

# **POVERTY ESTIMATES IN INDIA: A CRITICAL APPRAISAL**

*Dissertation submitted to the Jawaharlal Nehru University  
in partial fulfilment of the requirements  
for the award of the Degree of*

**MASTER OF PHILOSOPHY**

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2004**

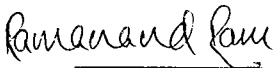


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Date: July 2004


DECLARATION

This is to certify that the dissertation titled "*Poverty Estimates in India: A Critical Appraisal*", being submitted to the Centre for Economic Studies and Planning, School Of Social Sciences, Jawaharlal Nehru University, by Mr. Ramanand Ram, in partial fulfillment of the requirements for the award of the degree of *Master of Philosophy* of this University has not been previously submitted for any other degree of this or any other University.

  
(Ramanand Ram)

We recommend that this dissertation be placed before the examiners for external evaluation.

  
Prof. Arun Kumar  
Chairperson

  
Prof. Utsa Patnaik  
Supervisor

*Dedicated to  
my parents*

## *Acknowledgement*

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I would like to express my sincere gratitude towards my supervisor, Prof. Utsa Patnaik, for her inspiration and intellectual guidance. To work under her supervision has been a great learning and unlearning experience for me. Her suggestions have contributed a lot in developing most of constructive and valid arguments on the topic.

I wish to thank the staff of Jawaharlal Nehru University library, Indian Statistical Institute library for their help. I also like to thank the Coordinator of the Global Studies Programme for providing me the computer facility all the time.

I acknowledge my indebtedness to all the authors whose work I have used for my dissertation. They have all enriched me in various ways. My sincere thanks are due to my friends Vijoo Krishanan, Ramgati, Amal, Kiran Bhairannavar, Arijit and all my classmates. I am indebted to Manish and Sarbeswar for their immense support and being very good friend of mine. I am also indebted to my friend Nandan for his immense help towards formatting this dissertation.

I extend my sincere gratitude and deep reverence to my parents who have been a great source of inspiration for me. I must express my love to brother Tarak, sisters Chumki, Munmun, Laksmi didi and Jijaji and my nephew Uday who have missed me a lot during this period. This work would not have been possible without their encouragement and support.

The discrepancies that might have crept in this work are entirely my responsibility.

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# Chapter-1

## Introduction

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### 1.1 Overview

There has been much debate on the concept and measurement of poverty in India. The debate has centred around the definition of a minimum level of living. Clearly, in a poor and overpopulated country, where majority of population is undernourished, a poverty line must be based on a minimum diet or calorie intake necessary for minimum subsistence.

Having stipulated some nutritional norm, however arbitrary, the next step is to define a set of basket of goods or alternative consumption baskets that would provide the recommended intake of nutrients. This basket would be different for different regions, different income groups and over time, depending on particular tastes, needs and habits of individuals, and on the availability and accessibility of commodities. In order to define the poverty line in terms of income, it would be necessary to estimate how much a recommended subsistence diet formula would cost at a given point in time. This would imply using prices as a conversion factor, which would introduce a certain degree of arbitrariness especially as fluctuations in prices are very great: they vary between income groups, from day to day and village to village. Clearly, estimates of poverty based on actual consumption would be superior to those based on a poverty line in terms of a minimum level of living (Rohini Nayyar, 1991).

The literature survey on the methodology for estimating poverty in India suggests that the Planning Commission (and much of the literature on poverty estimation) has used the indirect method to measure the incidence of headcount poverty. The indirect method involves the calculation of per capita total monthly expenditure in a particular base year (which was 1973-74) at which the minimum nutritional needs are satisfied, assuming that the same consumption basket as in 1973-74 prevails also at later dates, and applying a price index to update the original poverty lines (without reference to actually changing consumption pattern). It has been argued by Patnaik (2004) that the indirect method of poverty estimation uses the concept of a Laspeyre's index. The quantities of food people

consumed in 1973-74 are retained unchanged (assumption of an invariant consumption basket) and the 1973-74 poverty lines are updated by using a price index. However, the price index used itself has varied and given rise to varying estimates even with this indirect method.

However some scholars have also estimated poverty by the direct method which not only incorporates current consumption data but also allow for an independent check on how well the indirect method is doing in capturing the actual calorie intake at later periods than the base year of 1973-74. It has been pointed out that based on the direct method, the total per capita expenditure required to attain the minimum calorie intake has been consistently higher than the price-adjusted base year poverty line. Moreover, the divergence has increased over time quite sharply. As a result the actual calorie intake associated with indirectly estimated poverty line has fallen far below any norm (Mehta and Venkataraman, 2000). It has been pointed out by Rohini Nayyar (1991) that poverty estimates based on the actual consumption data are superior to those derived from a price adjusted poverty line, as the use of a deflator poses many problems.

