer approximation to basic material needs in the Region than the well-known global standard of $1 a day because of the additional expenditures on heating and warm clothing that are required by the cold climate. In terms of poverty levels, the Region was divided in four distinct subgroups of countries. Their findings shows that, the eight new member states of the European Union (EU-8) have low poverty (less than 5 percent) confined to specific subgroups of

the population. Secondly, Countries in Southeastern Europe (SEE) have generally moderate levels of poverty (around 5–20 percent). Thirdly, the same poverty level that exist in Sotheastern Europe exist for the middle-income countries in the Commonwealth of Independent States (CIS). Lastly, the low-income countries in the CIS, however, have extremely high levels of poverty (more than 40 percent).

Brewer, Goodman, Shaw and Shephard (2005) provide an updated on trends in poverty and inequality in Great Britain, based on the latest official government statistics. They use the same approach to measuring incomes and poverty in Great Britain as the government employs in its Households Below Average Income (HBAI) publication. Their finding shows that in 2003/04, almost two-thirds of the population had incomes below the national average income of £408 per week. The distribution is skewed by a relatively small number of people on relatively high incomes. Median income in 2003/04 was £336 per week – in other words, half the population had household income below this amount. They also showed that between 2002/03 and 2003/04 child poverty fell by 100,000 measured after housing costs (AHC) and was unchanged measured before housing costs (BHC). These changes were smaller than have been expected, given the amount of new spending directed towards families with children through the new tax credits. Throwing light on child poverty, it stands at 3.5 million AHC and 2.6 million BHC. They gave the reasons why child poverty fell by less than expected. First, administrative problems with the new tax credits in the first quarter of 2003/04 meant that many families had lower-than-expected incomes at that time. Second, the number of children living in families where no adult works rose, according to HBAI, although this is at odds with evidence from other sources. Each of these reasons increased child poverty by around 90,000 AHC and 80,000 BHC.

Son (2007) examines the relationships between economic growth, income distribution, and poverty for 17 Asian countries for the period 1981–2001. His findings show that there is a trade-off between inequality and growth. Thus, his analysis suggested certain policies, firstly, the government should opt for pro-poor policies and reducing inequality because it benefit the ultra-poor much more than the poor living close to the poverty line. Secondly, growth-enhancing policies would be more effective for countries where mean income is low and the trade-off index is very small, say less than 1. Lastly, when the level of inequality is higher, the trade-off index will be greater. Therefore, he suggests that in such a situation, inequality-reducing pro-poor policies will be more effective.

Vaidyanathan (2002) explain how the data on income distribution are collected and analyzed in India and how these procedures could be improved. His analysis on the consumer

expenditure survey (CES) of 1993-94 showed that in the rural areas, the bottom 30 percent of population Contributed to 14.25 percent of total consumption expenditure in comparison to the 51.7 percent by the top 30 percent. Whereas, in the urban areas the bottom 30 percent of the population contributed to12.14 percent of total consumption expenditure as against the 56.05 percent by the top 30 percent. This in effect indicated that the poor were poorer and the rich richer in urban areas in comparison to those living in rural areas. Comparing these results with the CES of 1987-88, it is observed that in both rural and urban areas the share of the bottom 30 percent of the population had declined while the share of the top 30 percent had increased indicating an increase in inequalities. The sources of income distribution statistics are consumer expenditure surveys of NSS, income surveys of NCAER and national accounts statistics of the CSO. Unfortunately, he pointed out that, the estimates from these three sources of data have not been mutually consistent, leading to arguments about the accuracy of the data. Thus, he suggested that, NSSO should explore the possibility of collecting information on income as an adjunct to the surveys on economically active population, to facilitate comparisons between findings of the income surveys with the results of the CES. The interviews in the CES should be spread evenly over the 12 months to overcome seasonal variations. And since the valuation of consumption of home-grown crops / products at the farm level or ex-factory prices introduces underestimation of consumer expenditures, an additional column may be introduced in the CES questionnaire to include the market value of such products as reported by the respondent.

Dubey, Gangopadhyay and Wadhwa (2001), examined the incidence of poverty in Indian towns and cities. Investigating through logit model, they found that poverty incidence decline with town and cities size for all occupational groups. The findings also showed that education did play an important role in reducing poverty. However, while larger cities have higher educational levels, education alone does not explain the differing poverty incidence. One explanation is that lager cities have better social and economic infrastructures. Thus, their findings show that larger towns and cities are capable of supporting more complex economic activities and in improving labour productivity, and hence lowering the incidence of poverty.

Deaton and Dreze (2002) presents a new set of integrated poverty and inequality estimates for India and Indian states for 1987-88, 1993-94 and 1999-2000. The poverty estimates are broadly consistent with independent evidence on per-capita expenditure, state domestic product and real agricultural wages. They show that poverty decline in the 1990s preceded more or less in line with earlier trends. Regional disparities increased in the 1990s, with the southern and western regions doing much better than the northern and eastern regions. Economic inequality also increased

within states, especially within urban areas, and between urban and rural areas. They briefly examine other development indicators, relating for instance to health and education. The result shows that most indicators have continued to improve in the nineties, but social progress has followed very diverse patterns, ranging from accelerated progress in some fields to slowdown and even regression in others. Thus they found no support for sweeping claims that the nineties have been a period of "unprecedented improvement" or "widespread impoverishment".

Sen and Himanshu (2004), examine 55th round of the NSS in the context of other NSS rounds to examine the 1990s trends in their entirety. Comparison of these food-adjusted 55th round counts with the 50th round mixed 30/365-day recall (MRP), their finding shows that although poverty ratios may have declined, this was by at most 3 percentage points and the absolute number of poor did not decline. Since this magnitude of poverty reduction during 1993-2000 is less than that obtained for 1987- 1994 with previous NSS thick rounds and implies no reduction in the number of poor, it corresponds to the gut feeling expressed by many at the seminars referred to above and corroborates the pre-55th round consensus that the 1990s were a relatively lost decade for poverty reduction.

Jha (2000) examines the empirical relationship among inequality, poverty and economic growth in India. Using data on consumption from the 13th to the 55th Rounds of the National Sample Survey, he computes, for both rural and urban sectors, the Gini coefficient and three popular measures of poverty. His finding shows that there is a change in inequality and poverty. There is a sharp rise in rural and, particularly, urban inequality and only a marginal decline in poverty in the post-reform period. The rise in inequality is explained in terms of an increase in the relative share of output going to capital as compared to labour, a drop in the rate of labour absorption and the rapid growth of the services sector. The rise in inequality has diminished the poverty-reducing effects of higher growth. The reforms have also been characterized by widening regional inequality. This is especially true in the case of the incidence of rural poverty, but also, to a lesser extent, urban poverty. Thus, he suggested that the composition of growth should be altered to encourage agricultural as opposed to non-agricultural growth, especially in the poorest areas. Moreover, there should be widespread tax reform to increase tax revenues which would enable greater provision for public expenditure for anti-poverty programmes. Lastly, the efficiency of public expenditure and of the social safety net should be improved.

Pradhan and Subramanian (1999) analysed the role of education and skill development in mitigating social and economic vulnerability. Their findings report some new evidence from an all-India household survey on demand and supply issues in schooling. In India, most studies

attribute poor educational performance to poverty. Though this factor is important, the recent survey evidence shows that just lack of interest in schooling is the major factor explaining low enrolment and high dropout rates in India. This is because of the lack of expected future earnings. They suggest that the solution to this problem lies in reorienting the educational sector to demand lead supply transformation towards skill enhancement by privatising the educational sector. The role of the state should also be reduced to support only the basic education at the primary level.

Singh (2007) examined the extent and nature of poverty between the valley and the hills districts of Manipur. His finding shows that there is a marked difference in the extent of poverty between the valley and the hills in Manipur. Districts wise poverty in Manipur shows that poverty ratios in all the hills districts exceed 50 percent, except sanapati, in 1988. But for the valley districts, the ratios are below 45 percent in the same period. Besides the poor and uneven economic performance of the state and the lackadaisical implementation of poverty alleviation schemes, he pointed out that, the failure of land reform in the hills explains the persistence of poverty in the hills.

2.5: POVERTY ALLEVIATION PROGRAMME:

Reduction of poverty has been the main objective of many government and nations. The Millennium Development Goal of the World Bank to reduce poverty depicts that poverty is the main problems facing the world today. As such many programmes have been initiated by the NGO's as well as by the government. But how successful those programmes have been are evaluated by many scholars. Many literatures explain the causes for success and failure of those programmes and the obstacles facing the implementation.

Fan, Zhang and Zhang (2002) explain the role of specific public investment in promoting growth and reducing poverty and in regional inequality in rural China. Using provincial-level data for 1970-97, they develop a simultaneous equation model to estimate the effects of different types of government expenditure. This model not only ranks the marginal effects of public investment on growth and poverty, but also tracks various channels of investment and their effectiveness. The results show that government production-enhancing investment, such as, agricultural research and development, irrigation, rural education and infrastructure contributed not only to agricultural production growth, but also to reduction of rural poverty and inequality. Moreover, Government expenditure on education had the largest impact in reducing poverty and regional inequality and significant impact on production growth. Lastly, increasing rural non-farm employment has got a favourable effect in poverty and inequality reduction.

Somanathan (2006) explains the role of state programs in reducing poverty and also illustrates some of the biases inherent in using household consumption data to arrive at poverty estimates. His analysis on the available data's on the distribution of household consumption and of public spending suggests the following conclusion. First, that some types of spending can substantially raise household consumption and reduce poverty. Second, that the benefits from public programs are spread unevenly, both across and within regions, and these benefits are not well captured by measures of household consumption typically used to estimate poverty. As a result, there is likely to be some misclassifications of poor and non-poor households and regional differences in poverty may be larger than what the current estimates suggest. It appears, ironically, that the poor in India are often excluded from the benefits of state redistribution. In this sense, poverty and exclusion go together and an accurate assessment of poverty requires an understanding of the nature of this exclusion.

Srivastava, Dutt, Nagaraja, Bandyopadhayay, Rani, Hegde and Jayaraman (2004) examined the policies and interventions related to poverty alleviation. Since incidence of poverty and land degradation is seen to co-exist in several agro-ecological zones in India. They are of the view that, policies and interventions related to poverty alleviation, should aimed at breaking this nexus, drive labour and capital flows by creating the alternate livelihood systems beyond the exploitative dependence of stakeholders on marginal natural resources. Using the maps brought out by National Remote Sensing Agency on National wasteland, they brings out the dynamics of relationship between the incidence of poverty and natural resources degradation in the different States of India, representing the diverse ecosystems as well as different economic and social policy regimes and institutional mechanisms. Looking beyond wasteland mapping, their study examines how macro-economic variables could determine the dynamics of poverty and natural resources degradation relationship in rural India.

Lanjouw, Pradhan, Saadah, Sayed and Sparrow (2001) investigated the extent to which the poor benefit from public and private provisioning of these services: education and health. They carry out traditional static benefit- incidence analysis of public spending in education and health, and find patterns which are consistent with experience in other countries: spending on primary education and primary health care tends to be pro-poor, while spending on higher education and hospitals is less obviously beneficial to the poor. They also examine the incidence of changes in government spending. The result was that the marginal incidence of spending in both junior and senior secondary schooling is more progressive than what static analysis would suggest, consistent with a process of "early capture" by the non-poor of education spending. Thus in the case of

health, marginal and average incidence analysis point to the same conclusion: the greatest benefit to the poor would come from an increase in primary health care spending.

Joshi and Moore (2000) analysed how the government and other agencies designed and manage their anti-poverty programmes to encourage mobilization of funds. They pointed out the advantage and disadvantage of the direct method of attacking poverty and put a case for the indirect or parametric approach that encourages the poor people, social activists and grassroots political entrepreneurs to invest in pro-poor mobilization. The indirect approach includes provocation, conscientisation, organizational preference and creating an enabling institutional environment. They present a language of understanding the various dimensions of this enabling institutional environment by setting the examples of two successful cases: rural water supply in Nepal, and the employment guarantee scheme in Maharastra.

Tarozzi (2002) examined whether a sudden increase of the price of rice supplied by the Indian Public Distribution System in Andhra Pradesh had a negative impact on child weight. After the price increase, the Indian National Family Health Survey started measuring weight in a sample of children in Andhra Pradesh. The data collection continued for several months, so that children measured later in the survey lived for a longer period of time in a less favorable price regime. They studied whether this implied a worsening of their nutritional status as measured by weight, but their findings do not have any evidence supporting this hypothesis.

Moon and Dixon (1985) studied the ways political processes influence the provision of basic human needs once the effects of aggregate national wealth are removed. The findings of the study confirm that political attributes of states do indeed have some impact on the provision of basic human needs when controlling for aggregate social wealth.

Deshpande (2002) examined the impact of infrastructure development in alleviating poverty in Maharastra. His findings show that lack of infrastructure related basic needs has deprived the rural people of the benefits of development. This creates a gap between living conditions of the rural viz-a-vis urban populations. The findings also pointed out that despite Maharashtra being an industrially advanced State; agriculture continues to be the main provider of employment to very large proportion of the State's work force. Infrastructure and productive assets created under four schemes are of utmost importance to all farmers in general and small/marginal farmers in particular because marginal and small farmers are the potential beneficiaries of the poverty alleviation programmes/schemes. Since poverty alleviation programmes are meant to benefit villagers, He suggests that involvement of contractors should be discouraged. And at least

providing employment to needy from the same village should be made mandatory to contract seeking agencies.

Datt and Ravallion (1994) studied the public employment schemes, which are aimed at directly reducing poverty in Shirapur district of Maharastra. The result states that failure to obtain such work by the poor people are due to corruption because such employment are rationed.

Nair & Mathew (2000) examine as to what extent development programmes by several tiers of government have shaped the economic social and political life of the people of this village. Their findings suggest that even though the governmental interventions have taken place in several sectors of the economy, it has a very negligible impact on the quality of life of the people. Put together, all these programmes have not so far been able to offer even the basic necessities, like drinking water, sanitation, medicine and transport to a satisfactory extent. Moreover, their findings showed that lack of appropriate programmes itself was a problem, particularly programmes involving the participation and involvement of a large number of people, to make even a short-run attack on underdevelopment and poverty. Lastly, the disinterest of a large number of people in developmental activities is a symptom of wider problem rather than a cause.

Datt and Ravallion (2003), examined the impact of countries economic growth with that of poverty. They argued that India has probably maintained its 1980s rate of poverty reduction in the 1990s. However, there is considerable diversity in performance across states. India's economic growth in the 1990s has not been occurring in the states where it would have the most impact on poverty nationally. Moreover, due to sectoral and geographic imbalance of growth, the national rate of growth cannot generate a rate of poverty reduction that was double India's historical trend rate. Lastly, their findings shows that states with relatively low levels of initial rural development and human capital development are not well-suited to reduce poverty in response to economic growth.

Bagchee (2005) analysed the Maharastra employment guarantee scheme. His finding showed that, the programme was successful because it enjoyed a commitment widely shared across the political spectrum. Moreover, strong inputs in terms of planning, budgeting and technical supervision made the programme successful. Thus, she states that it will be difficult to replicate the same political commitment in India of 2005. However, she support the implementation of the employment guarantee scheme on the ground that 250-300 million of the population are still poor, which is a social disease.

Kannabiran (2005) examined the correlation between marketing self-help group and the impact on poverty. His findings showed that the increasing participation of women in micro-credit

and formation of women's self-help group's have done a little more than assuring short-term relief to ease immediate needs. However, he points out that a long term social, political and cultural vision will end the subordination of women and poverty instead of focusing on a short term micro-credit to ease the immediate needs.

Singh (1989) studied the impact of IRDP in alleviating poverty in India. His findings showed that the beneficiaries of the programme have crossed the poverty line in the country. The findings also showed that there are many problems encountered in implementing such programme. Thus, they suggested that at the district level decentralization of planning is a vital importance in making the programme effective. Lastly, people's participation in the planning system was also suggested.

Sharma (1994) studied poverty and unemployment in Himachal Pradesh. The findings showed that there is an inter-relationship between the value of household productive assets, gainful employment opportunities, household income and the consumption expenditure. On the smaller size of holdings due to the lack of sufficient productive assets, the family human labours are either unemployed or under-employed, which resulted into meagre household income with the help of which they are not even in a position to meet out their minimum food and non-food income. The head count ratio came out to be 32.06 percent.

Ao (1993) studied the impact of poverty alleviation programmes undertaken by the State Rural Development Agency (SRDA) and implemented by the local level organisation particularly the Village Development Board (VDB) at Mediziphema. His findings reveal that not much was done under State Rural Development Agency (SRDA) in uplifting the poor. It was found that under TRYSEM programme, there was no training facility in Medziphema where young men and women can be trained. Moreover, the objective of National programme to improve chullah was found missing.

But the main weaknesses in most of these studies done in India are that, they consider only the so called major states of Indian Union (sixteen to seventeen States). Therefore, all the states belonging to the North-Eastern region in general and Nagaland in particular, with the exception of Assam state, have been left out of these studies. So far no literature on measuring and discussion on poverty and nutrition have been found in Nagaland. Thus, this study is aimed at filling up those lacunae.

CHAPTER III

SOCIO-ECONOMIC PROFILE OF THE STUDY AREA

Modern economist view development as both physical and a state of mind, in which, society has, through some combination of economic, social and institutional process, secured the means for obtaining a better life that fulfills the objectives of (i) increase in availability of basic life subsistence like food, shelter, health and protection, (ii) raise in the level of living through higher income, job opportunities and better education and (iii) expand the range of economic and social choices available to individuals by freeing them from servitude and dependence[42]. To examine the extent of socio-economic development in Nagaland in general and Wokha district in particular, some indicators have, therefore, been selected such as, (i) demographic dynamics, (ii) Sectoral employment and its contribution to NSDP, (iii) physical infrastructure – transport and communications, electricity and banking, (iv) social services, housing, health, education, water supply and sanitation and (v) co-operatives.

3.1: HISTORICAL BACKGROUND AND PHYSICAL FEATURE:

Nagaland, the 16th state of Indian Union, was inaugurated on 1st of December 1963. The state lies between 25°60' and 27°40° latitude north of equator and between the longitudinal lines 93°20' E and 95°15' E having an area of 16,579 Sq.KmS. The state is bounded by Assam in the North and West, by Myanmar and Arunachal Pradesh in the East and Manipur in the South and runs more or less parallel to the left bank of Brahmaputra. The topography is very hilly ranges, which break into a wide chaos of spurs and ridges. The altitude varies between 194 metres and 3048 metres. Most of the thousand odd villages' stands at 1 to 2000 metres high as it is very typical of the Naga's to build their houses on the hill top and at higher elevation. The highest peak in the state is Mt. Saramati, which is 3, 840 metres above the sea level. The State has eleven (11) districts at present, *viz*, Dimapur, Kiphire, Kohima, Longleng, Mokokchung, Mon, Peren, Phek, Tuensang, Wokha and Zunheboto. There are 1,317 villages in the state, out of which 1, 278 are inhabited. The state is almost entirely inhibited by tribals. There are many separate tribes and sub-tribes amongst the Nagas, with their own distinctive language and cultural features, viz, Angamis, Aos, Lothas, Semas, Sangtams, Konyaks etc (GON, 2004).

The focus area of the present study is Wokha district of Nagaland. The district is bounded by Mokokchung and Assam in the North, Assam in the West, Kohima in the south and Zunheboto

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[42] Todaro M.P. (1998), *"Economic Development"*, 6th edition, Addison-Wesley Reading, Massachusetts, p 394.

in the east. In the year 1876, the British Government occupied Wokha as the district headquarters of the Naga Hills under Assam. In 1878, the headquarters was shifted to Kohima and thereafter Wokha became a sub-division. Later in 1889, the sub-divisional headquarters was again shifted to Mokokchung. It was only in the year 1957, when Mokokchung became a separate district, Wokha was restored to the status of sub-division under the district. It was only in the year 1973, Wokha was granted a full-fledged district[43]. Wokha district has an area of 1,628 Sq. km (GON, 2001) inhibited by Lotha tribe. It is equidistant at 80 km both from Kohima as well as Mokokchung. Wokha literally means counting of votes in Lotha dialect. Wokha district enjoys a moderate and pleasant climate. The topography of the district is more or less similar with that of other district in the state, having hilly ranges and ridges dissected by seasonal streams. The altitude ranges from 303.3 metres to 1313.67 metres above the sea level. The highest elevation of the district is Mt. Tiyi with the height of 1970 metre above the sea level. The annual rainfall varies from 200 cms to 250 cms. Important rivers of the district are Doyang, Chubi, Nzhu and Nruk. The district is divided into three ranges, viz, Upper, Middle and Lower ranges. The district has a total of 129 villages, out of which, 128 villages were inhabited and 1 inhabited (GON, 2004).

3.2: DEMOGRAPHIC DYNAMICS:

Population plays an important role in affecting the income and consumption levels and thereby the living standard of any society[44]. In Nagaland, the total population enumerated in 2001 census was 19, 88,636. Out of this, 10, 41,686 are males and 9, 46,950 are females[45], giving a sex ratio of 909 per thousand male that is lower than the national ratio of 933. The density of population is 120 per sq. km, which is lower than the national level of 324 persons per sq. km. These highlight the difference in the magnitude of the burden that land is being called upon to carry. In this sense, the state is not as highly populated and over burden as compared with the country as a whole. However, in view of the state's hilly topographical feature and the slow pace of economic development, the rapid rate of population growth of 69.44% during the last decade and the total fertility rate of 3.77 in 1998[46], which rates are the highest in the country, are matters of concern. Further, there has been a progressive increase in the number of urban population from 2, 08,162.87 in 1991 to 3, 52,784.03 in 2001, yet the proportion of people residing in urban area was increased only marginally from 17.21% to 17.74% during the same period. This is lower than

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[43] Government of Nagaland (2007), "Breif history of the District", p1. Online [Available] at www.wokha.nic.in.
[44] Sharma K.C. (1994), *"Poverty, Unemployment and Inequalities in Tribal India; With Special Reference to Himachal Pradesh"*, Reliance Publishing House, New Delhi, p 97.
[45] Government of India (2001), *"Provisional population total; rural-urban distribution"*, Census of India, Directorate of Census Operatio, Nagaland, p 5.
[46] Government of Nagaland (2004), *"State Human Development Report 2004"*, Department of Planning and Coordination, Nagaland, p 15.

the national average of 27.78%. Thus, Nagaland continues to be predominantly rural accounting for 1635815 (82.26%) of the total population. Among the districts, at one extreme, Tuensang has a population of 4.14 lakhs that account for 20.86% of the state population and on the other extreme, Phek has only 1.48 lakhs that accounts for 7.45% of the state population. The average household size is 6.1 persons (census 2001). The tribal constitutes 89.1% of Nagaland population.

In 2001, out of the State's total population, 1, 61,098 persons live in Wokha district that consist of 8.10% of the total population. The proportion of rural population in the district is, 1,23,402 accounting for 76.61% of the total district population, which is lower than the State average. The proportion of urban population is, 37,696 accounting for 23.39% of the total population, that is higher than the state average. The sex ratio is 927, which is also higher than the state's ratio. But there is a significant difference between rural and urban areas in this respect. In rural areas sex ratio is 952 as compared to 843 in the urban areas. It may be noted that Wokha district has the highest decennial population growth rate of 1991-2001 (95.01%) in the state as well as at the national level. However, the density of population is 99.03 persons per Sq.km only that is lower than the state as well as the country's averages. The average household size is higher than the state average with 6.23 persons.

3.3: SECTORAL EMPLOYMENT AND ITS CONTRIBUTION TO NSDP:

In Nagaland, workers constitute 42.74% of its total population. Naga society is predominantly agrarian where 68.03% of the working force is engaged in agriculture and allied activities. In absolute terms, out of the total 8, 49,983 workers, 5, 44,432 are cultivators and 33,852 are agricultural labourers that account for 64.05% and 3.98% respectively. Household industrial sector employs 18,072 workers and 2, 53,625 are other worker that constitutes 2.13% and 29.84% respectively of the total workers. Comparatively, Wokha district has a total work force of 56,453 giving a lower percentage of 35.04%. The district shares a similar pattern of sectoral distribution of workers to that of the state. The total work force engaged in agricultural sector as cultivator and agricultural labour adds up to 37,295 workers that accounts for 66.06% of the total work force in the district. Whereas, 1435 workers are engaged in household industries and 17723 are engaged in other services/works, accounting for 2.54% and 31.39% respectively of the total work force.

The gender wise distribution of workers in the state shows that male dominates the employment sector with 57.35%. The share of female employment in agricultural sector and household industries together accounted for 50.32% whereas male's share is closer to female with 49.68%. The share of male worker in other sector is 75.50% of the sector work force. Comparatively, the gender-wise distribution of workers in Wokha district reveals that male

dominates the employment sector with 55.66%. However, sector-wise data reveals that agricultural and household industries are dominated by female workers with 54.92% and 66.06% respectively. It is only in other work where male shares a higher with 79.09% of the total sector work force.

The unemployment scenarios in Nagaland, as on March 2000, showed that 35, 000 were job seekers who had registered at the state employment exchange. Out of this total, 3, 000 were graduates and post graduates, 13, 000 were matriculates and 14, 000 were under matriculates[47]. This brings out the fact that majority of (91.43%) unemployed persons in the state are not even graduates, indicating the quality of the workforce available. However, these statistics do not fully represent the extent of unemployment, as large number of unemployed persons do not get registered.

The sectoral contribution to NSDP for the period 1997-98 to 2001-02 at 1993-94 prices in the state reveals that the share of primary sector has increased from 26.21 percent to 36.68 percent, while the share of secondary sector and tertiary sector have declined from 20.04 percent to 10.25 and from 53.75 percent to 53.07 percent respectively during the same period (GON, 2004). These facts point that the primary sector is gaining importance over the other sector in the state NSDP. However, the share of tertiary sector in NSDP is still higher than the other sectors even though it has declined marginally over the years.

3.4: PHYSICAL INFRASTRUCTURE: It is concern with the needs of facilities for production sector like agriculture, industry, trade, etc. which include services such as power, transport, telecommunication, etc[48].

3.4.1: Transport and communication: One of the important features of development is better infrastructure in transport and communication. It is the basic infrastructure needed for generating economic activities of the land-locked hilly state like Nagaland. Thus, an all-weather road linking the scattered villages is the pre-requisite for development of potential areas. The total length of road in the state as on 2002-03 is 13, 368.45 Kms, out of which 6, 225.62 Kms are surfaced and are all weather roads while 7, 142.83 kms are unsurfaced. National high way accounts for 248 Kms while villages roads account for 5, 150 Kms. The surfaced roads or all weather roads in the villages, account for 2, 129 Kms (GON, 2004). In Nagaland only 23.61% of the villages (311) are having pucca road link, 56.95% of the villages (750) are connected with Kutcha road (VLDI, 2002) while 19.44% of the villages (256) do not have a link road. Moreover, the state is connected with one airport and railway station both located at Dimapur. Comparatively, the national highway

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[47] Ibid 44.

[48] Jamir, K (2006), "Status of Infrastructure in Nagaland: Strategies to Strengthen Infrastructures for Economic Development", In NUTA (ed.) 2006, *"Economic Development in Nagaland, Constraints and Prospects"*, p 234.

61 passes through Wokha district covering only 37 km that constituted 14.92% of the total national highway in the state. Of the total villages in the district, only 22 villages (17.05%) are linked by pucca road and 82 villages are having only kutcha road. The rest 25 villages of the district do not have any link road (VLDI, 2002). Thus, 80.62% of the total villages in the district have a road link, which is slightly higher than the state average of 80.56%. Since there are many villages, which are not covered by all weather roads, it clearly depicts the extent of deprivation of the villagers of all aspects of socio-economic development in general and ready access of farmer's products to the markets in particular. The district is neither connected by railway nor airport.

In the area of communication, the state is not lagging behind. The number of post office including one head office serving the entire population of the State during 2004 is 328. Out of the total post offices, branch post office account for 284 while number of sub-post office in the state is 43. The telephone connection in the state as on 2001-02 is 38, 597 (GON, 2004). In comparison, the district has 2 sub-post offices, that accounts for 4.65% of the state sub-post offices and 20 branch offices accounting for 7.04% of the state total branch offices, giving us a total of 22 offices, i.e, 6.71% of the post offices in the state during 2004. There were 963 Households with telephone connections in the district accounting for 2.5% of the state telephone connection during 2001-02, one of the lowest among the districts in Nagaland (GON, 2004).

3.4.2: Electricity: The most important factor which can act as a stimulant for economic growth of a country is that of energy. There is a direct correlation between the degree of economic growth and the size of per capita energy consumption. Among the various sources of energy, Nagaland has great potential in Hydro-electric power. Non-conventional source of energy like solar, wind and tidal power have been scarcely used. The installed capacity of Hydro-electric power in the state as on 2002-03 is 28.50 MKWH. Whereas, the generation of power in the state during the same period was 8.63 MKWH and the energy imported was 271.41 MKWH. Whereas, the consumption during the same period was 278.88 MKWH (GON, 2004). Thus, it implies that only 3% of the total energy requirement in the state is met by its own generation, the rest of 97% is imported from other state. Out of the total 1, 278 inhabited villages, 1, 200 villages have been electrified as on 2001-02 (GON, 2004). Thus, 93.89% of the total inhabited villages have been electrified so far. The revenue generated from the sale of power as on 2002-03 stands at Rs. 2085.90 lakhs.

Out of the total electrified villages in Nagaland Wokha district account for 10% of the total villages. Further, out of the total of 128 inhibited villages in the district, 107 were electrified in 1991. The number has increased to 120 by 2001-01 (GON, 2004). Thus, the figure clearly shows

that 93.75% of the inhibited villages are having electricity facility, which is almost equivalent to that of the state average of 93.89%.

3.4.3: Banking: Banks plays an important role in stimulating economic growth by strengthening agricultural, industrial and other self-employment activities. Banks are also credited for designing social banking policies and programmes, which supports vital sectors of the economy. It aims at alleviating poverty by benefiting number of farmers; artisans, professionals and self-employment. The banks that are operating in the state are the State Bank of India, Allahabad bank, United Bank of India, United Commercial Bank, Vijaya Bank, Bank of Baroda apart from Nagaland Cooperative Bank and Rural Bank. The total number of scheduled commercial banks and their branches in the state as on 2002 is 85 (Economic Survey of Nagaland, 2001-02). Thus, there are 85 banks serving the entire population giving us a ratio of 1: 23, 395.71 (i.e. one bank is serving a total population of 23, 396). Dimapur district has the highest number with 22 banks, while Mon district has the lowest with 5 banks. The total deposits of these banks as on June 2002 stood at Rs. 93,490 lakhs and credit at Rs. 13,073 lakhs. Thus, the credit-deposit ratio of the state is 1: 7.15.

Out of the total banks and branches in the state, only 6 banks, viz, 4 SBI, 1 Nagaland Rural Bank and 1 State Co-operative Bank are located in Wokha district (as on June 2002). This account for 7.06% of the total banks in the state, serving a total population of 1, 61, 098 (Economic survey of Nagaland, 2001-02). This gives bank - population ratio of 1: 26, 850, which is below the state ratio. The total deposit in these banks is Rs. 2, 666 lakhs and the total credit is Rs. 496 lakhs as on June 2002 (Economic survey of Nagaland, 2001-02). This give the credit-deposit ratio of the district as 1 : 5.38, which is higher than the state ratio. As far as rural area is concern, only 1 village has the banking facilities as on 1991 (VLDI, 2002). From the above figure, it clearly indicates that there is a need to increase the number of banks and their branches in the district extending its facilities to rural villages.

3.5: SOCIAL INFRASTRUCTURE: It is concerned with facilities that enhance human welfare, freedom from ignorance, diseases and fear and are collectively termed as social infrastructure such as, education, health care, water and sanitation services[49].

3.5.1: Education: Education is important not only for creating a means to enhance human capital, productivity and hence the compensation of labour. But it is equally important for enabling the process of acquisition, assimilation and communication of information and knowledge, all of which augments a person's quality of life. Thus, education has a great impact in developing the socio-economic status of the people. The literacy rate in the state is 67.11% (GON, 2004) that is

[49] Ibid 46.

above the national level. The male literacy rate in the state is 71.2% and female literacy rate in the state is 61.5%. One of the determinants of literacy is the existence of educational institutions. There are 2, 421 educational institutions in Nagaland as on 2003-04. These institutions include primary to higher secondary schools as well as colleges and University in the state. Out of 2, 421 institutions, 1, 737 (71.75%) are government owned institutes and 684 (28.25%) are private owned institutions. The total number of enrollment in the institution as on 2003-04 was 4, 57,644. Out of this total, male enrollment constitutes 2, 39, 355 (52.30%) and female accounts for 2, 18, 289 (27.70%). The total number of teachers in these institutions is 21,764, out of which male teacher accounts for 14, 148 (65%) whereas female teacher accounts for 7, 616 (35%). Thus, in Nagaland teacher - students' ratio is 1: 21.03 as on 2003-04 and institution - student's ratio is 1: 189.03. Moreover, institution - teacher's ratio is 1: 8.99 in the state.

The literacy rate of Wokha district is 81.28% next only to Mokokchung. Male literacy rate is 85.69% and female literacy rate is 76.46%. The total enrollment of students in institutions in the district is 54.5%. Boys enrollment rate is 55.7% surpassing girls enrollment rate, which stands at 53.2%. The ratio of teacher and students is 1:20, which is above the state ratio of 1:21.03 (NSHDR 2003). Out of the total villages in the district, 107 (82.95%) villages have the primary schools, 33 (25.58%) villages have middle schools and 8 (6.20%) villages have high school in 1991 census (VLDI, 2002).

3.5.2: Health: One way of understanding the quality of life is the availability of hospitals, dispensaries, primary health centres, subsidiaries health centres, sub-centres and medical practitioners (Doctors, Nurses and Compounders). The total numbers of hospitals, primary health centres, subsidiaries health centres and sub-centre in the state, as on 2003, is 603. The total number of beds in these hospitals and centres, as on 2002, is 2,183 (GON, 2004). The number of doctors serving the entire population, as on 2003, is 367, where as, nurses is 1,232 and the compounders are 505. Thus the total number of medical practitioners in Nagaland, as on 2003, is 2,104. This implies that one hospital or centre is serving 3,297.91 people and one medical practitioner is serving 945.17 people. The life expectancy at birth as an indicator of health is 74.4 years, which is above the national average of 62.3 years. Infant mortality rate is 42.2 per 1000 live births as compared to the national average of 68. Similarly, under-five mortality rate per 1000 live births is 63.8 as against the national average of 96 (GON, 2004). Moreover, the state expenditure in health sector as on 1998-99 is just 5.39% of the total state expenditure (NSHRD, 2003). Thus, there is an urgent need to enhance the share of government expenditure in this sector if the state's objective is welfare one.

In the case of health sector, Wokha district has a total of 61 health institution which comprises of, 1 district hospital, 3 community health centre, 8 primary health centre, 5 subsidiary health centre, 1 dispensary, 42 sub-centre and 1 S.T.D clinic as on 2003. This shows that the district accounts for 9.95% of the total hospitals and centers in the state. The total medical practitioners in the district during the same period were 170, which accounted for 8.08% of the total medical practitioners in the state. Out of this total 26 are doctors, 49 compounders and 95 nurses. Thus, it shows that one hospital or centres is serving 2,640.95 people and 1 medical practitioner is serving a total of 947.63 people, which is little higher than the state level. There are a total of 170 beds in the hospitals and health centers, which accounts for 7.79% of the total beds in the state. Out of this total, 50 beds are in the urban hospital, 30 in community health centre, 78 in primary health centre, 10 in subsidiary health centre and 2 in dispensaries (GON, 2004). The facilities of hospital, primary health centre and dispensary are available only in 49 (37.98%) villages in the district as on 1991 census (VLDI, 2002). Out of this total, only one village has hospital facilities, while 48 villages have either dispensary or subsidiary health centre during the same period, whereas 62.02% of the villages in the district were left with no health care institution.

3.5.3: Water supply and sanitation: Availability of safe dinking water and proper sanitation forms an important component of health. Thus, the supply of portable drinking water was identified as one of the thrust areas of development in the state since such amenity contributes significantly in the maintenance of health care. The accelerated rural water supply programme is sponsored by the Ministry of Rural Development, Government of India with 100% assistance and is being implemented by Public Health Engineering Department. This programmes was implemented in all the districts. Consequently the household with safe drinking water facility in Nagaland has increased from 53.37 percent in 1991 to 95 percent in 2003 (NSHRD, 2004). However, majority of the villages are only partially covered with safe drinking water. The budget allocation for the facility during 2001-02 under state plan was Rs. 3, 901 lakhs, while under centrally sponsored scheme for the same period was Rs. 1, 788 lakhs.

In 1991, a total of 82 villages in Wokha district were covered partially or wholly with water supply. By 2001-01 additional 24 villages were also covered with safe drinking water (GON, 2004). Thus, the total number of villages covered wholly and partially with the availability of safe drinking water has increased to 106 villages. The result reveals that 82.17% of the villages in the district were covered with drinking water supply which is below the state level coverage of 95%.

Nagaland has a significant burden of infectious diseases that is closely linked to sanitation and water facilities. According to the Nagaland State Human Development Report 2004, only

24.8% of the households in Nagaland have flush toilets and 49.4% have pit toilets. Nearly one-fourth of the population has no sanitation facility. Although Nagaland does better than the National average of 30% in terms of availability of toilets, yet much have to be done to improve this status.

Comparatively, the district level sample survey conducted by NSHDR 2004 shows that the household having access to toilets in Wokha district is 63.38% that is above the state level of 57%. The survey also show that own toilets account for 59.84% and 3.54% account for common toilets, while open defecation accounts for 36.61%. Even though the district performance as compared to other districts of the state is better, a lot more efforts and investment needs to be done in this sector because a better housing and environment is essential for healthy living conditions of the people.

3.5.4: Housing: Another factor affecting the health as well as the general quality of life is Housing. The sample survey done by Nagaland Human Development Report 2004 revealed that majority of the sampled households across the districts lived in semi pucca and kutcha houses. On an average 44.14% of the houses are Kutcha in the state. The district wise figure on type of housing shows that in Mon 78% of the houses were kutcha, Phek 55%, Kohima 50% and Tuensang 45%. Thus the causes for the high prevalence of infectious diseases are to be attributed to factors like, poor housing, sanitation and environment that surround them.

As per the survey conducted by NSHRD 2004, in Wokha district 18.90% of the total household is having a pucca house next only to Dimapur district, while 59.06% of the households are living in semi-pucca houses. The data also shows that Wokha district is having the highest number of household with semi-pucca houses followed by Mokokchung with 58.33%. The rest of the households are residing in kutcha houses that accounts for 22.04%. Thus in terms of housing facilities, the district exhibit a better condition than other district in the state with 77.96% of the households being either in pucca or semi-pucca houses, followed by Mokokchung with 76.93%.

3.6: Co-operation:

The ideology of co-operation is based on the principle of self-help, self-responsibility, democracy, equity and solidarity. The main objective of co-operation is propagation of co-operative education and training to members, office bearers, employees of the co-operatives societies and general masses for creating enlightened membership, improving business efficiency, developing leadership and co-operative awareness. The co-operative movement in the country traces its origin to the agriculture and allied sector, which originally evolved as a mechanism for pooling the people's meager resources with a view to providing them the advantages of the economic scales. In Nagaland element of co-operation was firmly rooted in the tribal mode of life. It continues to play a vital role in the social and economic development of the state. It has made

significant progress in terms of number of societies and number of members. The state has 5306 co-operatives societies of different types in various districts out of which 167 were registered during the year 2001-02. From 634 audited societies in 2001-02, the total amount was estimated to be Rs. 4, 48, 149 (Economic Survey of Nagaland, 2001-02). It is expected that these societies significantly contribute in uplifting the socio-economic conditions especially in rural areas.

There are 106 co-operative societies in Wokha district as on 2001-02, accounting for 1.99% of state total co-operatives (Economic survey, 2001-02). During 2000-01 the integrated co-operative development project (ICDP) has been approved by the state government and entrust state co-operative banks for the project. The recovery of ICDP loans during 2000-02 in the district was 4.34 lakhs.

3.7: PROFILE OF THE SAMPLE VILLAGES:

The village organization in Nagaland is primarily based on institution of clan, which is considered as the basic unit of the society. A clan is a group of families amongst where inter-marriage is strictly prohibited. Generally, two or more such clans form a Naga village (GON, 1998). Further, a Naga village is divided into number of Khels (Wards or Hamlets) according to the size of the village. The unique features of each Naga village are the family, clan and community. The houses are primarily built of thatch, wood and bamboos. As society progress, one can see pucca houses in the villages too. In this section, socio-economic profile of the sample villages is highlighted.

Longsa Village: The village is situated at the upper range of Wokha Districts, 5 Km away from Wokha Town (Statistical Hand Book of Nagaland, 2004). The village is connected with Pucca road (constructed in 2005). It has 680 households with a total population of 5250; out of which 2475 are males and 2775 are females (VDB report 2002). There are 4 educational institutions in the village which comprises of 1 middle school and 3 primary schools. Out of these 2 schools are government owned and 2 are private owned. The government water supply does not cover the village. A total of 650 households in the village are electrified accounting for 92.65% of the total household in the village. The village has one dispensary with 4 workers.

