POVERTY IN NAGALAND

T. Zarenthung Ezung

In the vast literature of Economics, poverty is a well researched and well debated topic. However, it is indeed deplorable that we have scanty information about poverty of Nagaland. The literature which is considered to be a major tool for the ameliorating of people's living standard is inadequate about the state. Thus, effort was made to fill this gap through this piece of research work.

The present work attempts to bring out the average nutritional norms for the rural areas of the state as well as for different age and sex groups. Effort is also made to highlight the relationship between the average family size and average calorie intake, and average monthly per capita expenditure. The study also tries to bring out the average monthly per capita expenditure and poverty line for the state. Further, the extent and depth of poverty is measured based on its own norms. The extent of inequalities in the distribution of calorie intake and monthly per capita expenditure has been estimated. Moreover, the study also estimated the relationship between the proportion of poor and the disparity in the distribution of calorie intake and monthly per capita expenditure. The study concludes with certain suggestive measures.

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T. Zarenthung Ezung (b. 1978) hails from Longsa village, educated at CME school and DBS school Wokha, Nagaland. He graduated from St. Anthony's College, Shillong. He further pursued his master degree in Economics at NEHU. He has also completed his Ph.D. from Nagaland University in the Department of Economics. He was awarded "Fr. I. Ricaldone Award" by St. Anthony's College for securing the highest marks in Economics' honours' subject in 1999. He served as an Assistant Professor in Modern College, Kohima and Kohima Arts College, Kohima.

Currently, he is serving as an Assistant Professor in the Department of Economics, Nagaland University, Lumami.

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Introduction

This chapter deals with the concepts and issues relating to nutrition norms and poverty lines. The problems, universe, periods and methodology of the study has been highlighted. Moreover, the chapter also discussed the objectives and hypothesis of the study.

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 the 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. 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] Therefore, it is natural to expect from our planners under the leadership of Nehru to give top priority to poverty and consequently the introduction of poverty alleviation programme in the planning process.

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 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 on 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 fact, 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 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] There are many scholars who define poverty interms of basic minimum consumption or nutrition. Horwitz (1997)[11] states that "Poverty breeds malnutrition and, in turn, malnutrition increases poverty, a vicious circle". 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 varies 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 interlinkage 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]

Poverty Line and Nutritional Norms

Now the pertinent question that arises here is, then, what is the actual nutritional requirement or income of the people to be considered as 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. A poverty line dividing the poor from non-poor is used, by putting a price on the minimum required consumption level of foods.[19] 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.[20] The total expenditure on both food and non-food divided by the population gives the poverty line. 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 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.[21] 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.

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.

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.

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 households.

Poverty line in the context of India was first mooted by the Indian Labour Conference in 1957. The definition of poverty line was attempted first in 1962 by a working group of eminent economists and social thinkers after taking into account the recommendation of the Indian Council of 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.

In the late sixties, Ojha (1970)[22] 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 foodgrains (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 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. On the basis of these minima, he estimated that in 1960-61, 51.8% of rural population and 7.6% of urban population are below poverty line.

One of the earliest and very comprehensive studies was made by Dandekar and Rath (1971).[23] 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 and 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. On the basis of these minima, they estimated that in 1960-61, 40% of rural population and 50% of urban population are below poverty line.

Bardhan (1973), defined poverty line to be monthly per capita income of Rs. 15 at 1960-61 prices for the rural people. He noted that 53% of the rural population were below the poverty line.[24] Minhas (1978)[25] 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. On this basis, he estimated that in 1967-68, 37.1% of rural population and 50.6% of urban population are below poverty line.

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).

Likewise the estimate of Datt and Ravallion[26] (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.

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 1960-61 prices. Whereas, the urban poverty line at 1960-61 prices is reported to be Rs. 18 per capita per month.[27] 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.

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.

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.

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. Thus the poverty line has been changing over the time and from scholars to scholars.

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,[28] 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.[29] Following the convention, many

Governments and nations 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 Goal 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.[30] Thus, eradication of poverty is taking the centre stage in all nations' development agenda.

It was 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 reduce inequalities of income and wealth and to set up a socialist society based on equality and justice and absence of exploitation.[31] But despite all the pious sentiment for the weaker sections the number of the poor continued to swell in the country. The *Gariɔi 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.[32] 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 26.10 % in 1999-2000. This poverty numbers are derived from sample surveys carried out by the NSSO on consumer expenditure.

Nagaland, the 16th state of Indian Union is no exception to other state when it comes to poverty. Nagaland, even after more than four decades of statehood, has 32.67 percentages of people living below poverty line during 1999-00. Moreover, 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[33] 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 on Nutrition and Poverty in Nagaland was done to fill the lacuna in this area.

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 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 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%.[34] The district is divided into three 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 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 monthly per capita expenditure (MPCE) of the people in the villages during the period 2005-06.

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 MPCE.
5. To measure the extent of poverty and inequalities in calorie intake and MPCE.
6. To assess the impact of governments poverty alleviation programmes undertaken in the village on the sample population.
7. To suggest policy options for implementing poverty alleviation programme.

Hypotheses of the Study

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

a. Low-income groups are vulnerable to poor diet and nutrition and thus, MPCE is positively correlated with higher incidence of poverty.

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

c. Higher the size of the household, lower is the monthly per capita expenditure.

d. 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.

Methodology

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 and intoxicants, fuel and light, miscellaneous goods and services, including non-institutional medical care, rents and, taxes, cereals, egg, fish and meat, fruits (fresh and 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.

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.

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.

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:

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

x is the Arithmetic means, Σx 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:

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

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,

$C.V = \sigma/\text{Mean} \times 100$

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

$\text{Variance} = \sigma^2$

(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;

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

(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;

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

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.

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

(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

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

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.[35]

(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[36] 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 shortfall of the calorie norms/poverty line and the transfer of income/calorie from the poor to the very poor. The Index is given as,

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

n = Total population.

q = Total number of poor.

z = Calorie norms/income requirement.

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).

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