## **1.2 Methodology**

The objective of the dissertation is to estimate the incidence of headcount poverty based on the actual consumption data of the 55<sup>th</sup> Round. We have estimated poverty ratio based on the direct method of poverty estimation subject to the calorie norms of 2400 calories per capita per day as recommended by the Nutrition Expert Group (1968) based on age, sex and activity pattern. We have taken the data on average calorie intake by expenditure classes from NSSO, Report Number 471 on Nutritional Intake in India. The data on the distribution of persons and average expenditure by each expenditure class is taken from NSSO, Report Number 454 on Household Consumer Expenditure in India-Key Results. Note that there has been a change in the survey design in the NSS 55<sup>th</sup> Round using two recall-periods (7-day and 30-day). Here, we have used the data on 30-day recall-period for estimating poverty. We have constructed the ogive (cumulative distribution functions) to read off the expenditure level satisfying the calorie norm of 2400 calories and subsequently to read off what percentage of persons are lying below the calorie norm.

### **1.3 Chapterisation**

This dissertation entitled as the “Poverty Estimates in India: A critical Appraisal” is organised into six chapters. The second chapter explains some of the conceptual issues on poverty. The third chapter presents a literature survey on the methodology for estimating poverty in India. We have mainly explained the methodology for estimating poverty in Rural-India by Dandekar and Rath (1971), Minhas (1993), Planning Commission, J V Meenakshi and Brinda Viswanathan (2003) and Angus Deaton (2003). The fourth chapter explains the fundamental critiques of indirect method of poverty estimation as used by the Planning Commission and many other researchers. This chapter also presents our estimate of poverty for Rural-India and rural areas of 15 major States based on the direct method of poverty estimation for the year 1999-2000 (i.e., for the 55<sup>th</sup> Round). The chapter five discusses the crucial factors that explain poverty in India in the decade of 1990s. Finally, the chapter six draws the main findings of the study and concludes.



## Chapter-2

### Poverty: Some Basic Concepts

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#### 2.1 Introduction

The Oxford English Dictionary defines poverty as: 'The condition of having little or no wealth or material possessions: indigence, destitution, want,' and suggests its first use was in AD 1075. In recent years, research tapping the perspectives of poor people has recognized that poverty involves a wider set of deprivations, including vulnerability and exclusion from society, in addition to material destitution<sup>1</sup>.

Poverty is hunger. Poverty is lack of shelter. Poverty is being sick and not able to see a doctor. Poverty is not being able to go to school and not knowing how to read. Poverty is not having a job, is fear for the future, living one day at a time. Poverty is losing a child to illness brought about by unclean water. Poverty is powerlessness, lack of representation and freedom.

The United Nations Committee on Economic, Social and Cultural Rights, in its statement on poverty, defined poverty as "a 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 and other civil, cultural, economic, political and social rights"<sup>2</sup>.

Dr. Joe Remenyi, an Australian Economist, state what he meant by the poor. This is what he said : To be poor, in economic sense, one merely has to have a sufficiently low income relative to the national average. In this study the standard below which one is regarded as poor is defined as an annual income less than one half of the national (gross domestic product) per head. On this basis it is evident that to be poor is the norm in most developing countries. This fact is critical if we are to target development to benefit the

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<sup>1</sup>. [www.ussc.edu/atlas/glossary.html](http://www.ussc.edu/atlas/glossary.html)

<sup>2</sup>. United Nations: Economic and Social Council; Poverty and the International Covenant on Economic, Social and Cultural Rights: 10-5-2001

poor. If one further defines the poor as those who belong to households with an annual income of half the national GDP per capita or less, we define as poor between one half and three quarters of the households of developing countries. In other words, the poor are where the bulk of the people are<sup>3</sup>.

Poverty has many faces, changing from place to place and across time, and has been described in many ways. Most often, poverty is a situation people want to escape. So poverty is a call to action-for the poor and the wealthy alike – a call to change the world so that many more may have enough to eat, adequate shelter, access to education and healthy protection from violence, and a choice in what happens in their communities.