Yunchuchu Village: This village is situated in the middle range of Wokha District, 43 km away from the Main district headquarter (Wokha Town) and 5 km away from Sanis subdivision (Statistical Hand Book of Nagaland, 2004). It has a total household of 85, out of which 59 households have electricity connectivity. The village is connected with Kutcha road but not pliable during rainy season. The village solely depends on the well and streams as the source of drinking

water. It has a total population of 844 out of which 378 are male and 466 are female (VDB annual report 2005). It has 1 Government primary school (till class VI) and 1 Dispensary mend by1 nurse.

Sunglup Village: This village is 45 km away from the Main district headquarter (Wokha Town) situated in Middle range and the nearest suburban centre (Sanis subdivision) is 7 km away (Statistical Hand Book of Nagaland, 2004). The village has a total household of 118 with a total population of 880 which comprises of 420 male and 460 female (VDB annual report 2005). The village is connected by Kutcha road but not pliable during rainy season. The main sources of drinking water are streams and well. Only 36 households have been connected with electricity. The village has 2 educational institutions comprising of 1 private owned school having up to class IV and 1 government primary school having up to class VI. The village has a dispensary with one nurse who is looking after the health care needs of the village.

Bhandari Village: Bhandari village is in the lower range of Wokha District and is located 46 km away from Wokha Town (Statistical Hand Book of Nagaland, 2004) and is 6 km away from Bhandari town. The village comprises of 96 households with a population of 311, where 161 are males and 150 are females (VDB annual report 2005). The village has 1 government primary school (Up to class II). Total number of household having electricity connection is 60. The main sources of drinking water are well and streams. The village is connected by kutcha road, and there is one dispensary in the village.

Table 3.7: Profile of the sample villages:

Category	Total	Sample Villages			
		Longsa	Yunchuchu	Sunglup	Bhandari
No. of Household	979	680	85	118	96
Total Population	7285	5250	844	880	311
Male	3434	2475	378	420	161
Female	3851	2775	466	460	150
Sex ratio (per 1000 males)	1121 females	1121 females	1232 Females	1095 Females	931 Females
No. of Electrified Household	785	630	59	36	60
% of Electrified Household	80.18%	92.65%	69.41%	30.51%	62.5%
Water Supply (PHE)	0	0	0	0	0
No. of Educational institute	8	4	1	2	1
Number of Teacher	51	32	5	11	3
Number of students	485	380	35	50	20
No. of Dispensary	4	1	1	1	1
No. of Doctor	0	0	0	0	0
No. of Nurse, compounder, peon and Helper	7	4	1	1	1
Road (Pucca/Kutcha)	1 Pucca and 3 Kutcha	Pucca	Kutcha	Kutcha	Kutcha

Source: VDB unpublished official file 2005-06.
0: Not available.

A comparative analysis of the data given in table number 3.7 reveals the variation among the sample villages, district and with state averages in respect to household size, sex ratio, electrification, water supply and sanitation, education, health and road infrastructure.

3.7.1: Household size: The average household size for the sample villages as a whole is (7285/979) 7.44 persons, which is higher than the district average (6.23) and state average (6.1). Inter-village analysis shows that, Yunchuchu village has the highest average household size with (844/85) 9.93 persons, followed by Longsa with (5250/680) 7.72 persons, Sunglup with (880/118) 7.46 persons and Bhandari with (311/96) 3.24 persons.

The household size at Yunchuchu village is found to be higher than the sample average, district as well as state averages by 2.49 persons, 3.7 persons and 3.83 persons respectively. Also Longsa and Sunglup villages exhibits higher average than the sample, district and the state averages. However, Bhandari village has an average that is significantly lower than the average of the sample villages, district and the state averages. The standard deviation comes to 2.79 and the variance is 7.81, revealing that there is a variation among the sample villages in the household size.

3.7.2: Sex ratio: For the sample villages, the male population account for 3434 and female with 3851 of the total population giving a sex ratio of 1121 females per thousand males. For Longsa village, the sex ratio is 1121 females per thousand males that is equal to the sample average. For Yunchuchu village it is 1232 females per thousand males giving us higher sex ratio than the sample average. The sex ratio for Sunglup village is 1095 females per thousand males which falls below the average ratio. Bhandari village have the lowest sex ratio with 931 females per thousand males. Thus, except for Bhandari village, the sex ratio is significantly higher than the sample average. However, the sex ratio of the sample villages is higher than both the district (927) as well as the state (909) averages.

3.7.3: Electrification: Electricity is one of the most essential needs of any human being has reached the villages. Yet, only 80.18% of the total households in the sample villages are electrified. For Longsa village 92.65% of households are electrified. For Yunchuchu, Sunglup and Bhandari, electrified household are, 69.41%, 30.51% and 62.5% respectively. Moreover, except for Longsa village all the villages are below the sample average. It clearly shows a wide-ranging variation in the availability of basic needs. The range of variation between the highest and the lowest is more than 60%. Their standard deviation is 25.65 and the variance is 657.9, showing us that there is a wide variation among the sample villages in respect of households electrification facility.

3.7.4: Water supply: The government's safe drinking water supply programme has not been implemented in any of the sample villages. Therefore these villages depend on natural sources like streams, well and harvested rainwater.

3.7.5: Road: Infrastructure plays an important role in uplifting village economy. But the figure shows that except for Longsa village, all other three villages are being connected by Kutcha roads. Moreover, Longsa village has all weather road connectivity while the other three do not have all weather road connectivity.

3.7.6: Educational institution: The over all educational institutions in the entire study area is 8. There are 4 schools in Longsa, 2 schools in Sunglup and 1 school each in Yunchuchu and Bhandari villages. The total number of teachers in the sample villages is 51 with a total of 485 students. The teacher - student ratio is 1: 9.51 for the sample villages, which is higher than the district (1: 20) and state's (1 : 21) ratio. The Teacher – student ratio is highest in Sunglup with 1: 4.55, Yunchuchu with 1: 7 is next, followed by Bhandari with 1: 6.67, which is higher the average sample village ratio. However, a Longsa village has a ratio of 1: 11.88 that is lower than the sample ratio. Thus, all the sample villages have a higher ratio then the district and state's average. The institution – student ratio is 1: 60.63, which is higher state ratio of 1: 189.03. Among the sample villages, Longsa has the lowest ratio with 1: 90 that is below the sample ratio but higher than state's ratio. Sunglup and Bhandari with 1: 25 and 1: 20 respectively are at the top followed by Yunchuchu with 1: 35, are very much above the state's ratio. The institution – teacher ratio for the sample villages is 1: 6.38 that is above the state's ratio of 1: 8.99. Longsa village exhibit the lowest ratio with 1: 8 among the sample villages, which is almost the same with that of the state's ratio (1: 8.99). The rest of the sample villages: Sunglup with 1: 5.5, Yunchuchu with 1: 5, and Bhandari with 1: 3, are above the sample ratio and the state's ratio.

3.7.7: Health Institution: There are 4 dispensaries, one in each sample villages giving first aid to the villagers. No doctors are available in any of these sample villages; however, there is 9 medical staff in the rank of compounder, nurse and others. Except for Longsa village, which have 4 such staff, all other villages have just one staff each. The average ratio of medical staff and the people is 1:809.44 for the sample villages. The table clearly shows that in Longsa one medical staff takes care of 1312.5 people (1:1312.5) that is lower than the sample village's ratio, district ratio and state's ratio. However, Yunchuchu with 1: 844 for, Sunglup with 1: 880 for and Bhandari 1: 311 are above the district and state's ratio. Thus, if we take the sample average ratio as the required ratio, then we find that there is a need for increasing the medical staff in the villages. This is because, except for Bhandari village, all other village is below the average ratio.

3.8: THE SAMPLE HOUSEHOLDS:

The variation that exists among the villages in terms of demography, sanitation, housing, electricity, education etc from the sample households are explained below. A total of 99 household was surveyed from the four mention sample villages, 68 households from Longsa village, 9 households from Yunchuchu village, 12 households from Sunglup village and 10 households from Bhandari village.

3.8.1: Demographic characteristic of the Sample Population: From the total of 99 households surveyed, the total population of the universe is 393. From the table no. 3.8.1 it can be seen that among the villages, Longsa village with 259 persons accounted for 65.9% of the total population followed by Bhandari, Yunchuchu and Sunglup with 54, 42 and 38 persons respectively. Their respective percentage share in the total population is 13.74% for Bhandari village, 10.69% for Yunchuchu and 9.67% for Sunglup village. From the table given below, discussions are done here in this section on household size, sex ratio, literacy and the sectoral employment in comparison with the sample villages, districts and the state.

(a) Household size: The average household size of the sample population as given in table no 3.8.1 is 3.97 persons that are lower than the average household size of the sample villages (7.44), district (6.23) and the state (6.1). Among the villages Bhandari village exhibits the highest family size with 5.4 persons, which is the reverse of the figure shown in the sample villages table with 3.24 persons and being the lowest. Yunchuchu village followed next with 4.67 persons that are more than half the size as provided by the VDB. Longsa and Sunglup villages are at the bottom with 3.97 persons and 3.81 persons respectively. In these villages also the family size as provided by VDB are double the size of the actual findings.

(b) Sex ratio: From table no 3.8.1 it is seen that for the sample population male population accounts for 172 persons and female population accounts for 221 persons showing us a sex ratio of 1284 females per thousand males. The ratio is higher than the figure given by the sample village, the district and the state. However, findings from the sample population are close to the information given by the VDB as both the analysis shows a higher female population than male population. Among the villages Longsa village tops in terms of sex ratio with 1443 females per thousand males, followed by Yunchuchu with 1333 females per thousand males, Sunglup with 1111 females per thousand males and Bhandari with 800 female per thousand males. The findings from the sample population shows that except for Bhandari village all other village have a higher female population, which is the same as given by the VDB report.

Table 3.8.1: Demographic characteristic of the Sample Population.

Category	Total	Longsa	Yunchuchu	Sunglup	Bhandari
Total population	393	259	42	38	54
Percentage	100	65.9	10.69	9.67	13.74
Male	172	106	18	18	30
Female	221	153	24	20	24
No of Household	99	68	9	12	10
Household size (persons)	3.97	3.81	4.67	3.17	5.4
Number of persons above 7 years of age	316	209	34	37	36
Percentage	82.95	80.69	80.95	97.37	66.67
Literate	228	149	27	21	31
Percentage	72.15	71.29	79.41	56.76	86.11
Male	120	73	10	12	25
Percentage	83.92	82.95	90.9	70.59	92.59
Female	108	76	17	9	6
Percentage	64.48	62.81	73.91	45	66.67
Illiterate	88	60	7	16	5
Percentage	27.85	28.71	20.59	43.24	13.89
Male	23	15	1	5	2
Percentage	16.08	17.05	9.1	29.41	7.41
Female	65	45	6	11	3
Percentage	35.52	37.19	26.19	55	33.33
Total work force	253	158	23	33	39
Percentage	64.38	61	54.76	86.84	72.22
Agriculturalist	152	83	15	26	28
Percentage	60.08	52.53	65.22	78.79	71.8
Male	39	13	3	10	13
Percentage	25.66	15.66	20	38.46	46.43
Female	113	70	12	16	15
Percentage	74.34	84.34	80	61.54	53.57
Non-agriculturist	64	51	6	2	5
Percentage	25.29	32.27	26.09	6.06	12.83
Male	56	45	5	2	4
Percentage	87.5	88.24	83.33	100	80
Female	16	14	1	0	1
Percentage	12.5	11.76	16.67	0	20
Unemployed	37	24	2	5	6
Percentage	14.63	15.2	8.79	15.25	15.37
Male	21	11	1	4	5
Percentage	56.76	45.83	50	80	83.33
Female	16	13	1	1	1
Percentage	43.24	54.17	50	20	16.67

Sources: Field Survey 2005-06.
0: Nil

(c) Literacy rate: Out of the total 316 people that are above the 7 years of age, 228 people are literate giving a percentage of 73.25 as the literacy rate for the sample population. The rate is

above the state literacy rate (67.11%) but below the district literacy rate (81.28%). Among the villages Bhandari village has the highest literacy rate with 86.11% higher than the rate of the sample population, the district and the state. Yunchuchu village with 79.41% have the rate that is lower the district but higher than the sample population and the state rate. The next is Longsa with 71.29% of literacy rate that is lower than the rate of the sample population and the district but higher than the state rate. The lowest literacy rate is shown by Sunglup with 56.76% that is lower then the rate of the sample population, district and the state.

Gender-wise literacy rate shows that male literacy rate is 83.92% of the sample male population, which is higher than the state's male literacy rate but lower than the district male literacy rate. For female literacy rate the percentage is 64.48% of the sample female population that is also higher than the state rate but lower than the district rate. Bhandari village exhibit a higher literacy rate for both male (92.59%) and female (84.21%) is that is higher than the rate of the sample population, district and the state. For Yunchuchu village male literacy rate with 90.91% is higher than the rate of the sample population, the district and the state. However, the female literacy rate with 73.91% is higher than the rate of the sample population and the state but lower than the district rate. For Longsa village male literacy rate is 82.95% that is higher than the state rate but lower than the rate of the sample population and the district rate. The female literacy rate is 68.81% that is higher than the rate of the sample population and the state but lower than the district rate. Sunglup village has 70% of male and 45% of female literacy rate, which is lower than the rate of the sample population, district and the state. Thus, the figure clearly exhibits that like that of the state and the district, the sample population also shows a higher male literacy rate over the female rate.

(d) Occupation: The workers constitute 64.38% of the total sample population, which is higher than the state and district percentage of work force. Out of this total work force agriculturalist constitute 60.08% that is lower than the state and the district percentage. More over, 25.29% of the total work force is engaged in Non-agricultural activities, which is lower than the state and district percentage. The remaining 14.24% are unemployed. Sunglup with 86.84% of work force and Bhandari with 72.5% of work force are higher than the sample, district and the state work force. However, Longsa with 61% of work force and Yunchuchu with 54.76% of work force are lower than the sample average work force but higher than the state and the district work force. The proportion of population engaged in agricultural activities are, Sunglup with 78.79% tops among the villages followed by Bhandari with 71.8%. These two villages exhibit a higher proportion of people engaged in agricultural activities over the average proportion of the sample population, the

district and the state. While, Sunglup with 65.22% and Longsa with 52.53% shows a lower proportion of people engaged in agriculture than the district and the state average. However, a Sunglup village shows a higher average proportion than the sample population. In the case of non-agricultural activities, Longsa shows a higher proportion of population with 32.22% that is higher than the sample average proportion and state but lower than the district average proportion. The rest of the villages, viz, Yunchuchu with 26.09%, Bhandari with 12.83% and Sunglup with 6.06%, shows a lower average proportion of population engaged in non-agricultural activities that is lower than the state, district and the sample proportion. However, for Yunchuchu village, the proportion is higher than the sample proportion. In unemployment, Bhandari has the highest percentage with 15.37%, followed by Sunglup and Longsa villages with 15.25% and 15.2% respectively, all these three villages exhibits a higher rate than the sample proportion. For Yunchuchu, the percentage is low with 9% of its sample population being unemployed, which is lower than the average sample population.

The gender-wise occupation pattern shows that 74.34% of the total sample female populations are engaged in agricultural and allied activities, while only 25.29% of male populations are engaged in this sector. However, for non-agricultural sector male dominate with 87.5% of male population engaged in this sector as compared with that female with 12.5%. The unemployment rate among males is 56.76% that is higher than the female percentage of 43.24%. The village level gender-wise occupational pattern shows that female dominate the agricultural sector in all the villages, that is, Longsa with 84.34%, Yunchuchu with 80%, Sunglup with 61.54% and Bhandari with 53.57% of the total work force are engaged in agricultural activities. However, for Sunglup and Bhandari villages, male's percentage in agricultural sector is also high with 38.46% and 46.43% respectively. In non-agricultural activities, male percentage is higher than female percentage in all the villages. The highest is in Sunglup village with 100% of the work force engaged in non-agricultural activities being male followed by Longsa with 88.24%, Yunchuchu with 83.33% and Bhandari with 80% of the work force being male. The female contribution in this sector is low in all the villages, viz, Longsa with 11.76%, Yunchuchu with 16.67%, Bhandari with 20% and Sunglup having no female engaged in this sector. The highest incidence of unemployment is among the males population in all villages. The village wise male unemployment shows that Bhandari village has the highest unemployment with 83.33% followed by Sunglup with 80%, Yunchuchu with 50% and Longsa with 45.83%. Among the female unemployed, Longsa village exhibits highest with 54.17% followed by Yunchuchu with 50%, Sunglup with 20%and Bhandari with 16.67% each.

3.8.2: Physical and Social infrastructure of the sample household: The analysis of physical and social infrastructure of the sample households are given in the table below;

Table 3.8.2: Physical and Social infrastructure:

Category	Total Sample household		Longsa		Yunchuchu		Sunglup		Bhandari	
	No	%	No	%	No	%	No	%	No	%
Total Households	99	100	68	100	9	100	12	100	10	100
Pucca House	6	6.06	4	5.9	0	0	2	16.7	0	0
Semi-Pucca House	27	27.27	19	27.9	4	44.44	1	8.3	3	30
Kutcha House	66	66.67	45	66.2	5	65.66	9	75	7	70
Household with electricity facility	79	79.79	58	85.3	8	88.9	6	50	7	70
House hold without electricity facility	20	20.21	10	14.7	1	11.1	6	50	3	30
River as a source of drinking water	99	100	68	100	9	100	12	100	10	100
House holds that has Proper sanitation	29	29.29	17	25	3	33.3	5	41.7	4	40
House holds that does not have Proper sanitation	70	70.71	51	75	6	66.7	7	58.3	6	60

Source: Field Survey 2005-06.
0: Nil

(a) Housing: From the table no. 3.8.2 it can be seen that 6 households has a pucca house accounting for 6.06% of the total houses, which is far below the district average of 18.90%. The highest percentage of pucca houses is in Sunglup with 16.67% of the total houses, followed by Longsa village with 5.88%. However, no pucca houses are found in Yunchuchu and Bhandari villages. Further, the semi-pucca houses account for 27.27% that is also lower than the district average of 59.06%. Village-wise comparison reveals that Yunchuchu with 44.44% exhibit the highest percentage of semi-house that is higher than the average sample household but lower than the district average. Sunglup with 30% and Longsa with 27.94% also show a higher percentage then the average sample households but lower than the district average. However, Bhandari with 8.33% exhibits a low percentage that is lower than both the average sample household and district average. Thus majority of the villagers have a Kutcha houses that accounts for 66.67% of the total houses. Sunglup has the highest percentage of kutcha houses with 75%, followed by Bhandari with 70%, Longsa with 66.18% and Yunchuchu with 55.56%.

(b) Sanitation: From the total of 99 households surveyed only 29 households have proper sanitation accounting for 29.29% of the total availability of sanitation as shown in table no 3.8.2. The result is far below the district average of 63.38% and the state's average of 57%. Sunglup with

41.67% tops in terms of sanitation followed by Bhandari with 40% and Sunglup with 33.33%. At the bottom lies Longsa village with 25% of the households having sanitation facility.

(c) Water: The source of drinking water for all the sample households is well, stream and rainwater harvest.

(d) Electricity: In terms of the availability of electricity facility table no. 3.8.2 reveals that 79 households in the sample villages have been electrified that accounted for 79.79% of the total households. Village-wise data reveals that Yunchuchu is having the highest percentage of electrified households (88.89%) followed by Longsa with 85.29% and Bhandari with 70%. On the other extreme, Sunglup is having the lowest percentage with 50%.

The socio-economic profile of the study areas reveals that a lot more needs to be done to improve people's standard of living. In the field of physical infrastructure, all weathered road, electricity connectivity, transport and communication and the access to banking system need to be emphasized because this infrastructure facilitates the production sector like agriculture, industry, trade, etc. Moreover, equal importance needs to be given to improve the social infrastructure because it enhance human welfare, freedom from ignorance, diseases and fear etc.

CHAPTER IV

ASSESSMENT OF NUTRITION AND PCTE

Poverty, hunger and malnutrition are linked. Here, nutritional status of a person is associated with food intake, which in turn, is taken to be dependent on income. This status can be indicated in various ways. One simple indicator is the number of the calories consumed by an individual during a given period of time[50]. Hunger is a curving or need for food and malnutrition is faulty or imperfect nutrition. Hunger can be defined as a condition in which people lack the basic food intake to provide them with energy and nutrients for fully productive lives[51]. Whereas, the immediate causes of malnutrition are poor access to diet and safe drinking water. This malnutrition is responsible for much of the suffering of the people of the world. At least $1/5^{th}$ of the worldwide loss of life to death and to disability is due to malnutrition[52]. Malnutrition continues to be a primary cause of ill-health and premature mortality among children in developing countries[53]. Thus we see that poverty and nutritional intake are highly correlated. An improved nutrition is therefore, central to improved income generation, poverty reduction, and more rapid development.

Therefore, those people who are under nourished are term as poor. Food poverty can be defined as the inability of any individual to have access to nutritionally adequate diet and the related impacts on health and culture[54]. Hence, by measuring the calorie intake of an individual and household in a given society, a calorie norms is arrived which are used as a nutritional minimum by that society. This nutritional norm is then used as a food poverty line while measuring poverty. But to arrive at the poverty line of any society, expenditure on both food and basic non-food items by a household is computed. The average expenditure is then used as the poverty line while measuring poverty[55].

In this chapter the nutritional requirement by different age and income groups among the rural population of Wokha district has been analysed. Further more, the calorie intake and its relationship with family size and monthly per capita expenditure (MPCE) has been explained.

4.1: CALORIE INTAKE:

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[50] Ibid 3 .

[51] Behrman, J. RAlderman, H. and Hoddinott, J. (2004), "Hunger and Malnutrition", *Copenhagen Census Challenger Paper*, 7 May 2004, p 3.

[52] Ibid 7

[53] Subramanian S V etal (2005), "Poverty, Child under Nutrition and Morbidity: New Evidence from India", *Bulletin of WHO*, 2005, p 210.

[54] Ibid 3 .

[55] Ibid 4 .

The national aggregate daily calorie requirement is calculated by summing up the nutritional intake across all individuals. The average calorie intake is then calculated by dividing the national aggregate of daily calorie intake with the total population[56]. The measurement of food security at the national level entails the calculation of the extent to which the production of the staple food in a country can provide the nutritional minimum of 2047 Kcal per day for the rural population and 2020 Kcal per day for the urban population in 2004-05[57]. The existence of national food security, however, does not guarantee that all regions and all people, especially the poor, will have access to the nutritional minimum because of existing regional, economic and social inequalities. It is therefore, necessary, to measure food security at the household level, since there is usually considerable socio-economic inequality between household[58]. It should be kept in mind that, there are many other important nutritional inputs, such as proteins, micronutrients etc., but it is assumed that the minimum requirements of these nutrients will be met if calorie requirements are met[59]. Thus, the minimum nutritional norm for the sample population is arrived at by calculating the average calorie intake of the sex and age groups.

A poverty norm in the context of India was first mooted by the Indian Labour Conference in 1957. A distinguished working group of eminent economists and social thinker set up by the Planning Commission, Government of India, in 1962, to deliberate on the question of what should be regarded as the nationally desirable minimum level of consumer expenditure. The working group after taking into account the recommendation of the Medical Research (ICMR, 1958) came to the view that in order to provide the minimum nutritional diet in terms of calorie intake, the national minimum per capita consumption expenditure should be Rs. 20 per month at 1960-61 prices. A Task Force (1979) constituted by the perspective planning division of planning commission adopted derivation of poverty line in the normative minimum calorie intake. This group accepted the calorie intake norms recommended by the Nutrition Expert Group (1968), according to fourteen age-sex-activity categories. This provided the age-sex-activity-specific composition of the rural and urban populations. The specific calorie norms were then weighted by the corresponding compositions of the rural and urban populations separately, to derive the rural and urban average calorie norms. The daily calorie requirement per person worked out, on average, to 2435 and 2095 calories in rural and urban India, respectively (GOI, 1979). Thus if the people living in rural and urban can afford to consume on average at least 2435 and 2095 calories of food

[56] Ibid 2.
[57] GOI (2004-05), "Nutritional intake in India", *NSSO Report 513*, p i.
[58] Safiliou-Rothschild (2001), "Food Security and Poverty: Definition and Measurement", Working Paper 4, Online [Available] at *www.iwmi.org/dqil*, p 1.
[59] Government of Sri Lanka (2004), *"Official Poverty Line for Sri Lanka"*, Department of Census and Statistics, p 2.

per day, respectively, they are said to be above the poverty line[60]. In a study conducted by Dandekar and Rath in 1971, an intake of 2250 calories per capita per day was assured as adequate under the Indian condition both in rural and urban areas[61]. A study conducted by Ojha in 1970, defined poverty in terms of minimum needs which, in turn, were expressed in terms of physical survival. According to him, the minimum calories needed were 2250 per capita per day. In terms of food grains (pulses and cereals) minimum calories required were 1500 and 1800 for urban and rural areas respectively. Minimum calorie intake was then expressed in terms of physical quantities of food grains. He estimated 518 grams per day per person for rural areas and 432 grams per day per person for urban areas[62]. Thus, in the context of India, poverty norms have been worked out by many scholars in terms of calorie intake.

To arrive at the calorie norms for the sample population, the data on household consumption of various food items were collected from four villages of Wokha district in 2005-06. The food items that were covered by the survey are as follows rice, fruits (fresh and dry), vegetables, meat, fish, egg, milk, sugar, salt, oils, etc. The reference periods used for collection of these data is for 30 days prior to the survey. The collected data on consumption of food items were converted into calorie using the conversion table provided by the NSSO report 513. Again basing on the NSSO division of age group, the per capita calorie intake of different ages and sex groups were calculated. From the table no. 4.1 and figure 1, it is clear that the average calorie intake of the rural sample population for the year 2005 – 06 is 2441.92 Kcal per person per day, which is higher than both the average calorie intake of 2044 Kcal for the rural areas in Nagaland and the National average for rural area of 2047 Kcal per person per day for the year 2004-05 by 16.3% and 16.17% respectively.

Table 4.1: Calorie Norms Estimates.

Category	Average Rural calorie norms (Kcal per person per day)
*National calorie norms (2004-05)	2047
*Nagaland Norms (2004-05)	2044
Sample survey Norms (2005-06)	2441.92

Sources: *NSSO Report 508 and Field Survey 2005-06.

[60] GOI (1979), "*Report on the Task Force on the Projection of Minimum Needs and Effective Demand*", Perspective Planning, Planning Commission, New Delhi, p 5-7.
[61] Ibid 5.
[62] Ibid 5..

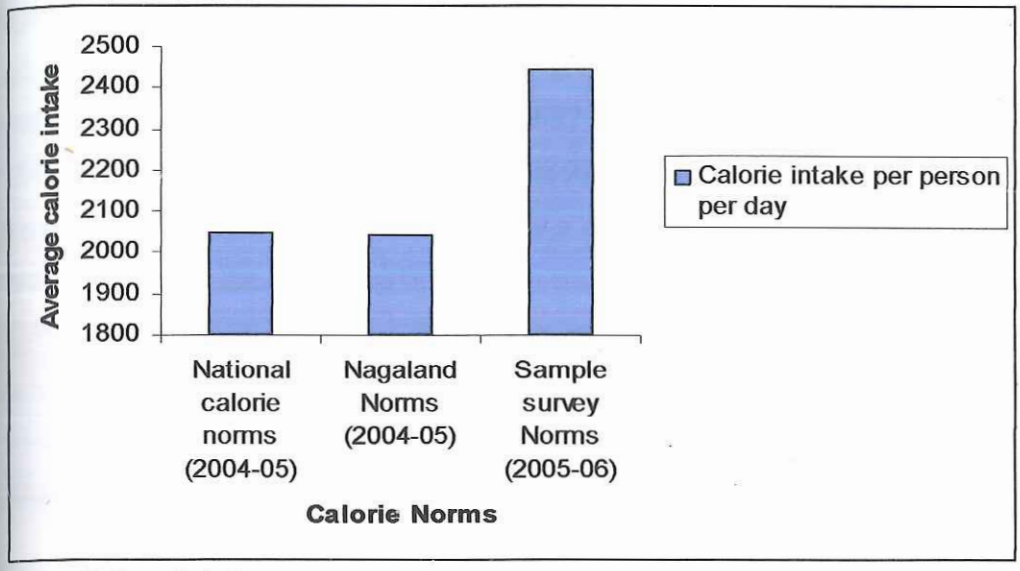

Figure 1: Estimated calorie norms.

4.1.1: Average Calorie Intake per day by age and sex groups.

Nutritional requirement vary from person to person depending on age and gender. Thus, calorie intake by different age and sex group per person per day are shown in the table given below.

Table 4.1.1: Average calorie intake by Age and Sex Groups.

Age group (in years)	Average calorie intake (Kilo calorie per day)		Sex groups average calorie intake in Kcal per day.		Percentage difference by gender
	Average	% to total	Male	Female	
Over all	2441.92	100	2427.48	2453.16	1.06
<1	246.6	0.92	406.79	175.41	131.91
1 – 3	973.66	3.65	936.92	1036.11	10.59
4 – 6	1816.99	6.81	1742.06	1869.88	7.34
7 – 9	2036.19	7.63	2301.63	1848.82	24.49
10 – 12	2408.42	9.02	2915.67	2252.34	29.45
13 – 15	2842.36	10.65	2797.54	2877.03	2.84
16 – 19	2862.29	10.73	3042.57	2700.04	12.69
20 – 39	2916.92	10.93	2847.99	2968.87	4.24
40 – 49	2918.79	10.94	2812.23	3036.14	7.96
50 – 59	2829.45	10.6	2860.37	2807.63	1.88
60 – 69	2597.16	9.73	2513.59	2634.77	4.82
70 and above	2239.14	8.39	2323.18	2127.1	9.22

Sources: Field Survey 2005-06.

It may be observed from the table No.4.1.1 that the average calorie intake per person per day for the sample population as a whole is 2441.92 Kcal. The significant difference in calorie intake amongst different age group is evident from the table and figure 2. As such, the lower age group shows a much lower per capita calorie intake than the older age group for both the sexes due to the obvious reason. As we move on to higher age groups, the average calorie intake increases up to age group of 40-49 years and thereafter it declines. The figures in the table indicate that, for the

age group of 1 year and below, the calorie intake is estimated at an average of 246.6 Kcal, for the group 1-3 years it is 973.66 Kcal, for the group 4-6 years it is 1816.99 Kcal, for the group 7-9 years it is 2036.19 Kcal, for the group 10-12 years it is 2408.42 Kcal, for the group 13-15 it is 2842.36 kcal, for the group 16-19 years it is 2862.29 Kcal, for the group 20-39 years it is 2916.92 Kcal and it rose to 2918.79 Kcal for the age group of 40-49 years. From there on, it declines to 2829.45 Kcal for the age group of 50-59 years, 2597.16 kcal for the age group of 60-69 years and 2239.14 Kcal for 70 years and above. The analysis reveals that there is a consistent increase in percentage share of per capita calorie intake across the age group of 1 year and below (.92%) to 40-49 years (10,94%). From thereon, it declines to 10.6%, 9.73% and 8,39% for the age group of 50-60 years, 60-69 years and 70 years and above respectively.

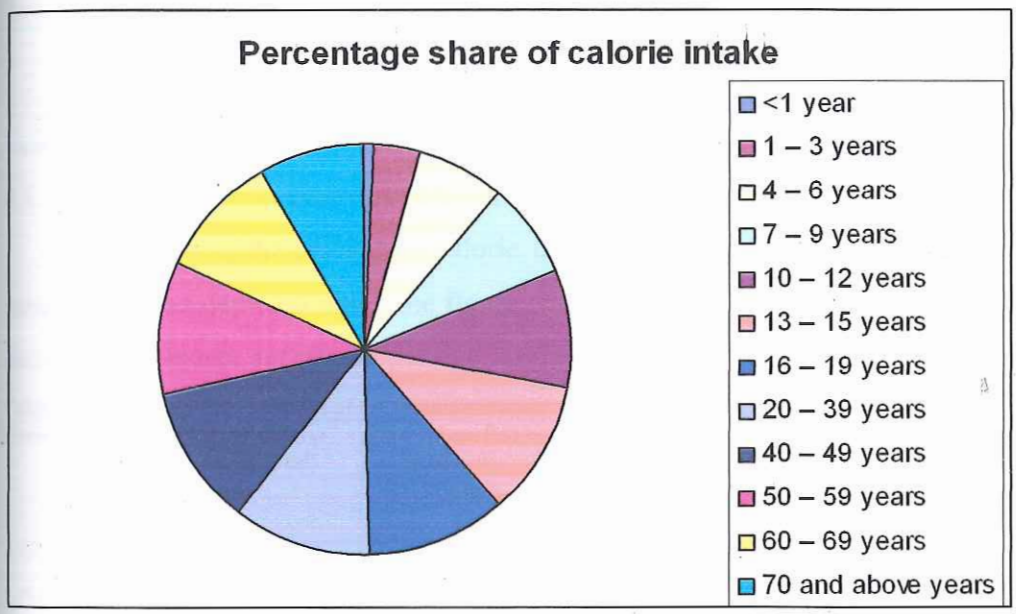

Figure 2: Percentage share of different age groups in the total average calorie intake.

The sex-wise data are less consistent than the population average, yet both the consumption data display similar trends as shown in figure 3. The sex-wise sample population calorie intake shows that the average calorie intake per person per day among the female population is 2453.16 Kcal that is marginally higher than the average calorie intake of male population (2427.48 Kcal) by1.06%. It further suggests that for the age group 1 year and below, male average calorie intake per day is significantly higher than female average calorie intake by131.91%. For the age group 7-9 years, 10-12 years, 16-19 years, 50-59 years and 70 years and above, the average calorie intake of male is higher than the female by 24.49%, 29.45%, 12.69%, 1.88% and 9.22% respectively. Whereas, for the age group 1-3 years, 4-6 years, 13-15 years, 20-39 years, 40-49 years and 60-69

years, the average calorie intake of female is higher than male by 10.59%, 7.34%, 2.84%, 4.24%, 7.96% and 9.22% respectively.

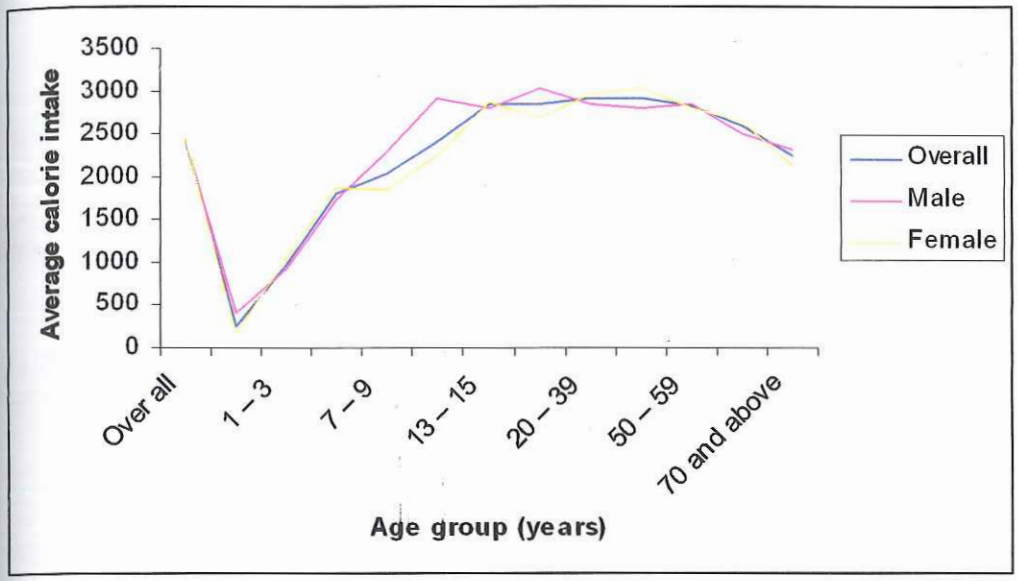

Figure 3: Calorie intake by age and sex groups.

4.1.2: Village-wise Average calorie intake:

Apart from the individual calorie intake per person per day, village wise average calorie intakes are also depicted here. The figure in table no. 4.1.2 and the column diagram of figure no 4 show calorie intake per person per day for the sample villages of Wokha district, Nagaland.

Table 4.1.2: Average calorie intake of the sample villages.

Category	Average Calorie intake (in Kcal)	Percentage (%) difference to total average.	Male (in Kcal)	Female (in Kcal)	Percentage (%) difference by Gender
All villages	2441.92	100	2427.48	2453.16	1.06
Longsa	2428.59	-0.55	2443.98	2417.94	1.07
Yunchuchu	2318.97	-5.03	2086.29	2493.46	19.52
Sunglup	2613.65	+7.03	2544.62	2675.78	5.15
Bhandari	2480.59	+1.58	2503.61	2451.82	2.11

Sources: Field Survey 2005-06.

The table suggests that among the villages, the average calorie intake is highest in Sunglup village. It is higher than the sample average by 7.03%, Nagaland rural calorie norms by 26.5% and the National rural calorie norms by 26.29%. Bhandari village also shows a higher average calorie intake over the sample average, State rural calorie norms and National rural calorie norms by 1.58%, 21.05% and 20.87% respectively. Whereas Longsa and Yunchuchu villages with an average calorie intake of 2428.59 Kcal and 2318.97 Kcal respectively exhibit lower average calorie intake than the sample average calorie intake by .55% and 5.03% respectively. However,

both these averages are higher than the State and the National rural calorie norms by about 18% and 14% respectively.

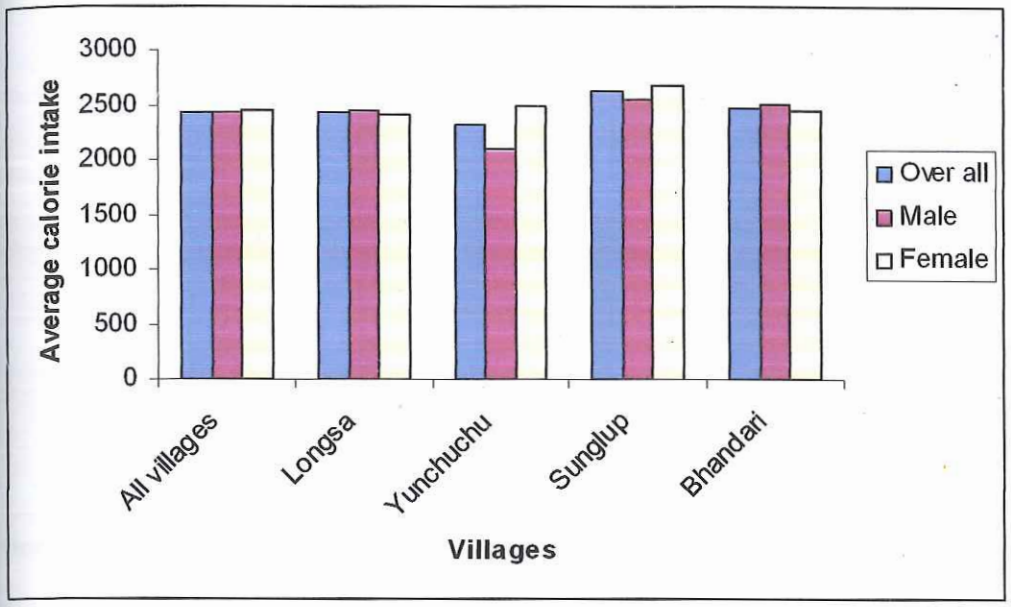

Figure 4: Average calorie intake of different villages.

Gender-wise average calorie intake analysis shows that on an average, female average calorie intake are higher than male by a margin of 1.06%. Village-wise average calorie intake by gender as depicted in the above table and figure shows that the average calorie intake of male is higher than that of female in Longsa and Bhandari villages by 1.07% and 2.11% respectively. Whereas, in Sunglup and Yunchuchu villages, the average calorie intake of female is higher than male by 5.15% and 19.52% respectively.

4.1.3: Range-wise Average calorie intake:

The figure in table no. 4.1.3 and the column diagram of figure 5 show calorie intake per person per day for the sample ranges of Wokha district, Nagaland.

Table 4.1.3: Average calorie intake of the sample Ranges.

Category	Average Calorie intake (in Kcal)	Percentage difference to total average.	Male (in Kcal)	Female (in Kcal)	Percentage difference by Gender
All Ranges	2441.92	100	2427.48	2453.16	1.06
Upper range	2428.59	-0.55	2443.98	2417.94	1.07
Middle range	2458.94	0.69	2315.46	2576.33	11.27
Lower range	2480.59	1.58	2503.61	2451.82	2.11

Sources; Field survey 2005-06

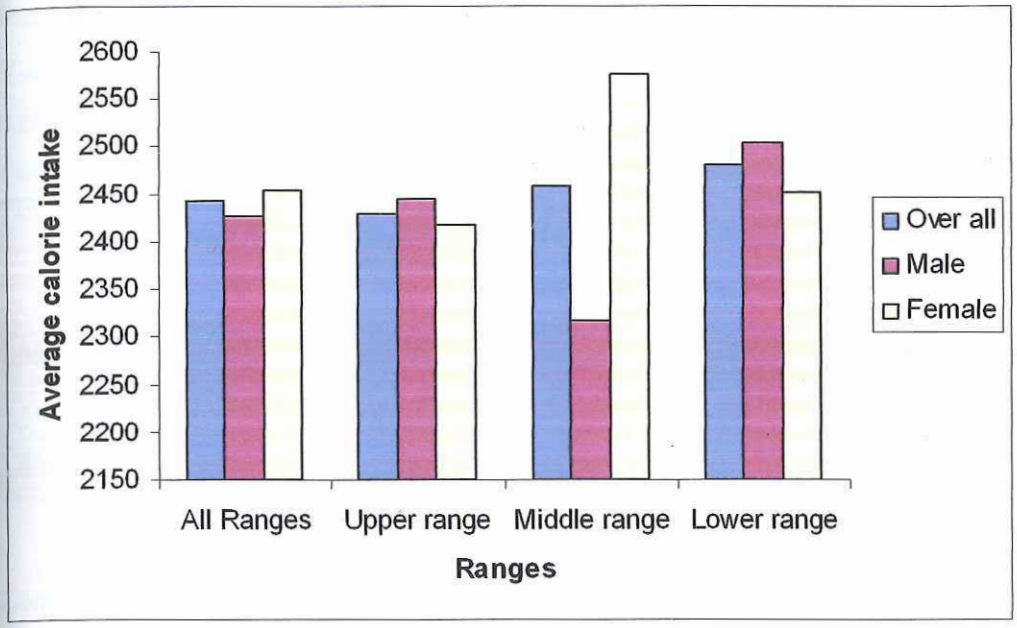

Figure 5: Average calorie intake of different ranges.