Poverty of a life lies not merely in the impoverished state in which the person actually lives, but also in the lack of real opportunity – given by social constraints as well as personal circumstances - to choose other types of living. Even the relevance of low incomes, meagre possessions, and other aspects of what are standard seen as economic poverty relates ultimately to their role in curtailing capabilities (that is, their role in severely restricting the choices people have to lead valuable and valued lives). Poverty is, thus, ultimately a matter of ‘capability deprivation’.

## **2.2 Absolute Poverty Versus Relative Poverty**

A poverty line is necessarily defined in relation to social conventions and the contemporary living standards of a particular society, and in this way somebody in the United States may be adjudged poor even though he has a higher income than the average person in India. In order to bring out the reasons why poverty cannot be meaningfully defined in an absolute way, it may be useful to consider the work of Rowntree in Britain and Orshansky in the United States. Rowntree, in defining poverty, saw his approach as being based on absolute lines: a family was considered to be living in poverty if its total earnings were ‘insufficient to obtain the minimum necessities for the maintenance of merely physical efficiency’ (1901, p.117). For this purpose he used estimates by the American nutritionist Atwater to calculate the minimum requirements of protein and

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<sup>3</sup>. The Oxford Conference on Christian Faith and Economics on the paper titled ‘Income generation by the poor: A case study of credit.

calories. These requirements were transformed into 'a diet containing the necessary nutrients at the lowest cost compatible with a certain amount of poverty'.

The absolute poverty approach, however, involves a number of serious conceptual difficulties as pointed out by Townsend (1964), Rein (1970), and others. Most importantly, there is no single 'subsistence' level which can be used as a basis for the poverty line. There is no one level of food intake required for subsistence but rather a broad range where physical efficiency declines with a falling intake of calories and proteins. Moreover, an individual's nutritional needs depend on his level of activity, the office worker requiring less than a miner or a farm worker. Where precisely the line is drawn depends, therefore, on the judgement of the investigator and the idea of a purely physiological basis for poverty criterion is lost. Even if nutritional requirements could be determined in terms of calories, protein, etc. there still be problems arising from the disparity between expert judgement and actual consumption behaviour. Not only do housewives lack the dietary knowledge required to calculate the least cost foods, not only are poor families forced to purchase food in uneconomical ways<sup>4</sup>, but also eating habits are profoundly influenced by social conventions. Orshansky stated explicitly that 'social conscience and custom dictate that there be not only sufficient quantity but sufficient variety to meet recommended nutritional goals and conform to customary eating patterns. Calories alone are not enough' (1965, p.5).

A poverty line cannot be defined in a vacuum, but only in relation to a particular society at a particular date. Poverty must be seen not in absolute but in relative terms: People are 'poor' because they are deprived of the opportunities, comforts and self-respect regarded as normal in the community to which they belong. It is, therefore, the continually moving average standards of that community that are starting points for an assessment of its poverty, and the poor are those who fall sufficiently far below these average standards. (Social Science Research, 1968).

The relative nature of the poverty has long been recognized. Adam Smith, for example, said in a widely quoted passage:

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<sup>4</sup> . For example, through being unable to exploit the economics of bulk buying. For discussion of whether in general 'the poor pay more', see Caplovitz (1963), Alcala and Klevorick (1971) and Piachaud (1974).

*By necessities I understand only the commodities which are indispensably necessary for the support of life but whatever the custom of the country renders it indecent for creditable people, even of the lowest order, to be without. A linen shirt, for example, is strictly speaking not a necessary of life. The Greek and Romans lived, I suppose, very comfortably though they had no linen. But in the present time ... a creditable day-labourer would be ashamed to appear in public without a linen shirt, the want of which would be supposed to denote that disgraceful state of poverty (1776, p. 691).*

In the same way, Marx referred to the fact that for the worker 'the number and extent of his so-called necessary wants ... are themselves the product of historical development and depend, therefore, to a great extent on the degree of civilization of a country' (quoted by Coates and Silburn, 1970, p.24)

Poverty has, therefore, to be interpreted in relation to the living standards of the society in question.

### **2.3 Approaches to Define Poverty**

Biological Approach: Seebohm Rowntree defined families as being in 'primary poverty' if their 'total earnings are insufficient to obtain the minimum necessities for the maintenance of merely physical efficiency'. It is evident from above definition of poverty that biological considerations are related to requirements of survival or work efficiency. However, the biological approach has come under rather intense fire as there are several problems with its use. First, there are significant variations related to physical features, climatic conditions and work habits<sup>5</sup>. In fact, even for a specified group in a specific region, nutritional requirements are difficult to define precisely. Also, there is difficulty in drawing a line somewhere, and the so-called 'minimum nutritional requirements' have an inherent arbitrariness that goes well beyond variations between groups and regions. Second, the translation of minimum nutritional requirements into minimum food requirements depends on the choice of commodities. This cannot be easily solved by the programming exercise of a 'diet problem' as people's food habits are

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<sup>5</sup> . See Rein (1971), Townsend (1974), Sukhatme (1977, 1978) and Srinivasan (1977a, 1979)

not, in fact, determined by such as cost minimization exercise. The consumption habits of the people, in fact, plays an important role in determining the actual income at which specified nutritional requirements are met. However, the advantage of this approach is that the 'identification' exercise under the nutritional approach need not go through the intermediary of income at all. Proximity of actual habits and particular patterns of consumption behaviour makes it possible to derive income levels at which the nutritional norms will be typically met.

Inequality Approach: To try to analyse poverty 'as an issue of inequality', or the other way round, would do little justice to either. Inequality and poverty are not, of course, unrelated. A transfer of income from a person in the top income group to one in the middle income range must *ceteris paribus* reduce inequality; but it may leave the perception of poverty quite unaffected. Similarly, a general decline in income that keeps the chosen measure of inequality unchanged may, in fact, led to a sharp increase in starvation, mal-nutrition and obvious hardship; it will then be fantastic to claim that poverty is unchanged. Inequality is not just a matter of the size distribution of income but one of investigating contrasts between different sections of the community from many different perspectives. It may be the case that a different distribution system may cure poverty even without an expansion of the country's productive capabilities.

Relative Deprivation: One could use 'relative deprivation' in an objective sense to describe situations where people possess less of some desired attribute, be it income, favourable employment conditions or power, than do others. Here, it is important to note the difference between the 'feelings of deprivation' and 'conditions of deprivation'<sup>6</sup>. The choice of 'conditions of deprivation' cannot be independent of 'feelings of deprivation'. It is not easy to dissociate 'conditions' from feelings. So an objective diagnosis of 'condition' requires an objective understand of 'feelings'. This approach of relative deprivation cannot be the only basis for the concept of poverty. A famine shows a case of acute poverty no matter what the relative pattern within the society happens to be. The reports of starvation, malnutrition and visible hardship cannot be explained by the relative deprivation. There exists an irreducible core of absolute deprivation in the idea

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<sup>6</sup> Wedderburn (1974), p.4.

of poverty. Thus, the approach of relative deprivation supplements rather than supplants the analysis of poverty in terms of absolute dispossession.

## 2.4 Commodities and Characteristics

To begin with the concept of poverty, we require to ask as who should be the focus of our concern. The specification of certain 'consumption norms' or of a 'poverty line' give us a boundary line for separating the poor from the non-poor. The poor are those people whose consumption standards fall short of the norms, or whose incomes lie below that line. The problem of measurement of poverty must include two distinct – but not unrelated exercises. Firstly, the identification of the poor and secondly, the aggregation of their poverty characteristics into an over-all measure. It should be mentioned here that identification exercise needs to be done prior to aggregation. The most common route to identification is through specifying a set of 'basic' – or 'minimum' – needs, not regarding the inability to fulfil these needs as the test of poverty. The concept of relative deprivation is very useful in specifying the 'basic' needs but this cannot serve as the sole basis of such specification. There exists an irreducible core of absolute deprivation in the concept of poverty as discussed earlier, and this makes the concept of relative deprivation inapplicable in this context. Are the basic needs involved in identifying poverty better specified in terms of commodities, or in terms of 'characteristics'? Wheat, rice, potatoes, etc. are commodities, while calories, proteins, vitamins, etc. are characteristics of these commodities that the consumers seek<sup>7</sup>. The characteristic requirements do not specify the commodity requirements as it is difficult to translate the characteristic needs into commodity needs since characteristics could be obtained not from only one commodity but from many others. While calories are necessary for survival, neither wheat nor rice is.

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<sup>7</sup> The literature on basic needs is vast. For some of the main issues involved, see ILO (1976 a, 1976 b), Haq (1976), Jolly (1976), Stewart and Streeten (1977), Streeten (1977), Balogh (1978), Griffin and Khan (1978), Perkins (1978), Singh (1978), and Streeten and Burki (1978). On related issues, see also Adelman and Morris (1973), Chenry, Ahluwalia, Bells Duloy and Jolly (1974), Morawetz (1977), Reutlinger and Selowsky (1976), Drewnoski (1977), Grant (1978), Chichilnisky (1979), Morris (1979), and Fields (1980).