The table suggests that among the ranges, the average calorie intake is highest in Lower range. It is higher than the sample average by 1.58%, State rural calorie norms and National rural calorie norms by 21.05% and 20.87% respectively. Middle range with an average calorie intake of 2458.94 Kcal per person per day also shows a higher average calorie intake than the sample average by .69%, State rural calorie norms and National rural calorie norms by 16.75% and 16.87% respectively. However, Upper range with an average calorie intake of 2428.59 Kcal exhibit lower average calorie intake than the sample average calorie intake by .55%. But the average calorie intake is higher than the State and the National rural calorie norms by about 18%.

Gender-wise average calorie intake analysis shows that on an average, female average calorie intake are higher than male by a margin of 1.06%. Range-wise average calorie intake by gender as depicted in the above table and figure shows that the average calorie intake of male is higher than that of female in Upper and Lower by 1.07% and 2.11% respectively. However, in Middle range, the average calorie intake of female is higher than male by 11.27%.

4.1.4: Average calorie intake by Sex-wise head of the Household.

An analysis is done to show the variation in the average calorie intake by female and male headed households of the sample villages, which is shown in table no. 4.1.4 and figure 6. The data in the table and figure clearly indicates that on an average, the per capita calorie intake per day of female-headed household is higher than male headed household by 9.78%. Among the villages, Sunglup shows the highest average calorie intake that is higher than the average calorie intake of male headed household by 6.57%. It also indicates that Bhandari has a higher average calorie

intake than sample average of male headed households by 1.46%. However, Longsa and Yunchuchu villages show lower averages than the sample average of male headed household by -0.67% and. 4.31% respectively.

Table 4.1.4: Male and Female headed household Average calorie intake per day.

Category	Average Calorie Intake per day (Kcal)					Percentage difference by sex of head
	Total Average	Male headed household	Percentage difference to total male	Female headed household	Percentage difference to total female	
All villages	2441.92	2374.04	100	2606.26	100	9.78
Longsa	2428.59	2358.25	-0.67	2715.59	+4.19	15.15
Yunchuchu	2318.97	2271.71	-4.31	2437.11	-6.49	7.92
Sunglup	2613.65	2530.13	+6.57	2983.51	+14.47	17.92
Bhandari	2480.59	2408.62	+1.46	1987.6	-23.74	21.18

Sources: Field Survey 2005-06.

For the female headed household, the table shows that the average calorie intake per day in Longsa and Sunglup villages are higher than the average calorie intake of female headed households by 4.19% and 14.47% respectively. While Yunchuchu and Bhandari villages have average calorie intake that are lower than the average of female headed household by 6.49% and 23.74% respectively.

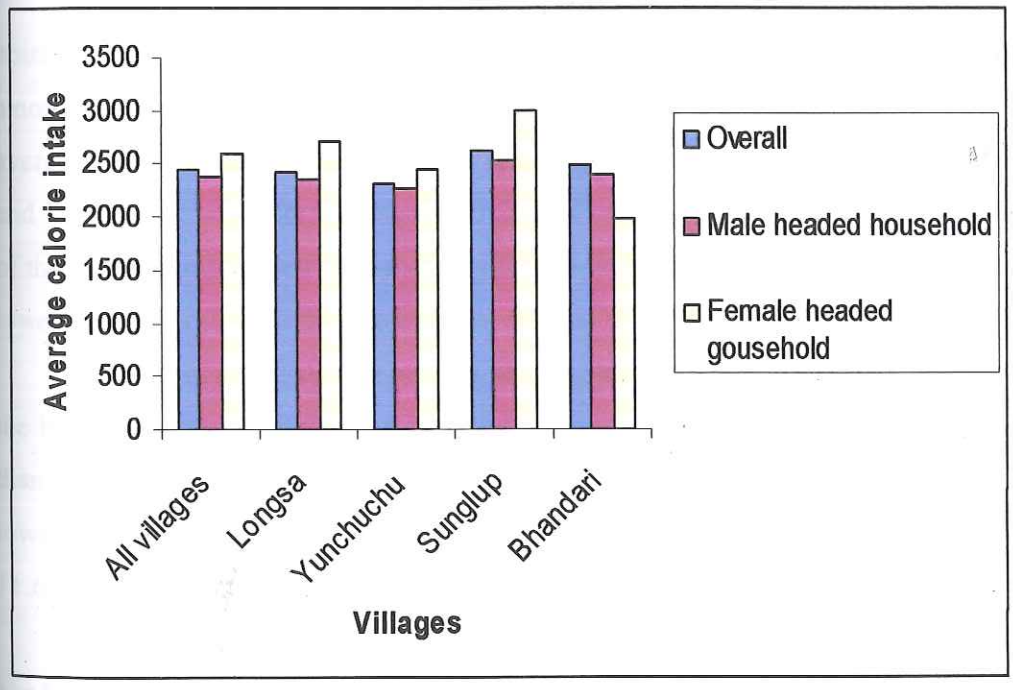

Figure 6: Average calorie intake by sex-wise head of household.

On comparing the average calorie intake of male and female headed households, the result shows that on an average, the calorie intake of female headed households are higher than the male headed households by 9.78%. Among the villages, the female headed households in Longsa, Sunglup and Yunchuchu have higher average calorie imtake per day than male headed household

by 15.15%, 17.92% and 7.28% respectively. It is only in Bhandari village the average calorie intake is higher in male headed households than female headed households by 21.18%. The result suggests that female headed household are nutritionally better off.

4.1.5: Average calorie intake by Occupation-wise head of the Household.

The households have been segregated based on the occupation of the head of the family as Agricultural and Service headed household. Thereafter, estimate their average calorie intake and the extent of variation amongst the selected categories which are shown in the given table and figure below.

Table 4.1.5: Agriculture and Service headed household Average calorie intake per day.

Category	Average Calorie Intake per day (Kcal)					Percentage difference by Occupation of head
	Total Average	Agriculture headed household	Percentage difference to total Agriculture	Service headed household	Percentage difference to total Service	
All villages	2441.92	2582.31	100	2455.2	100	5.18
Longsa	2428.59	2522.02	-2.33	2531.43	+3.1	0.37
Yunchuchu	2318.97	2620.47	+1.48	2081.34	-15.23	25.9
Sunglup	2613.65	2735.54	+5.94	2717.68	+10.66	0.66
Bhandari	2480.59	2715.14	+5.15	2168.45	-11.68	25.21

Sources: Field Survey 2005-06.

From the table above it can be seen that the average calorie intake of agricultural headed household is higher than the service headed household by 1.05%. The Village-wise data shows that among the agricultural headed household, Sunglup have a higher average calorie intake than the average calorie intake of the agricultural headed household by 5.94%. It is followed by Bhandari and Yunchuchu with 2715.14 Kcal and 2620.47 Kcal of calorie intake, that are above the average of the agricultural headed household by 5.15% and 1.48% respectively. While Longsa exhibits the lowest average calorie intake among the villages that is lower than the average by 2.33%.

In respect of the service headed household, figure 7 and table 4.1.5 shows that Sunglup has the highest average calorie intake that is followed by Longsa whose averages are higher average than the average of the service headed household. However, Yunchuchu and Bhandari exhibit lower average than the average calorie intake of the service headed households by 15.23% and 11.68% respectively.

The inter-village variation in average calorie intake between the agricultural and service headed household shows that in Yunchuchu, Sunglup and Bhandari, the agricultural headed households are higher than the service headed households by 25.9%, 0.66% and 25.21% respectively. However, in Longsa the average calorie intake of service is higher than agricultural headed household by 0.37%.

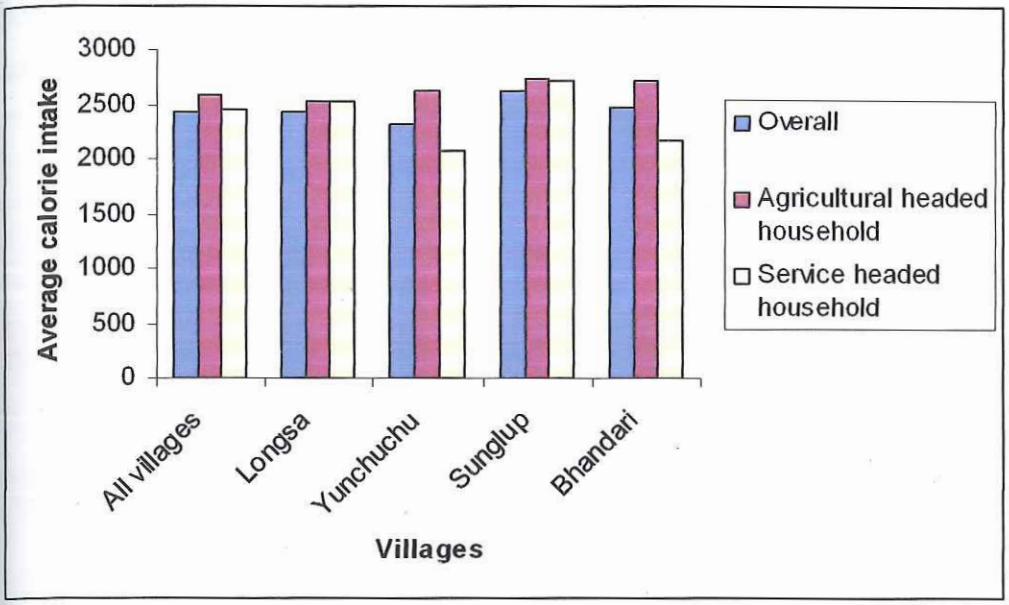

Figure 7: average calorie intake by occupation-wise head of household.

4.1.6: Family size and Calorie intake.

The relationship between calorie intake and the household size are explained by the table no 4.1.6 and figure 8 given below.

Table 4.1.6: Family size and average daily Calorie intake.

Average Family size (X)	No. of household	Total No. of person	Average calorie intake (Y)
1 person	12	12	2757.27
2 persons	14	28	3023.7
3 persons	16	48	2687.18
4 persons	17	68	2433.09
5 persons	19	95	2297.81
6 persons	14	84	2185.92
7 persons	6	42	2645.64
8 persons	1	8	2579.54
10 persons	1	10	1987.54
total	99	393	2441.92

Sources: Field Survey 2005-06.

From the table it is observe that the household size of one takes 2757.27 Kcal per day per person, for a household of two person it is 3023.69 Kcal per person per day, for the household size of three the average calorie intake is 2687.17 Kcal per person per day, for the household size of four the average calorie intake is 2433.08 Kcal per person per day, for the household size of five it is 2297.80 Kcal per person per day, for the household size of six it is 2185.91 Kcal per person per day, for the household size of seven it is 2645.63 Kcal per person per day, for the household size of eight it is 2579.53 Kcal per person per day and for the household size of ten it is 1987.56 Kcal per person per day.

The table reveals that on an average, as the size of the family goes on increasing the average calorie intake goes on declining. Thus, there may exists an inverse relationship between

calorie intake and the size of the family, i.e. higher the size of the household, lower is the average calorie intake per person per household.

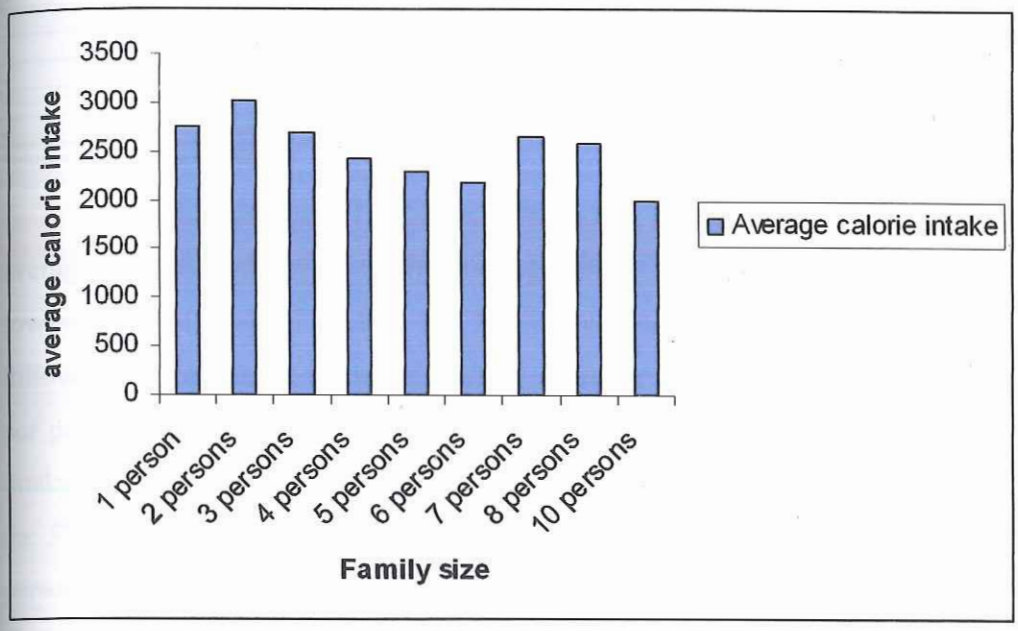

Figure 8: Family size and average calorie intake.

To examine whether the hypothesis holds true or otherwise, the correlation between the two variables (household size and calorie intake) is evaluated using Karl Pearson methods of Correlation. The solution for correlation gives,

$r = -0.703$

The result shows that the correlation coefficient value is negative. This indicates that there exist an inverse relation between the calorie intake and family size. To find out the extent to which it is dependable the probable error of correlation coefficient is calculated[63]. It is found that the r value is less than its probable error of 0.15, this means r value is only 4.86 times lower than the probable error. Moreover, it is observed that its coefficient of determinant (r^2) is 0.47, which implies that the explained variance is 47%. In otherwords, only 47% of the changes in calorie intake are explained by changes in family size. Therefore, the relationship is statistically insignificant. Thus the hypothesis does not hold true.

4.1.7: Calorie intake and income.

It is common experience that a person with higher income tends to have better diet and vice versa. Thus, it is vital to examine the relation between these two variables. Table no. 4.1.7 and figure 9 shows the per capita monthly income and average daily calorie intake for different income groups.

[63] Elhance,D.N., Elhance V and Agrawal, B.M. (1999), "*Fundamentals of statistics*", Kitabmahal, Allahabad, p 11.45

Table 4.1.7: Per capita daily calorie intake and per capita monthly income for different income groups.

Group No	Income Group (Rs.)	No. of HH	Total No of person	Per capita daily calorie intake	Per capita monthly income (Rs.)
1	1 - 500	55	186	2408.58	258.89
2	501 - 1000	24	121	2481.54	761.72
3	1001 - 2000	16	70	2430.02	1271.29
4	2001 - 3000	2	11	2665.4	2581.82
5	3001 - 4000	1	1	2927.4	3100
6	4001 and above	1	4	2266.6	5194.25

Sources: Field Survey 2005-06.

From the table no 4.1.7, it can be seen that as the average income goes on increasing, the average calorie intake shows a fluctuating trends. The calorie intake per person per day for the lowest income group of Rs.1 to Rs. 500 per capita per month is 2408.58 Kcal. The next group follows with the calorie intake of 2481.54 Kcal per person per day but decreased to 2430.02 Kcal per person per day for the next income group. However, in the fourth income group the calorie intake rose to 2665.4 Kcal per person per day and increased to 2927.4 Kcal per person per day in the 5th group. For the highest income group the calorie intake is the lowest with 2266.6 Kcal per person per day. It appears that there is a fluctuating relationship between the two variables.

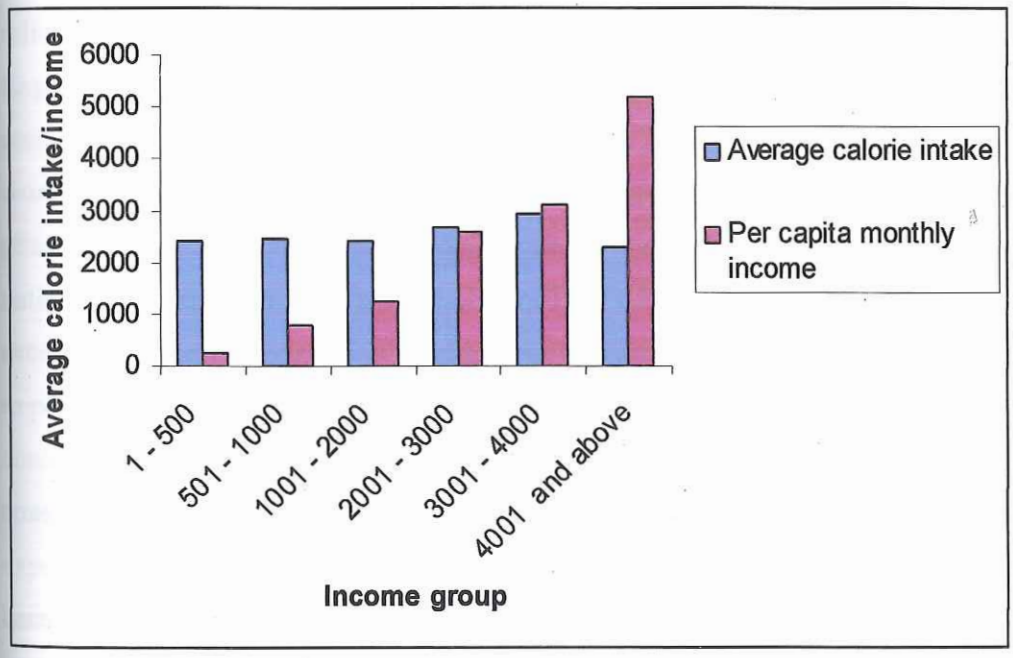

Figure 9: Average calorie intake and average income.

The relationship between per capita income and per capita calorie intake can best be ascertained by finding the correlation between the two. The correlation solution shows,

r = .0089

The value of correlation coefficient is closer to 0, therefore there is no linear relationship between the variables. To find out the extent to which it is dependable the probable error of correlation coefficient is calculated. The probable error is .203, which shows that r value is less than the

probable error by .044 times. The correlation coefficient is, therefore, not statistically significant. It is also observed that its coefficient of determinant (r^2) is 0.000079, which indicates that the explained variance is .0079%. In otherwords, only .0079% of the changes in calorie intake are due to changes in income. Thus, the hypothesis which states that higher the income of the people, higher is the calorie intake does not holds true in this case. The result clearly violates the common experience that people take higher calories as their income increases under normal circumstances.

However, the information about the monthly income as provided by the interviewee cannot be considered as reliable because of two reasons. Firstly, people in the rural areas does not keep any record of their monthly income, thus reliable data at the household level is not available. Secondly, People seldom tell their true monthly income to any interviewer. Hence, we cannot use this income while measuring poverty and instead Per Capita Monthly Expenditure is used.

4.2: Monthly Per Capita Total Expenditure (PCTE).

The Report of the Expert Group (1993) maintains that the household consumer expenditure is more reliable than income and hence more suitable for measuring poverty. The reliability of the consumption expenditure is well recognized[64]. Thus, Monthly Per Capita Expenditure is used as a proxy for the actual income while determining poverty. Poverty line in the context of India was first mooted by the Indian Labour Conference in 1957. A distinguished working group of eminent economist and social thinker set up by the planning commission, government of India, in 1962, to deliberate on the question of what should be regarded as the nationally desirable minimum level of consumer expenditure. The working group after taking into account the recommendation of the Medical Research (ICMR, 1958) came to the view that in order to provide the minimum nutritional diet in terms of calorie intake, the national minimum per capita consumption expenditure should be Rs. 20 per month at 1960-61 prices. A task force (1979) constituted by the perspective planning division of planning commission estimated the total expenditure of the food and non-food expenditure: these expenditure levels for rural and urban became the poverty lines. At 1973 prices, the poverty lines for rural and urban areas stood at Rs 49 and Rs 57 per person per month respectively (GOI 1979). Currently, these figures stand at approximately Rs 368 and Rs 559 per person per month for rural and urban areas respectively (GOI 1993). In a study conducted by Dandekar and Rath in 1971, an intake of 2250 calories per capita per day was assured as adequate under the Indian condition both in rural and urban areas. On the basis of National Sample survey data on consumer expenditure, the study revealed that an

[64] Pradhan, B. K., and Saluja, M.R., (1998), 'An Assessment of Poverty Studies in India with Special Reference to Economic Reforms', *Pakistan Development Review* , p 10 81-1102.

average annual per capita expenditure of Rs. 170.8 or Rs. 14.2 per capita per month at 1960-61 prices would suffice to meet this calorie requirement in the rural areas. The corresponding figures in the urban areas were Rs. 271.7 and Rs. 22.6 at 1960-61 prices. A study conducted by Ojha in 1970, defined poverty line at Rs. 15-18 (at 1960-61 prices) per capita per month for rural population and Rs. 8-11 (at 1960-61 prices) per capita per month for urban population. On this basis, he found that in 1960-61, 190 million people (44% of the total population) lived below the poverty line. For rural India it was 184 million (51.8% of the rural population) and 6 million in urban areas (7.6% of the total urban population).

To generate the total household expenditures, the aggregate of the sub-total of various consumption items were divided into two groups, viz, food items and non-food items. The expenditure on food items includes cereals and cereal substitutes, pulses and their products, edible oils, egg, fish meat, vegetables, sugar, salt and spices, beverages, processed food etc. While the data of households expenditure on foods, pan, tobacco & intoxicants, fuel and light, miscellaneous goods and services, including non-institutional medical care, rents and, taxes, cereals, egg, fish & meat, fruits (fresh& dry), conveyance etc. are collected over the last 30 days prior to the survey[65]. Valuation of consumption out of purchase is evaluated at the purchase price. Consumption out of home produce is evaluated at ex farm or ex factory rate. The average expenditure on this food items yield a poverty norm that could be called starvation line or food energy requirement. However, the starvation poverty norm is generally supplemented by some allowance on non-food consumption. Thus, the expenditure on non-food items are also calculated to arrived at the poverty line. The expenditure on non-food items include fuels and light, clothing and footwear, education, medical, miscellaneous consumer goods, pan, tobacco, intoxicants, rent etc. The household expenditures data on clothing, footwear, education, medical care and durable goods which are not frequent, are collected over the last 365 days prior to the survey, thereafter, the total is divided by 12 months so as to arrive at monthly average expenditure. Value of consumption out of gifts, loans, free collections, and goods received in exchange of goods and services is imputed at the rate of average local retail prices prevailing during the reference period. The PCTE or poverty line is arrived at by dividing the household expenditure on both food and non-food items by the number of person in each household[66].

4.2.1: The Monthly PCTE Assessment.

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[65] GOI (2004-05), "Nutritional intake in India". *NSSO report 508,* p 14.
[66] Ibid 7.

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The data in the table no 4.2.1 (a) and figure 10 show that the estimated monthly per capita expenditure for the sample population is Rs. 942.66 (at 2005-06 prices), which is higher than the NSSO estimation of Rs. 558.78 (2004-05 prices) per person per month at National level by 69% but lower than Nagaland state average of Rs. 1010.81(2004-05 prices) per person per month by 7%.

Table 4.2.1 (a): PCTE Estimates.

Category	Average Rural PCTE (Rs. Per person per month)
*National PCTE (at 2004-05 prices)	558.78
*Nagaland PCTE (at 2004-05 prices)	1010.81
**Sample survey PCTE (at 2005-06 prices)	942.60

Sources: *NSSO Report 508 and ** Field Survey 2005-06.

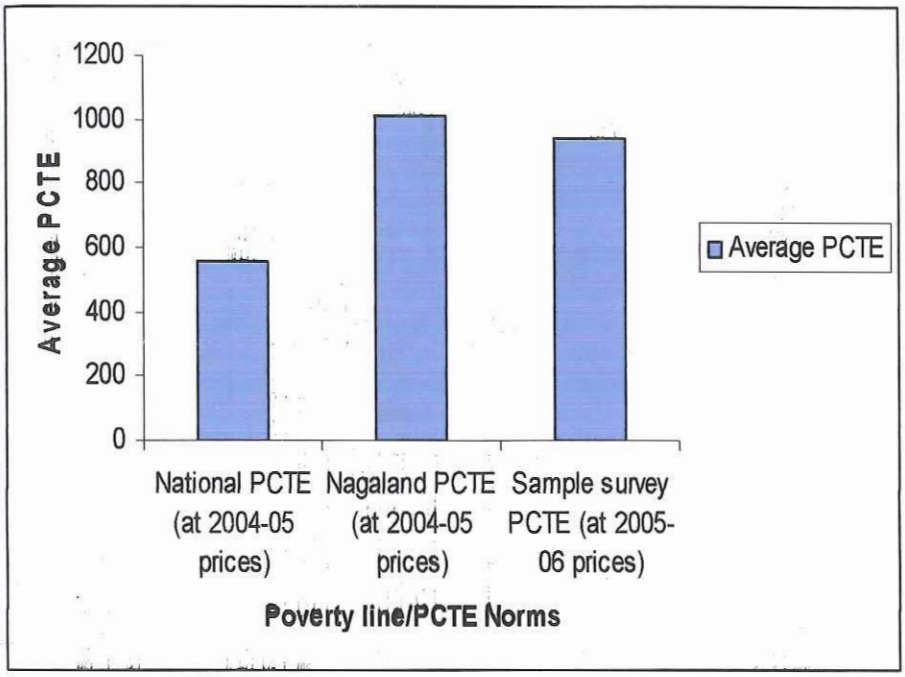


Figure 10: Average NSSO and Sample Survey PCTE.

Table no 4.2.1 (b) and figure 11 shows the percentage share of food and non-food items in the total per capita monthly expenditure (PCTE).

Table 4.2.1 (b): Share in average monthly PCTE (Village-wise).

Category	Average PCTE (Rs.) (FE + NFE)	Share in PCTE by different items				Village wise Percentage (%) difference with the total average
		share of FE		share of NFE		
		Average (Rs.)	(%)	Average (Rs.)	(%)	
Villages	942.60	722.32	77	219.91	23	1
Longsa	950.18	709.71	75	240.47	25	+0.79
Yunchuchu	844.85	682.46	81	162.39	19	-10.38
Sunglup	866.82	752.34	87	114.48	13	-8.05
Bhandari	920.48	792.7	86	127.78	14	-2.35

Sources: Field Survey 2005-06.
FE: Food Expenditure.
NFE: Non-food Expenditure.

It is clear from table 4.2.1 (b) and figure 11 that on an average the expenditure on food items is higher than non-food. The food items accounts for 77% while non-food items account for 23% of the total monthly per capita expenditure (PCTE).

The village wise average monthly PCTE assessments given in the table no. 4.2.1 (b) and figure 11 show that Longsa village has an average PCTE of Rs 950.18 per month that is higher than the sample survey average by 0.79%, while Yunchuchu, Sunglup and Bhandari have an average per capita expenditure that is lower than the sample average by 10.38%, 8.05% and 2.35% respectively.

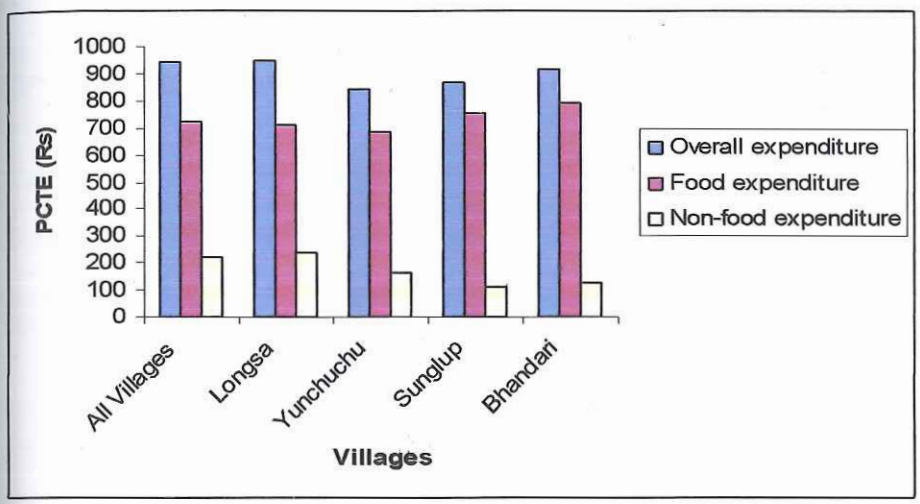


Figure 11: Percentage share of food and non-food items in PCTE.

The share of monthly per capita expenditure on food and non-food items for Longsa village is 75% and 25% respectively. It can be seen that the share of expenditure on non-food is highest among the villages and higher than the sample average as well. The share of per capita monthly expenditure on food and non-food items for the Yunchuchu village is 81% and 19% respectively. For Sunglup, the share of per capita monthly expenditure by food items with 87% exhibits the highest percentage share among the selected villages. While the share of per capita monthly expenditure on non-food items with 13% shows the lowest percentage share among the selected category. The share of per capita monthly expenditure on food and non-food items for Bhandari village is 86% and 14% respectively.

4.2.2: Range-wise decomposition of monthly PCTE:

The Range-wise average monthly PCTE assessments given in the table no. 4.2.2 and figure 12 show that Upper range has an average PCTE of Rs 950.18 per month that is higher than the sample survey average by 0.79%, while Middle and Lower ranges have an average per capita expenditure that is lower than the sample average by 3.72% and 2.35% respectively.

Table 4.2.2: Share in average monthly PCTE (Range wise).

Category	Average PCTE (Rs.) (FE + NFE)	Share in PCTE by different items				Range-wise Percentage (%) difference with the total average
		Share of FE		Share of NFE		
		Average (Rs.)	(%)	Average (Rs.)	(%)	
All Ranges	942.6	722.32	77	219.91	23	1
Upper	950.18	709.71	75	240.47	25	0.79
Middle	907.54	715.66	79	191.54	23	-3.72
Lower	920.48	792.7	86	127.78	14	-2.35

Sources: Field Survey 2005-06.

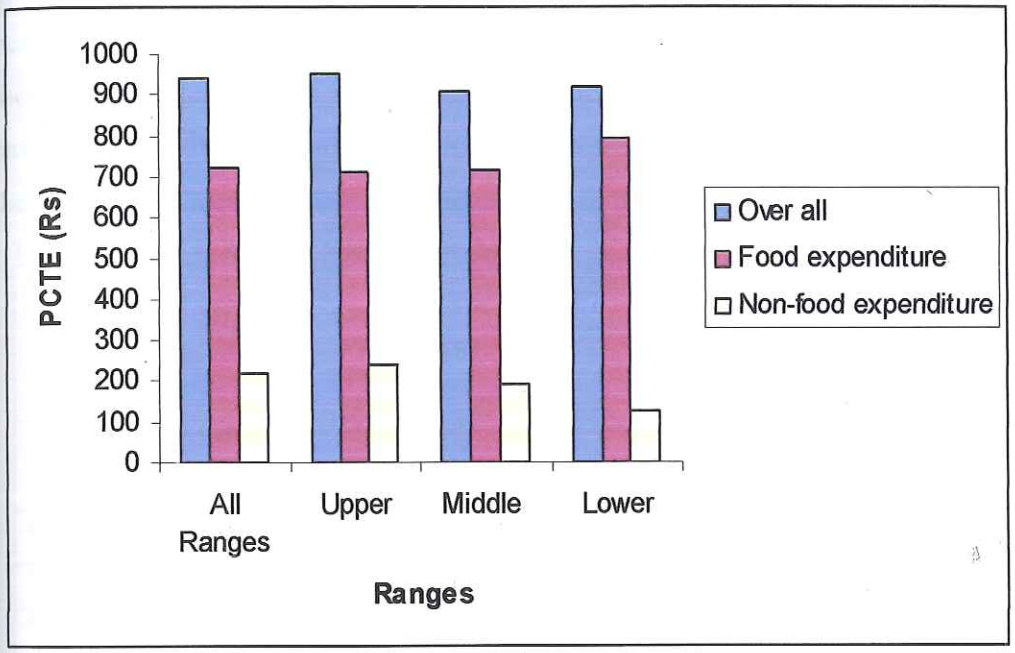


Figure 12: Percentage share of food and non-food items in PCTE.

The share of monthly per capita expenditure on food and non-food items for the Upper range is 75% and 25% respectively. It can be seen that the share of expenditure on non-food is highest among the ranges and higher than the sample average as well. The share of per capita monthly expenditure on food and non-food items for the Middle range is 79% and 23% respectively. For Lower range, the share of per capita monthly expenditure by food items with 86% exhibits the highest percentage share among the selected ranges. While the share of per capita monthly expenditure on non-food items with 14% shows the lowest percentage share among the selected category.

4.2.3: Decomposition of monthly PCTE by Sex-wise Head of the Household:

The differences in monthly PCTE among the male and female headed households and their allocation pattern and food and non-food items are explained in this section. The data in table 4.2.3 and figure 13 (a) and (b) shows the average PCTE of male headed household is Rs. 945.74, while

it is Rs. 924.82 with female headed households. This follows that the average PCTE per month for male headed household is higher than both the female headed household and the average of the sample survey by 2.26% and 0.33% respectively. This may be due to higher income earning opportunities for male, which leads to higher income resulting in higher monthly PCTE for male headed households.

For male headed households, the proportions of monthly expenditure on food and non-food items are 76% and 24% respectively. The corresponding shares of expenditure in the female headed household are 79% and 21% respectively. This indicates that despite having lower PCTE per month with female headed households, a greater proportion of their expenditure is made on food items as compared to male headed households. It may be due to the reason that when women have sole control over family resources, the expenditure on food items tend to be higher because they are more concern in providing better food to the family.

Table 4.2.3: PCTE by Sex-wise Head of Household.

Selected category	Average PCTE (Rs.) (FE + NFE)	Share in PCTE by different items				Village wise % difference with the respective average
		share of FE		share of NFE		
		Average (Rs.)	(%)	Average (Rs.)	(%)	
Male headed household	**945.74**	**718.76**	**76**	**226.98**	**24**	**1**
Longsa	947.77	691.71	73	256.06	27	+0.21
Yunchuchu	879.81	668.66	76	211.15	24	-6.97
Sunglup	901.1	747.91	83	153.19	17	-4.72
Bhandari	1023.02	859.34	84	163.68	16	+8.17
Female headed household	**924.82**	**730.61**	**79**	**194.21**	**21**	**1**
Longsa	963.29	770.63	80	192.66	20	+4.16
Yunchuchu	976.61	712.92	73	263.68	27	+5.6
Sunglup	936.42	795.95	85	140.47	15	+1.25
Bhandari	658.6	467.61	71	190.99	29	-28.79

Sources: Field Survey 2005-06.
FE: Food Expenditure.
NFE: Non-food Expenditure.

The village-wise data given in the table no. 4.2.3 and figure 13 (a) and (b) indicates that among the female headed households, Longsa, Yunchuchu and Sunglup villages exhibit higher monthly PCTE than the average of the female headed households by 4.16%, 5.6% and 1.25% respectively; while Bhandari village shows a lower monthly PCTE than the corresponding average by 28.79%. Furthermore, in regard to the allocation of monthly PCTE on food and non-food items among female headed households, Sunglup village spends highest percentage of PCTE on food items (85%), followed by Longsa village with 80%; both are higher than the percentage of the total

female headed household. On the other, Bhandari shows the lowest proportion with 71% followed by Yunchuchu with 73%.

Among the total male headed households, Longsa and Bhandari villages exhibit higher PCTE per month than the average of total male headed household by 0.21% and 8.17% respectively. On the other hand, Sunglup and Yunchuchu villages have monthly PCTE that is lower than the corresponding average by 4.72% and 6.97% respectively. Furthermore, among the male headed households, Bhandari spends highest percentage of monthly PCTE on food items with 84%, followed by Sunglup with 83%; both are higher than average of the total male headed household ofn73%. On the other extreme, Longsa has the lowest percentage with 73%. Whereas, Yunchuchu with 76% is equal to their average.

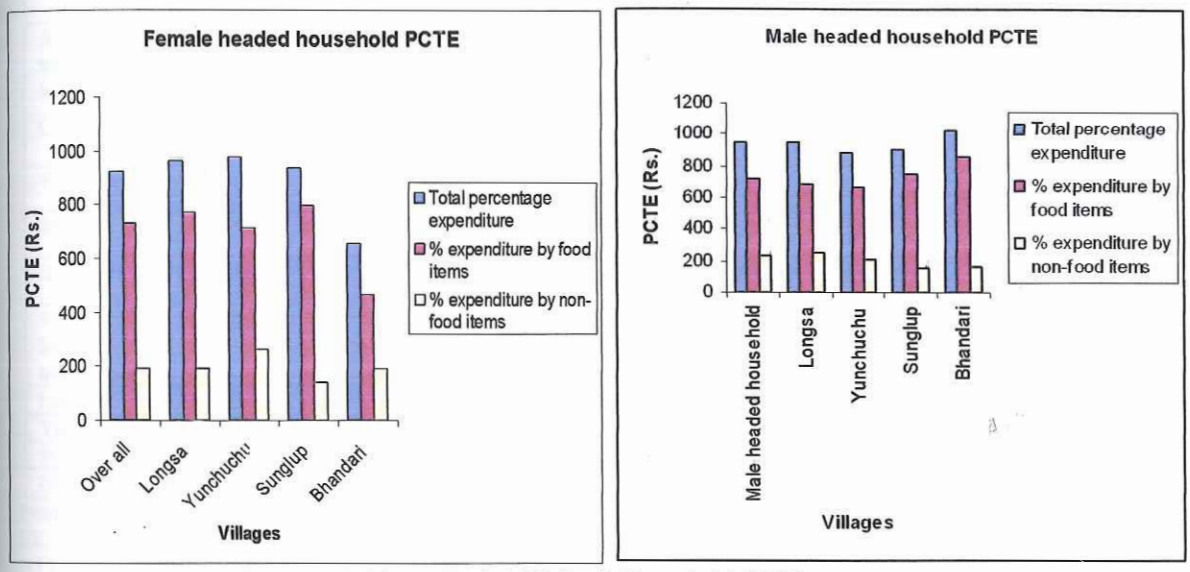


Figure 13: (a) Female headed households PCTE (b) Male headed households PCTE

From the above analysis, it follows that the female headed households in Sunglup and Longsa spend higher proportion of their monthly PCTE on food than male headed households, while in Bhandari and Yunchuchu, male headed household spend higher proportion of their monthly PCTE on food items than female headed households. On an average female headed household spend higher amount of money on food items than male headed household.

4.2.4: Decomposition of monthly PCTE by Occupation-wise Head of the Household:

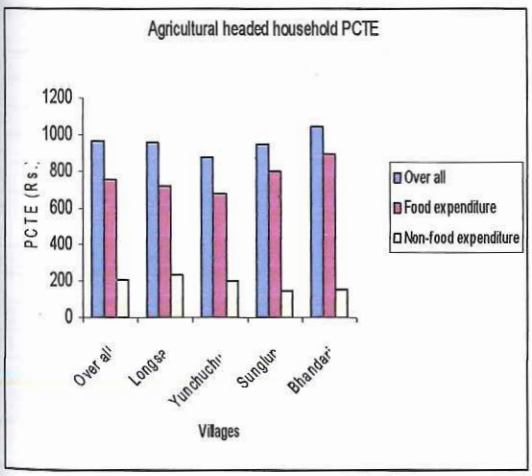
The variation in monthly PCTE among the agricultural and service headed households and their allocation pattern and food and non-food items are shown in table 4.2.4 and figure 14 (a) and (b). It can be seen that the average PCTE of Service headed household with Rs. 999.41 is higher than the average sample survey by 6.06%. The corresponding share of food and non- expenditure in PCTE is 74.46% and 25.54% respectively. The village-wise analysis indicates that among the

service headed households, Longsa exhibit higher monthly PCTE than the average of the service headed households by 2.49%, while Yunchuchu, Sunglup villages Bhandari village shows a lower monthly PCTE than the corresponding average by 2.2%, 5.68% and 13.24% respectively. Furthermore, in regard to the allocation of monthly PCTE on food and non-food items among service headed households, Sunglup village spends highest percentage of PCTE on food items (80.63%), followed by Sunglup, Yunchuchu and Longsa village with 71.98%, 70.69% and 70.55% respectively.

Table 4.2.4: PCTE by Occupation-wise Head of Household.