It is possible to move from characteristics requirements to commodity requirements. It is for this reason that 'basic' or 'minimum' needs are often specified in terms of a hybrid vector e.g., amounts of calories, proteins, housing, schools, hospital beds – some of the components being pure characteristics while other are unabashed commodities. There is little doubt that ultimately characteristics provide the more relevant basis for specification of basic needs, but the relative inflexibility of taste factors makes the conversion of these basic needs into minimum cost diets a function not merely of prices but also of consumption habits<sup>8</sup>. The relative inflexibility of taste factors is due to the fact that dietary habits of a population are not, of course, immutable but they have remarkable staying power.

## 2.5 Direct Method Versus Indirect Method

In identifying the poor for a given set of 'basic needs', it is possible to use at least two alternative methods<sup>9</sup>. One is simply to check the set of people whose actual consumption baskets happen to leave some basic need unsatisfied. This is known as the 'direct method' and it does not take into account use of any income notion, in particular not that of a poverty line income. In contrast, the 'income method' requires calculation of the minimum income at which all the specified minimum needs are satisfied. A poor person, on this approach, is one whose income is not adequate to meet the specified minimum needs in conformity with the conventional behavioural pattern<sup>10</sup>. The direct method and the indirect method represent two alternative conceptions of poverty rather than two alternative ways of measuring the same thing. Both concepts are of some interest in on their own in diagnosing poverty in a community.

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<sup>8</sup> While dietary habits are not easy to change, they do, of course, undergo radical transformation in a situation of extreme hunger, for example in famine conditions. In fact, one of the more causes of death during a famine is diarrhoea caused by eating unfamiliar food- and non-food.

<sup>9</sup> See Sen (1976d) on this general issue, and Rath (1973), Bhattacharya and Chatterjee (1974, 1977), and Sen (1976b) on the underlying empirical issues.

<sup>10</sup> See Sen (1976d) on this general issue, and Rath (1973), Bhattacharya and Chatterjee (1974, 1977), and Sen (1976b) on the underlying empirical issues.

While the indirect method is a bit more remote in being dependent on the existence of some typical behaviour pattern in the community, it is also a bit more refined in going beyond the observed choices into the notion of ability.

The direct method is not based upon particular assumptions of consumption behaviour that may or may not be accurate. There can be a case for bringing in the intermediary of income only in the absence of direct information regarding the satisfaction of the specified needs. In this sense the direct method is superior to the income method and hence the income method is at most a second best.

The income method can be seen as a way for approximating the results of the direct method. The income method can also be seen as a way of taking note of individual idiosyncrasies without upsetting the notion of poverty based on deprivation. The income of a person can be seen not merely to be a rough aid to predicting a person's actual consumption, but also as capturing a person's ability to meet his minimum needs (whether or not he, in fact, chooses to use that ability)<sup>11</sup>. If the poverty level income can be derived from typical behaviour norms of society, a person with a higher income who is choosing to fast on bed of nails can, with some legitimacy, be declared to be non-poor. The income method does, therefore, have some merit of its own, aside from its role as a way of approximating what would have been yielded by the direct method had all the detailed consumption data been available.

The income method has the advantage of providing a metric of numerical distances from the 'poverty line' in terms of income shortfalls. This the 'direct method' does not provide, since it has to be content with pointing out the shortfall of each type of need. On the other hand, the income method is more restrictive in terms of preconditions necessary for the 'identification' exercise. First, if the pattern of consumption behaviour has no uniformity, there will be no specific level of income at which the 'typical' consumer meets his or her minimum needs. Second, if the prices facing different groups of people differ, e.g., between social classes or income groups or localities, then the

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<sup>11</sup> The income method has close ties with the welfare economics of real income comparisons; see Hicks (1958).



poverty line will be group specific, even when uniform norms and uniform-consumption habits are considered<sup>12</sup>. There are real difficulties and cannot be wished away.

## 2.6 Family Size and Equivalent Adults

For poverty estimation, family rather than the individual is the natural unit as far as consumption behaviour is concerned. By dividing the family income by the number of family members, there can be a possibility of a correspondence between family income and individual income for meeting the minimum needs of families of different size. There are two problems with this method. Firstly, this method overlooks the economics of large scale that operate for many items of consumption. Secondly, this method fails to consider the fact that the children's needs may be quite different from those of adults. To cope with these issues, the common practice for both poverty estimation and social security operations is to convert each family into a certain number of 'equivalent adults' by the use of some 'equivalence scale' or, alternatively to convert the families into 'equivalent households'<sup>13</sup>.

There tends to be a lot of arbitrariness in any such conversion. The exact consumption pattern of the people varies from family to family and with age composition. The question of mal-distribution within the family is also an important issue in this regard.

## 2.7 Measures of Poverty

The commonest measure of over-all poverty is the Head-count measure H, given by the proportion of the total population that happens to be identified as poor e.g., as falling below the specified poverty-line income. If q is the number of people who are identified as being poor and n the total number of people in the community, then the head-count measure H is simply  $q/n$ . The headcount measure-H has at least two

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<sup>12</sup> For evidence of sharp differences in income-group-specific price deflators in India, see Bardhan (1973), Vaidynathan (1974) and Radhakrishna and Sarma (1975), among others. See also Osmani (1978).

<sup>13</sup> See Orshansky (1965), Abel-Smith and Townsend (1965), and Atkinson (1969) among others. See also Fields (1980).

drawbacks. First, H takes no account of the extent of the shortfall of incomes of the poor from the 'poverty-line': a reduction in the incomes of all the poor without affecting the incomes of the rich will leave this head count measure completely unchanged. Second, it is insensitive to the distribution of income among the poor; in particular, no transfer of income from a poor person to one who is richer can increase this head count measure. The head-count measure H is, of course, not insensitive to the number below the poverty-line; indeed, for a given society it is the only thing to which H is sensitive. But H pays no attention whatever to the extent of income shortfall of those who lie below the poverty-line. It matters not at all whether someone is just below the line or very far from it, in acute misery and hunger.

However, the poverty gap measure takes into account the amount by which the incomes of the poor fall short of the poverty line. It measures the difference between the income level of the poor and the income level necessary to raise them to the poverty line. Poverty gap is the aggregate shortfall of income of all the poor from the specified poverty line. However, the poverty gap is an absolute sum which conveys no information about the number of the poor. It can be reduced to an index as follows:

$$PGI = (g/q) \times e$$

where PGI is the Poverty Gap Index, g the poverty gap, q the number of poor and e is the poverty line. This index measures the proportionate shortfall in the income of the poor; its value lies between 0 and 1. The PGI will be zero when everyone's income is equal to or above the poverty line, and it will be 1 when everyone below the poverty line has a zero income.

Clearly, both the incidence measure and the poverty gap measure must form part of a composite poverty index. However, neither is sensitive to the distribution of income among the poor. A transfer of income from the poorest to the slightly better off might leave the number of poor unchanged; but if this transfer lifts some of the least poor just above the poverty line, it would actually lead to a fall in the number of the poor. This seems to be a 'perverse response'. According to Sen, 'given other things a pure transfer of income from a person below the poverty line to anyone who is richer must increase the poverty measure': this he calls his transfer axiom<sup>14</sup>. Neither the head-count nor the

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<sup>14</sup> A.K.Sen, op. cit.

poverty gap measure satisfies this transfer axiom. Sen's P measure is one which incorporates all these aspects into a single index. The Sen P measure incorporates both the incidence measure and the poverty gap; in addition it takes account of the inequality in the distribution of income among the poor.

$$\text{Sen P} = (q/n) \times (1/e) [ e - c (1-G_p) ]$$

where  $c$  is the mean income of the poor and  $G_p$  is the Gini coefficient of the distribution of income among the poor. In the above equation  $(q/n)$  is the incidence measure, providing an estimate of the proportion of the rural population which is categorized as poor;  $(e-c)$  is the average income shortfall from the poverty line. In addition to this poverty gap arising out of the proportionate shortfall in average income from the poverty line, there is a gap arising from the unequal distribution of the mean income which is reflected by the Gini coefficient of the income distribution among the poor multiplied by the mean income ratio i.e.  $G_p \times c/e$ . The Sen P Index lies between 0 and 1. It is zero when everyone's income is above the poverty line (that is when  $q = 0$ ) and is 1 when everyone has a zero income ( that is when  $c = 0$  and  $q = n$  ).

In the Sen P Index , there is clearly a trade-off between the mean income ( $c$ ) of the poor and equality  $(1-G_p)$  in their income distribution, the trade off being given by  $c(1-G_p)$ . Thus it is perfectly possible for the Sen index to register a decline in poverty when the poor have become poorer in absolute terms (that is  $c$  has decreased) so long as equality in their income distribution  $(1-G_p)$  has increased more than proportionately. Thus, the index implies a reduction in poverty even if there are transfers of income from the poor to the non-poor so long as the remaining incomes of the poor are sufficiently better distributed. A maximum reduction of  $(1-G_p)$  per cent can be made in the total income of the poor, yet an improvement in distribution can still neutralize the effect of this income loss on the Sen index. These applications, while acceptable when weighting the incomes of the entire population as in the Atkinson inequality index, may be more difficult to swallow when applied only to those below the poverty line, especially if this is interpreted as an absolute minimum. In this case, one may not wish to weight the incomes of the poor people differently, preferring instead the value judgement of equal or unit weights on all their income gaps. Treating the incomes of the poor similarly yields a poverty measure which is simply the normalized value of the Sen index.