Selected category	Average PCTE (Rs.) (FE + NFE)	Share in PCTE by different items				Village wise % difference with the respective average
		share of FE		share of NFE		
		Average (Rs.)	(%)	Average (Rs.)	(%)	
Agricultural headed household	**961.12**	**756.02**	**78.66**	**205.1**	**21.34**	**1**
Longsa	959.7	723.13	75.35	236.57	24.65	-.14
Yunchuchu	878.43	677.71	77.15	200.72	22.85	-.8.6
Sunglup	948.92	799.09	84.21	149.83	15.79	-1.26
Bhandari	1046.42	893.75	85.41	152.67	14.59	+8.88
Service headed household	**999.41**	**744.16**	**74.46**	**255.25**	**25.54**	**1**
Longsa	1024.38	722.7	70.55	301.68	29.45	+2.49
Yunchuchu	977.07	690.69	70.69	286.38	29.31	-2.2
Sunglup	942.68	678.54	71.98	264.14	28.02	-5.68
Bhandari	867.12	699.16	80.63	167.96	19.37	-13.24

Sources: Field Survey 2005-06.
FE: Food Expenditure.
NFE: Non-food Expenditure.



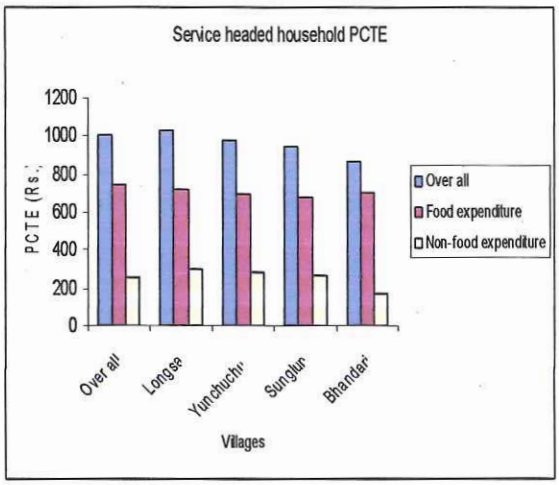


Figure 14 (a) Agricultural headed household PCTE (b) Service Headed household PCTE

The average PCTE of agriculture headed household with Rs. 961.12 is higher than the average sample survey by 1.96%. The corresponding share of food and non- expenditure in PCTE

is 78.66% and 21.34% respectively. Among the agricultural headed households, Bhandari village exhibit higher PCTE per month than the average agricultural PCTE by 8.88%. However, Longsa, Sunglup and Yunchuchu villages have monthly PCTE that is lower than the corresponding average by 0.14%, 1.26% and 8.6% respectively. Furthermore, among the agricultural headed households, Bhandari spends highest percentage of monthly PCTE on food items with 85.41%, followed by Yunchuchu with 84.21%, Yunchuchu with 77.15% and Longsa 75.35%. This shows that Longsa village has higher percentage of non-food expenditure in the average PCTE than other villages.

4.2.5: PCTE and family size:

Table 4.2.5 and figure 15 given below explains the relationship between PCTE and the size of family. It is shown here in the table that the size of family decreases as the average PCTE increases, giving us an inverse relation between the two. Table no 4.2.5 and figure 15 shows that the size of the family fluctuates across PCTE groups. By PCTE groups, the average size of the family is largest in the second group (601-700 PCTE) with 5.8 persons, which is followed by the fourth group (801-900 PCTE) with 4.5 persons, the third group (501-600 PCTE) with 4.35 persons and the fifth group (901-1000 PCTE) with 4 persons that is higher than the average size of the family (3.76 persons). On the other extreme, the eleventh group (1500 and above PCTE) has the smallest family size with 2.25 persons, which is followed by ninth group (1301-1400 PCTE) with 3 persons, the seventh group (1101-1200 PCTE) with 3.13 persons, the first group (0-600 PCTE) with 3.25 persons, the sixth group (1001-1100 PCTE) with 3.46 persons and the eight group (1201-1300 PCTE) with 3.63 persons. Thus on an average the size of the family declines as the PCTE goes up.

Table 4.2.5: PCTE and family size.

Sl No	PCTE group (Rs.)	Average family size (persons)	Average No. of children *	average no. of adult**	Average PCTE (Rs.)
1	0 - 600	3.25	1.75	1.5	526.99
2	601 - 700	5.8	1.6	4.2	652.31
3	701 - 800	4.35	1.93	2.42	745.94
4	801 - 900	4.5	1.81	2.69	842.92
5	901 - 1000	4	3	1	946.36
6	1001 - 1100	3.46	0.77	2.69	1067.39
7	1101 - 1200	3.13	0.25	2.88	1149.87
8	1201 - 1300	3.63	0.5	3.13	1240.11
9	1301 - 1400	3	1	2	1329.57
10	1401 - 1500	4	1.75	2.25	1429.49
11	1500 and above	2.25	0.25	2	1429.49

Sources: Field Survey 2005-06.
* Persons under 15 years of age.
** Persons 15 years and above.

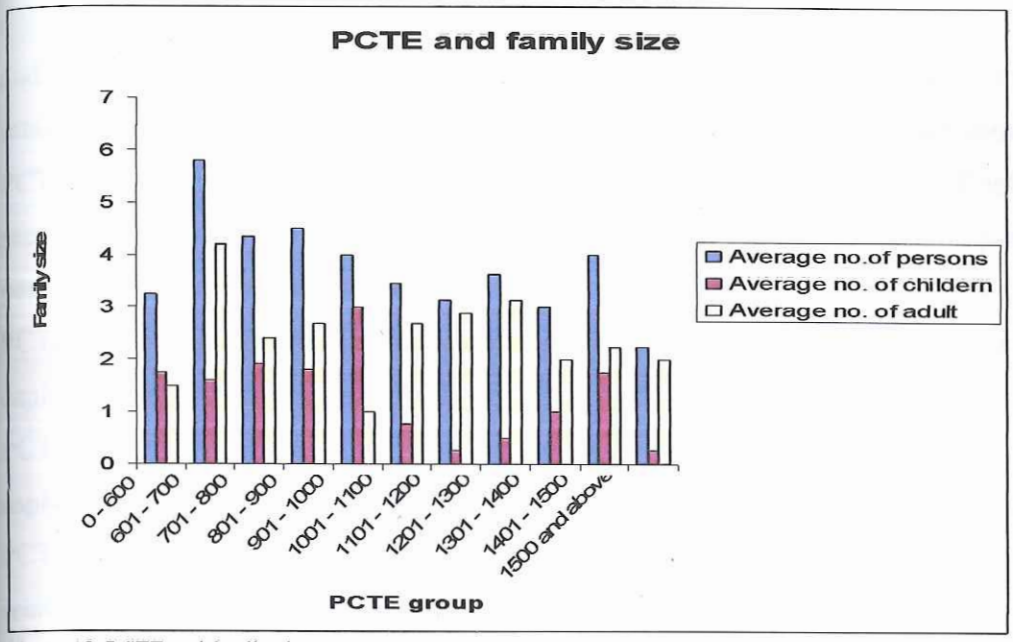


Figure 15: PCTE and family size.

This relationship can be ascertained by looking at the correlation between the two variables.

r = -0.57

Thus from the correlation (r) between the two, it shows that there is an inverse relation between family size and the PCTE. It means that smaller the size of the family higher is the expenditure on food and non-food items. However, it is observed that its coefficient of determinant (r^2) is 0.32, which indicates that the explained variance is 32%. In otherwords, only 32% of the changes in family size are due to changes in PCTE. The negative correlation coefficient is, therefore, not statistically significant as its r value is less than its probable error with 0.14.

4.2.6: Monthly PCTE and Average Calorie Intake:

Since PCTE is the best measure of poverty than income as provided from the data, it is important to examine the relationship between the monthly PCTE and average calorie intake per day. The monthly PCTE is used as a proxy of income.

Table 4.2.6: Average calorie intake and Monthly PCTE for different PCTE group.

Sl No	PCTE group (Rs.)	Monthly PCTE (Rs.)	Average calorie (Kcal)
1	0 - 600	526.99	1826.27
2	601 - 700	652.31	1950.71
3	701 - 800	745.94	2139.71
4	801 - 900	842.92	2154.46
5	901 - 1000	946.36	2711.33
6	1001 - 1100	1067.39	2884.94
7	1101 - 1200	1149.87	2898.11
8	1201 - 1300	1240.11	3151.26
9	1301 - 1400	1329.57	3443.7
10	1401 - 1500	1429.49	2931.2
11	1500 and above	1429.49	3338.92

Sources: Field Survey 2005-06.

The data on monthly PCTE and average calorie intake per day are shown in table no. 4.2.6 and figure 16. Here one could clearly see that as the level of PCTE goes up, the average calorie intake also increases in the same direction. The data in the table and figure shows that the lowest PCTE group are having a per capita consumption of calorie at 1826.27 Kcal per day, for the second PCTE group it is 1950.71 Kcal per capita per day, the third PCTE group have 2139.71 Kcal per capita per day, for the fourth PCTE group it is 2154.71 Kcal per capita per day, for the fifth PCTE group it is 2711.33 Kcal per capita per day, for the sixth PCTE group it is 2884.94 Kcal per capita per day, for the seventh PCTE group it is 2898.11 Kcal per capita per day, for the eighth PCTE group it is 3151.26 Kcal per capita per day, for the ninth PCTE group it is 3443.7 Kcal per capita per day, for the tenth PCTE group it is 2931.2 Kcal per person per day and for the highest PCTE group (eleven group) it is 3338.92 Kcal per person per day. Thus from the average it can be seen that the average calorie intake goes on increasing along with the PCTE group till the ninth PCTE group. Then there is a slight fall in per capita calorie intake in the tenth PCTE group. But in general the per capita calorie intake shows a rising trend as the PCTE group goes up. This means that higher the PCTE higher is the calorie intake per person. Thus, there is a positive relation between PCTE and per capita calorie intake. So the proposition that higher the income, higher is the calorie intake appears to be true once we take PCTE as the real income of the people.

To examine the relationship between monthly PCTE and average calorie intake per day, their correlation coefficient (r) have been worked out as follows,

$r = 0.94$

This implies that there is a high positive relationship between per capita monthly expenditure and per capita calorie intake. In other words, people with higher PCTE take more calories. It is observed that its coefficient of determinant (r^2) is 0.88, which indicates that the explained variance is 88%. In otherwords, 88% of the changes in per capita calorie intake is due to changes in PCTE. The positive correlation coefficient is highly significant as its r value is 39.83 times greater than its probable error of 0.023. To measure the effect on per capita calorie intake from a change in monthly PCTE has been analysed through simple regression method.

$$Y = 1642.74 + 1.7X$$

Where, y is the per capita calorie intake per day and x is the monthly per capita expenditure (PCTE). This result shows that the regression coefficient 'byx' of Y on X is 1.7 and the intercept 'a' is 1642.72. The positive value of the regression coefficient indicates that the relation between y and x is direct. This shows that a unit change in the PCTE (X) will have an impact on per capita

calorie intake of the people (Y) by 1.7 times. The standard error estimate is 201.28, which indicates the likely error in the estimated values of Y.

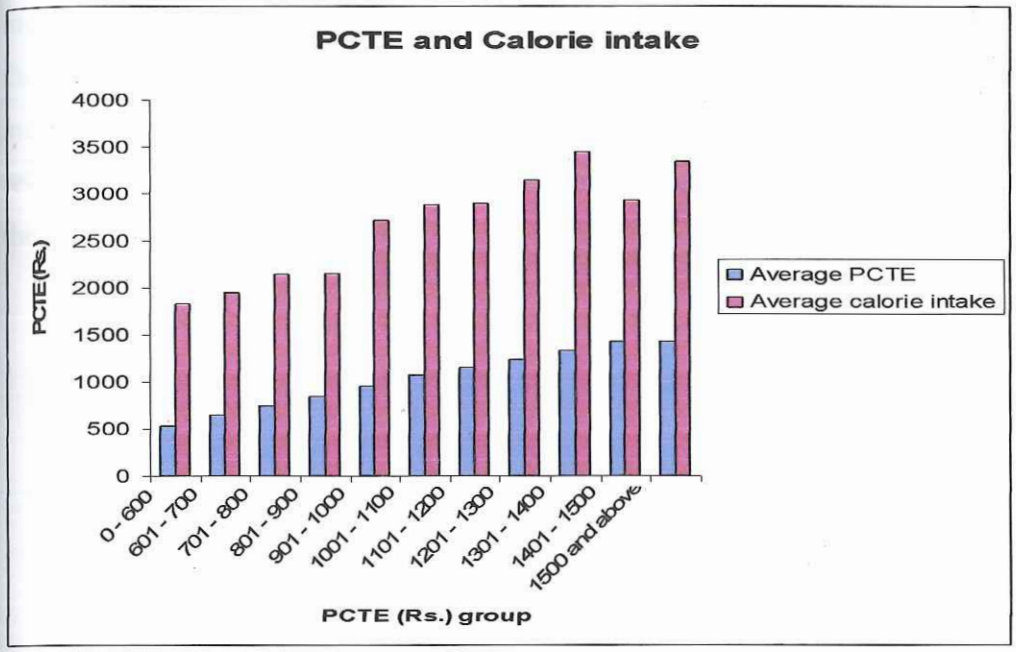


Figure 16: PCTE and Calorie intake.

The regression line is shown by figure 17.

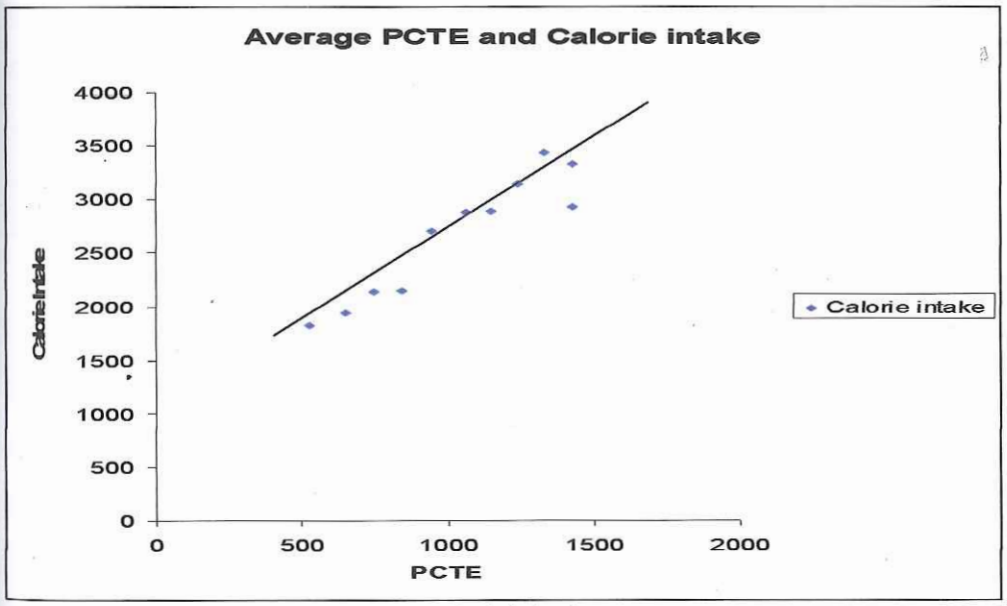


Figure 17: Regression line of average PCTE and calorie intake.

In conclusion, we see that the average sample population calorie intake is higher than the rural calorie norms of the State and Nation. The assessment on calorie intake also shows that on an average the calorie intake rose with the age. However, sex-wise calorie intake shows that female calorie intake is higher on an average. Among the heads of family by sex, it is shown that female

headed household do better in terms of calorie intake. But calorie intake and the size of the family are inversely related. The assessment on PCTE of the sample population shows that the Per capita monthly expenditure for the sample survey is higher than the National rural PCTE but lower than the State rural PCTE. The result also shows that 77% of the Total consumption expenditure is made on food items. The relation between PCTE and family size shows an inverse relation. On the relation between income/PCTE and calorie intake, the result shows a very high relation between the two.

CHAPTER V

MEASUREMENT OF POVERTY AND INEQUALITIES

Poverty can be defined as 'in a given society when one or more person fail to attain a level of economic well being considered to be a reasonable minimum by the society'. Poverty has various manifestations, including lack of income and productive resources to ensure sustainable livelihoods; hunger and malnutrition; ill-health; limited or lack of access to education and other basic services; increased morbidity and morality from illness; homelessness and inadequate housing and unsafe environments. It occurs in all countries: as mass poverty in many developing countries, loss of livelihoods as a result of economic recession, sudden poverty as a result of disaster or conflict, the poverty of low-wage workers, and the utter destitution of people who fall outside family support systems, institutions and safety nets[67]. In India the culture of poverty has got transmitted from generation to generation. Poverty here is not a pathological deviation from the normal and normative but the state of affairs and the set of conditions under which the overwhelming majority of the people are compelled to live. Thus, poverty has been a major issue in the formulation of development policy as well as one of the most debated topics in Indian academic circles. Hence, estimating the extent of poor and inequalities in a given society becomes vital in formulating suitable pro-poor policies. Recent quantitative assessment of poverty distinguishes between absolute and relative poverty. In absolute standards, minimum physical quantities of cereals, pulse, milk, etc. are determined for a subsistence level and then the price quotations convert into physical quantities monetary terms. Aggregating all the quantities are expressed in terms of per capita consumer expenditure. The population, whose incomes (expenditure) are below the figure, is considered to be below the poverty line. According to relative standard, income distribution of the population in different sub-groups is estimated and a comparison of the level of living of the top 5 to 10 percent with the bottom 5 to 10 percent of the population is made, which reflect the relative standard of poverty[68]. However, to measure the extent of poverty it is pertinent to know who is poor. Thus, defining poverty line becomes the first step in measuring poverty.

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[67] Gordon, G. (2000), 'Measuring Absolute and Overall Poverty', in D. Gordon and P. Townsend (eds.), *Breadline Europe: The Measurement of Poverty*, p 49-50.
[68] Ibid 8.

In this section the estimated poverty line of India and the sample survey poverty line are used for measuring the extent of poverty and inequalities that existed among the sample population.

5.1: POVERTY LINE:

Poverty line serves as a cut-off line for separating the poor from non-poor, given the size of population by per capita consumer expenditure classes. Thus, a poverty line dividing the poor from non-poor is used by putting a price on the minimum required consumption levels of food, clothing, shelter, fuel and health care, etc. In other words, to work out the monetary counterpart or equivalently, poverty lines of calorie norms are converted to monthly per capita expenditure using appropriate conversion factors[69]. In India, the derivation of the minimum normative absolute living standard or poverty line is based on the calorific norms and per capita monthly expenditure (PCTE). The national aggregate daily calorie requirement is calculated by summing up the nutritional intake across all individuals. The average calorie intake is then calculated by dividing the national aggregate of daily calorie intake with the total population. Thus, the minimum nutritional norm for the sample population is arrived at by calculating the average calorie intake of the sex and age group. Then, the cost/expenditure of the normative calorie requirement is worked out, which yield a poverty norm that could be called starvation line or food energy requirement[70]. However, in deriving the poverty line, the average expenditure of the households on both food and non-food items are calculated. Thus, the Indian poverty line captures both the normative calorie intake and the expenditure on food and non-food items. To convert this to per capita amount, the household expenditure on food and non-food items are divided by the number of person in each household, this gives the per capita total expenditure, or the PCTE or the poverty norms[714]. Hence, to measure the extent of poverty, poverty lines of the sample survey and the national estimate given in the tables Table 5.1 (a) are used. From the table below it is evident that the per capita calorie intake fixed by the NSSO at the National level is 2047, which is higher than the State level of 2044 but lower than the sample estimate by 394.92 Kcal in the rural areas.

Table 5.1 (a): Calorie Norms.

Group	Calorie Intake Per day (Kcal) Rural areas
*National (2004-05)	2047
*Nagaland State (2004-05)	2044
Sample Estimate (2005-06)	2441.92

Sources:* NSSO, report 513 and Field Survey 2005-06.

[69] Ibid 64.
[70] Ibid 2.

[71] Ibid 7.

The NSSO and the Sample survey estimates of Poverty line for rural areas based on PCTE are given in the table below.

Table 5.1 (b): Poverty line through PCTE.

Group	PCTE (Rs.) for Rural areas
*National 2004-05	558.78
*State 2004-05	1010.81
From the estimate for 2005-06	942.60

Sources: *NSSO, report 508 and Field Survey 2005-06.

From the table it is clear that the NSSO estimates of Nagaland PCTE is higher than the National level PCTE. That is, for Nagaland poverty line has been fixed at Rs. 1010.81 per person per month and National level is Rs. 558.78 as per the report of 2004-05. However, sample survey estimate shows a PCTE of Rs. 942.66, which is lower than the State level but higher than the National level.

5.2: MEASUREMENT OF POVERTY:

From the sample data poverty has been measured at village level, gender-wise, sex-wise head of the family and occupation-wise head of the household in the rural area using both calorific norms and the PCTE. The extent of absolute poverty is measured using tools such as Head Count Ratio, Poverty Gap Ratio, Foster Greer and Thorbecke and Sen Index. *Head Count Ratio (HCR),* this method measures the proportion of the population who are deficient in calorie intake/income. In other words, this measure shows the number of persons that are in poverty or below the calorie norms/poverty line. However, one drawback of this index is that it is highly insensitive to the extent of the aggregate short fall of the calorie intake/income from the calorie norms/poverty line as well as to the distribution of calorie intake/income amongst the poor. *Calorie Gap Ratio (PG),* This is an indicator, which measures the depth of poverty. It depends on the distance of the poor below the calorie norm/poverty line. In other words, by how much the poor are falling short of the calorific norm/income is explained by this measure. Thus, it takes care of the aggregate shortfall of the calorie intake/income from the calorie norms/poverty line. One drawback of the poverty gap measure is that it ignores the number actually in poverty. *Sen Index (P),* This index takes care of the proportion of person below their calorie norms/poverty line and the calorie/income short fall of the poor people. This measure is used to find out the number of poor falling below the calorie norms/poverty line. One serious limitation of Sen Index is it is not decomposable. The poverty index suggested by Foster, Greer and Thorbecke takes care of this problem. *Foster, Greer and Thorbecke Measure (P^F),* this index measure the severity of calorie/income deficiency, as it gives a higher weight to those who are most deprived – whose calorie intake/income are far below the

calorie norms/poverty line. Thus, this measure shows the percentage of the most deprived person in a society.

5.2:1: Measuring Poverty through Calorie Intake:

To arrive at the average nutritional intake of the sample population, the data on household consumption of various food items were collected from four villages of Wokha district in 2005-06. The minimum nutritional norm for the sample population is arrived at by calculating the average calorie intake of the sex and age group. Thus, the rural average calorie norms of NSSO 61st round for the Nation and State and the Sample survey average are used to measure the calorie deprivation among the sample population. The resultant figures of the analysis are given in table No. 5.2.1.

Table: 5.2.1: Measuring Poverty through Calorie Norms.

Category	Head Count Ratio (HCR)			Poverty Gap (PG)			Sen Index (P)			Foster, Greer and Thorbecke (P^F)		
	1	2	3	1	2	3	1	2	3	1	2	3
Sample population	.2875	.2875	.4606	.1001	.0997	.1449	.0765	.0764	.1159	.0592	.0591	.0779
Gender-wise												
Male	.3081	.3081	.4826	.1010	.1007	.1563	.0801	.0799	.1240	.0582	.0581	.0839
Female	.2805	.2805	.4479	.0986	.0984	.1405	.0789	.0787	.1124	.0605	.0604	.0778
Village-wise												
Longsa	.2973	.2973	.4633	.1060	.1057	.1534	.0846	.0844	.1209	.0651	.0650	.0861
Yunchuchu	.2857	.2857	.5476	.1338	.1336	.1744	.1039	.1037	.1354	.0790	.0789	.1008
Sunglup	.2105	.2105	.2895	.0457	.0455	.0762	.0577	.0575	.0687	.0160	.0159	.0305
Bhandari	.3148	.3148	.4815	.0720	.0717	.1293	.0586	.0584	.1006	.0351	.0350	.0546
Range-wise												
Upper	.2973	.2973	.4633	.1060	.1057	.1534	.0846	.0844	.1209	.0651	.0650	.0861
Middle	.25	.25	.45	.0918	.0916	.1274	.1197	.1195	.1852	.0498	.0496	.0674
Lower	.3148	.3148	.4815	.0720	.0717	.1293	.0586	.0584	.1006	.0351	.0350	.0546
Sex-wise head of household Male headed family	.3035	.3035	.4601	.1202	.1111	.1558	.0834	.0832	.1228	.0667	.0665	.0865
Female headed family	.1875	.1875	.4375	. 0569	. 0568	.1009	.0475	.0473	.0842	.0306	.0305	.0446
Occupation-wise head of household Service	.2704	.2704	.4654	.0823	.0821	.1296	.0701	.0698	.1104	.0442	.0441	.0888
Agricultural	.3034	.3034	.4531	.1127	.1124	.1550	.0878	.0876	.1209	.0696	.0694	.0886

Source: Annexure II

1 – Calorie Norms of 2047 Kcal per person per day (National Norms)

2 – Calorie Norms of 2044 Kcal per person per day (State Norms)

3 – Calorie Norms of 2441.92 Kcal per person per day (Sample Survey Norms)

(a) Sample Population:

From the table it is seen that Head Count Ratio (HCR) based on 2047 Kcal and 2044 Kcal cutoff are the same and is 28.75%. This means that 28.75% of the sample population are poor or are living below the calorie norms. Whereas, the HCR based on 2441.92 Kcal cutoffs shows a

higher percentage of poor for the sample population with 46.06%. This percentage of poor is higher than the number of poor estimated using the National and State calorie norms by 17.57%.

The calorie gap ratio based on 2047 Kcal is 10.01% per poor person for the sample population. This means that every poor person is falling short of the calorie norm by 204.9 Kcal. In other words, to support every poor person at the calorie requirement level, 204.9 of calorie intake is needed per poor person. However, calorie gap ratio based on 2044 Kcal cutoff shows a lower percentage of 9.97% per poor person for the sample population. This means that every poor person is falling short of the calorie norm by 203.79 Kcal. Whereas, the calorie gap ratio based on 2441.92 Kcal cutoffs shows a higher calorie deprivation for the sample population with 14.49% per poor person. It means to support every poor person at the calorie norms, calorie intake of 353.83 Kcal per poor person is required. Thus, calorie gap ratio based on 2441.92 Kcal shows a deeper calorie deprivation than the calorie gap ratio based on National and State norms by about (151 Kcal) 4.48% per poor person.

Sen Index (P) based on 2047 Kcal is 7.65% for the sample population. This means that 7.65% of poor amongst the poor are falling below their average calorie norm. Whereas, Sen Index based on 2044 Kcal cutoff shows that 7.64% of poorest amongst the poor are falling below their average calorie norm. However, the P based on 2441.92 Kcal cutoffs shows a higher extent of calorie deprivation with 11.59% of poorest amongst the poor falling below their calorie norm. Thus, P based on 2441.92 Kcal shows a higher percentage of poorest amongst the poor than the P based on National and State norms by about 3.95%.

The estimation of Foster, Greer and Thorbecke (P^F) based on 2047 Kcal cutoff reveals that the severity of calorie deprivation among the sample population is 5.92% for the poorest among the poor. This means that 5.92% of the poorest among the poor are far below the calorie norms. In other words, the severity of calorie inadequacy falls on 5.92% of the poorest among the poor among the sample population. The analysis of P^F based on 2044 Kcal cutoff shows that 5.91% of the poorest among the poor are far below the calorie norms. However, the P^F based on 2441.92 Kcal cutoff shows that calorie inadequacy is more severe with 7.79%. It means 7.79% of the poorest among the poor among the sample population are far below the calorie norms. Thus, P^F based on 2441.92 Kcal shows a more severity in calorie inadequacy than the P^F based on National and State norms by about 2.37% for the poorest among the poor.

(b) Gender-wise:

The Gender-wise analysis of HCR base on 2047 Kcal and 2044 Kcal cutoff shows that, male (30.81%) have a higher percentage of poor than female (28.05%) by 2.76%. The estimation

of HCR using 2441.92 Kcal cutoff shows that the percentage of poor for male is 48.26% while for female, it is 44.79% of poor population.

Calorie gap ratio estimates based on 2047 Kcal for male and female shows that male have higher ratio of 10.10% than female ratio of 9.86%. It means that to place every poor person at the calorie norms, calorie intake of 206.75 Kcal per poor person and 201.83 Kcal per poor person respectively, is required by male and female poor population. However, calorie gap ratio based on 2044 Kcal cutoff shows a lower percentage for both male and female population. The figures in the table show that male calorie gap is (205.83 Kcal) 10.07% per poor person and female calorie gap is (201.12 Kcal) 9.84% per poor person. Whereas, the calorie gap ratio based on 2441.92 Kcal cutoff shows a higher calorie deprivation for both male and female population with 15.63% and 14.05% per poor person respectively. On comparison between male and female calorie gap ratio based on different calorie norms, it is seen from the table that the calorie gap ratio of male is higher than female across different calorie norms.

Gender-wise Sen Index based on 2047 Kcal shows that male have higher percentage of poor amongst the poor than female. The result of the analysis shows that male has 8.01% of poor amongst the poor falling below their calorie norm, while female have 7.89% of poor amongst the poor falling below their calorie norm. The estimation of P based on 2044 Kcal cutoff shows a similar result with small difference. The figure in the table indicates that male have 7.99% of poor amongst the poor whose calorie intake are falling below their calorie norm that is slightly higher than female percentage of 7.87%. However, P based on 2441.92 Kcal cutoff shows that male population have 12.40% of poor amongst the poor falling below their calorie norm, while female have 11.24% of poor amongst the poor falling below their calorie norm. The comparison between male and female Sen Index based on different calorie norms show that Sen Index of male is higher than female across different calorie norms.

The estimation of Foster, Greer and Thorbecke (P^F) based on 2047 Kcal shows that gender-wise calorie deprivation is more severe for female population than male population. The result of the analysis shows that the severity of calorie inadequacy falls on 6.05 % of the poorest among the poor for female population, while it is 5.82% of the poorest among the poor for male population. The estimation of P^F based on 2044 Kcal shows that, calorie inadequacy for both male and female is 5.81% and 6.04% of the poorest among the poor respectively. However, P^F based on 2441.92 Kcal cutoff shows a higher calorie inadequacy than the result based on National and State calorie norms. It can be seen from the table that severity of calorie inadequacy falls on 8.39% of the poorest among the poor for male population, while it is 7.78% for the female population. The

comparison between male and female P^F based on different calorie norms show that P^F of female is higher than male at lower calorie norms calorie norms but lower at the higher calorie norms.

(c) Village-wise:

The village-wise HCR estimate based on 2047 Kcal and 2044 Kcal cutoff shows that, Bhandari has the highest percentage of poor with 31.48%, followed by Longsa with 29.73% and Yunchuchu with 28.57%. Sunglup with 21.05% exhibits the lowest percentage of poor. However, the estimation of HCR based on 2441.92 Kcal cutoffs indicates a higher proportion of poor among the sample population. Among the villages, Yunchuchu with 54.76% has the highest proportion of population living below the calorie norms. This is followed Bhandari with 48.15% and Longsa with 46.33%. Sunglup shows the lowest proportion of poor with 28.95%. The use of different calorie norms influences the magnitude of head count ratio. On an average, HCR based on 2441.92 Kcal cutoff are higher by 17.57% than HCR computed using 2047 Kcal and 2044 Kcal. It may be noted that, among the villages, Bhandari exhibits the highest percentage of poor when measured using National and State calorie norms. However, using the sample calorie norms, it is found that Yunchuchu has the highest percentage of poor.

The estimation of calorie gap ratio based on 2047 Kcal cutoff shows that, among the villages, the depth of calorie deprivation is highest in Yunchuchu with (273.89 Kcal) 13.38% per poor person, this followed by Longsa with (216.98 Kcal) 10.6% per poor person and Bhandari with (147.38 Kcal) 7.20% per poor person. Sunglup with (93.55 Kcal) 4.57% per poor person exhibits the lowest calorie deprivation among the villages. The calorie gap ratio estimates based on 2044 Kcal cutoff shows similar result to that of the analysis based 2047 calorie norms but lower ratio. It can be seen from the table that the depth of calorie deprivation is highest in Yunchuchu with (273.09 Kcal) 13.36% per poor person, followed by Longsa with (216.05 Kcal) 10.57% per poor person and Bhandari with (147.17 Kcal) 7.17% per poor person. Sunglup with (93 Kcal) 4.55% per poor person exhibits the lowest calorie deprivation among the villages. However, the estimation of calorie gap ratio based on 2441.92 Kcal cutoffs indicates a higher calorie deprivation among the sample population. Among the villages, Yunchuchu with (433.19 Kcal) 17.44% per poor person shows the highest shortfall of calorie norms. This is followed by Longsa with (374.59 Kcal) 15.34% per poor person and Bhandari with (315.74 Kcal) 12.93% per poor person. Sunglup with (186.07 Kcal) 7.62% shows the lowest calorie deprivation among the villages. On comparison among different villages calorie gap ratio based on different calorie norms, it is seen from the table that the calorie gap ratio of Yunchuchu is higher than other villages across different calorie norms, while Sunglup exhibits lower gap than other villages.

The analysis of Sen Index (P) based on 2047 Kcal cutoff shows that, Yunchuchu with 10.39% exhibits the highest percentage of poor amongst the poor falling below their calorie norm. It is followed by Longsa with 8.46% and Bhandari with 5.86% of poor amongst the poor falling below their calorie norm. Sunglup with 5.77% of poor amongst the poor falling below their calorie norm exhibits the lowest percentage among the villages. The P estimates based on 2044 Kcal cutoff shows similar result to that of the analysis based 2047 calorie norms with small difference. It can be seen from the table that the extent of calorie deprivation is highest in Yunchuchu with 10.37% of poor amongst the poor falling below their calorie norm. It is followed by Longsa with 8.44% and Bhandari with 5.84% of poor amongst the poor falling below their calorie norm. Sunglup with 5.75% of poor amongst the poor falling below their calorie norm exhibits the lowest percentage among the villages. However, the estimation of P based on 2441.92 Kcal cutoffs indicates a higher percentage of poor amongst the poor falling below their calorie norm for the sample population. Among the villages, Yunchuchu with 13.54% have the highest percentage of poor amongst the poor falling below their calorie norm. This is followed by Longsa with 12.09% and Bhandari with 10.06% of poor amongst the poor falling below their calorie norm. Sunglup with 6.87% of poor amongst the poor falling below their calorie norm shows the lowest percentage among the villages. On comparison among different villages Sen Index based on different calorie norms, it is seen from the table that Sen Index of Yunchuchu is higher than other villages across different calorie norms, while Sunglup exhibits smaller Sen Index than other villages.

Estimation of Foster, Greer and Thorbecke (P^F) based on 2047 Kcal cutoff shows that, the calorie inadequacy is more severe in Yunchuchu with 7.9% for the poorest poor. It means 7.9% of the poorest among poor in Yunchuchu are far below the calorie norm. It is followed by Longsa with 6.51% and Bhandari with 3.51% of the poorest among the poor facing calorie inadequacy. Sunglup with 1.6% of the poorest among the poor facing calorie inadequacy exhibits the lowest severity of calorie deprivation among the villages. The P^F estimates based on 2044 Kcal cutoff shows a similar result to that of the analysis based 2047 calorie norms with small difference. It can be seen from the table that the severity of calorie deprivation is highest in Yunchuchu with 7.89% for the poorest among the poor. It is followed by Longsa with 6.50% and Bhandari with 3.50% of the poorest poor facing calorie inadequacy. Sunglup with 1.59% of the poorest among the poor facing calorie inadequacy exhibits the lowest severity of calorie deprivation among the villages. However, the estimation of P^F based on 2441.92 Kcal cutoffs indicates a higher severity of calorie deprivation among the sample villages. Among the villages, Yunchuchu with 10.08% of the poorest among the poor shows the highest percentage of severity in calorie deprivation. This is

followed by Longsa with 8.61% and Bhandari with 5.46% of the poorest among the poor facing calorie inadequacy. Sunglup with 3.05% of the poorest among the poor facing calorie inadequacy shows the lowest severity in calorie deprivation among the villages. Comparison the severity in calorie deprivation among different villages based on different calorie norms shows that Yunchuchu has higher inadequacy than other villages across different calorie norms, while Sunglup exhibits smaller calorie inadequacy than other villages.

(d) Range-wise:

Range-wise estimation of poverty is shown in the table no 5.2.1. From the table it is clear that the upper range is represented by Longsa village and lower range is represented by Bhandari village. Thus, the explanation given for these villages also represents their respective range. However, middle range is represented by two villages, viz, Yunchuchu and Sunglup.

The range-wise HCR estimate based on 2047 Kcal and 2044 Kcal cutoff shows that, middle range has the lowest percentage of poor with 25%. However, the estimation of HCR based on 2441.92 Kcal cutoffs indicates a higher proportion of poor among the sample ranges. Among the ranges, lower range with 48.15% has the highest proportion of population living below the calorie norms, while middle range with 45% of the people living below their calorie norms has the lowest percentage of poor. On comparison among different ranges HCR based on different calorie norms, it is seen from the table that middle range has the lowest proportion of poor among the ranges.

The estimation of calorie gap ratio based on 2047 Kcal cutoff shows that, among the ranges, the depth of calorie deprivation is highest in upper range with (216.98 Kcal) 10.6% per poor person followed by middle range with (187.63) 9.18%. Lower range with (147.38 Kcal) 7.20% per poor person exhibits the lowest calorie deprivation among the ranges. The calorie gap ratio estimates based on 2044 Kcal cutoff shows similar result to that of the analysis based 2047 calorie norms but lower ratio. It can be seen from the table that the depth of calorie deprivation is highest in upper range with (216.05 Kcal) 10.57% per poor person followed by middle range with (187.23) 9.16%. Lower range with (147.17 Kcal) 7.17% per poor person exhibits the lowest calorie deprivation among the ranges. However, the estimation of calorie gap ratio based on 2441.92 Kcal cutoffs indicates a higher calorie deprivation among the sample ranges. Among the ranges, upper range with (374.59 Kcal) 15.34% per poor person has the highest calorie deprivation, while middle range with (311.1) 12.74% shows the lowest calorie deprivation among the ranges. On comparison among different ranges calorie gap ratio based on different calorie norms, it is seen from the table that the calorie gap ratio of Upper range is higher than other ranges across different calorie norms.

The analysis of Sen Index (P) based on 2047 Kcal cutoff shows that, middle range with 11.97% exhibits the highest percentage of poor amongst the poor falling below their calorie norm. Lower range with 5.86% of poor amongst the poor falling below their calorie norm exhibits the lowest percentage among the ranges. The P estimates based on 2044 Kcal cutoff shows similar result to that of the analysis based 2047 calorie norms with small difference. It can be seen from the table that the extent of calorie deprivation is highest in middle range with 11.95% of poor amongst the poor falling below their calorie norm. Lower range with 5.84% of poor amongst the poor falling below their calorie norm exhibits the lowest percentage among the ranges. However, the estimation of P based on 2441.92 Kcal cutoffs indicates a higher percentage of poor amongst the poor falling below their calorie norm for the sample ranges. Among the ranges, middle range with 18.52% has the highest percentage of poor amongst the poor falling below their calorie norm. Lower range with 10.06% of poor amongst the poor falling below their calorie norm shows the lowest percentage among the ranges. On comparison among different ranges Sen Index based on different calorie norms, it is seen from the table that Sen Index of middle range is higher than other ranges across different calorie norms.

Estimation of Foster, Greer and Thorbecke (P^F) based on 2047 Kcal cutoff shows that, the calorie inadequacy is more severe in upper range with 6.51% of the poorest among the poor facing calorie inadequacy. It is followed by middle range with 4.99% and lower range with 3.51% of the poorest among the poor facing calorie inadequacy. The P^F estimates based on 2044 Kcal cutoff shows a similar result to that of the analysis based 2047 calorie norms with small difference. It can be seen from the table that the severity of calorie deprivation is highest upper range with 6.50%. It is followed by middle range with 4.97% and lower range with 3.50% of the poorest among the poor facing calorie inadequacy. However, the estimation of P^F based on 2441.92 Kcal cutoffs indicates a higher severity of calorie deprivation among the sample ranges. Among the ranges, upper range with 8.61% of the poorest among the poor shows the highest percentage of severity in calorie deprivation. This is followed by middle range with 6.74% and lower range with 5.46% of the poorest among the poor facing calorie inadequacy. Comparing the severity in calorie deprivation among different ranges based on different calorie norms shows that upper range has higher inadequacy than other ranges across different calorie norms, while lower range exhibits smaller calorie inadequacy than other ranges.

(e) Sex-wise head of household:

Sex-wise head of household estimation of HCR based on 2047 Kcal and 2044 Kcal cutoff shows that the proportion of poor is higher in male headed family than female headed family. The

table shows that 30.35% of the population in male headed family is below the calorie norms, while female headed family has 18.75% of poor people. The estimation of HCR using 2441.92 Kcal cutoff shows an increase in magnitude of poor but lesser difference in the proportion of poor between male and female headed family. The proportion of poor for male headed family is 46.01%, while it is 43.75% for the female headed family. Thus, it is clear that male headed family have higher proportion of poor across different calorie norms.