# Chapter-3

## Review of Literature:

### Methodology for Estimating Poverty in India

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#### 3.1 Introduction

One of the earliest to venture into a quantitative statement about the poverty in India was (the late) Dr. Ram Manohar Lohia who made a statement in the House of People (Lok Sabha) of the Indian Parliament in the late 1950s about the proportion of Indians who had less than a specified level of expenditure. The definition of poverty line in the Indian context was attempted for the first time in 1962 by a Working Group of eminent Economists and social thinkers after taking into account the recommendations of the Nutrition Advisory Committee of the Indian Council of Medical Research (ICMR, 1958) regarding balanced diet.

The Working Group<sup>1</sup> consisting of nine distinguished economists and social workers, set up by a Seminar on Some Aspects of Planning, after considerable discussion on minimum standard of living, recommended in July 1962 that:

i) The national minimum for each household of 5 persons (4 adult consumption units) should be not less than Rs. 100 per month in terms of 1960-61 prices or Rs. 20 per capita. For urban areas, this figure will have to be raised to Rs. 125 per month per household or Rs. 25 per capita to cover the higher prices of the physical volume of commodities on which the national minimum is calculated.

ii) The 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.

iii) An element of subsidy in urban housing will have to be included after taking Rupees 10 per month, or 10 per cent as the rent element payable from the proposed

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<sup>1</sup> . See for reference: "Perspective of Development: 1961-2, Implications of Planning for a Minimum level of living" (paper prepared in Perspective Planning Division of the Planning Commission) – in Bardhan and Srinivasan (1974): Poverty and Income Distribution in India.

national minimum of Rupees 100 per month. The Planning Commission noted that on the basis of available data on distribution of population according to per capita expenditure, nearly half the Indian population in 1960-61 was below this national minimum level of Rupees 20 per capita per month, and the Commission called them poor.

A similar study by Bardhan related to India as a whole, and to its states, for the years 1960-61 and 1967-68/1968-69, using the NSS data<sup>2</sup>. However, Bardhan used two alternative poverty norms. The first was a poverty line of Rs 20 per capita per month at 1960-61 prices as recommended by a group of Experts and accepted by the Planning Commission. On the assumption that prices in rural areas are lower than in urban areas, Bardhan used Rs. 15 per capita per month as the minimum level of living in rural India<sup>3</sup>. The second was a nutritional norm based on the diet formula drawn by the Central Government Employees Pay Commission (1957-58). In this case, the rural poverty line worked out to Rs. 14 at 1960-61 prices and Rs. 28 at 1968-69 prices<sup>4</sup>. There is not much discrepancy between the two sets of poverty lines. On the basis of these poverty norms Bardhan estimated that the proportion of the poor in the rural population had increased from 38% in 1960-61 to 59% in 1968-69<sup>5</sup>.

Thus, there are two clear steps involved in estimating the level of poverty within any population. The first is to define the reference level of well being below which a person will be deemed to be poor. The second is to decide on a method of calculating the cost incurred to support this reference level to make the necessary transition from a physical description of poverty to a monetary one. In the Indian context, the reference level has been fixed on the basis of per capita per day calorie intake since the work of Dandekar and Rath (1971). This paper envisaged that the 'poverty line' be fixed for any given period of time on the basis of the distribution of per capita per day calorie intake according to expenditure on all items, food and non-food. The total expenditure

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2. P.K. Bardhan, 'On the incidence of Poverty in Rural India in sixties' in T.N. Srinivasan and P.K. Bardhan (eds), *op cit*.

3. *ibid*; p-264

4. *ibid*; p-275

5. *ibid*; p-275

corresponding to the calorie intake level of 2,250 k. calories per capita per diem was defined as the monetary measure of poverty line.

The calorie norm made a connection between an objective physical measure of well being i.e., food intake, and its overall monetary value. The calculation of poverty line in Dandekar and Rath (1971) was based on the behavioural data collected in the household consumer expenditure survey of 1961-62 by the NSSO. From 1972 onwards, NSSO carried out a large sample consumer expenditure surveys on a quinquennial basis, a practice that continues today. Since then focus had shifted from a calorie based approach to an income based one in the determination of poverty. Since detailed household expenditure data was available every five years, the method of using price indices was considered the preferred one for estimating poverty lines in subsequent years.