The analysis of calorie gap ratio based on 2047 Kcal cutoff shows that the depth of calorie deprivation is higher in male headed family than female headed family. Table No. 5.2.1 shows that the depth of calorie deprivation in male headed family is 12.02% per poor person, while it is 5.69% per poor person for female headed family. It means to help every poor person at the calorie norms, calorie intake of 246.05 Kcal and 116.47 Kcal per person is required by the poor population of male headed family and female headed family respectively. However, calorie gap ratio based on 2044 Kcal cutoff shows a lower percentage for both male and female headed family. The figures in the table shows that male headed household has calorie gap of (227.09 Kcal) 11.11% per poor person while it is (116.09 Kcal) 5.68% per poor person for female headed household. The estimation of calorie gap ratio using 2441.92 Kcal cutoff shows an increase in the depth of calorie deprivation in both male and female headed family. The calorie short fall of the population in male headed family is 15.58% per poor person, while it is 10.09% per poor person in female headed family. On comparison between male and female headed calorie gap ratio based on different calorie norms, it can be seen that calorie gap ratio of male headed household is higher than female headed household.

Estimation of P based on 2047 Kcal cutoff shows that the percentage of poor amongst the poor falling below their calorie norm in male headed family is 8.34%, while it is 4.75% for the female headed family. Sen Index based on 2044 Kcal cutoff shows that male headed household has 8.32% of poor amongst the poor falling below their calorie norm, while it is 4.73% female headed household. However, Sen Index based on 2441.92 Kcal cutoff shows that the percentage of poor amongst the poor falling below their calorie norm in male headed family is 12.28%, while it is 8.42% for the female headed family. On comparison between male and female headed Sen Index based on different calorie norms, it can be seen that Sen Index of male headed household is higher than female headed household.

The estimation of P^F based on 2047 Kcal cutoff shows that the severity of calorie deprivation in male headed family is 6.67% for the poorest poor, while it is 3.06% for the poorest poor of the female headed family. The result of P^F based on 2044 Kcal cutoff shows similar result

with 6.65% of the poorest poor facing calorie deficiency by male headed family, while 3.05% of the poorest poor in female headed family are facing calorie deficiency. However, the estimation of calorie inadequacy using 2441.92 Kcal cutoff shows an increase in the severity of calorie deprivation in both male and female headed family. The calorie inadequacy in male headed family is 8.65% for the poorest poor, while it is 4.46% for the poorest poor in female headed family. On comparison between male and female headed family P^F based on different calorie norms, it was found that calorie deficiency is higher in male headed family than female headed family.

(f) Occupation-wise head of household:

The estimation of HCR based on 2047 Kcal and 2044 Kcal cutoff shows that the proportion of poor is higher in the household headed by agriculturalist than the services. From the table it is seen that the household headed by agriculturalist have 30.34% of its population below the calorie norms, whereas, those household headed by service have 27.04% of its population below the calorie norm. However, the estimation of HCR based on 2441.92 Kcal cutoffs indicates that the service headed family has higher proportion of poor population with 46.54% than the agricultural headed family with 45.31% of poor population.

The analysis of calorie gap ratio based on 2047 Kcal cutoff shows that agriculturalist have higher gap of 11.27% than the services with 8.23%. Thus, the depth of calorie deprivation for household headed by agriculturalist is 230.69 Kcal per poor person, while it is 168.47 Kcal per poor person for households headed by service. The estimation of calorie gap ratio based on 2044 Kcal cutoff shows a lower percentage for the household headed by agriculturalist and service. The figures in the table show that calorie gap is (229.75 Kcal) 11.24% and (167.81 Kcal) 8.21% per poor person for agricultural and service headed household respectively. However, the calorie gap ratio based on 2441.92 Kcal cutoff shows a higher ratio than the result based on National and State calorie norms. The calorie short fall is 12.96% per poor person for the household headed by service, while it is 15.50% in agricultural headed household. On comparison between service and agricultural headed calorie gap ratio based on different calorie norms, it is found that calorie gap ratio of the agricultural headed household is higher than the service headed household.

The estimation of Sen Index (P) based on 2047 Kcal cutoff shows that agricultural headed family have higher percentage of poor amongst the poor falling below their calorie norm with 8.78% than the service headed family with 7.01%. The estimation of Sen Index based on 2044 Kcal cutoff shows that 8.76% and 6.89% of the poor amongst the poor agricultural headed household and service headed household respectively are falling short of their calorie norms. However, the Sen Index based on 2441.92 Kcal cutoff reveals that the percentage of poor amongst

the poor falling below their calorie norm in agricultural headed family is 12.09%, while it is 11.04% for the service headed family. The comparison between service and agricultural headed Sen Index based on different calorie norms reveal that percentage of poor amongst the poor is higher in agricultural headed household than the service headed household.

The analysis of P^F based on 2047 Kcal cutoff shows that severity of calorie deprivation is higher in agricultural headed family than the service headed family. It can be seen from the table that severity of calorie inadequacy falls on 6.96% of the poorest among the poor for the agricultural headed family, while it is 4.42% for the service headed family. The estimation of P^F based on 2044 Kcal cutoff shows that 6.94% and 4.41% of the poorest among the poor for the agricultural headed household and service headed household respectively are facing calorie inadequacy. However, the P^F based on 2441.92 Kcal cutoff shows a higher calorie deprivation than the result based on National and State calorie norms. The percentage of the poorest among the poor facing calorie inadequacy in agricultural headed family is 8.86%, while it is 8.88% for the service headed family. The comparison between service and agricultural headed household in the severity of calorie deprivation based on different calorie norms reveal that percentage of the poorest among the poor is higher in agricultural headed household than the service headed household when the calorie norm is 2044 Kcal and 2047. But in 2441.92 Kcal norms, percentage of the poorest among the poor is higher in service headed household than the agricultural headed household.

Thus, it is seen that the use of different calorie norms influence the magnitude of Head Count Ratio, Calorie Gap, Sen index and Foster, Greer and Thorbacke measures. It is clear from the above explanation that the extent, depth and severity of calorie deprivation is lower, when the estimation is based on State and National calorie norms. Whereas, the estimation based on sample survey norms show a higher deprivation among the selected category.

5.2.2: Measuring Poverty through PCTE:

The PCTE or the poverty line is arrived at by dividing the household expenditure on both food and non-food items by the number of person in each household. Thus, in measuring the poor among the sample population, the estimation of PCTE by NSSO and the sample survey are used. The resultant figures of the analysis are given in the following table No. 5.2.2.

Table 5.2.2: Measuring Poverty through PCTE.

Category	Head Count Ratio (HCR)			Poverty Gap (PG)			Sen Index (P)			Foster, Greer and Thorbecke (P^F)		
	1	2	3	1	2	3	1	2	3	1	2	3
Sample population	.0204	.6718	.5954	.0013	.1382	.1009	.0011	.1189	.0868	.00013	.0522	.042
Gender-wise												
Male	.0116	.686	.6279	.00004	.1398	.1012	.00004	.1219	.0882	.000002	.0349	.0219
Female	.0271	.6606	.5701	.0019	.1369	.1006	.0016	.1181	.0868	.000023	.0366	.0242
Village-wise												
Longsa	.0309	.6216	.5792	.0019	.1421	.1078	.0058	.1209	.0919	.000206	.0393	.0263
Yunchuchu	0	.7381	.5714	0	.1313	.0874	0	.1195	.0796	0	.0283	.0159
Sunglup	0	.8947	.7632	0	.1339	.0846	0	.1222	.0775	0	.0268	.0144
Bhandari	0	.5741	.5741	0	.2112	.0883	0	.1048	.0765	0	.0311	.0199
Range-wise												
Upper	.0309	.6216	.5792	.0019	.1421	.1078	.0058	.1209	.0919	.000206	.0393	.0263
Middle	0	.8125	.6625	0	.1325	.0863	0	.1929	.1386	0	.0276	.0152
Lower	0	.5741	.5741	0	.2112	.0883	0	.1048	.0765	0	.0311	.0199
Sex-wise head of household	.0192	.6613	.5879	.00079	.1355	.0985	.0028	.1172	.0854	.00003	.0349	.0225
Male headed family												
Female headed family	.025	.7125	.625	.0031	.1487	.1092	.0051	.1289	.0947	.00054	.0552	.0258
Occupation-wise head of household	0	.7547	.4969	0	.08001	.0535	0	.0719	.0481	0	.0375	.0319
Service												
Agricultural	.0342	.735	.6752	.0021	.1616	.1206	.0019	.1454	.1085	.00021	.0439	.293

Source: Annexure II

1 – Poverty line of Rs 558.78 (National Poverty Line)

2 - Poverty line of Rs 1010.81(State Poverty Line)

3 - Poverty line of Rs 942.6 (Sample Survey Poverty Line)

(a) Sample population:

The estimation of Head Count Ratio (HCR) based on the poverty line of Rs. 558.78 shows that 2.04% of the sample populations are poor. While HCR based on poverty line of Rs. 1010.81 shows that 67.18% of the sample populations are poor. However, the HCR based on the poverty line of Rs. 942.60 reveals that 59.54% of the sample populations are poor. This percentage of poor is higher than the percentage of poor estimated using the National poverty line by 57.50% but lower than the estimated percentage of poor based on State poverty line by 7.64%.

The analysis of poverty gap ratio based on National poverty line is .13% per poor person. This means that every poor person is falling short of the income by Rs. 0.73. In other words, to support every poor person at the poverty line, Rs. 0.72 of income is needed per poor person. The estimation of poverty Gap ratio based on State poverty line shows a higher income deprivation for the sample population with 13.82% per poor person. However, the poverty gap ratio based on sample survey poverty line with 10.09% shows a lower income deprivation for the sample population than the estimation based on State poverty line but higher than the estimation based on

National poverty line. It means to support every poor person at the poverty level, income of Rs. 95.11 per poor person is required.

From the table it is seen that Sen Index (P) based on National poverty line for the sample population is 0.11%. This means that 0.11% of poor amongst the poor are falling below their poverty line. The P based on the State poverty line shows that the extent of income deprivation for the sample population is 21.22%. It means that 21.22% of poor amongst the poor are falling below their poverty line. However, the P based on sample survey poverty line shows that 16.94% of poor amongst the poor are living below their poverty line. Thus, P based on state poverty line shows a higher percentage of poor amongst the poor than the P based on National poverty line by 21.11% and sample survey poverty line by 4.28%.

The estimation of Foster, Greer and Thorbecke measure (P^F) based on National poverty line shows that the severity of income inadequacy for the sample population is 0.01% for the poorest of the poor. This means that 0.01% of the poorest among the poor are far below the poverty line. The P^F based on the State poverty line shows that the severity of income inadequacy for the sample population is 5.22% for the poorest of the poor. However, the P^F based on sample survey poverty line shows that income inadequacy with 4.2% is less severe than the estimation based on State poverty line but more severe than the estimation based on National poverty line.

(b) Gender-wise:

The analysis of HCR based on the poverty line of Rs. 558.78 shows that 1.16% of the male population is poor, while 2.71% of the female population is poor. The estimation of HCR based on poverty line of Rs. 1010.81 shows that that male (68.6%) have a higher percentage of poor than female (66.06%) by 2.54%. The estimation of HCR using Rs. 942.60 poverty line shows that 62.79% of male population is poor where as 57.01% of female population is poor. Comparison between male and female percentage of poor based on different poverty line reveals that the percentage of poor is higher among male than female when poverty line is based on Rs.1010.81 and Rs. 942.6. But the percentage of poor is higher among female than male when poverty line is based on Rs.558.78.

The income gap ratio estimates based on National poverty line for male and female shows that female have higher ratio of .19% per person than male ratio of .004% per person. It means to help every poor person at the poverty level, income of Rs. 1.062 per poor person and Rs.0.022 per poor person respectively, is required by female and male poor population. However, poverty gap ratio based on State poverty line shows a higher percentage for both male and female population. The figures in the table show that poverty gap is (Rs. 141.31) 13.98% and (Rs. 138.38) 13.69% per

poor person for male and female population respectively. Whereas, the poverty gap ratio based on sample survey poverty line shows a lower income shortfall for both male and female population with 10.12% and 10.06% per poor person respectively. It means to support every male poor person at the poverty level 10.12% of income is required while it is 10.06% per person for the female poor. On comparison between male and female poverty gap ratio based on State and sample survey poverty line, it is seen that the poverty gap ratio of male is higher than female.

The analysis of P based on National poverty line shows that female have higher percentage (.16%) of poor amongst the poor falling below their poverty line than male percentage (.004%). The estimation of P based on State poverty line shows a higher percentage for both male and female population. The figure in the table indicates that male have 12.19% of poor amongst the poor are falling short of their poverty line that is slightly higher than female percentage of 11.81%. However, P based sample survey poverty line shows that male population have 8.82% of poor amongst the poor falling below their poverty line, while female have 8.68% of poor amongst the poor falling below the poverty line. The comparison between male and female Sen Index based on State and sample survey poverty line shows that Sen Index of male is higher than female across different poverty line.

The P^F estimates based on National poverty line shows that income deprivation is more severe for female population than male population. The analysis shows that the severity of income inadequacy falls on 0.0023 % for the poorest of the poor among the female population, while it is 0.0002% for the male population. The estimation of P^F based on State poverty line shows a similar result with large difference. The income inadequacy for both male and female comes out to be 3.49% and 3.66% for the poorest poor respectively. However, P^F based on sample poverty line shows that severity of income inadequacy falls on 2.19% of the poorest among the poor in male population, while it is 2.42% for the female population. The comparison between male and female P^F based on different poverty line shows that the income inadequacy of female is higher than male.

(c) Village-wise:

The HCR estimate based on National poverty line for the sample villages shows that only Longsa exhibits the existence of poor population with 3.09%, while other villages shows that every one is above the poverty line. The estimation of HCR based on State poverty lines for different villages shows that Sunglup with 89.47% has the highest proportion of population below poverty line. This is followed by Yunchuchu with 73.81% and Longsa with 62.16% of population below the poverty line. Bhandari shows the lowest proportion of poor with 57.41%. However, the estimation of HCR based on sample survey poverty line shows Sunglup with 76.32% has the

highest percentage of poor among the villages. It is followed by Longsa with 57.92% and Bhandari with 57.41% of the population living below the poverty line. Yunchuchu with 57.14% shows the lowest percentage of poor people living below the poverty line. On comparing the proportion of poor among different villages based on poverty line of the State and Sample survey, it is seen from the table that Sunglup exhibits highest existence of poverty.

The poverty gap ratio estimates based on National poverty line shows that, the depth of income deprivation exist only in Longsa with (Rs. 1.06) .19% per poor person. The estimation of poverty gap using State poverty line shows that the depth of income deprivation is highest in Bhandari with (Rs. 213.28) 21.12% per person. It is followed by Longsa with (Rs. 143.64) 14.21% per poor person and Sunglup with (Rs. 135.35) 13.39% per poor person. Yunchuchu with (Rs. 132.72) 13.13% per poor person exhibits the lowest income deprivation among the villages. However, the estimation of poverty gap ratio based on sample survey poverty indicates a higher income deprivation among the sample population than the estimation based on National poverty line but lower than the estimation based on State poverty line. Among the villages, Longsa with (Rs. 101.61) 10.78% per poor person shows the highest shortfall of income. This is followed by Bhandari with (Rs. 83.23) 8.83% per poor person and Yunchuchu with (Rs. 82.38) 8.74% per poor person. Sunglup with (Rs. 79.74) 8.46% shows the lowest income deprivation among the villages. On comparison among the villages it is seen that the highest depth of income deprivation exist in Bhandari when measurement is based on State poverty line. However, the estimation of poverty gap ratio based on sample survey poverty and National poverty line indicates that Longsa has the highest shortfall of income.

The estimation of Sen Index (P) based on National poverty line shows that, the extent of income deprivation exist only in Longsa with 0.58% of poor amongst the poor falling below their poverty line. The P based on State poverty line shows that, among the villages, Sunglup with 12.22% exhibits the highest percentage of poor amongst the poor falling below their poverty line. It is followed by Longsa with 12.09% and Yunchuchu with 11.95% of poor amongst the poor falling below their poverty line. Bhandari with 10.48% of poor amongst the poor falling below their poverty line exhibits the lowest percentage among the villages. However, the estimation of P based on sample survey poverty line indicates a higher percentage of poor amongst the poor than the estimation based on National poverty line but lower than the estimation based on State poverty line. Among the villages, Longsa with 9.19% have the highest percentage of poor amongst the poor falling below their poverty line. This is followed by Yunchuchu with 7.96% and Sunglup with 7.75% of poor amongst the poor falling below their poverty line. Bhandari with 7.65% of

poor amongst the poor falling below their poverty line shows the lowest percentage among the villages. On comparing among the villages, it was found that Sunglup has the highest number of poor amongst the poor when measurement is based on State poverty line, while Longsa exhibit the highest number of poor amongst the poor when measured at the sample survey poverty line.

Village-wise analysis of P^F based on National poverty line shows that, the severity of income deprivation exist only in Longsa with 0.02% for the poorest of the poor. The P^F based on State poverty line shows that, among the villages, income inadequacy is more severe in Longsa with 3.93% for the poorest of the poor. It means 3.93% of the poorest among the poor in Longsa are far below the poverty line. It is followed by Bhandari with 3.11% and Yunchuchu with 2.83% of the poorest poor facing income inadequacy. Sunglup with 2.68% of the poorest among the poor facing income inadequacy exhibits the lowest severity of income deprivation among the villages. However, the estimation of P^F based on sample survey poverty line indicates a higher severity of income deprivation than the estimation based on National poverty line but lower than the estimation based on State poverty line. Among the villages, Income inadequacy is more severe in Longsa with 2.63% for the poorest of the poor. It means 2.63% of the poorest among the poor in Longsa are far below the poverty line. It is followed by Bhandari with 1.99% and Yunchuchu with 1.59% of the poorest among the poor facing income inadequacy. Sunglup with 1.44% of the poorest among the poor facing income inadequacy exhibits the lowest severity of income deprivation among the villages. On comparison among the villages it was found that Longsa exhibits higher severity of income deprivation, while Sunglup has a lower income inadequacy across different poverty line.

(d) Range-wise:

Range-wise estimation of poverty is shown in the table no 5.2.2. From the table it is clear that the upper range is represented by Longsa village and lower range is represented by Bhandari village. Thus, the explanation given for these villages also represents their respective range. However, middle range is represented by two villages, viz, Yunchuchu and Sunglup.

The HCR estimate based on National poverty line for the sample villages shows that only upper range exhibits the existence of poor population with 3.09%, while other ranges shows that every one is above the poverty line. The estimation of HCR based on State poverty lines shows that middle range with 81.25% has the highest proportion of population below poverty line. This is followed by upper range with 62.16% and lower range with 57.41% of population below the poverty line. Moreover, the estimation of HCR based on sample survey poverty line also shows that middle range with 66.25% has the highest percentage of poor among the ranges. It is followed

by upper range with 57.92% and lower range with 57.41% of the population living below the poverty line. On comparing the proportion of poor among different ranges based on poverty line of the State and Sample survey, it is seen from the table that middle range exhibits highest existence of poverty.

The poverty gap ratio estimates based on National poverty line shows that, the depth of income deprivation exist only in upper range with (Rs. 1.06) .19% per poor person. The estimation of poverty gap using State poverty line shows that the depth of income deprivation is highest in lower range with (Rs. 213.28) 21.12% per person. It is followed by upper range with (Rs. 143.64) 14.21% per poor person. Middle range with (Rs. 133.93) 13.25% per poor person exhibits the lowest income deprivation among the ranges. However, the estimation of poverty gap ratio based on sample survey poverty indicates a higher income deprivation among the sample ranges than the estimation based on National poverty line but lower than the estimation based on State poverty line. Among the ranges, upper range with (Rs. 101.61) 10.78% per poor person shows the highest shortfall of income. This is followed by lower range with (Rs. 83.23) 8.83% per poor person. Lower range with (Rs. 81.35) 8.63% shows the lowest income deprivation among the ranges. On comparison among the ranges it is seen that the highest depth of income deprivation exist in lower range when measurement is based on State poverty line. However, the estimation of poverty gap ratio based on sample survey poverty line and National poverty line indicates that upper range has the highest shortfall of income per person.

The estimation of Sen Index (P) based on National poverty line shows that, the extent of income deprivation exist only in upper range with 0.58% of poor amongst the poor falling below their poverty line. The P based on State poverty line shows that, middle range with 19.29% exhibits the highest percentage of poor amongst the poor falling below their poverty line. It is followed by upper range with 12.09% of poor amongst the poor falling below their poverty line. Lower range with 10.48% of poor amongst the poor falling below their poverty line exhibits the lowest percentage among the ranges. However, the estimation of P based on sample survey poverty line indicates a higher percentage of poor amongst the poor than the estimation based on National poverty line but lower than the estimation based on State poverty line. Among the ranges, middle range with 13.86% has the highest percentage of poor amongst the poor falling below their poverty line. This is followed by upper range with 9.19% of poor amongst the poor falling below their poverty line. Lower range with 7.65% of poor amongst the poor falling below their poverty line shows the lowest percentage among the ranges. On comparing among the ranges, it was found

that middle range has the highest number of poor amongst the poor when measurement is based on State poverty line and sample survey poverty line.

Range-wise analysis of P^F based on National poverty line shows that, the severity of income deprivation exist only in upper range with 0.02% for the poorest of the poor. The P^F based on State poverty line shows that, among the ranges, income inadequacy is more severe in upper range with 3.93% for the poorest of the poor. It is followed by lower range with 3.11% of the poorest among the poor facing income inadequacy. Middle range with 2.76% of the poorest among the poor facing income inadequacy exhibits the lowest severity of income deprivation among the ranges. However, the estimation of P^F based on sample survey poverty line indicates a higher severity of income deprivation than the estimation based on National poverty line but lower than the estimation based on State poverty line. Among the ranges, Income inadequacy is more severe in upper range with 2.63% for the poorest poor. It is followed by lower range with 1.99% of the poorest poor facing income inadequacy. Middle range with 1.52% of the poorest poor facing income inadequacy exhibits the lowest severity of income deprivation among the ranges. On comparison among the ranges it was found that upper range exhibits higher severity of income deprivation, while lower range has a lower income inadequacy across different poverty line.

(e) Sex-wise Head of Household:

Estimation of HCR based on National, State and sample survey poverty line shows that the proportion of poor is higher in female headed family than male headed family. Using the National poverty line, table no. 5.2.2 shows that 2.5% of the populations in female headed family are living below the poverty line, while male headed family has 1.92% of poor people. The estimation of HCR using State poverty line shows that 71.25% of the populations in female headed family are living below the poverty line, while it is 66.13% for the male headed family. However, the estimation of HCR based on Sample survey poverty line shows a lower percentage of poor living below the poverty line than the estimation based on State poverty line. The percentage of poor based on sample survey poverty line is 62.5% for female headed family and 58.79% for male headed family. Thus, the existence of higher poor is seen among the female headed household.

The sex-wise head of household estimation of poverty gap ratio based on the National poverty line shows that the depth of income deprivation higher in female headed family than male headed family. Table No. 5.2.2 shows that the depth of income deprivation in female headed family is 0.31% (Rs. 1.73) per poor person, while it is 0.08% (Rs. 0.44) per poor person for male headed family. The estimation of poverty gap ratio using State poverty line shows that the income short fall of the population in female headed family is (Rs. 150.31) 14.87% per poor person, while

it is (Rs. 136.96) 13.55% per poor person in male headed family. The estimation of poverty gap ratio based on Sample survey poverty line shows a lower gap than the estimation based on State poverty line. The female headed household has an income shortfall of (Rs. 102.93) 10.92% per poor person, while it is (Rs. 92.85) 9.85% per poor person. Thus, it can be seen that female headed household have higher income deprivation as compared to male headed household across different poverty line.

The estimation of P based on the National poverty line reveals that the percentage of poor amongst the poor falling below their poverty line is higher in female headed family than male headed family. It can be seen from table no. 5.2.2 that the percentage of poor amongst the poor falling below their poverty line in female headed family is .051%, while it is .028% for the male headed family. The estimation of P using State poverty line shows that the number of poor amongst the poor falling below their poverty line in female headed family is 12.89%, while it is 11.72% for the male headed family. The estimation of P based on Sample survey poverty line shows a lower P than the estimation based on State poverty line. The female headed household has 9.47% of poor amongst the poor living below their poverty line, while 8.54% of the poor amongst the poor in male headed family are below their poverty line. Thus, the estimation of Sen Index based on different poverty line shows that female headed household has higher percentage of poor amongst the poor than male headed household.

The estimation of P^F on the National poverty line shows that the severity of income deprivation higher in female headed family than male headed family. It can be seen from table No. 5.2.2 that the severity of income deprivation in female headed family is 0.05% for the poorest of the poor, while it is 0.003% for the male headed family. The estimation of P^F using State poverty line shows that the income inadequacy for the poorest poor in female headed family is 5.52%% for the poorest of the poor, while it is 3.49% for the male headed family. The estimation of P^F based on Sample survey poverty line shows a lower P^F than the estimation based on State poverty line. The female headed household has an income inadequacy of 2.58% for the poorest of the poor, while it is 2.25% for the male headed family. Thus measuring P^F basing on different poverty line shows that severity of income inadequacy is higher in female headed household than male headed household.

(f) Occupation-wise head of household:

Estimation of HCR based on National poverty line shows that poverty exist only the household headed by agriculturalist with 3.42%. But the analysis of HCR based on State poverty line shows that the proportion of poor is higher in the household headed by services than the

agriculturalist. From the table it is seen that the household headed by service have 75.47% of its population below the poverty line, whereas, those household headed by agriculturalist have 73.5% of its population living below the poverty line. However, the estimation of HCR based on the sample survey poverty line indicates that the proportion of poor is higher in the household headed by agriculturalist than the services. Table No. 5.2.2 shows the household headed agriculture has 65.52% of poor population, while it is 49.69% in service headed family. Thus, the estimation based on different poverty line gives a mix result.

The analysis of poverty gap ratio based on National poverty line shows that Income deprivation exists only in the household headed by the agriculturalist with .21% per person. From the table it is seen that the depth of income deprivation for household headed by agriculturalist is Rs. 1.24 per poor person. The estimation of poverty gap ratio based on State poverty line shows that income gap is 16.16% per poor person for agricultural headed family. For the household headed by service, the income shortfall of poverty line is 8% per poor person. However, the poverty gap ratio based on sample survey poverty line shows that the income short fall of the household headed by service is 5.35% per poor person, where as it is 12.06% per poor person for agricultural headed household. On comparison between service and agricultural headed poverty gap ratio based on different poverty norms, it found that poverty gap ratio of the agricultural headed household is higher than the service headed household.

The estimation of P based on National poverty line shows that .19% of the poor amongst the poor in the household headed by the agriculturalist are below their poverty line. The estimation of Sen Index based on State poverty line shows that 14.54% and 7.19% of the poor amongst the poor in agricultural headed household and service headed household respectively are falling below their poverty line. Whereas, the Sen Index based on sample survey poverty line shows that the percentage of poor amongst the poor falling below their poverty line in agricultural headed family is 10.85%, while it is 4.71% for the service headed family. The comparison between service and agricultural headed household Sen Index based on different poverty line reveals that percentage of poor amongst the poor is higher in agricultural headed household than the service headed household.

The analysis of P^F based on National poverty line shows that severity of income deprivation is .02% for the poorest of the poor among the agricultural headed family; while the service headed family have zero poor population. The estimation of P^F based on State poverty line shows that 4.39% and 3.75% of the poorest among the poor in agricultural headed household and service headed household respectively are facing income inadequacy. However, the P^F based on

sample survey poverty line shows a lower income deprivation than the result based on State poverty line. The percentage of the poorest among the poor facing income inadequacy in agricultural headed family is 2.93%, while it is 3.19% for the service headed family. The comparison between service and agricultural headed household in the severity of income deprivation based on different poverty line reveals that percentage of the poorest among the poor is higher in agricultural headed household than the service headed household when estimate is based on the State and National poverty line. But the percentage result based on the sample survey poverty line shows that the percentage of the poorest poor facing income deficiency is higher in service headed household than the agricultural headed household.

Thus, measuring poverty based on different poverty line shows that the extent and depth of poverty is higher when measurement is based on State poverty line. However, the extent and depth of poverty reveals a negligible existence of poor people when the estimation is based on National poverty line. Thus, the poverty line derived from the sample survey lies in between the National and State poverty line.

5.3: MEASUREMENT OF INEQUALITY:

At the core of relative poverty is inequality. The relative poverty takes into account relative deprivation rather than the absolute deprivation. The most preferred measure of inequality is Gini Index[72]. The first step in calculating Gini index is plotting of Lorenz Curve. In Lorenz curve technique, the size of items and frequencies are both cumulated and taking the total as 100, percentages are cumulated for the various cumulated values. These percentages are plotted on a graph paper. If there is proportionately equal distribution of the frequencies over various values, the point would lie in a straight line. The degree to which the Lorenz Curve line deviates from the line of equal distribution is a measure of inequality of distributions of income or calorie intake. The Gini-coefficient measures the distance between the line of Equal distribution and Lorenz Curve. The Lower value of Gini-coefficient implies more equitable distribution of income /calorie intake.

5.3.1: Measuring Inequality through Calorie Intake:

Inequalities in the distribution of calorie intake are being measured for different selected category.

(i): Distribution of Calorie Intake among the Sample Population:

The cumulated percentages among the sample population as well as the daily calorie intake are presented in table No. 5.3.1 (i). The cumulated percentages calorie intake and population, when

[72] Ibid 2.

plotted on a graph paper gives the resultant shape which is evident from figure 18. This figure reveals that the bottom 14% of the population consumes about 4% of the total calorie intake at one end and at the other end about 17% of the total calorie intake is shared by the top 10%. Thus 90% of the population share 83% of the total calorie intake. The Gini-coefficient of calorie intake for the sample population comes out to be .2032. Both Gini-coefficients and the shape of Lorenz curve shows less inequality in the distribution of calorie intake among the sample population.

Table No. 5.3.1 (i): Distribution of calorie intake among the Sample population.

Calorie group	Total number of person (F)	Total calorie intake (Q)	% of F	% of Q	Cf of F	Cf of Q
0 – 500	15	3117.4	3.82	0.33	3.82	0.33
501 - 1000	16	11934.96	4.08	1.24	7.9	1.57
1001 – 1500	22	27767.46	5.59	2.89	13.49	4.46
1501 – 2000	56	99691.1	14.25	10.39	27.74	14.85
2001 – 2500	92	209987.1	23.41	21.88	51.15	36.73
2501 – 3000	87	239188.7	22.14	24.92	73.29	61.65
3001 – 3500	63	204667.8	16.03	21.32	89.32	82.97
3501 – 4000	31	113319.1	7.89	11.82	97.21	94.79
4000 and above	11	50000.66	2.79	5.21	100	100

Sources: Field Survey 2005-06.

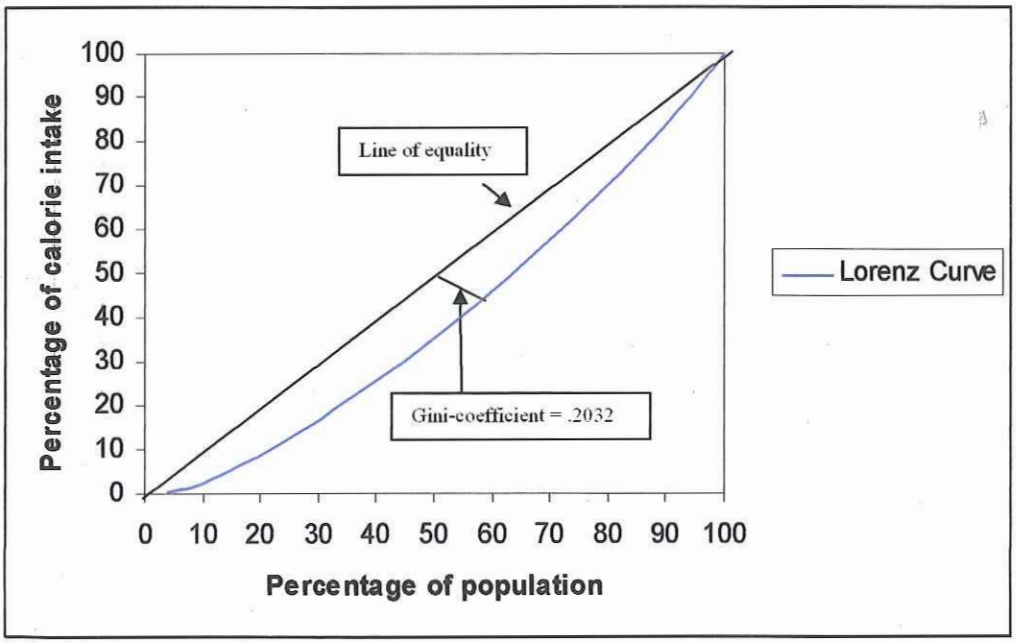

Figure 18: Distribution of calorie intake among Sample population.

(ii) Gender-wise distribution of Calorie Intake:

The cumulated percentages among the population of male and female and their daily calorie intake are presented in table No. 5.3.1 (ii, a and b). The cumulated percentages calorie

intake and population of male and female, when plotted on a graph paper gives the resultant shape which is evident from figure 19.

Table No.5.3.1 (ii, a): Distribution of Calorie Intake among the Population of Male.

Calorie group	Total number of person (F)	Total calorie intake (Q)	% of F	% of Q	Cf of F	Cf of Q
0 – 500	5	1610.19	2.91	0.38	2.91	0.38
501 - 1000	10	7242.53	5.81	1.74	8.72	2.12
1001 – 1500	11	13810.99	6.39	3.3	15.11	5.42
1501 – 2000	24	44183.7	13.95	10.59	29.07	16.01
2001 – 2500	42	95025.71	24.42	22.76	53.49	38.77
2501 – 3000	32	87664.09	18.60	20.99	72.09	59.76
3001 – 3500	33	107873.7	19.19	25.84	91.28	85.6
3501 – 4000	12	44151.49	6.98	10.58	98.26	96.18
4000 and above	3	15964.99	1.74	3.82	100	100

Sources: Field Survey 2005-06.

Table No 5.3.1 (ii, b): Distribution of Calorie Intake among the Population of Female.

Calorie group	Total number of person (F)	Total calorie intake (Q)	% of F	% of Q	Cf of F	Cf of Q
0 – 500	10	1507.21	4.52	0.28	4.52	0.28
501 - 1000	6	4692.43	2.71	0.86	7.23	1.14
1001 – 1500	11	13956.47	4.98	2.57	12.22	3.71
1501 – 2000	33	58098.67	14.93	10.70	27.15	14.41
2001 – 2500	50	114961.4	22.62	21.17	49.77	35.58
2501 – 3000	54	149834.3	24.44	27.59	74.21	63.17
3001 – 3500	30	96794.1	13.57	17.82	87.78	80.99
3501 – 4000	19	69167.57	8.61	12.74	96.38	93.73
4000 and above	8	34035.67	3.62	6.27	100	100

Sources: Field Survey 2005-06.

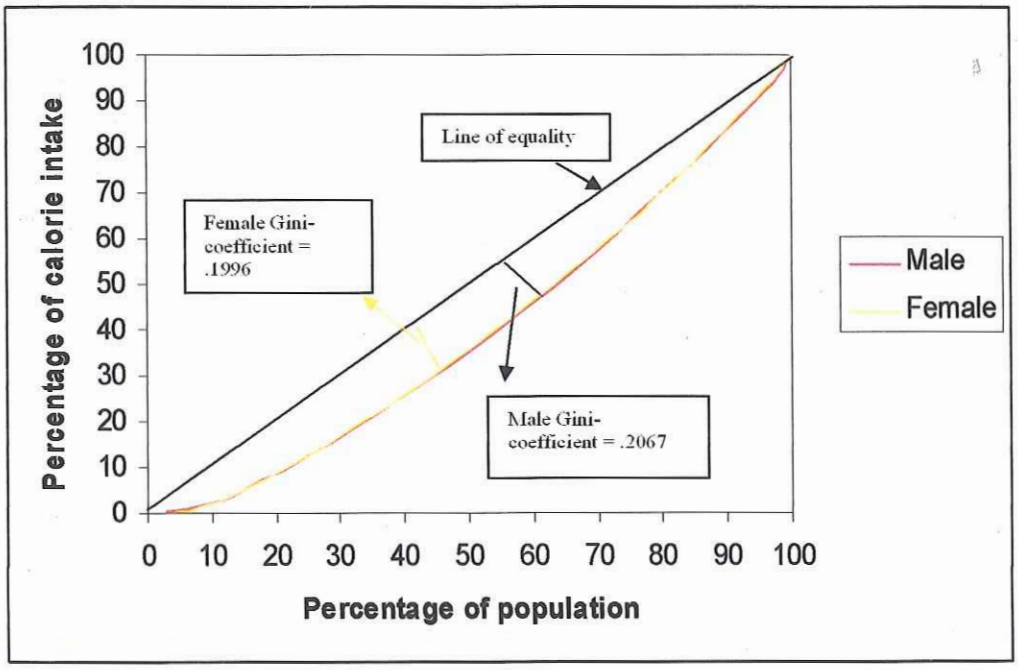

Figure 19: Distribution of calorie intake among the population of Male and Female.

(a) Distribution of Calorie Intake among the Population of Male:

The data in table no 5.3.1 (ii, a) reveals that the bottom 15% of the male population consumes about 5% of the total calorie intake at one end. But at the other end about 14% of the total calorie intake is shared by the top 8%, which is lower than the percentage of the sample population. Thus 92% of the population shares 86% of the total calorie intake, which is higher than the sample population share. The Gini-coefficient of calorie intake for the population of male comes out to be .2067. The red line in figure 19 represents the Lorenz curve of male.

(b) Distribution of Calorie Intake among the Population of Female:

The data in table no 5.3.1 (ii, b) reveals that the bottom 12% of the female population consumes about 3% of the total calorie intake at one end. But at the other end about 19% of the total calorie intake is shared by the top 10%, which is higher than the percentage of the sample population. Thus 90% of the population shares 81% of the total calorie intake, which is lower than the sample population share. The Gini-coefficient of calorie intake for the population of female comes out to be .1996. The yellow line in figure 19 represents the Lorenz curve of female.

Both Gini-coefficient and the shape of Lorenz curve shows higher inequalities in the distribution of calorie intake among the population of male as compared to that of the sample and female population.

(iii): Village-wise distribution of Calorie Intake:

The cumulated percentages among the population of Longsa, Yunchuchu, Sunglup and Bhandari villages and their daily calorie intake are presented in table No. 5.3.1 (iii, a, b, c and d). The cumulated percentages calorie intake and population of these villages, when plotted on a graph paper gives the resultant shape, which is evident from figure 20.

(a) Distribution of calorie intake among the population of Longsa village:

The data in table no 5.3.1 (iii, a) reveals that the bottom 14% of the population consumes about 4% of the total calorie intake at one end that is similar to the percentage of the sample population. But at the other end about 16% of the total calorie intake is shared by the top 10%, which is slightly lower than the percentage of the sample population. Thus 90% of the population share 84% of the total calorie intake. The Gini-coefficient of calorie intake for the population of Longsa village comes out to be .2116. The red line in figure 20 represents the Lorenz curve of Longsa village.

Table No. 5.3.1 (iii, a): Distribution of Calorie Intake among the Population of Longsa village.

Calorie group	Total number of person (F)	Total calorie intake (Q)	% of F	% of Q	Cf of F	Cf of Q
0 – 500	15	4199.33	5.8	0.67	5.8	0.67
501 - 1000	7	4948.66	2.71	0.79	8.51	1.46
1001 – 1500	14	17385.51	5.41	2.76	13.92	4.22
1501 – 2000	36	63267.69	13.89	10.06	27.81	14.28
2001 – 2500	64	145821.75	24.71	23.18	52.52	37.46
2501 – 3000	46	126591.71	17.76	20.13	70.28	57.59
3001 – 3500	51	164756.93	19.69	26.19	89.97	83.78
3501 – 4000	18	66037.48	6.95	10.51	96.92	94.29
4000 and above	8	35998.24	3.08	5.71	100	100

Sources: Field Survey 2005-06.

Table No. 5.3.1 (iii, b): Distribution of calorie intake among the population of Yunchuchu village.

Calorie group	Total number of person (F)	Total calorie intake (Q)	% of F	% of Q	Cf of F	Cf of Q
0 – 500	1	0	2.38	0	2.38	0
501 - 1000	4	3217.07	9.53	3.3	11.91	3.3
1001 – 1500	5	6328.23	11.9	6.49	23.81	9.79
1501 – 2000	2	3512.48	4.76	3.6	28.57	13.39
2001 – 2500	13	30154.73	30.96	30.96	59.53	44.35
2501 – 3000	7	18867.05	16.67	19.37	76.2	63.72
3001 – 3500	4	13470.48	9.53	13.84	85.73	77.56
3501 and above	6	21846.47	14.27	22.44	100	100

Sources: Field Survey 2005-06.

Table No. 5.3.1 (iii, c): Distribution of calorie intake among the population of Sunglup village.

Calorie group	Total number of person (F)	Total calorie intake (Q)	% of F	% of Q	Cf of F	Cf of Q
0 – 500	0	0	0	0	0	0
501 - 1000	2	1861.22	5.26	1.77	5.26	1.77
1001 – 1500	0	0	0	0	5.26	1.77
1501 – 2000	6	10957.84	15.79	10.42	21.05	12.19
2001 – 2500	3	12819.06	7.89	12.19	28.94	24.38
2501 – 3000	16	42544.87	42.12	40.45	71.06	64.83
3001 – 3500	9	29193.01	23.68	27.76	94.74	92.59
3501 – 4000	1	3700.57	2.63	3.52	97.37	96.11
4000 and above	1	4089.5	2.63	3.89	100	100

Sources: Field Survey 2005-06.

Table No. 5.3.1 (iii, d): Distribution of calorie intake among the population of Bhandari village.

Calorie group	Total number of person (F)	Total calorie intake (Q)	% of F	% of Q	Cf of F	Cf of Q
0 – 500	1	0	1.9	0	1.9	0
501 - 1000	1	826.08	1.9	0.62	3.8	0.62
1001 – 1500	3	4053.72	5.6	3.02	9.4	3.64
1501 – 2000	12	21953.09	22.2	16.38	31.6	20.02
2001 – 2500	12	27038.97	22.2	20.19	53.8	40.21
2501 – 3000	17	48432.51	31.4	36.16	85.2	76.37
3001 – 3500	0	0	0	0	85.2	76.37
3501 – 4000	6	21734.54	11.1	16.23	96.3	92.6
4000 and above	2	9912.92	3.7	7.4	100	100

Sources: Field Survey 2005-06.

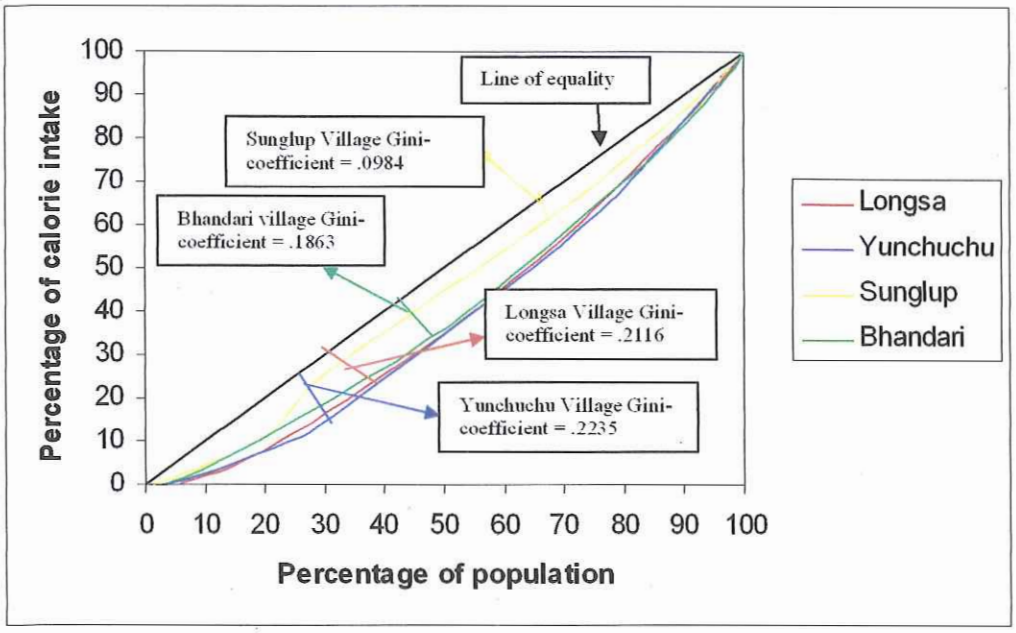

Figure 20: Distribution of calorie intake among the population of Longsa, Yunchuchu, Sunglup and Bhandari villages.

(b): Distribution of calorie intake among the population of Yunchuchu village:

The data in table no 5.3.1 (iii, b) reveals that the bottom 12% of the population consumes about 3% of the total calorie intake at one end that is lower than the percentage of the sample population. But at the other end about 22% of the total calorie intake is shared by the top 14%, which is higher than the percentage of the sample population. Thus 86% of the population share 78% of the total calorie intake. The Gini-coefficient of calorie intake for the population of Yunchuchu village comes out to be .2235. The blue line in figure 20 represents the Lorenz curve of Yunchuchu village.

(c): Distribution of calorie intake among the population of Sunglup village:

The data in table no 5.3.1 (iii, c) reveals that the bottom 21% of the population consumes about 12% of the total calorie intake at one end that is higher than the percentage of the sample population. But at the other end about 7% of the total calorie intake is shared by the top 5%, which is lower than the percentage of the sample population. Thus 95% of the population share 93% of the total calorie intake. The Gini-coefficient of calorie intake for the population of Sunglup village comes out to be .0984. The yellow line in figure 20 represents the Lorenz curve of Sunglup village.

(d): Distribution of calorie intake among the population of Bhandari village:

The data in table no 5.3.1 (iii, d) reveals that the bottom 9% of the population consumes about 3% of the total calorie intake at one end that is higher than the percentage of the sample population. But at the other end about 7% of the total calorie intake is shared by the top 3%, which is higher than the percentage of the sample population. Thus 96% of the populations share 92% of

the total calorie intake. The Gini-coefficient of calorie intake for the population of Bhandari village comes out to be .1863. The green line in figure 20 represents the Lorenz curve of Bhandari village.

On comparison among the villages, both Gini-coefficient and the shape of Lorenz curve reveal that Longsa and Yunchuchu villages have higher inequalities in the distribution of calorie intake than the sample population. Whereas, the resultant figures of Gini-coefficient and the shape of Lorenz curve in Sunglup and Bhandari villages reveals that the distribution of calorie intake in these villages is lower than the sample population. Moreover, it was also seen that Yunchuchu village exhibits higher inequalities in the distribution of calorie intake among the selected category, while the distribution of calorie intake is more equal in Sunglup village as compared to other villages.

(iv): Range-wise distribution of calorie intake:

Range-wise estimation of inequalities in the distribution of calorie intake is shown in the table no 5.3.1 (iv, a, b and c). The cumulated percentages calorie intake and population of these ranges, when plotted on a graph paper gives the resultant shape which is evident from figure 21.

Table No. 5.3.1 (iv, a): Distribution of calorie intake among the population of Upper range.

Calorie group	Total number of person (F)	Total calorie intake (Q)	% of F	% of Q	Cf of F	Cf of Q
0 – 500	15	4199.33	5.8	0.67	5.8	0.67
501 - 1000	7	4948.66	2.71	0.79	8.51	1.46
1001 – 1500	14	17385.51	5.41	2.76	13.92	4.22
1501 – 2000	36	63267.69	13.89	10.06	27.81	14.28
2001 – 2500	64	145821.75	24.71	23.18	52.52	37.46
2501 – 3000	46	126591.71	17.76	20.13	70.28	57.59
3001 – 3500	51	164756.93	19.69	26.19	89.97	83.78
3501 – 4000	18	66037.48	6.95	10.51	96.92	94.29
4000 and above	8	35998.24	3.08	5.71	100	100

Sources: Field Survey 2005-06.

Table No. 5.3.1. (iv, b): Distribution of calorie intake among the population of Middle range.

Calorie group	Total number of person (F)	Total calorie intake (Q)	% of F	% of Q	Cf of F	Cf of Q
0 – 500	1	0	1.25	0	1.25	0
501 - 1000	6	5078.29	7.5	2.58	8.75	2.58
1001 – 1500	5	6328.23	6.25	3.22	15	5.8
1501 – 2000	8	14470.32	10	7.35	25	13.15
2001 – 2500	16	37126.37	20	18.87	45	32.02
2501 – 3000	23	61411.92	28.75	31.22	73.75	63.24
3001 – 3500	13	42663.49	16.25	21.69	90	84.93
3501 – 4000	7	25547.04	8.75	12.99	98.75	97.92
4000 and above	1	4089.5	1.25	2.08	100	100

Sources: Field Survey 2005-06.

Table No. 5.3.1 (iv, c): Distribution of calorie intake among the population of Lower range.

Calorie group	Total number of person (F)	Total calorie intake (Q)	% of F	% of Q	Cf of F	Cf of Q
0 – 500	1	0	1.9	0	1.9	0
501 - 1000	1	826.08	1.9	0.62	3.8	0.62
1001 – 1500	3	4053.72	5.6	3.02	9.4	3.64
1501 – 2000	12	21953.09	22.2	16.38	31.6	20.02
2001 – 2500	12	27038.97	22.2	20.19	53.8	40.21
2501 – 3000	17	48432.51	31.4	36.16	85.2	76.37
3001 – 3500	0	0	0	0	85.2	76.37
3501 – 4000	6	21734.54	11.1	16.23	96.3	92.6
4000 and above	2	9912.92	3.7	7.4	100	100

Sources: Field Survey 2005-06.

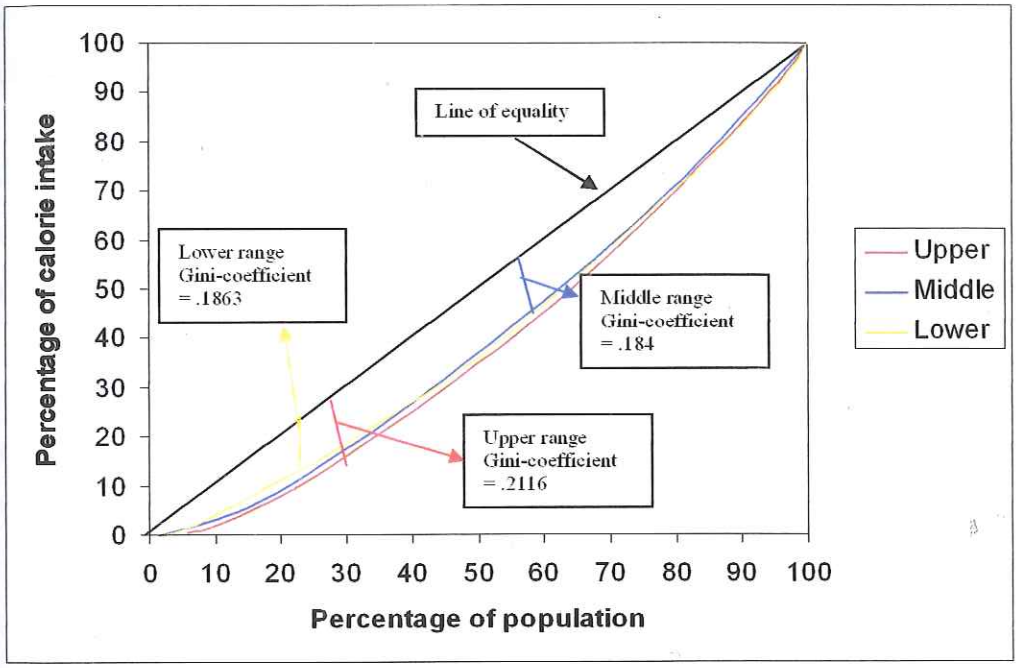

Figure 21: Distribution of calorie intake among the population of Upper, Middle and Lower ranges.

(a) Distribution of calorie intake among the population of upper range:

The data in table no 5.3.1 (iv, a) reveals that the bottom 14% of the population consumes about 4% of the total calorie intake at one end that is similar to the percentage of the sample population. But at the other end about 16% of the total calorie intake is shared by the top 10%, which is slightly lower than the percentage of the sample population. Thus 90% of the population share 84% of the total calorie intake. The Gini-coefficient of calorie intake for the population of upper range is .2116. The red line in figure 21 represents the Lorenz curve of upper range.

(b) Distribution of calorie intake among the population of middle range:

The data in table no 5.3.1 (iv, b) reveals that the bottom 15% of the population consumes only 5.8% of the total calorie intake at one end that is higher than the percentage of the sample population. But at the other end about 15% of the total calorie intake is shared by the top 10%, which is slightly lower than the percentage of the sample population. Thus 90% of the populations

share 85% of the total calorie intake. The Gini-coefficient of calorie intake for the population of middle range comes out to be .184. The blue line in figure 21 represents the Lorenz curve of middle range.

(c): Distribution of calorie intake among the population of Lower range:

The data in table no 5.3.1 (iv, c) reveals that the bottom 9% of the population consumes about 3% of the total calorie intake at one end that is higher than the percentage of the sample population. But at the other end about 7% of the total calorie intake is shared by the top 3%, which is higher than the percentage of the sample population. Thus 96% of the population shares 92% of the total calorie intake. The Gini-coefficient of calorie intake for the population of lower range is .1863. The yellow line in figure 21 represents the Lorenz curve of lower range.

Both Gini-coefficient and the shape of Lorenz curve of different ranges reveals that the distribution of calorie intake among the population of middle range is lower than the other two ranges, while upper range exhibits the existence of higher inequalities.

(v): Distribution of calorie intake according to Sex-wise head of the household:

The cumulated percentages among the population of male and female headed family as well as their daily calorie intake are presented in table No. 5.3.1 (v, a and b). The cumulated percentages calorie intake and population of male and female headed family, when plotted on a graph paper gives the resultant shape which is evident from figure 22.

Table No. 5.3.1 (v, a): Distribution of calorie intake among the population of Male-headed family.

Calorie group	Total number of person (F)	Total calorie intake (Q)	% of F	% of Q	Cf of F	Cf of Q
0 – 500	14	3117.4	4.48	0.42	4.48	0.42
501 - 1000	15	11385.32	4.79	1.52	9.27	1.94
1001 – 1500	18	22976.48	5.75	3.06	15.02	5
1501 – 2000	48	85667.21	15.34	11.4	30.36	16.4
2001 – 2500	72	166171.56	23	22.12	53.36	38.52
2501 – 3000	69	189984.76	22.04	25.29	75.4	63.81
3001 – 3500	46	149579.54	14.69	19.91	90.09	83.72
3501 – 4000	23	84445.21	7.35	11.24	97.44	94.96
4000 and above	8	37846.03	2.56	5.04	100	100

Sources: Field Survey 2005-06.

Table No. 5.3.1 (v, b): Distribution of calorie intake among the population of Female-headed family.

Calorie group	Total number of person (F)	Total calorie intake (Q)	% of F	% of Q	Cf of F	Cf of Q
0 – 500	2	549.64	2.5	0.27	2.5	0.27
501 - 1000	0	0	0	0	2.5	0.27
1001 – 1500	4	4790.98	5	2.29	7.5	2.56
1501 – 2000	8	14023.89	10	6.73	17.5	9.29
2001 – 2500	21	46389.79	26.25	22.25	43.75	31.54
2501 – 3000	17	46629.71	21.25	22.34	65	53.88
3001 – 3500	17	55088.29	21.25	26.43	86.25	80.31
3501 – 4000	8	28873.85	10	13.85	96.25	94.16
4000 and above	3	12154.63	3.75	5.84	100	100

Sources: Field Survey 2005-06.

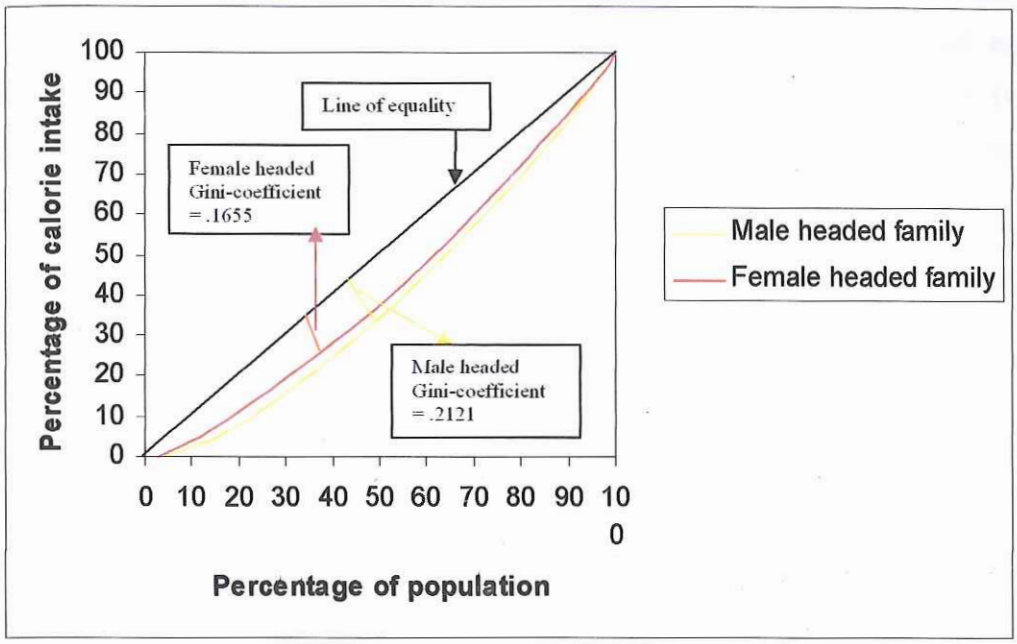

Figure 22: Distribution of calorie intake among the population of Male and Female headed family.

(a): Distribution of calorie intake among the population of Male-headed family:

The data in table no 5.3.1 (v, a) reveals that the bottom 15% of the population consumes about 5% of the total calorie intake at one end that is higher than the percentage of the sample population. But at the other end about 16% of the total calorie intake is shared by the top 10%, which is slightly lower than the percentage of the sample population. Thus 90% of the population share 83% of the total calorie intake, quite similar with that of the sample population. The Gini-coefficient of calorie intake for the population of male-headed family comes out to be .2121. The Lorenz curve of male headed family is represented by the yellow line in figure 22.

(b): Distribution of calorie intake among the population of Female-headed family:

The data in table no 5.3.1 (v, b) reveals that the bottom 17% of the population consumes about 9% of the total calorie intake at one end that is higher than the percentage of the sample population. But at the other end about 19% of the total calorie intake is shared by the top 13%, which is lower than the percentage of the sample population. Thus 86% of the population share 80% of the total calorie intake, which is lower than the sample population. The Gini-coefficient of calorie intake for the population of female-headed family comes out to be .1655. The Lorenz curve of female headed family is represented by the red line in figure 22.

Both Gini-coefficient and the shape of Lorenz curve shows the lower inequalities in the distribution of calorie intake among the population of female-headed family as compared to that of the sample population and male headed family.

(vi) Distribution of calorie intake according to Occupation-wise head of the household:

The cumulated percentages among the population of service and agricultural headed household and their daily calorie intake are presented in table No. 5.3.1 (vi, a and b). The cumulated percentages calorie intake and population of the service and agricultural headed household, when plotted on a graph paper gives the resultant shape which is evident from figure 23.

Table No.5.3.1 (vi, a): Distribution of calorie intake among the population of Service headed household

Calorie group	Total number of person (F)	Total calorie intake (Q)	% of F	% of Q	Cf of F	Cf of Q
0 – 500	4	970.2	2.52	0.26	2.52	0.26
501 - 1000	5	2704.8	3.14	0.72	5.66	0.99
1001 – 1500	10	12846.61	6.29	3.46	11.95	4.45
1501 – 2000	22	39666.55	13.84	10.69	25.79	15.14
2001 – 2500	42	95522.79	26.42	25.73	52.20	40.87
2501 – 3000	34	93875.15	21.38	25.29	73.58	66.16
3001 – 3500	36	115973.9	22.64	31.24	96.23	97.40
3501 – 4000	4	1499.31	2.52	0.40	98.74	97.80
4000 and above	2	8162.27	1.26	2.20	100	100

Sources: Field Survey 2005-06.

Table No. 5.3.1 (vi, b): Distribution of calorie intake among the population of Agricultural headed household:

Calorie group	Total number of person (F)	Total calorie intake (Q)	% of F	% of Q	Cf of F	Cf of Q
0 – 500	11	2147.2	4.7	0.38	4.7	0.38
501 - 1000	11	8230.1	4.7	1.44	9.4	1.82
1001 – 1500	12	14920.85	5.13	2.62	14.53	4.44
1501 – 2000	34	60024.55	14.53	10.52	29.06	14.96
2001 – 2500	51	116603.5	21.79	20.44	50.85	35.4
2501 – 3000	55	150078	23.5	26.31	74.35	61.71
3001 – 3500	25	81783.34	10.69	14.34	85.04	76.05
3501 – 4000	26	94751.25	11.11	16.61	96.15	92.66
4000 and above	9	41838.39	3.85	7.34	100	100

Sources: Field Survey 2005-06.

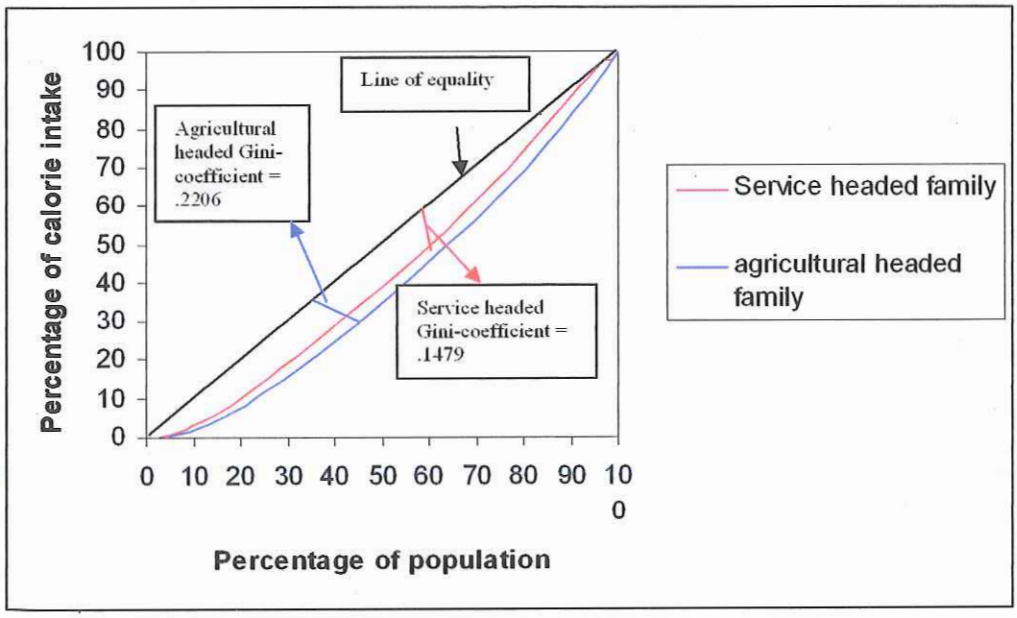

Figure 23: Distribution of calorie intake among the population of Service and Agricultural headed household.

(a) Distribution of calorie intake among the population of Service headed household:

The data in table No. 5.3.1 (vi, a) reveals that the bottom 11% of the population consumes about 4% of the total calorie intake at one end, while at the other end about 33% of the total calorie intake is shared by the top 26%, which is lower than the percentage of the sample population. Thus 73% of the population shares 66% of the total calorie intake, which is lower than the sample population share. The Gini-coefficient of calorie intake for the population of service headed household comes out to be .1479. The red line in figure 23 represents the Lorenz curve of service headed family.

(b) Distribution of calorie intake among the population of Agricultural headed household:

The data in table No. 5.3.1 (vi, b) reveals that the bottom 14% of the population consumes about 4% of the total calorie intake at one end, while at the other end about 23% of the total calorie intake is shared by the top 14%, which is lower than the percentage of the sample population. Thus 86% of the population shares 77% of the total calorie intake, which is lower than the sample population share. The Gini-coefficient of calorie intake for the population of agricultural headed household comes out to be .2206. The blue line in figure 23 represents the Lorenz curve of agricultural headed family.

Both Gini-coefficient and the shape of Lorenz curve shows higher inequalities in the distribution of calorie intake among the population of agricultural headed household as compared to that of the sample and service headed population.

5.3.2: Measuring Inequality through PCTE:

Inequalities in the distribution of Per Capita Monthly Expenditure are being measured for different selected category.

(i): Distribution of income/PCTE among the sample population:

The cumulated percentages of the sample population as well as per capita monthly expenditure are presented in table No. 5.3.2 (i). The cumulated percentages PCTE and population, when plotted on a graph paper gives the resultant shape, which is evident from figure 24. This figure reveals that the bottom 10% of the population is sharing about 6% of the total income at one end and at the other end about 13% of the total income is shared by the top 8% of the population. Thus 91% of the population shares 86% of the total income. The Gini-coefficient of income for the sample population comes out to be .1392. Both Gini-coefficient and the shape of Lorenz curve shows less inequalities in the distribution of income among the sample population as compared with that of the distribution in calorie intake.

Table No. 5.3.2 (i): Distribution of income/PCTE among the Sample population.

PCTE group	Total number of person (F)	Total PCTE (Rs.)	% of person (F)	% PCTE Q	Cf of F	Cf of Q
0 - 600	13	7162.92	3.31	1.95	3.31	1.95
601 - 700	29	18909.17	7.38	5.21	10.69	7.16
701 - 800	61	45624.89	15.52	12.55	26.21	19.71
801 - 900	117	91387.27	29.77	25.56	55.98	45.27
901 - 1000	40	37909.83	10.18	10.24	66.16	55.51
1001 - 1100	45	47951.45	11.45	13.2	77.61	68.71
1101 - 1200	25	28737.51	6.36	7.9	83.97	76.61
1201 - 1300	29	35660.92	7.38	9.82	91.35	86.43
1301 - 1400	9	11953	2.29	3.2	93.64	89.63
1401 - 1500	16	23051.17	4.07	6.3	97.71	95.93
1500 and above	9	14792.46	2.29	4.07	100	100

Sources: Field Survey 2005-06.

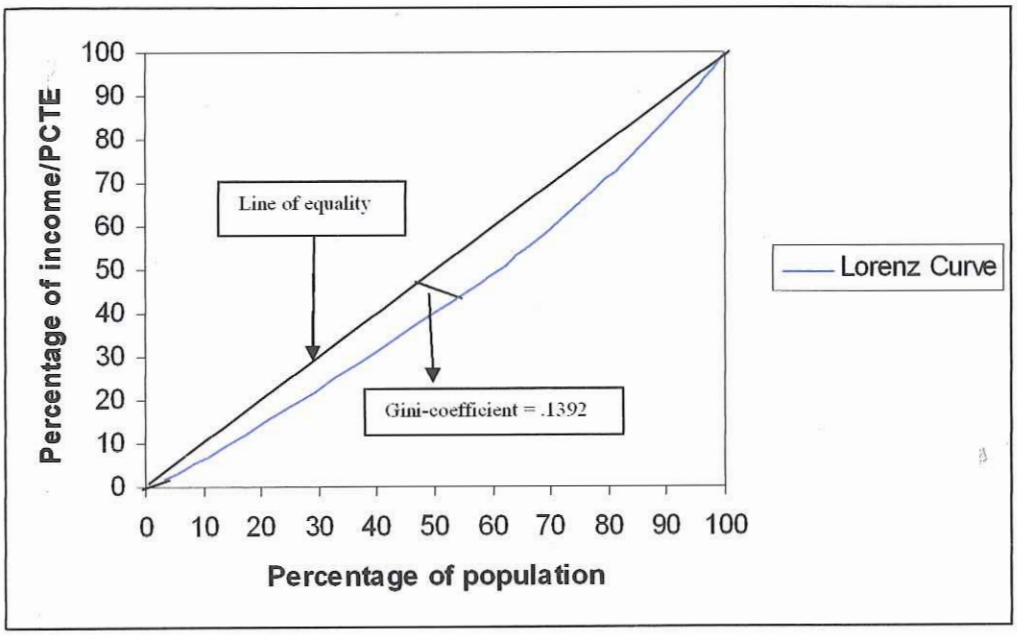

Figure 24: Distribution of income/PCTE among the Sample population.

(ii): Gender-wise distribution of Income/PCTE:

The cumulated percentages among male and female population as well as their per capita monthly expenditure are presented in table No. 5.3.2 (ii, a and b). The cumulated percentages PCTE and male and female population, when plotted on a graph paper gives the resultant shape, which is evident from figure 25.

(a): Distribution of Income/PCTE among the Male population:

The data in table No. 5.3.2 (ii, a) reveals that the bottom 10% of the population is sharing about 7% of the total income at one end, which is higher than the sample population average. However at the other end, about 9% of the total income is shared by the top 5% of the population that is lower than the share of the sample population. Thus 95% of the population share 91% of the total income that is higher than the sample population percentage. The Gini-coefficient of income

for the male population comes out to be .1280. The red line in figure 25 represents the Lorenz curve of male.

5.3.2 (ii, a): Distribution of Income/PCTE among the Male population:

PCTE group	Total number of person (F)	Total PCTE (Rs.)	% of person (F)	% PCTE Q	Cf of F	Cf of Q
0 - 600	3	1665.34	1.74	1.03	1.74	1.03
601 - 700	15	9823.57	8.72	6.09	10.46	7.12
701 - 800	27	20103.46	15.70	12.47	26.16	19.59
801 - 900	56	47390.03	32.56	29.4	57.72	48.99
901 - 1000	17	15989.22	9.88	9.92	68.61	58.81
1001 - 1100	16	17095	9.3	10.6	77.91	69.41
1101 - 1200	12	13805.34	6.97	8.57	84.88	77.98
1201 - 1300	13	15942.12	7.56	9.89	92.44	87.87
1301 - 1400	3	3999.4	1.74	2.48	94.18	90.35
1401 - 1500	6	8609.42	3.49	5.35	97.67	95.7
1500 and above	4	6743.41	2.33	4. 3	100	100

Sources: Field Survey 2005-06.

Table 5.3.2 (ii, b): Distribution of Income/PCTE among the Female population:

PCTE group	Total number of person (F)	Total PCTE (Rs.)	% of person (F)	% PCTE Q	Cf of F	Cf of Q
0 - 600	10	5497.58	4.52	2.63	4.52	2.63
601 - 700	14	9085.31	6.33	4.35	10.85	6.98
701 - 800	34	25521.42	15.39	12.22	26.24	19.20
801 - 900	61	51320.08	27.60	24.57	53.84	43.77
901 - 1000	27	25558.28	12.22	12.24	66.06	56.01
1001 - 1100	25	26758.71	11.31	12.81	77.37	68.82
1101 - 1200	13	14932.17	5.88	7.15	83.25	75.97
1201 - 1300	16	19718.8	7.24	9.45	90.49	85.42
1301 - 1400	6	7953.6	2.72	3.8 1	93.21	89.23
1401 - 1500	10	14441.76	4.52	6.92	97.73	96.14
1500 and above	5	8049.05	2.27	3.86	100	100

Sources Field Survey 2005-06.

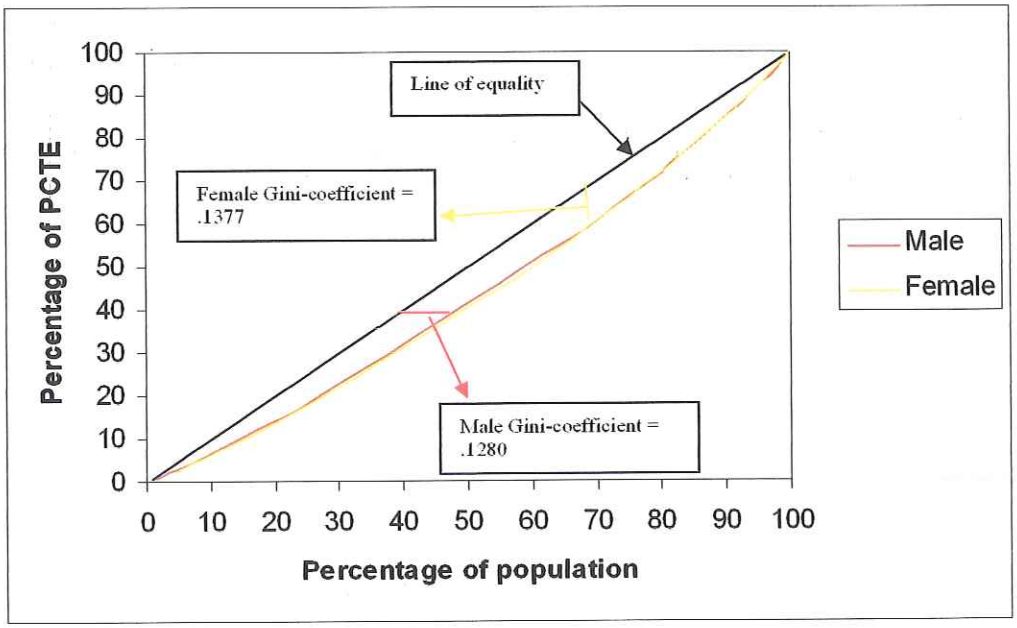

Figure 25: Distribution of Income/PCTE among the Male and Female population.

(b): Distribution of Income/PCTE among the Female population:

The data in table No. 5.3.2 (ii, b) reveals that the bottom 10% of the population is sharing about 6% of the total income at one end, which is higher than the sample population average. However at the other end, about 10% of the total income is shared by the top 6% of the population that is higher than the share of the sample population. Thus 94% of the population share 90% of the total income that is higher than the sample population percentage. The Gini-coefficient of income for the female population comes out to be .1377. The yellow line in figure 25 represents the Lorenz curve of female.

Both Gini-coefficient and the shape of Lorenz curve shows less inequalities in the distribution of income among female population than the sample population but higher inequalities when compared to male population.

(iii): Village-wise distribution of Income/PCTE:

The cumulated percentages among Longsa village population as well as the per capita monthly expenditure are presented in table No. 5.3.2 (iii, a, b, c and d). The cumulated percentages PCTE and population of these villages, when plotted on a graph paper gives the resultant shape, which is evident from figure 26.

Table No. 5.3.2 (iii, a): Distribution of income/PCTE among the population of Longsa village.

PCTE group	Total number of person (F)	Total PCTE (Rs.)	% of person (F)	% PCTE Q	Cf of F	Cf of Q
0 - 600	13	7162.92	5.02	2.91	5.02	2.91
601 - 700	19	12326.17	7.33	5.01	12.35	7.92
701 - 800	38	28536.45	14.67	11.58	27.02	19.5
801 - 900	75	62463.94	28.96	25.36	55.98	44.86
901 - 1000	23	21762.2	8.89	8.84	64.87	53.7
1001 - 1100	25	26784.1	9.65	10.88	74.52	64.58
1101 - 1200	20	23007.9	7.72	9.34	82.24	73.92
1201 - 1300	14	17432.58	5.41	7.08	87.65	81
1301 - 1400	9	11953	3.47	4.85	91.12	85.85
1401 - 1500	16	23051.17	6.18	9.36	97.3	95.21
1500 and above	7	11784.14	2.7	4.79	100	100

Sources: Field Survey 2005-06.

Table No. 5.3.2 (iii, b): Distribution of income/PCTE among the population of Yunchuchu village.

PCTE group	Total number of person (F)	Total PCTE (Rs.)	% of person (F)	% PCTE Q	Cf of F	Cf of Q
0 - 600	0	0	0	0	0	0
601 - 700	0	0	0	0	0	0
701 - 800	14	10466.35	33.33	27.46	33.33	27.46
801 - 900	10	8687	23.81	22.79	57.14	50.25
901 - 1000	7	6605.66	16.67	17.33	73.81	67.58
1001 - 1100	7	7526.01	16.67	19.75	90.48	87.33
1101 - 1200	0	0	0	0	90.48	87.33
1201 and above	4	4828.67	9.52	12.67	100	100

Sources: Field Survey 2005-06.

Table No. 5.3.2 (iii, c): Distribution of income/PCTE among the population of Sunglup village.

PCTE group	Total number of person (F)	Total PCTE (Rs.)	% of person (F)	% PCTE Q	Cf of F	Cf of Q
0 - 600	0	0	0	0	0	0
601 - 700	0	0	0	0	0	0
701 - 800	9	6622.09	23.68	19.2	23.68	19.2
801 - 900	15	13061.16	39.48	37.87	63.16	57.07
901 - 1000	10	9542	26.32	27.67	89.48	84.74
1001 - 1100	1	1090.67	2.63	3.16	92.11	87.9
1101 - 1200	1	1164.91	2.63	3.38	94.74	91.28
1201 - 1300	0	0	0	0	94.74	91.28
1301 - 1400	0	0	0	0	94.74	91.28
1401 - 1500	0	0	0	0	94.74	91.28
1500 and above	2	3008.34	5.26	8.72	100	100

Sources: Field Survey 2005-06.

Table No. 5.3.2 (iii, d): Distribution of income/PCTE among the population of Bhandari village.

PCTE group	Total number of person (F)	Total PCTE (Rs.)	% of person (F)	% PCTE Q	Cf of F	Cf of Q
0 - 600	0	0	0	0	0	0
601 - 700	10	6583	18.52	12.87	18.52	12.87
701 - 800	0	0	0	0	18.52	12.87
801 - 900	17	14498	31.48	28.35	50	41.22
901 - 1000	4	3637.67	7.41	7.11	57.41	48.33
1001 - 1100	8	8453	14.81	16.53	72.22	64.86
1101 - 1200	4	4564.67	7.41	8.93	79.63	73.79
1201 and above 1300	11	13399.67	20.37	26.21	100	100

Sources: Field Survey 2005-06.

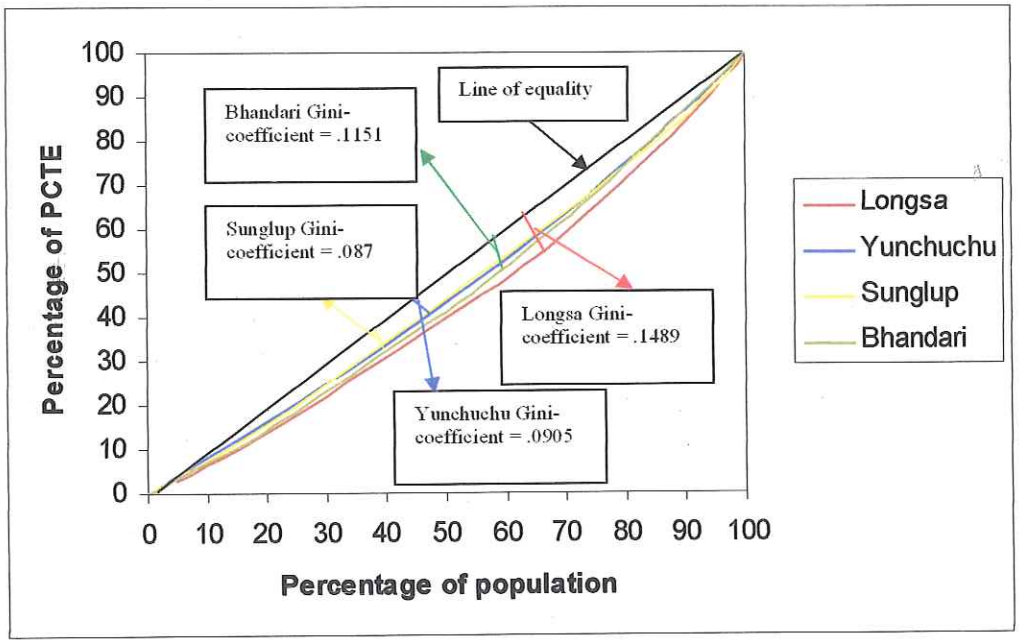

Figure 26: Distribution of Income/PCTE among the population of Longsa, Yunchuchu, Sunglup and Bhandari villages.

(a): Distribution of Income/PCTE among the population of Longsa village:

The data in table No. 5.3.2 (iii, a) reveals that the bottom 12% of the population is sharing about 7% of the total income at one end, which is lower than the sample population average. However at the other end, about 11% of the total income is shared by the top 8% of the population that is lower than the share of the sample population. Thus 91% of the population share 85% of the

total income that is lower than the sample population percentage. The Gini-coefficient of income for the population of Longsa village comes out to be .1489. The red line in figure 26 represents the Lorenz curve of Longsa village.

(b): Distribution of Income/PCTE among the population of Yunchuchu village:

The data in table No. 5.3.2 (iii, b) reveals that the bottom 33.33% of the population is sharing about 27% of the total income at one end, which is higher than the sample population share. However at the other end, about 12% of the total income is shared by the top 9% of the population that is lower than the share of the sample population. Thus 90% of the population share 87% of the total income that is higher than the sample population percentage. The Gini-coefficient of income for the population of Yunchuchu village comes out to be .0905. The blue line in figure 26 represents the Lorenz curve of Yunchuchu village.

(c): Distribution of Income/PCTE among the population of Sunglup village:

The data in table No. 5.3.2 (iii, c) reveals that the bottom 23.68% of the population is sharing about 19% of the total income at one end, which is higher than the sample population share. However at the other end, about 8% of the total income is shared by the top 5% of the population that is slightly lower than the share of the sample population. Thus 94% of the population share 91% of the total income that is higher than the sample population percentage. The Gini-coefficient of income for the population of Sunglup village comes out to be .0870. The yellow line in figure 26 represents the Lorenz curve of Sunglup village.

(d): Distribution of Income/PCTE among the population of Bhandari village:

The data in table No. 5.3.2 (iii, d) reveals that the bottom 18% of the population is sharing about 12% of the total income at one end, which is slightly higher than the sample population share. However at the other end, about 26% of the total income is shared by the top 20% of the population that is lower than the share of the sample population. Thus 79% of the population share 73% of the total income that is lower than the sample population percentage. The Gini-coefficient of income for the population of Bhandari village comes out to be .1151. The green line in figure 26 represents the Lorenz curve of Bhandari village.

Both Gini-coefficient and the shape of Lorenz curve shows that Longsa village has the highest inequality in the distribution of income among the selected category. Whereas, Sunglup exhibits a higher equality in both the distribution of calorie intake as well as income/PCTE among the selected category.

(iv) Range-wise distribution of income/PCTE:

Range-wise estimation of inequalities in the distribution of income/PCTE is shown in the table No 5.3.2 (iv, a, b and c). The cumulated percentages of income and population of these ranges, when plotted on a graph paper gives the resultant shape which is evident from figure 27.

Table No. 5.3.2 (iv, a): Distribution of income/PCTE among the population of Upper range.

PCTE group	Total number of person (F)	Total PCTE (Rs.)	% of person (F)	% PCTE Q	Cf of F	Cf of Q
0 - 600	13	7162.92	5.02	2.91	5.02	2.91
601 - 700	19	12326.17	7.33	5.01	12.35	7.92
701 - 800	38	28536.45	14.67	11.58	27.02	19.5
801 - 900	75	62463.94	28.96	25.36	55.98	44.86
901 - 1000	23	21762.2	8.89	8.84	64.87	53.7
1001 - 1100	25	26784.1	9.65	10.88	74.52	64.58
1101 - 1200	20	23007.9	7.72	9.34	82.24	73.92
1201 - 1300	14	17432.58	5.41	7.08	87.65	81
1301 - 1400	9	11953	3.47	4.85	91.12	85.85
1401 - 1500	16	23051.17	6.18	9.36	97.3	95.21
1500 and above	7	11784.14	2.7	4.79	100	100

Sources: Field Survey 2005-06.

Table No. 5.3.2 (iv, b): Distribution of income/PCTE among the population of Middle range:

PCTE group	Total number of person (F)	Total PCTE (Rs.)	% of person (F)	% PCTE Q	Cf of F	Cf of Q
0 - 600	0	0	0	0	0	0
601 - 700	0	0	0	0	0	0
701 - 800	23	17088.44	28.75	23.54	28.75	23.54
801 - 900	25	21748.16	31.25	29.95	60	53.49
901 - 1000	17	16147.66	21.25	22.24	81.25	75.73
1001 - 1100	8	8616.68	10	11.87	91.25	87.60
1101 - 1200	1	1164.91	1.25	1.60	92.5	89.20
1201 - 1300	4	4828.67	5	6.65	97.5	95.85
1301 - 1400	0	0	0	0	97.5	95.85
1401 - 1500	0	0	0	0	97.5	95.85
1500 and above	2	3008.34	2.5	4.15	100	100

Sources: Field Survey 2005-06.

Table No. 5.3.2 (iv, d): Distribution of income/PCTE among the population of Lower range.

PCTE group	Total number of person (F)	Total PCTE (Rs.)	% of person (F)	% PCTE Q	Cf of F	Cf of Q
0 - 600	0	0	0	0	0	0
601 - 700	10	6583	18.52	12.87	18.52	12.87
701 - 800	0	0	0	0	18.52	12.87
801 - 900	17	14498	31.48	28.35	50	41.22
901 - 1000	4	3637.67	7.41	7.11	57.41	48.33
1001 - 1100	8	8453	14.81	16.53	72.22	64.86
1101 - 1200	4	4564.67	7.41	8.93	79.63	73.79
1201 and above 1300	11	13399.67	20.37	26.21	100	100

Sources: Field Survey 2005-06.

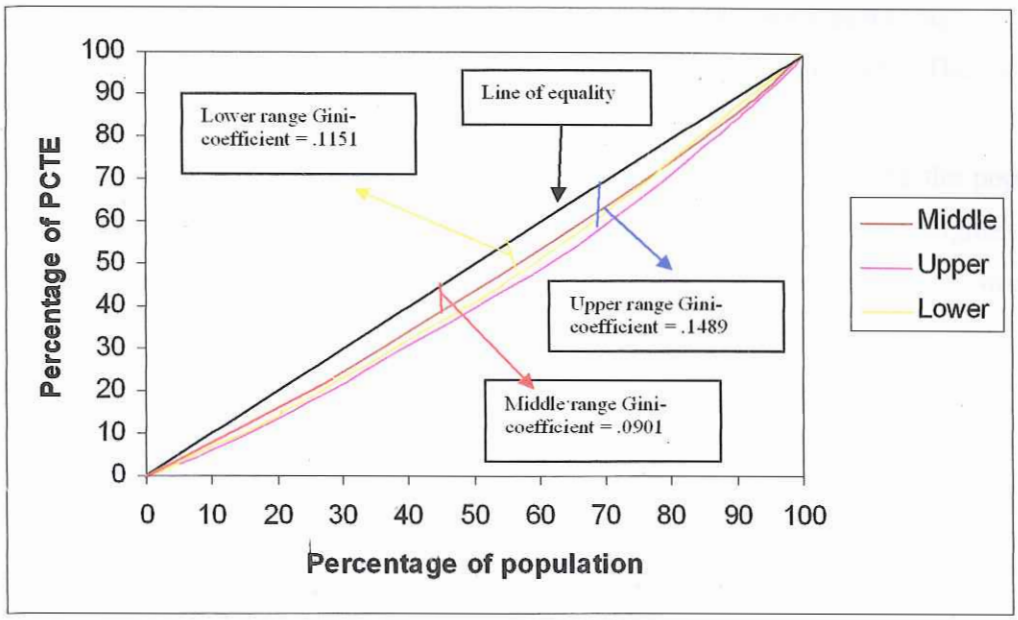

Figure 27: Distribution of income/PCTE among the population of Upper, Middle and Lower ranges.

(a) Distribution of income/PCTE among the population of Upper range:

The data in table No. 5.3.2 (iv, a) reveals that the bottom 12% of the population is sharing about 7% of the total income at one end, which is lower than the sample population average. However at the other end, about 11% of the total income is shared by the top 8% of the population that is lower than the share of the sample population. Thus 91% of the population share 85% of the total income that is lower than the sample population percentage. The Gini-coefficient of income for the population of Longsa village comes out to be .1489. The blue line in figure 27 represents the Lorenz curve of upper range.

(b) Distribution of income/PCTE among the population of Middle range:

The data in table No. 5.3.2 (iv, b) reveals that the bottom 28.75% of the population is sharing about 23.54% of the total income at one end that is higher than the percentage of the sample population. But at the other end about 10% of the total income is shared by the top 7%, which is slightly lower than the percentage of the sample population. Thus 93% of the population shares 90% of the total income. The Gini-coefficient of calorie intake for the population of middle range comes out to be .0901. The red line in figure 27 represents the Lorenz curve of middle range.

(c) Distribution of income/PCTE among the population of Lower range:

The data in table No. 5.3.2 (iv, c) reveals that the bottom 18% of the population is sharing about 12% of the total income at one end, which is slightly higher than the sample population share. However at the other end, about 26% of the total income is shared by the top 20% of the population that is lower than the share of the sample population. Thus 79% of the population share

73% of the total income that is lower than the sample population percentage. The Gini-coefficient of income for the population of Bhandari village comes out to be .1151. The yellow line in figure 27 represents the Lorenz curve of Lower range.

On comparison it is seen that the distribution of income among the population of middle range is more equal than the other two ranges, while upper range reveals highest inequalities. This fact is confirmed by examining their respective Gini-coefficients and the shape of the Lorenz curve.

(v) Distribution of Income/PCTE according to Sex-wise head of the household:

Sex-wise head of the household estimation of inequalities in the distribution of income/PCTE is shown in the table No 5.3.2 (v, a and b). The cumulated percentages of income and population of these ranges, when plotted on a graph paper gives the resultant shape which is evident from figure 28.

Table No. 5.3.2 (a): Distribution of income/PCTE among the population of Male headed family.

PCTE group	Total number of person (F)	Total PCTE (Rs.)	% of person (F)	% PCTE (Q)	Cf of F	Cf of Q
0 - 600	11	6184.83	3.51	2.08	3.51	2.08
601 - 700	19	12326.2	6.07	4.16	9.58	6.24
701 - 800	52	38747.8	16.62	13.09	26.2	19.33
801 - 900	88	74265.6	28.12	25.08	54.32	44.41
901 - 1000	37	34839.5	11.82	11.77	66.14	56.18
1001 - 1100	32	34152.1	10.22	11.54	76.36	67.72
1101 - 1200	22	25310.1	7.03	8.56	83.39	76.28
1201 - 1300	24	29245.4	7.67	9.88	91.06	86.16
1301 - 1400	7	9324	2.24	3.15	93.3	89.31
1401 - 1500	16	23051.2	5.11	7.79	98.41	97.1
1500 and above	5	8571.4	1.59	2.9	100	100

Sources: Field Survey 2005-06.

Table No. 5.3.2 (b): Distribution of income/PCTE among the population of Female headed family.

PCTE group	Total number of person (F)	Total PCTE (Rs.)	% of person (F)	% PCTE (Q)	Cf of F	Cf of Q
0 - 600	2	978.09	2.5	1.32	2.5	1.32
601 - 700	10	6583	12.5	8.9	15	10.22
701 - 800	9	6877.14	11.25	9.3	26.25	19.52
801 - 900	29	24444.55	36.25	33.04	62.5	52.56
901 - 1000	7	6708	8.75	9.07	71.25	61.63
1001 - 1100	9	9701.68	11.25	13.11	82.5	74.74
1101 - 1200	3	3427.4	3.75	4.63	86.25	79.37
1201 - 1300	5	6415.5	6.25	8.67	92.5	88.04
1301 - 1400	2	2629	2.5	3.55	95	91.59
1401 - 1500	0	0	0	0	95	91.59
1500 and above	4	6221.06	5	8.41	100	100

Sources: Field Survey 2005-06.

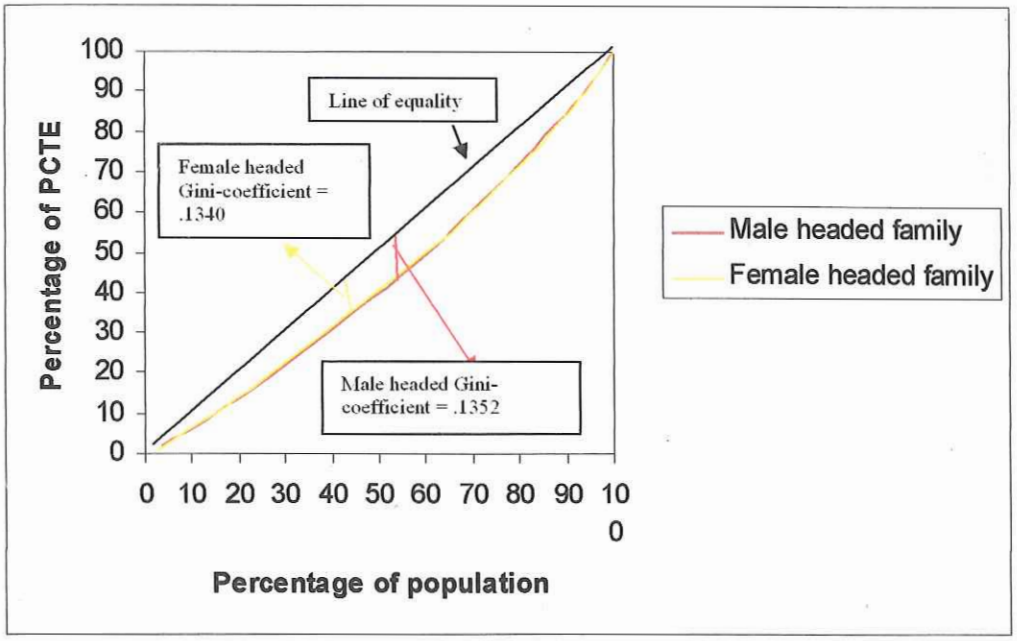

Figure 28: Distribution of Income/PCTE among the population of Male and Female headed family.

(a): Distribution of Income/PCTE among the population of Male headed family:

The data in table No 5.3.2 (a) reveals that the bottom 9% of the population is sharing about 6% of the total income at one end, which is slightly higher than the sample population share. However at the other end, about 10% of the total income is shared by the top 6% of the population that is slightly higher than the share of the sample population. Thus 94% of the population share 90% of the total income that is higher than the sample population percentage. The Gini-coefficient of income for the population of male headed family village comes out to be .16352. The Lorenz curve of male headed family is represented by the red line in figure 28.

(b): Distribution of Income/PCTE among the population of female headed family:

The data in table No 5.3.2 (a) reveals that the bottom 15% of the population is sharing about 10% of the total income at one end, which is higher than the sample population share. However at the other end, about 11% of the total income is shared by the top 7% of the population that is lower than the share of the sample population. Thus 95% of the population shares 91% of the total income that is slightly higher than the sample population percentage. The Gini-coefficient of income for the population of female headed family comes out to be .1340. The Lorenz curve of female headed family is represented by the yellow line in figure 28.

Both Gini-coefficient and the shape of Lorenz curve of female headed family shows higher equality in distribution of income compared with that of the male headed family and the sample population.

(vi) Distribution of Income/PCTE according to Occupation-wise head of the household:

The cumulated percentages among the population of service and agriculturalist headed family as well as their per capita monthly expenditure are presented in table No. 5.3.2 (vi, a and b). The cumulated percentages PCTE and population of service and agriculturalist headed family, when plotted on a graph paper gives the resultant shape which is evident from figure 29.

Table 5.3.2 (vi, a): Distribution of Income/PCTE among the population of Service headed family:

PCTE group	Total number of person (F)	Total PCTE (Rs.)	% of person (F)	% PCTE (Q)	Cf of F	Cf of Q
0 - 600	0	0	0	0	0	0
601 - 700	15	10069	9.43	6.46	9.43	6.46
701 - 800	17	13025.07	10.69	8.36	20.12	14.82
801 - 900	42	38798.91	26.42	24.89	46.54	39.71
901 - 1000	21	19985.17	13.21	12.82	59.75	52.53
1001 - 1100	32	34240.94	20.13	21.96	79.88	74.49
1101 - 1200	15	17200.1	9.43	11.03	89.31	85.52
1201 - 1300	10	12266.25	6.29	7.87	95.6	93.39
1301 - 1400	0	0	0	0	95.6	93.39
1401 - 1500	7	10303.83	4.40	6.61	100	100
1500 and above	0	0	0	0	100	100

Sources: Field Survey 2005-06.

Table 5.3.2 (vi, b): Distribution of Income/PCTE among the population of Agriculturalist headed family:

PCTE group	Total number of person (F)	Total PCTE (Rs.)	% of person (F)	%PCTE Q	Cf of F	Cf of Q
0 - 600	13	7162.9	5.56	3.54	5.56	3.54
601 - 700	14	8840.2	5.98	4.37	11.54	7.91
701 - 800	44	32599.8	18.8	16.1	30.34	24.01
801 - 900	78	65474.25	33.33	32.35	63.68	56.36
901 - 1000	23	21562.33	9.82	10.65	73.50	67.01
1001 - 1100	9	9612.84	3.85	4.75	77.35	71.76
1101 - 1200	9	10398.25	3.85	5.14	81.20	76.9
1201 - 1300	19	23394.7	8.12	11.56	89.32	88.46
1301 - 1400	10	1392.16	4.27	0.69	93.59	89.15
1401 - 1500	9	12745.3	3.85	6.3	97.44	95.45
1500 and above	6	9229.4	2.56	4.55	100	100

Sources: Field Survey 2005-06.

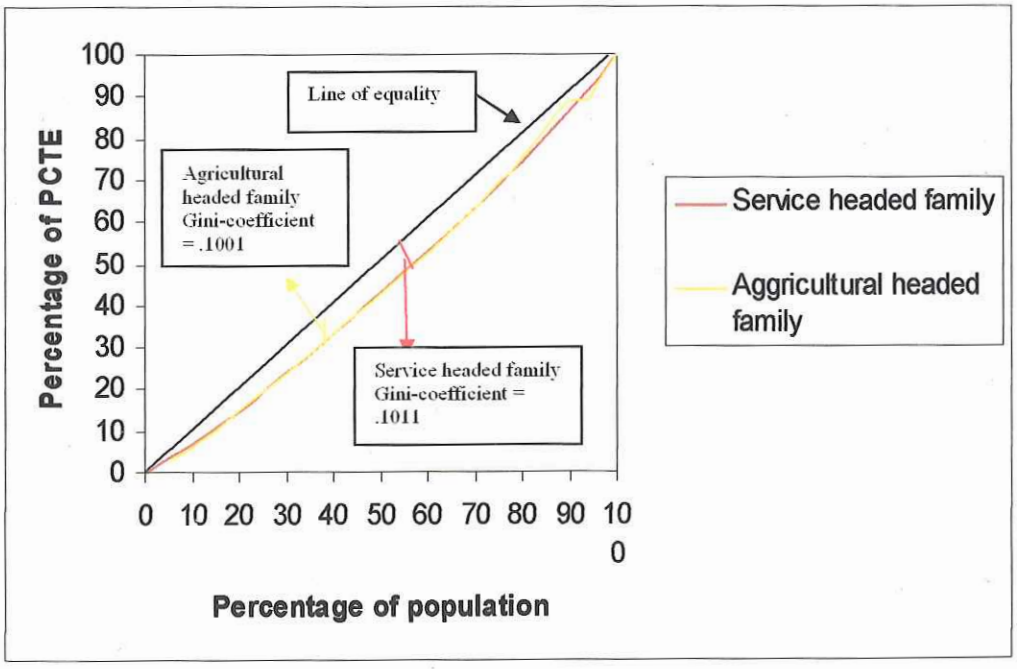

Figure 29: Distribution of Income/PCTE among the population of Service and Agricultural headed family.

(a): Distribution of Income/PCTE among the population of service headed family:

The data in table No. 5.3.2 (vi, b) reveals that the bottom 9% of the population is sharing about 6% of the total income at one end, which is higher than the sample population share. However at the other end, about 14% of the total income is shared by the top 10% of the population that is lower than the share of the sample population. Thus 90% of the population shares 86% of the total income that is slightly higher than the sample population percentage. The Gini-coefficient of income for the population of service headed family comes out to be .1011. The red line in figure 29 represents the Lorenz curve of service headed family.

(b): Distribution of Income/PCTE among the population of Agriculturalist headed family:

The data in table No. 5.3.2 (vi, b) reveals that the bottom 11% of the population is sharing about 7% of the total income at one end, which is higher than the sample population share. However at the other end, about 10% of the total income is shared by the top 6% of the population that is higher than the share of the sample population. Thus 94% of the population shares 90% of the total income that is slightly higher than the sample population percentage. The Gini-coefficient of income for the population of agricultural headed family comes out to be .1001. The yellow line in figure 29 represents the Lorenz curve of agriculturalist headed family.

Both Gini-coefficient and the shape of Lorenz curve of the agriculturalist headed family shows less inequalities in the distribution of income than the sample population as well as the service headed family.

From the analysis of inequalities among the selected category, the following conclusion may be drawn;

1) The extent of inequality in terms of calorie intake is higher among the sample population than measured in terms of the PCTE.
2) Gender-wise, the degree of inequality is higher among the male than female in terms of calorie intake and vice-versa in terms of PCTE.
3) Among the sample villages, Yunchuchu exhibits highest degree of inequality in terms of calorie intake, while Longsa shows the highest inequality in terms of PCTE.
4) A range-wise inequality shows that upper range exhibits the highest degree of inequality both in terms of calorie intake and PCTE.
5) Sex-wise head of the household shows that the extent of inequality is higher among the male headed household than female headed household both in terms of calorie intake and PCTE.

6) It also reveals from the analysis among the occupation-wise head of the household, the inequalities in terms of calorie intake is higher among the agricultural headed families while in terms of PCTE it is the service headed household.

5.4: INEQUALITY IN THE DISTRIBUTION OF CALORIE INTAKE AND THE PROPORTION OF POOR:

To estimate the relationship that existed between the inequalities in the distribution of calorie intake and the proportion of poor we look at the Gini-coefficients in the distribution of calorie intake and the Head Count Ratio measured using the sample survey calorie norms as given in table no 5.4.

Table No. 5.4: Gini-coefficient of calorie intake distribution and the Head Count Ratio.

Selected category	Gini-coefficients	HCR (Measured using sample survey norms)
Sample population	.2032	.4606
Gender-wise		
Male	.2067	.4826
Female	.1996	.4479
Village wise		
Longsa	.2116	.4633
Yunchuchu	.2235	.5476
Sunglup	.0984	.2895
Bhandari	.1863	.4815
Range-wise		
Upper	.2116	.4633
Middle	.1840	.45
Lower	.1863	.4815
Sex-wise Head of the Household		
Male headed family	.2121	.4601
Female headed family	.1655	.4375
Occupation-wise Head of the Household		
Service	.1479	.4654
Agriculture	.2206	.4531

Source: Field Survey 2005-06.

Looking at the correlation between the distribution of calorie intake and the proportion of poor measured through the sample survey norms, it was found that the correlation coefficient value is positive (+ 0.79). Testing the significance of the relation, it was also found that the positive correlation coefficient is significant as its r value is more than ten times greater than its probable error of 0.068. This implies that there is a high positive relationship between inequalities in the distribution of calorie and proportion of poor. Thus, the hypothesis, which states that higher the extent of inequalities in calorie distribution, higher is the proportion of poor in the society, has been proved true.

5.5: INEQUALITY IN THE DISTRIBUTION OF PCTE AND THE PROPORTION OF POOR:

To estimate the relationship that existed between the inequalities in the distribution of calorie intake and the proportion of poor we look at the Gini-coefficients in the distribution of PCTE and the Head Count Ratio measured using the sample Poverty line as given in table no 5.5.

Table No. 5.5: Gini-coefficient of PCTE distribution and the Head Count Ratio.

Selected category	Gini-coefficients	Sample survey poverty line
Sample population	.1392	.5954
Gender-wise		
Male	.1280	.6279
Female	.1377	.5701
Village wise		
Longsa	**.1489**	**.5792**
Yunchuchu	.0905	.5714
Sunglup	.0870	.7632
Bhandari	.1151	.5741
Range-wise		
Upper	.1489	.5792
Middle	.0901	.6625
Lower	.1151	.5741
Sex-wise Head of the Household		
Male headed family	.1352	.5879
Female headed family	.1340	.625
Occupation-wise Head of the Household		
Service	.1011	.4969
Agriculture	.1001	.6752

Source: Field Survey 2005-06.

The correlation coefficient value of inequality and the proportion of poor, measured through the sample survey norm show a negative relation (- 0.38). However, it was found that the negative correlation coefficient is not significant as its r value is less than its probable error of 0.1534. This implies that there is no evidence of relationship between inequalities in the distribution of income and proportion of poor. Thus, the hypothesis, which states that higher the extent of inequalities in income, higher is the proportion of poor in the society, has been proved wrong.

5.6: IMPACT OF POVERTY ALLEVIATION PROGRAMME AMONG THE SAMPLE POPULATION:

The provision of employment on public works has been advocated as a means of relieving poverty and famines in South Asia for at least a century[73]. Thus raising the standard of living of the masses is one of the main objectives of planning in India. The first scheme to directly reduce poverty was the Employment Guarantee Scheme introduced in 1972-73 by the government of

[73] Bhatia, B.M. (1967). *"Famines in India: A study of Some Aspects of the Economic History of India (1860-1965)"*, London: Asia publishing House. P 120.

Maharashtra. It was the first of its kind to give recognition to the 'right to work' enshrine in the constitution[74]. Since than, the Government of India has been initiating many pro-poor programmes to reduce poverty in the Country; namely, National Rural Employment Programme (NREP) 1980, Integrated Rural Development Programme (IRDP) 1980, Rural Landless Employment Guarantee Programme (RLEP) 1983, Jawahar Rozgar Yojana (JRY) 1989, Swaran Jayanti Shahari Rozgar Yojana (1997), etc. The most recent programme announced to alleviate poverty in India came with the legislation of National Rural Employment Guarantee Act (NERG) 2005. Since many programmes have been launched in the country to alleviate poverty, it becomes pertinent to examine the benefit from any of these programmes by the sample population. The analysis of the impact of poverty alleviation on the sample population has been shown in table no. 5.6.

Table No. 5.6: Poverty alleviation Programme.

Category	Total Sample household		Longsa		Yunchuchu		Sunglup		Bhandari	
	No	%	No	%	No	%	No	%	No	%
House holds that has so far received Poverty Alleviation Programme	10	10.10	9	13.24	0	0	1	8.3	0	0
No of persons	16	4.07	15	5.79	0	0	1	2.63	0	0
House holds that did not received Poverty Alleviation Programme	89	89.90	59	86.76	9	100	11	91.7	10	100
No of persons	377	95.93	244	94.21	42	100	37	97.37	54	100

Source: Field Survey 2005-06.
0: Nil

From the survey it was found that programme such as JRY and Below Poverty Line (Rice) have been implemented so far. Out of the total 99 households surveyed, only 10 households have been benefited from the implementation of poverty alleviation programme. This means that 89.90% of the households have not been benefited. The figures in the table reveals that only 4.07% of the total sample population have been benefited from the implementation of poverty alleviation programme. Out of this 1.78% of the population got the help from JRY, while 2.29% of the population got the Below Poverty Line (Rice). Among the villages, Longsa with 9 households had received aids from the government accounting for 13.23% of its total households surveyed, tops in the performance of poverty alleviation programme. Thus, in Longsa 5.79% of its population were benefited from the implementation of poverty alleviation programme. Out of this, 2.32% benefited from JRY, while 3.47% benefited from the Below poverty Line (Rice). Sunglup followed next with 8.33% of its total households surveyed getting the benefits from JRY. But the percentage of population being benefited is low with only 2.63%. For the remaining two villages the surveyed

[74] Ibid 8.

showed a zero benefit from any such programmes by the sample population. It was also observed that out the total beneficiaries, 2.54% of the populations are above the poverty line. The resultant figure clearly reveals that only a meagre proportion of poor have been benefited from such programmes, while 64.64% (based on State Poverty line) of the poor or 57.73% (based on Sample survey poverty line) of the poor remained outside the parameter of the poverty alleviation programme. This clearly shows the failure of the poverty alleviation programme in giving the complete coverage to the poor people. One of the reasons is the leakage of benefits to non- poor, which is termed as the total dead weight loss[75].

In conclusion, it can be said that estimation of poverty becomes vital in formulating suitable policy for eradicating poverty. The resultant proportion of poor, the shortfall of income and the severity of income deprivation throw light on the living standard of the people. This in turn helps in knowing not only the number of poor people but also their deprivation, which can be used by the government in formulation as well as implementation of any poverty alleviation programme.

[75] Ravallion, M. (2002), "On the Coverage of Public Employment Schemes for Poverty Alleviation", in Subramanian S. (edt), *"Measurement of Inequality and Poverty"*, Oxford University Press, p 281.

CHAPTER VI

FINDINGS AND CONCLUSIONS

Although at the national level estimation of poverty have been done in general yet no detail and comprehensive studies had so far been conducted on the estimation of poverty and inequalities among the rural population of Nagaland both at the national as well as at the state level. Thus, the basic objective of this research was to estimate poverty and inequalities of the rural people of Nagaland. The extent of poor amongst the sample population have been derived based on both sample norms and compared it with the NSSO norms of the State and Country. Then the extent of inequalities in the distribution of calorie intake and income (PCTE) that existed among the rural population are also examined in detail. Moreover, the levels of different socio-economic indicators of the study area, which have direct bearing on poverty of the rural population have been empirically analysed. The summary of important findings of the study is given below in detail.

6.1: SOCIO-ECONOMIC PROFILE:

(i) The indicators of demographic characteristics show that Wokha district has the highest decennial population growth rate with 95.01% as against the state growth rate of 69.44% in 2001. In Wokha the average household size is 6.23 persons, which is higher than the state average of 6.1 persons in 2001. Further, based on the data collected from the respective village councils of the sample villages; it was found that the average household size is 7.44 persons.

However, based on the sample household data, the average household size is 3.97 persons only. Thus there is no conformity in the data relating to household size. If we accept the estimated household size generated from the present sample household data, it may be inferred that the high population growth rate of the district as indicated by 2001 census may be an exaggerated figure which requires a separate indebt study.

Among the villages, Bhandari has the largest family size with 5.4 persons, followed by Yunchuchu, Longsa and Sunglup with 4.67, 3.97 and 3.81 persons respectively.

(ii) A distinctive demographic characteristics that emerge from the study is, the proportion of female population are significantly higher than the male population, which differs from the State's and the Country's sex ratio. This fact has been confirmed by the household sample data estimates of 1284 female per 1000 males. Village-wise data shows that Longsa village has the highest sex ratio of 1443 females per thousand males, while Bhandari village has the lowest sex ratio of 800 female per thousand males.

(iii) The household data reveals that the literacy rate is 73.25%, which is lower than the district literacy rate of 81.28% but higher than the state literacy rate of 67.11%. Among the villages, highest literacy rate ranges from 86.11% in Bhandari to 56.76% in Sunglup. Gender-wise analysis shows that male has higher literacy rate of 83.92% than female with 64.48%. Among the villages, Bhandari shows the highest male literacy rate of 92.59%, while Yunchuchu exhibits the highest female literacy rate of 73.91%.

(iv) The development of educational infrastructure in the sample villages is far from satisfactory. Altogether, there are 8 schools ranging from primary to middle school levels, yet, there is a wide variation in the distribution of these institutions among the villages indicated by the fact that Longsa has 4 schools, Sunglup with 2 schools, Yunchuchu and Bhandari having 1 school each. The teacher-student ratio for the sample village is 1: 10, which is better than the district and the state ratio of 1:20 and 1: 21 respectively.

(v) In regard to the availability of public health care facilities, each sample village has 1 dispensary that caters to the health care need of the people. Further, on an average 1 medical personal (Nurses/compounders) serves 809.44 people which is better than the district ratio of 1:947.63 and state ratio of 1: 945.17. However, it was found that none of the dispensary are looked after by doctors.

(vii) Among the many basic needs for human-well being, housing and sanitation facility are of vital importance. The study reveals that none of the population is without shelter. However, the quality of housing differs among the households. On an average, only 6.06% of the household resides in pucca house, which is lower than the district average of 18.90%. While the households residing in semi-pucca houses account for 27.27%, which is lower than the district average of 59.06%. This implies that majority of the households reside in Kutcha houses (66.67%).

Further, only 29.29% of the sample household has proper sanitation as against 63.38% of the district and 57% of the state averages. This implies that more than two-third of the household live in poor quality house and inadequate sanitation.

Among the villages, only Sunglup and Longsa have a few household residing in pucca houses (16.67% and 5.88% respectively), whereas, in other villages there is no evidence of pucca house. The highest proportion of semi-pucca houses is in Yunchuchu with 44.44%. It is followed by Sunglup, Longsa and Bhandari with 30%, 27.94% and 8.33% respectively. Among the villages, Sunglup has the highest percentage of proper sanitation with 41.67% while Longsa lies at the bottom with only 25% of its households having proper sanitation.

(vi) Although the government report shows that 82.17% of the villages in Wokha district have been provided with safe drinking water supply facility, yet none of the sample villages has tap water connectivity. Thus, people of these villages depend entirely on wells, streams and rain to meet the domestic needs of water.

(viii) Electricity is equally important for the well being of the people. The household survey indicates that 79.79% of the household have electricity connectivity. Yet this is lower than both the districts and the states rural household electrification percentage of 93.75% and 93.89% respectively. Thus, 20% of the households in the sample villages are still without these basic facilities. There is a wide variation among the sample villages in this respect. . Yunchuchu village reveals that 88.89% of the household have been electrified, whereas, in Sunglup only 50% of the household have been electrified.

(ix) All weather road connectivity is the basic need to improve the living conditions of the rural population. However, it is discouraging to observe that except for Longsa all other villages are covered by Kutcha roads. For Wokha district, only 17.05% of the villages are linked by pucca road which is below the state percentage of 23.61%.

(x) The result of the analysis on banking and post office indicates that there are no branches or sub-office in of the sample villages. Moreover, no telephone connectivity were found in any of the sample household.

(xi) The analysis on the sectoral employment among the sample household reveals that 60.08% of the total work force are engaged in agriculture which is lower than the district average of 66.06% and the state average of 68.03% as well. Moreover, all the sample households are partly or fully engaged in jhum cultivation which is the most primitive method of cultivation with low income potential. 25.29% of the total work force is engaged in service but none of the household are engaged in industrial activities.

6.2: THE ESTIMATED CALORIE INTAKE:

The result of cross section assessment of the average calorie intake per person per day by age group, village, gender, sex-wise and occupation-wise head of the households shows the following result.

(i) On an average, the per capita calorie intake is estimated at 2441.92 Kcal for the sample population. This average is higher than the NSSO estimate of 2047 Kcal per person for the National rural areas and 2044 Kcal per person for the State rural areas by 19.29% and 19.47% respectively.

(ii) The age-wise average calorie intake shows that it increases from age 1 year and less to 40-49 years, thereafter it declines because of the obvious reason.

(iii) The average calorie intake per person per day among the female population is 2453.16 Kcal that is marginally higher than the male population average of 2427.48 Kcal by 1.06%.

(iv) Among the villages Sunglup and Bhandari with an average of 2613.65 Kcal and 2480.59 Kcal, respectively, are higher than the sample average (2441.92 Kcal) by 7.03% and 1.58% respectively. On the other hand, Longsa and Yunchuchu villages with an average calorie intake of 2428.59 Kcal and 2318.97 Kcal respectively, are lower than the sample average by .55% and 5.03% respectively.

The average calorie intake by gender shows that male average is higher than that of female average in Longsa and Bhandari villages by 1.07% and 2.11% respectively. Whereas, in Sunglup and Yunchuchu villages, the average calorie intake of female is higher than male by 5.15% and 19.52% respectively.

(v) The per capita calorie intake per day by the sex-wise head of household shows that the calorie intake of female-headed household is higher than male headed household by 9.78%. Among the villages, the female headed households in Longsa, Sunglup and Yunchuchu have averages that are higher than their respective male headed household by 15.15%, 17.92% and 7.28% respectively. Thus, it is only in Bhandari the average calorie intake is higher in male headed households than female headed households by 21.18%.

(vi) The estimates of the calorie intake by the occupation-wise head of the household reveals that households headed by farmers have higher averages than the service headed household by 1.05%. The inter-village variation points that in Yunchuchu, Sunglup and Bhandari the households headed by farmers have higher averages than the service headed household by 25.9%, 0.66% and 25.21% respectively, while in Longsa the average calorie intake of service is higher than agricultural headed household by 0.37%.

6.3: THE ESTIMATED MONTHLY PER CAPITA EXPENDITUR (PCTE):

The assessment of the average monthly per capita expenditure (PCTE) by village, gender, sex-wise head and occupation-wise head of the household shows the following result.

(i) On an average, the monthly per capita expenditure for the sample population is Rs. 942.66 (at 2005-06 prices), which is higher than the NSSO estimation of Rs. 558.78

(2004-05 prices) per person per month at National level by 69% but lower than Nagaland state average of Rs. 1010.81(2004-05 prices) per person per month by 7%. The food items accounts for 77% while non-food items account for 23% of the total monthly per capita expenditure (PCTE).

(ii) The village wise result shows that Longsa has higher average PCTE than the sample average by 0.79%, while Yunchuchu, Sunglup and Bhandari have lower averages than the sample average by 10.38%, 8.05% and 2.35% respectively. The share non-food item on monthly per capita expenditure in Longsa village is 25% which exhibits the highest among the villages. While in Sunglup, the share food items on per capita monthly expenditure is 87% which is the highest among the selected villages.

(iii) The sex-wise head of the household analysis reveals that male headed household is having higher averages than both the female headed household and the sample averages by 2.26% and 0.33% respectively. Among the villages, Yunchuchu exhibit highest average that is higher than the over all averages of the female headed households by 5.6%, while Bhandari shows the lowest monthly PCTE that is lower than the corresponding average by 28.79%. Among male headed households, Bhandari exhibits the highest average that is higher than the average male headed household by 8.17%, while Yunchuchu village have the lowest average which is lower than the corresponding average by 6.97%.

Moreover, the analysis also shows that the female headed households in Sunglup and Longsa spend higher proportion of their monthly PCTE on food than male headed households, while in Bhandari and Yunchuchu, male headed household spend higher proportion of their monthly PCTE on food items than female headed households.

(iv) The analysis on occupation-wise head of the household shows that households headed by Service (Rs. 999.41) have higher average than the sample average by 6.06% and agricultural headed household by 4.1%.

Among the service headed villages, Longsa exhibit higher average than the corresponding average by 2.49%, while Bhandari village shows a lowest average that is lower than the corresponding average by 13.24%. In regard to the allocation of monthly PCTE on food and non-food items among service headed households, Sunglup village spends highest percentage of PCTE on food items (80.63%).

Among the agricultural headed households, Bhandari exhibit a higher average than the corresponding average by 8.88%, while Yunchuchu villages have the lowest

average that is lower than the corresponding average by 8.6%. Furthermore, Bhandari spends highest percentage of monthly PCTE on food items with 85.41%, while the expenditure on food items is lowest in Longsa with 75.35%.

6.4: ESTIMATION OF RELATIONSHIP:

The relationship between the per capita calorie intake per day with the size of the family, calorie intake and income/PCTE and PCTE and family size have been examined and the result reveals the following relationship.

(i) The correlation coefficient between the average per capita per day calorie intake and family size shows that there exist a negative relationship (r = -0.703). However, on calculating the probable error, it was found that the value of r is lower than the probable error (P.E. $_r$ = 0.15). Moreover, it is observed that its coefficient of determinant (r^2) is 0.47, which implies that only 47% of the changes in calorie intake are due to changes in family size. Thus, there is no evidence of correlation between the two variables. Thus, the hypothesis which states that larger the size of the household, smaller is the per capita calorie intake does not hold true and therefore rejected.

(ii) The value of correlation between per capita calorie intake and per capita monthly income is closer to 0 (.0089), therefore there is no linear relationship between the variables.

However, the information about the monthly income as provided by the interviewee cannot be considered as reliable because of two reasons. Firstly, people in the rural areas does not keep any record of their monthly income, thus reliable data at the household level is not available. Secondly, People seldom tell their true monthly income to any interviewer. Therefore, Per Capita Monthly Expenditure is used as a proxy of income while measuring poverty. The Report of the Expert Group (1993) maintains that the household consumer expenditure is more reliable than income and hence more suitable for measuring poverty. The reliability of the consumption expenditure is well recognized[76].

(iii) The value of correlation between monthly PCTE and average calorie intake per day, it was found that the correlation coefficient is 0.94. The positive correlation coefficient is highly significant as its r value is 39.83 times greater than its probable error of 0.023. This implies that there is a high positive relationship between per capita monthly expenditure and per capita calorie intake. In other words, people with higher income

[76] Ibid 75.

take more calories. Thus, the hypothesis which states that higher the income higher is the calorie intake has been proved true when income is replaced by PCTE.

(iv) The correlation coefficient between the family size and PCTE shows a negative relation ($r = -0.57$). However, its coefficient of determinant (r^2) is 0.32, which indicates that the explained variance is 32%. Moreover, the r value is less than its probable error with 0.14. The negative correlation coefficient is, therefore, not statistically significant. In other word, there is no evidence of relationship between the family size and PCTE.

(v) Looking at the correlation between the distribution of calorie intake and the proportion of poor measured through the sample survey norms, it was found that the correlation coefficient value is positive (+ 0.79). Testing the significance of the relation, it was also found that the positive correlation coefficient is significant as its r value is more than ten times greater than its probable error of 0.068. This implies that there is a high positive relationship between inequalities in the distribution of calorie and proportion of poor. Thus, the hypothesis, which states that higher the extent of inequalities in calorie distribution, higher is the proportion of poor in the society, has been proved true.

(vi) The correlation coefficient value of inequality and the proportion of poor, measured through the sample survey norm show a negative relation (- 0.38). However, it was found that the negative correlation coefficient is not significant as its r value is less than its probable error of 0.1534. This implies that there is no evidence of relationship between inequalities in the distribution of income measured through PCTE and proportion of poor. Thus, the hypothesis, which states that higher the extent of inequalities in income, higher is the proportion of poor in the society, has been proved wrong.

6.5: ESTIMATION OF POVERTY THROUGH CALORIE NORMS:

The summary on the result of poverty measurement based on different calorie norms for the selected category has been explained below.

(i) Sample population:

The result on the estimation of Head Count Ratio (HCR) based on 2047 Kcal and 2044 Kcal cutoff shows that 28.75% of the sample population are poor or are living below the calorie norms. Whereas, the HCR based on 2441.92 Kcal cutoffs shows a higher percentage of poor for the sample population with 46.06%.

For the calorie gap ratio based on 2047 Kcal the result came out to be 10.01% per poor person for the sample population. This means that every poor person is falling short of the calorie

norm by 204.9 Kcal. However, calorie gap ratio based on 2044 Kcal cutoff shows a lower percentage of 9.97% per poor person for the sample population. Whereas, the calorie gap ratio based on 2441.92 Kcal cutoffs shows a higher calorie deprivation for the sample population with 14.49% per poor person. It means to help every poor person at the calorie norms, calorie intake of 353.83 Kcal per poor person is required.

The result also shows that Sen Index (P) based on 2047 Kcal is 7.65% for the sample population. It implies that 7.65% of poor amongst the poor are falling below their calorie norm (mean calorie intake of the poor). Whereas, Sen Index based on 2044 Kcal cutoff is 7.64% for the sample population. However, the P based on 2441.92 Kcal cutoffs shows that the extent calorie deprivation is higher for the sample population with 11.59% of poor amongst the poor falling below their calorie norm.

The estimated result of Foster, Greer and Thorbecke (P^F) based on 2047 Kcal cutoff shows that the severity of calorie deprivation for the sample population is 5.92% for the poorest of the poor. This means that 5.92% of the poorest of the poor are far below the calorie norms. Whereas, P^F based on 2044 Kcal cutoff is 5.91% for the sample population. It means that 5.91% of the poorest of the poor are far below the calorie norms. However, the P^F based on 2441.92 Kcal cutoffs shows that calorie inadequacy is more severe for the sample population with 7.79% for the poorest of the poor.

Thus the estimation based on sample survey calorie norms shows higher percentage of poor and more severe calorie deprivation than the estimation based on NSSO norms.

(ii) Gender-wise:

The gender-wise analysis of HCR base on 2047 Kcal and 2044 Kcal cutoff shows that male (30.81%) have a higher percentage of poor than female (28.05%) by 2.76%. Whereas, using 2441.92 Kcal cutoff the percentage of poor for male is 48.26% against female percentage of 44.79%.

The calorie gap ratio estimates based on 2047 Kcal by gender shows that male have higher gap (10.10%) than female (9.86%). Calorie gap ratio based on 2044 Kcal cutoff shows that male and female calorie gap is (205.83 Kcal) 10.07% and (201.12 Kcal) 9.84% respectively. Whereas, the calorie gap ratio based on 2441.92 Kcal cutoff shows a higher calorie deprivation for both male and female population with 15.63% and 14.05% per poor person respectively.

Gender-wise estimation of Sen Index (P) based on 2047 Kcal shows that male have 8.01% of poor amongst the poor falling below their calorie norm, while it is 7.89% for female. The estimation of P based on 2044 Kcal cutoff shows that 7.99% of male and 7.87% of female poor

amongst the poor falling below their calorie norms. However, P based on 2441.92 Kcal cutoff shows that 12.40% of poor amongst the poor male and 11.24% of poor amongst the poor female are falling below their calorie norm.

Gender-wise P^F estimates based on 2047 Kcal shows that the severity of calorie inadequacy falls on 6.05 % and 5.82% of the poorest poor among the female and male population respectively. However, the estimation of P^F based on 2044 Kcal cutoff reveals that the calorie inadequacy for both male and female comes out to be 5.81% and 6.04% for the poorest poor respectively. The P^F based on 2441.92 Kcal cutoff shows that severity of calorie inadequacy falls on 8.39% of the poorest of the poor among the male population, while it is 7.78% for the female population.

The result of the measurement of poor based on both NSSO and sample survey calorie norms shows that the incidence of poverty is relatively higher among the male population than female population. Similarly, the calorie gap or the extent of calorie deprivation is higher among the male population the female. Further, the Sen Index reveals that higher proportion of male poor are below their average calorie intake. The severity of calorie inadequacy also falls relatively more on male population than the female population. However, it may be noted that the difference between male female is not very significant.

(iii) Village-wise:

The result of the village-wise HCR estimates based on 2047 Kcal and 2044 Kcal cutoff shows that, Bhandari has the highest percentage of poor with 31.48%, followed by Longsa with 29.73% and Yunchuchu with 28.57%. Sunglup with 21.05% exhibits the lowest percentage of poor. However, the estimation of HCR based on 2441.92 Kcal cutoffs indicates that Yunchuchu with 54.76% has the highest proportion of poor population. This is followed by Bhandari with 48.15% and Longsa with 46.33%. Sunglup shows the lowest proportion of poor with 28.95%.

The result of the estimates on village-wise calorie gap ratio based on 2047 Kcal cutoff shows that, the depth of calorie deprivation is highest in Yunchuchu with (273.89 Kcal) 13.38% per poor person, while Sunglup with (93.55 Kcal) 4.57% per poor person exhibits the lowest calorie deprivation among the villages. The calorie gap ratio estimates based on 2044 Kcal cutoff shows similar result to that of the analysis based 2047 calorie norms but lower ratio. However, the estimation of calorie gap ratio based on 2441.92 Kcal cutoffs indicates a higher calorie deprivation. Among the villages, Yunchuchu with (433.19 Kcal) 17.44% per poor person shows the highest shortfall of calorie norms, while Sunglup with (186.07 Kcal) 7.62% shows the lowest calorie deprivation among the villages.

The result of village-wise estimation of P based on 2047 Kcal cutoff shows that, Yunchuchu with 10.39% exhibits the highest percentage of poor amongst the poor falling below their calorie norm. It is followed by Longsa with 8.46% and Bhandari with 5.86% of poor amongst the poor falling below their calorie norm. Sunglup with 5.77% of poor amongst the poor falling below their calorie norm exhibits the lowest percentage among the villages. The P estimates based on 2044 Kcal cutoff shows that the extent of calorie deprivation is highest in Yunchuchu with 10.37% of poor amongst the poor falling below their calorie norm, while Sunglup with 5.75% of poor amongst the poor falling below their calorie norm exhibits the lowest percentage among the villages. However, the estimation of P based on 2441.92 Kcal cutoffs indicates that Yunchuchu with 13.54% have the highest percentage of poor amongst their poor falling below the calorie norm, while Sunglup with 6.87% of poor amongst their poor falling below the calorie norm shows the lowest percentage among the villages.

The village-wise P^F estimates based on 2047 Kcal cutoff shows that, the calorie inadequacy is more severe in Yunchuchu with 7.9% for the poorest poor. It is followed by Longsa with 6.51% and Bhandari with 3.51% of the poorest poor facing calorie inadequacy. Sunglup with 1.6% of the poorest poor facing calorie inadequacy exhibits the lowest severity of calorie deprivation among the villages. The P^F estimates based on 2044 Kcal cutoff shows that the severity of calorie deprivation is highest in Yunchuchu with 7.89% for the poorest poor, while Sunglup with 1.59% of the poorest poor facing calorie inadequacy exhibits the lowest severity of calorie deprivation among the villages. However, the estimation of P^F based on 2441.92 Kcal cutoffs indicates a higher severity of calorie deprivation among the sample population. Among the villages, Yunchuchu with 10.08% of the poorest poor shows the highest percentage of severity in calorie deprivation. This is followed by Longsa with 8.61% and Bhandari with 5.46% of the poorest poor facing calorie inadequacy. Sunglup with 3.05% of the poorest poor facing calorie inadequacy shows the lowest severity in calorie deprivation among the villages.

The comparison among different villages on the incidence of poverty based on NSSO calorie norms reveals that Bhandari has the highest proportion of poor. But when it is measured based on sample survey calorie norms, Yunchuchu stands the highest. On the other hand Sunglup is placed at the bottom of the ranking under both calorie norms. Based on all calorie norms, it is seen that the depth and severity of calorie deprivation is the highest in Yunchuchu and lowest n Sunglup.

(iv) Range-wise:

The range-wise HCR estimate based on NSSO norms shows that, middle range has the lowest percentage of poor with 25%. However, the estimation of HCR based on sample norms indicates that lower range with 48.15% has the highest proportion of population living below the calorie norms. On comparison among different ranges HCR based on different calorie norms, it is seen that middle range has the lowest proportion of poor among the ranges, while lower range has the highest percentage of poor.

The estimation of calorie gap ratio based on NSSO norms shows that, among the ranges, the depth of calorie deprivation is highest in upper range with a gap of about 10% per poor person. Moreover, the estimation of calorie gap ratio based on sample norms also indicates that upper range with (374.59 Kcal) 15.34% per poor person has the highest calorie deprivation. Thus it is seen that the calorie gap ratio of Upper range is higher than other ranges across different calorie norms.

The analysis of Sen Index (P) based on NSSO norms shows that the extent of calorie deprivation is highest in middle range with about 11% of poor amongst the poor falling below their calorie norm. The estimation of P based on sample survey norms also indicates that middle range with 18.52% has the highest percentage of poor amongst the poor falling below their calorie norm. On comparison, it is seen that Sen Index of middle range is higher than other ranges across different calorie norms, while lower range has the lowest percentage of poor amongst the poor.

Estimation of Foster, Greer and Thorbecke (P^F) based on NSSO and sample survey norms shows that, the calorie inadequacy is more severe in upper range with 6.51%, 6.5% and 8.61% respectively for the poorest poor facing calorie inadequacy, while lower range exhibits smaller calorie inadequacy than other ranges.

(v) Sex-wise head of the household:

The result sex-wise head of household estimation of HCR based on NSSO norms shows that around 30% of the population in male headed family are below the calorie norms, while female headed family has around 18% of poor people. However, the estimation of HCR using 2441.92 Kcal cutoff shows that the proportion of poor for male headed family is 46.01%, while it is 43.75% for the female headed family.

The estimation of calorie gap ratio based on NSSO norms shows that the calorie gap of male headed household is about 11% per poor person while it is about 5% in female headed household. The estimation of calorie gap ratio using sample survey norms shows that the calorie short fall of the population in male headed family is 15.58% per poor person, while it is 10.09% per poor person in female headed family.

Gender-wise head of household estimation of P based on NSSO norms reveals that the percentage of poor amongst the poor falling below their calorie norms in male headed family is about 8%, while it is about 4% for the female headed family. The estimation of Sen Index using 2441.92 Kcal cutoff shows that the percentage of poor amongst the poor falling below their calorie norm in male headed family is 12.28%, while it is 8.42% for the female headed family.

The result on the estimation of P^F sex-wise head of household based on NSSO norms shows that the severity of calorie deprivation in male headed family is about 6% for the poorest of the poor, while it is around 3% for the poorest of the poor of the female headed family. However, the estimation of calorie inadequacy using 2441.92 Kcal cutoff shows reveals that the calorie inadequacy in male headed family is 8.65% for the poorest poor, while it is 4.46% for the poorest poor in female headed family.

The result estimate based on NSSO and sample survey calorie norms shows that the extent, depth and severity of calorie deprivation of male headed household is higher than female headed household. It may be due to the reason that when women have sole control over family resources, the expenditure on food items tend to be higher because they are more concern in providing better food to the family.

(vi) Occupation-wise head of household:

The result of HCR on occupation-wise head of the households based on NSSO norms shows that the household headed by agriculturalist have around 30% of its population below the calorie norms, whereas, those household headed by service have around 27% of its population below the calorie norm. However, the estimation of HCR based on 2441.92 Kcal cutoffs indicates that the service headed family has 46.54% of poor population, while it is 45.31% in agriculture headed family.

The result on the analysis of calorie gap ratio based on NSSO norms shows that agriculturalist have higher gap of around 11% than the services with around 8%. Whereas, the calorie gap ratio based on 2441.92 Kcal cutoff that the calorie short fall is 12.96% per poor person for the household headed by service, while it is 15.50% in agricultural headed household.

The result analysis of P based on NSSO norms shows that agricultural headed family have higher percentage of poor amongst the poor falling below their calorie norm with around 8% than the service headed family with around 7%. Whereas, the Sen Index based on 2441.92 Kcal cutoff shows that the percentage of poor amongst the poor falling below their calorie norm in agricultural headed family is 12.09%, while it is 11.04% for the service headed family. .

The estimation of P^F based on NSSO norms reveals that the severity of calorie inadequacy falls on around 6% of the poorest poor among the agricultural headed family, while it is around 4% for the service headed family. Whereas, the P^F result based on 2441.92 Kcal cutoff reveals that the percentage of the poorest poor facing calorie inadequacy in agricultural headed family is 8.86%, while it is 8.88% for the service headed family.

The comparison between service and agricultural headed household in the proportion and severity of calorie deprivation based on NSSO calorie norms reveals that the proportion and percentage of the poorest poor is higher in agricultural headed household than the service headed household. However, the depth and sensitivity of calorie deprivation based on NSSO and sample survey calorie norms reveals that it is higher in agricultural headed household than the service headed household.

6.6: ESTIMATION OF POVERTY THROUGH PCTE:

The result of poverty measurement based on different poverty line for the selected category has been explained below.

(i) Sample population:

The result of Head Count Ratio (HCR) based on the poverty line of Rs. 558.78 shows that 2.04% of the sample population is poor. The HCR based on poverty line of Rs. 1010.81 shows that 67.18% of the sample populations are poor. Whereas, the HCR based on the poverty line of Rs. 942.60 reveals that 59.54% of the sample population are poor.

The analysis of poverty gap ratio based on National poverty for the sample population is .13% per poor person. This means that every poor person is falling short of the income by Rs. 0.73. In other words, to support every poor person at the poverty line, Rs. 0.72 of income is needed per poor person. The poverty Gap ratio based on State poverty line shows a higher income deprivation for the sample population with 13.82%. However, the poverty gap ratio based on sample survey poverty line with 10.09% shows a lower income deprivation for the sample population than the estimation based on State poverty line but higher than the estimation based on National poverty line.

The result on the estimation of Sen Index (P) based on National poverty line reveals that 0.11% of poor amongst the poor in the sample population are falling below their poverty line. The P based on the State poverty line shows that the extent of income deprivation for the sample population is 21.22%. However, the P based on sample survey poverty line shows that 16.94% of poor amongst the poor are living below the mean income of the poor.

The analysis of Foster, Greer and Thorbecke measure (P^F) based on National poverty line shows that 0.01% of the poorest poor are facing income inadequacy. The P^F based on the State poverty line shows that 5.22% of the poorest of the poor are far below the poverty line. However, the P^F based on sample survey poverty line shows that income inadequacy with 4.2% for the poorest poor is less severe than the estimation based on State poverty line but more severe than the estimation based on National poverty line.

On comparison between the estimate based on state poverty line and sample survey poverty line, it was found that the proportion, depth and severity based on State poverty line is higher.

(ii) Gender-wise:

The result of Gender-wise analysis of HCR based on the poverty line of Rs. 558.78 shows that 1.16% of the male population is poor, while 2.71% of the female population is poor. The estimation of HCR based on poverty line of Rs. 1010.81 shows that that male (68.6%) have a higher percentage of poor than female (66.06%) by 2.54%. The estimation of HCR using Rs. 942.60 shows that 62.79% of male population is poor where as 57.01% of female population is poor.

The result of income gap ratio estimates based on National poverty line for male and female shows that female have higher ratio of .19% per person than male ratio of .004% per person However, poverty gap ratio based on State poverty line shows that poverty gap is (Rs. 141.31) 13.98% and (Rs. 138.38) 13.69% per poor person for male and female population respectively. Whereas, the poverty gap ratio based on sample survey poverty line shows a lower income shortfall for both male and female population with 10.12% and 10.06% per poor person respectively.

The analysis of P based on National poverty line shows that female have higher percentage (.16%) of poor amongst the poor falling below their poverty line than male percentage (.004%). However, the estimation of P based on State poverty line that male have 12.19% of poor amongst the poor falling short of their poverty line that is slightly higher than female percentage of 11.81%. Whereas, P based on poverty gap ratio based on sample survey poverty line shows that male population have 8.82% of poor amongst the poor, while female have 8.68% of poor amongst the poor falling below their poverty line.

The result of P^F estimates based on National poverty line shows that the severity of income inadequacy falls on 0.0023 % of the poorest poor among the female population, while it is 0.0002% for the poorest poor male population. The estimation of P^F based on State poverty line reveals that the income inadequacy for both male and female comes out to be 3.49% and 3.66% for

the poorest poor respectively. However, P based on sample poverty line shows that severity of income inadequacy falls on 2.19% of the poorest poor among the male population, while it is 2.42% for the female population.

The based on National poverty line shows that the incidence and depth of income deprivation of female is higher among male. However, the estimation based on State and sample survey poverty line reveals that the incidence and depth of male poor is higher than female poor. The comparison between male and female P^F based on NSSO and sample survey poverty line shows that the income inadequacy of female is higher than male.

(iii) Village-wise:

The result of village-wise HCR estimate based on National poverty line shows that only Longsa exhibits the existence of poor population with 3.09%, while other villages shows that every one is above the poverty line. However, the estimation of HCR based on State poverty lines indicates that Sunglup with 89.47% has the highest proportion of population below poverty line, while Bhandari shows the lowest proportion of poor with 57.41%. The estimation of HCR based on sample survey poverty line shows Sunglup with 76.32% has the highest percentage of poor among the villages, while Yunchuchu with 57.14% shows the lowest percentage of poor people living below the poverty line.

The result of poverty gap ratio estimates based on National poverty line shows that, the depth of income deprivation exist only in Longsa with (Rs. 1.06) .19% per poor person. The estimation of poverty gap using State poverty line shows that the depth of income deprivation is highest in Bhandari with (Rs. 213.28) 21.12% per person. It is followed by Longsa with (Rs. 143.64) 14.21% per poor person and Sunglup with (Rs. 135.35) 13.39% per poor person. Yunchuchu with (Rs. 132.72) 13.13% per poor person exhibits the lowest income deprivation among the villages. However, the estimation of poverty gap ratio based on sample survey poverty indicates that Longsa with (Rs. 101.61) 10.78% per poor person shows the highest shortfall of income. This is followed by Bhandari with (Rs. 83.23) 8.83% per poor person and Yunchuchu with (Rs. 82.38) 8.74% per poor person. Sunglup with (Rs. 79.74) 8.46% shows the lowest income deprivation among the villages.

The analysis of village-wise P estimates based on National poverty line shows that, the extent of income deprivation exist only in Longsa with 0.58% of poor amongst the poor falling below their poverty line. The P based on State poverty line shows that, among the villages, Sunglup with 12.22% exhibits the highest percentage of poor amongst their poor falling below their mean PCTE of the poor, while Bhandari with 10.48% of poor amongst the poor falling below

their mean PCTE of the poor exhibits the lowest percentage among the villages. However, the estimation of P based on sample survey poverty line indicates that Longsa with 9.19% have the highest percentage of poor amongst the poor falling below their mean PCTE of the poor, while Bhandari with 7.65% of poor amongst their poor falling below the mean PCTE of the poor shows the lowest percentage among the villages.

The result of P^F village-wise based on National poverty line shows that, the severity of income deprivation exist only in Longsa with 0.02% for the poorest poor. The P^F based on State poverty line shows that, among the villages, income inadequacy is more severe in Longsa with 3.93% for the poorest poor, while Sunglup with 2.68% of the poorest poor facing income inadequacy exhibits the lowest severity of income deprivation among the villages. However, the estimation of P^F based on sample survey poverty line indicates a higher severity of income deprivation than the estimation based on National poverty line but lower than the estimation based on State poverty line. Among the villages, Income inadequacy is more severe in Longsa with 2.63% for the poorest poor. Sunglup with 1.44% of the poorest poor facing income inadequacy exhibits the lowest severity of income deprivation among the villages.

The estimation of HCR based on National poverty line shows that the proportion of poor is higher in Longsa. However, the proportion of poor is shown highest in Sunglup when the estimation if based on Sample survey and State poverty line. The estimation of depth based on National shows that Bhandari has the highest shortfall of income, while Longsa exhibit the highest when the estimation is based on National and sample survey poverty line. However, the sensitivity measures based on National and sample poverty line shows that Longsa has the highest number of poor who are falling below their average poverty norm. However, the estimate based on State poverty line shows that Sunglup has the number of poor who are falling below their average poverty norm. The severity of income based on NSSO and sample survey poverty line shows that Longsa has the highest income inadequacy among the sample villages.

(iv) Range-wise:

The HCR estimate based on National poverty line for the sample villages shows that only upper range exhibits the existence of poor population with 3.09%, while other ranges shows that every one is above the poverty line. The estimation of HCR based on State poverty line and sample survey poverty line shows that middle range with 81.25% and 66.25% has the highest proportion of population below poverty line. On comparing the proportion of poor among different ranges based on poverty line of the State and Sample survey, it is seen from the table that middle range exhibits highest existence of poverty, while lower range exhibits the lowest percentage of poor.

The poverty gap ratio estimates based on National poverty line shows that, the depth of income deprivation exist only in upper range with (Rs. 1.06) .19% per poor person. The estimation of poverty gap using State poverty line shows that the depth of income deprivation is highest in lower range with (Rs. 213.28) 21.12% per person. However, the estimation of poverty gap ratio based on sample survey poverty indicates that upper range with (Rs. 101.61) 10.78% per poor person shows the highest shortfall of income. On comparison among the ranges it is seen that the highest depth of income deprivation exist in lower range when measurement is based on State poverty line. However, the estimation of poverty gap ratio based on sample survey poverty line and National poverty line indicates that upper range has the highest shortfall of income per person.

The estimation of Sen Index (P) based on National poverty line shows that, the extent of income deprivation exist only in upper range with 0.58% of poor amongst the poor falling below their poverty line. The P based on State poverty line and sample survey poverty line shows that, middle range with 19.29% and 13.86% respectively exhibits the highest percentage of poor amongst the poor falling below their poverty line. On comparing among the ranges, it was found that middle range has the highest number of poor amongst the poor when measurement is based on State poverty line and sample survey poverty line, while lower range has the lowest percentage.

Range-wise analysis of P^F based on National poverty line shows that, the severity of income deprivation exist only in upper range with 0.02% for the poorest poor. The P^F based on State poverty line and sample survey poverty line shows that, among the villages, income inadequacy is more severe in upper range with 3.93% for the poorest poor. It is followed by lower range with 3.11% and 2.63% respectively for the poorest poor facing income inadequacy. On comparison among the ranges it was found that upper range exhibits higher severity of income deprivation, while lower range has a lower income inadequacy across different poverty line.

(v) Sex-wise head of household:

The result of HCR on gender-wise head of household based on National poverty line shows that 2.5% of the populations in female headed family are living below the poverty line, while male headed family has 1.92% of poor people. The estimation of HCR using State poverty line shows that 71.25% of the populations in female headed family are living below the poverty line, while it is 66.13% for the male headed family. However, the estimation of HCR based on Sample survey poverty line shows that the percentage of poor based on sample survey poverty line is 62.5% for female headed family and 58.79% for male headed family.

The analysis of poverty gap ratio based on the National poverty line shows that the depth of income deprivation in female headed family is 0.31% (Rs. 1.73) per poor person, while it is 0.08%

(Rs. 0.44) per poor person for male headed family. The estimation of poverty gap ratio using State poverty line shows that the income short fall of the population in female headed family is (Rs. 150.31) 14.87% per poor person, while it is (Rs. 136.96) 13.55% per poor person in male headed family. However, the estimation of poverty gap ratio based on Sample survey poverty line shows that the female headed household has an income shortfall of (Rs. 102.93) 10.92% per poor person, while it is (Rs. 92.85) 9.85% per poor person.

The estimation of P based on the National poverty line reveals that the percentage of poor amongst the poor in female headed family is .051%, while it is .028% for the male headed family. The estimation of P using State poverty line shows that the number of poor amongst the poor falling below their poverty line in female headed family is 12.89%%, while it is 11.72% for the male headed family. However, the result of P based on Sample survey poverty line shows that the female headed household with 9.47% of poor amongst the poor living below their poverty line has higher percentage than male headed family with 8.54%.

The result of P^F on the National poverty line shows that that the severity of income deprivation in female headed family is 0.05% for the poorest poor that is higher than male headed family with 0.003%. The estimation of P^F using State poverty line shows that the income inadequacy for the poorest poor in female headed family is 5.52%% for the poorest poor, while it is 3.49% for the poorest poor in male headed family. However, the estimation of P^F based on Sample survey poverty line reveals that the female headed household has an income inadequacy of 2.58% for the poorest poor, while it is 2.25% for the poorest poor in male headed family.

Thus the estimation based on NSSO and sample survey poverty line reveals that the proportion of poor, depth and severity of poverty is higher in female headed family than male headed. It may be due to the fact that the income earning ability of male is higher than female.

(vi) Occupation-wise head of household:

The result of HCR estimation on occupation-wise head of the households based on National poverty line shows that poverty exist only the household headed by agriculturalist with 3.42%. But the analysis of HCR based on State poverty line shows that the household headed by service have 75.47% of its population below the poverty line, whereas, those household headed by agriculturalist have 73.5% of its population living below the poverty line. However, the estimation of HCR based on the sample survey poverty line indicates that the household headed agriculture has 65.52% of poor population, while it is 49.69% in service headed family.

The analysis of poverty gap ratio based on National poverty line shows that poverty exists only in the household headed by the agriculturalist with .21% per person. The estimation of

poverty gap ratio based on State poverty line shows that income gap is 16.16% per poor person for agricultural headed family. For the household headed by service, the income shortfall of poverty line is 8% per poor person. However, the poverty gap ratio based on sample survey poverty line shows that the income short fall of the household headed by service is 5.35% per poor person, where as it is 12.06% per poor person for agricultural headed household.

The estimation of P based on National poverty line shows that poverty exists only in the household headed by the agriculturalist with .19% of the poor amongst the poor. While the estimation of Sen Index based on State poverty line shows that 14.54% and 7.19% of the poor amongst the poor agricultural headed household and service headed household respectively are falling below their poverty line. Whereas, the Sen Index based on sample survey poverty line shows that the percentage of poor amongst the poor falling below their poverty line in agricultural headed family is 10.85%, while it is 4.71% for the service headed family.

The result of P^F based on National poverty line shows that severity of income deprivation is .02% for the poorest poor among the agricultural headed family; while the service headed family have zero poor population. The estimation of P^F based on State poverty line shows that 4.39% and 3.75% of the poorest poor among the agricultural headed household and service headed household respectively are facing income inadequacy. However, the P^F based on sample survey poverty line shows that the percentage of the poorest poor facing income inadequacy in agricultural headed family is 2.93%, while it is 3.19% for the service headed family.

The result of the HCR estimation based on National and sample survey poverty line shows that the proportion of poor is higher among agricultural headed household than the service headed household. However, the estimate based on the State poverty line reveals that the proportion of poor is higher in service headed household than agricultural headed household. The estimation based on NSSO and sample poverty line shows that the depth and severity of income inadequacy is higher in among agricultural headed household than the service headed household.

Thus, measuring poverty based on different poverty line shows that the extent and depth of poverty is higher when measurement is based on State poverty line. However, the extent and depth of poverty reveals a negligible existence of poor people when the estimation is based on National poverty line. Thus, the poverty line derived from the sample survey lies in between the National and State poverty line.

6.7: ESTIMATION OF INEQUALITIES THROUGH CALORIE INTAKE:

(i) Sample population:

The distribution of calorie intake among the population reveals that the bottom 14% of the population consumes about 4% of the total calorie intake at one end and at the other end about 17% of the total calorie intake is shared by the top 10%. Thus 90% of the population share 83% of the total calorie intake. This shows that the distribution of calorie intake is not fairly equal. This is confirmed by the Gini index or coefficient of .2032.

(ii) Gender-wise:

The cumulated percentages calorie intake and population of male reveals that the bottom 15% of the population consumes about 5% of the total calorie intake at one end. But at the other end about 14% of the total calorie intake is shared by the top 8%, which is lower than the percentage of the sample population. This shows that the distribution of calorie intake for the male population is not equal and the Gini-coefficient is .2067. However, the distribution of calorie intake among the female shows that the bottom 12% of the population consumes about 3% of the total calorie intake at one end. But at the other end about 19% of the total calorie intake is shared by the top 10%, which is higher than the percentage of the sample population. The Gini-coefficient of calorie intake for the population of female comes out to be .1996. Both Gini-coefficient and the cumulative distribution of calorie intake shows more equitable distribution of calorie intake among the population of female as compared to that of the sample and male population.

(iii)Village-wise:

The distribution of calorie intake in Yunchuchu village reveals that the bottom 12% of the population consumes about 3% of the total calorie intake at one end that is lower than the percentage of the sample population. But at the other end about 22% of the total calorie intake is shared by the top 14%, which is higher than the percentage of the sample population. This shows that Yunchuchu has the highest percentage of inequality in the distribution of calorie intake among the villages. This is confirmed by the Gini coefficient of .2032. While the cumulated percentages calorie intake and population of Sunglup village reveals that the bottom 21% of the population consumes about 12% of the total calorie intake at one end and at the other end about 7% of the total calorie intake is shared by the top 5%, which is lower than the percentage of the sample population. Thus 95% of the population share 93% of the total calorie intake. Both Gini-coefficient (.0984) and the distribution of calorie intake among the people of Sunglup village show that it has the lowest percentage of inequalities as compared to other villages. However, Longsa has higher inequality than the sample population as shown by Gini-coefficient of .2116. The Gini-coefficient (.1863) of Bhandari shows that it has lesser inequalities than the sample population.

(iv) Range-wise:

The distribution of calorie intake in middle range reveals that the bottom 15% of the population consumes only 5.8% of the total calorie intake at one end but at the other end about 15% of the total calorie intake is shared by the top 10%, which is slightly lower than the percentage of the sample population. The Gini-coefficient of calorie intake for the population of middle range comes out to be .184. Both Gini-coefficient and the shape of Lorenz curve shows the lower inequalities in the distribution of calorie intake among the population of middle range as compared to that of the sample population and the other two ranges.

(v) Sex-wise head of household:

The analysis of male headed family reveals that the bottom 15% of the population consumes about 5% of the total calorie intake at one end that is higher than the percentage of the sample population. But at the other end about 16% of the total calorie intake is shared by the top 10%, which is slightly lower than the percentage of the sample population. Both Gini-coefficient (.2121) and the distribution of calorie intake shows higher inequalities among the population of male-headed family as compared to that of the sample population and female headed family. The inequality in the female-headed family as shown by Gini-coefficient is .1655.

(vi) Occupation-wise head of household:

The distribution of calorie intake among the service headed household reveals that the bottom 11% of the population consumes about 4% of the total calorie intake at one end, while at the other end about 33% of the total calorie intake is shared by the top 26%, which is lower than the percentage of the sample population. This shows that service headed household has the lower percentage of inequality than the sample population and the agricultural headed household. The Gini-coefficient of calorie intake for the population of service headed household comes out to be .1479. The Gini-coefficient of inequalities for the agricultural headed household is .2206.

6.8: ESTIMATION OF INEQUALITIES THROUGH PCTE:

(i) Sample population:

The distribution of income among the sample population reveals that the bottom 10% shares about 6% of the total income at one end and at the other end about 13% of the total income is shared by the top 8% of the population. This shows that there exist inequalities in the distribution of income among the sample population and the Gini-coefficient of income distribution is .1392.

(ii) Gender-wise:

The distribution of income among male population reveals that the bottom 10% of the population is sharing about 7% of the total income at one end and at the other end, about 9% of the

total income is shared by the top 5% of the population that is lower than the share of the sample population. Both Gini-coefficient (.1280) and the distribution of income show less inequalities in the distribution of income among male population than the sample population but higher than the female. The Gini-coefficient of inequalities for the female population is .1377.

(iii) Village-wise:

The distribution of PCTE in Longsa reveals that the bottom 12% of the population is sharing about 7% of the total income at one end, which is lower than the sample population average. However at the other end, about 11% of the total income is shared by the top 8% of the population that is lower than the share of the sample population. This shows that the inequality of the village is higher than the sample population and other selected villages. This has been confirmed by the Gini-coefficient of .1489. On the other hand, the distribution in Sunglup village reveals that the bottom 23.68% of the population is sharing about 19% of the total income at one end and at the other end, about 8% of the total income is shared by the top 5% of the population that is slightly lower than the share of the sample population. Both Gini-coefficient (.0870) and the distribution of income show less inequalities compared to other villages and the sample population. The Gini-coefficient of inequalities for Yunchuchu and Bhandari villages are .0905 and .1151.

(iv) Range-wise:

The distribution of income/PCTE among the population of middle reveals that the bottom 28.75% of the population is sharing about 23.54% of the total income at one end but at the other end about 10% of the total income is shared by the top 7%, which is slightly lower than the percentage of the sample population. Both Gini-coefficient and the shape of Lorenz curve shows the lower inequalities in the distribution of income among the population of middle range as compared to that of the sample population and the other two ranges.

(v) sex-wise head of household:

The distribution of income in Male headed family reveals that the bottom 9% of the population is shares about 6% of the total income at one end and at the other end, about 10% of the total income is shared by the top 6% of the population that is slightly higher than the share of the sample population. This explains that inequality is more in male headed family than female and the sample population. This is confirmed by the Gini-coefficient of .1352. The Gini-coefficient of inequality for female headed family is .1340.

(vi) Occupation-wise head of household:

The distribution of income among the service headed family reveals that the bottom 9% of the population is sharing about 6% of the total income at one end, which is higher than the sample population share. However at the other end, about 14% of the total income is shared by the top 10% of the population that is lower than the share of the sample population. Both Gini-coefficient (.1011) and the distribution show lower inequalities than the sample population but higher than the agricultural headed family. The Gini-coefficient of inequalities for the agricultural headed family is .1001.

6.9: POVERTY ALLEIATION PROGRAMME:

The result of the analysis on the impact of poverty alleviation programme on the sample population reveals that only 4.07% of the total sample populations have been benefited from the implementation of poverty alleviation programme. Out of this 1.78% of the population got the help from JRY, while 2.29% of the population got the Below Poverty Line (Rice). Among the villages, 5.79% of the populations in Longsa were benefited from the implementation of poverty alleviation programme. Out of this, 2.32% benefited from JRY, while 3.47% benefited from the Below poverty Line (Rice). Sunglup followed next with 2.63% of its total population surveyed getting the benefits from JRY. For the remaining two villages the surveyed showed a zero benefit from any such programmes by the sample population. The resultant figure clearly reveals that only a meagre proportion of poor of the sample population have been benefited from such programmes, while 64.64% (based on State Poverty line) of the poor or 57.73% (based on Sample survey poverty line) of the poor remained outside the parameter of the poverty alleviation programme. This clearly shows the failure of the poverty alleviation programme in giving complete coverage to the poor people.

6.8: POLICY IMPLICATION AND SUGGESTION:

Measurement of poverty has great bearing in resolving issues that arise for designing cost-effective relieve work schemes especially on the aspects relating to choices of coverage for the scheme and choice for the benefit level.

(i) The existence of poverty line has significant bearing on the policy choice over coverage of poverty alleviation programmes, as it defines the critical income level needed to escape poverty in a given society and that attaining this income level is qualitatively significant.

(ii) Identification of this unique level of income helps to identify those persons who are considered socially acceptable to be the participants in a poverty alleviation scheme, which is given by head count index of poverty. Further, it becomes possible to assess the required amount of resources or

budget that will place all the poor population in a given society at the critical level of income (poverty-gap).

(iii) However, under head count index, it is more likely that few privileged among the prospective participant may get the lion share of the benefit. Therefore, while implementing any poverty alleviation programme, the Sen Index and Foster, Greer and Thorbacke Indices should be taken into consideration, since these measures gives the implementing agency the option to target the benefits towards the poorest of the poor.

(iv) Other aspects of poverty measures also have bearing on policy choice over coverage and benefit levels. When a budget is made available to operate a poverty alleviation scheme, but if it is insufficient to bring all the poor up to the critical level of income, the policy planners face a dilemma as to whether they should adopt a wide coverage or limited coverage schemes so as to bring the greatest possible impact on aggregate level of poverty.

(a) When budget is low and the cost of administration is high or when the workers participation in the scheme is costly (high opportunity cost) limited coverage at benefit levels sufficient to escape poverty will be a desirable scheme for monotonic poverty measure (Sen Index and FGT which are distributionally sensitive). This will give a greater impact in reducing the proportion of poverty level (HCR).

(b) On the other hand, when the given budget is sufficiently high and the cost of administration is low, approaching the critical values needed to eliminate poverty and there is no participation cost for the poor and the assessment is based on monotonic measures, wide coverage scheme and flexible benefits levels should be the preferred policy, eg. Self-targeting employment generating scheme. Thus coverage and target efficiencies may be achieved.

(v) It follows that systematic survey and assessment of actual status of the living standards must be undertaken before implementing any programmes meant for poverty alleviation, so as to device a programme which will ensure coverage, target, transfer and impact efficiencies with high benefit-cost ratio.

Based on the estimation of the proportion of poor (HCR) and the measure of severity in income (PCTE) deprivation among the villages, it was found that even though Sunglup has the highest proportion of poor people, yet the severity of income among the poorest of the poor falls more in Longsa village. This implies that in order to achieve various efficiencies, while implementing any poverty alleviation programme, the severity of deprivation needs to be considered.

Similarly, among the other selected categories, the most vulnerable sections were male, female-headed households and agricultural-headed households. Thus, these sections of population should be the targeted group under any poverty alleviation programme.

(vi) The sample survey shows that none of the household has been covered by the ongoing NREG scheme. Therefore, it must be extended to all the rural areas targeting the poorest of the poor as it promotes supplementary employment for unskilled labour. This programme is self selecting having target efficiency as the wages are low so as to attract the poorest of the poor. Under this programme, the benefit-cost ratio may not be so high, as its direct transfer of benefit to individuals is usually small, but the indirect benefit to the society as a whole will be huge.

(vii) Selection of any such programme must be directed towards providing indirect benefits to the poor from the assets created under the employment generation scheme. As such, assets created under the programme should be durable (not just for instance, roads that are washed away in the next rain) and should benefit the poor at least along with the non-poor, through growth, developing rural-urban linkages etc.

(viii) The programme like land development and conservation must be given importance as social security options because land provides food security enables utilization of family labour and reduces vulnerability of the poor in labour and food market.

(ix) Availability of credit can also play important safety net function, which can prevent asset depletion of the poor and provide working capital to the self-employed poor.

(x) The study reveals that the incidence of poverty and inequality are positively related in terms of calorie intake. This implies that higher equitable distribution of calorie intake leads to lower incidence of poverty in a given social strata. It underlines the need to pursue a specific policy with an objective to ensure equal access to food and nutrition.

In view of this objective, public distribution system needs to be extended to the rural areas as this system ensures high transfer efficiency and wide coverage. Also midday school meals and children nutrition schemes are viewed as a means to attain food security. Further, it has an indirect impact on improving school enrolment and attendance. Thus this programme needs to be more regular with improved quality of food.

(xi) The main elements of social assistance are, it targets the poor and vulnerable sections of the society, and they are need based minimum assistance that protects the poor as a matter of entitlement (ILO, 1942). Thus, optimal mix of social schemes in terms of feasibility and appropriateness in meeting the spectrum of the need of poor and vulnerable section is important

with an attempt to reduce administration overhead, leakages, cooperation and other factors that undermines the targeting and efficiencies.

- Under social assistance programme of old age pension, the current amount of Rs. 90 per month needs to be enhanced to a reasonable level so that it will help the beneficiaries in meeting the basic minimum needs.
- This kind of social assistance should be extended to poor widows and handicaps.
- Moreover, maternity assistance limiting to the first two births, equal to two or three months wages for the female agricultural labour may be given in the rural areas.
- The selection of the beneficiaries should be based on distributionally sensitive measure of poverty, targeting the poorest of the poor. Such social assistance will benefit a very high proportion of the poor especially women who are in absolute destitution.

(xii) The social assistance and poverty alleviation programmes should be operated through the decentralized delivery systems operating through local institutions in which poor are members and which system empowers them, so as to reduce the costs of information, check frauds and corruptions at the roots. This system also enables quick settlement of claims, localization, provisions of credits, etc.

(xiii) Training programme for the development of skills and technical know-how to the rural population is required so as to enhance their earning capacity and income.

(xiv) Other indirect approaches to poverty alleviation programmes that are related to health and education policy like child care and nutrition can also influence nutritional status.

(xv) To ensure a better standard of living for the rural population of Nagaland importance should be given to the development of physical and social infrastructures. The development of these infrastructures will indirectly uplift the living standard of the rural population.

a) The road connectivity to the rural areas should be an all weather road. This is important because it will improve transport and communication, which in turn will improve the connectivity to urban areas and thereby leads to better agricultural marketing system of the rural people.
b) Since 66.67% of the total households in the sample villages are still residing in Kutcha house and 70.71% of the rural household does not have proper sanitation facility. Therefore it may be suggested the ongoing programme that covers housing of the rural people should still be continued and implemented judiciously. Moreover, common toilets for male and female separately should be built in every rural village.
b) Safe drinking water supply by the government to every village has to be given priority.

c) The connectivity of electricity to every household coupled with regular power supply should be emphasized. This is vital for the growth of small scale and cottage industries.

d) At least one medical doctor should be placed in every village. This will save time, money and health of the rural population, which in turn will improve their productive capacity.

e) None of the household covered by the sample survey has telephone connectivity, thus, it may be suggested that this facility should be extended to them at a minimum rate.

f) More over, banking and post office branches should be extended to the rural villages.

g) Organization of Self Help Group in rural areas should be encouraged and strengthened. This is important because it will improve the business efficiency; develop leadership qualities and co-operative awareness among the rural masses.

h) Primary and Middle schools in the sampled villages needs to be upgraded to high school level.

Conclusion:

The present empirical study reveals that there exists high percentage of poor population in the district as measured at both State as well as Sample survey poverty line. The result shows that 67.18% and 59.54% of the population are below the poverty line. Moreover, the result also reveals that the income deprivation of the poor people is more than 10% per person measured using the state as well as sample survey poverty line. The severity of income deprivation comes out at more than 4% for the poorest poor estimated using the same poverty line. Thus, any policy designed to ameliorate the plight of the poor must, among other things, recognize the importance of these income deprivation and severity of the poor apart from the proportion of the poor, before implementing any anti-poverty programmes. This is vital for proper coverage and impact efficiency of any poverty alleviation programme. The analysis also reveals that lots need to be done in development of credit, social securities and basic amenities like, housing, provision of potable water, health care facilities, proper road condition, education, subsidized food supplies and agriculture sector in the study areas. This is important because it will improve the living condition of the rural people which will directly or indirectly reduce the proportion of poor. Thus, the need to alleviate poverty in Wokha in particular and Nagaland as a whole should be the highest priority of the government because no society can surely flourish when greater part of its population is poor and miserable. For which, proper assessment of the extent and severity of income deprivation is vital for implementing and targeting the beneficiaries. Moreover, the present administrative

mechanism is not likely to be efficient for the task, therefore, local delivery system at grass root level should be involved and empowered.

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