This chapter explores into the methodological aspects of estimation of poverty in India. Estimates of poverty are typically based on a normative minimum calorie intake which has been discussed in details in the following sections. There are two methods of measuring poverty on the basis of a minimum calorie intake. One is to check the set of people who do not satisfy the minimum calorie intake. This may be called the direct method and “does not involve the use of any income notion, in particular not that of poverty line income” (Sen 1981:26). The second method may be called the ‘income method’ and involves the calculation of the minimum expenditure at which the specified minimum nutritional needs are satisfied, given the consumption patterns of the population. In the Indian context, the Planning Commission and much of the literature on poverty estimation has used the income indirect method to measure poverty in India.

This chapter is organized as follows. Section 3.2 explains the work of Dandekar and Rath on ‘poverty line’ as well as its criticisms. Section 3.3 explains the ‘poverty line’ in terms of ‘net zero displacement’ level by Minhas (1993). Section 3.4 explains the methodology adopted by the Planning Commission for estimating poverty in India since 1973-74 (i.e., the 28<sup>th</sup> round) to 1999-2000 in details and contains the results on poverty ratio (HCR). Section 3.5 explains the calculation of poverty in Rural India in terms of ‘Foster-Greer Thorbecke (FGT) class of indices by J V Meenakshi and Brinda Vishwanathan using the calorie based approach. Section 3.6 explains the methodology adopted by Angus Deaton to calculate poverty for rural- and urban-India. This also

includes the Deaton's adjustment procedure to estimate poverty for the 55<sup>th</sup> round due to its change in the design of the questionnaire.

### **3.2 Dandekar and Rath (1971)**

An effort at fixing a minimum income, which may be called the poverty line, on the basis of some objective criterion was made by Dandekar and Rath (1971) in their small monograph called 'poverty in India'. Dandekar and Rath started with the proposition that a level of income (or total expenditure) that was just able to ensure adequate food to every members of the household during the year may be considered as such a minimum income, and all households with less income than this may, therefore, be called poor. In order to translate 'adequate food' into some measurable quantitative form, they used calories provided by the food used in the household. Sukhatme (1965) had reported that according to nutrition experts (Nutrition Advisory Committee, 1958) an average Indian – average for age, sex, occupation, as well as geographic location – needed food at the retail level in the household that would give him 2,250 k. calories per day. This norm was used as the equivalent of 'adequate food'. The minimum protein requirement was not separately taken into account since, given the usual Indian diet, the food that give adequate calories also provided the minimum protein requirements. Also, no separate norms were considered for the non-food requirements of the household.

Given this normative basis in terms of food measured by its calorie context, Dandekar and Rath resorted to the NSSO data, which had been conducting annually a consumer expenditure survey since 1951, to find out the level of per capita total expenditure at which the average household was able to provide food with this calorie context. Dandekar and Rath used the quantity data for cereals and pulses for the year 1960-61 and for all the food items in detail for the year 1961-62 for estimation of the per capita per month expenditure group in different states of India in which the average person was able to get 2,250 k. calories from food. This gave the poverty line in terms of total monetary expenditure and the percentage of population below the poverty line in each state separately for rural and urban areas.

This exercise by Dandekar and Rath in terms of an 'adequate food' intake for determining the poverty line drew wide attention and was subjected to many criticisms.

Two objections to Dandekar-Rath's calorie norm to determine the poverty line in terms of total consumption expenditure were as follows. Firstly, Dandekar-Rath specified the calories irrespective of the composition of food by the sampled households, instead of specifying the norm in terms of a 'balanced diet'. Rao (1977) said, "A balanced diet approach is .... preferable to the calorie intake approach" and expressed his preference for such approach followed by Bardhan (1974) and Rudra (1974). Secondly, it was argued that poverty should, properly speaking, be defined in terms of deficiency in total level of living, and not mere calories obtained through food. Rao said, "poverty has to be identified with deficiency in total level of living. And, total level of living includes not only energy requirements but also balanced diet needed for health, and other basic needs essential for human existence at a tolerable level." But it is not easy to translate this "tolerable level of human existence" into many different commodities and services. And, even when it is done, in case of the balanced diet, operationally it has to be translated into a total expenditure in order to draw the poverty line.

The second set of objections to Dandekar-Rath approach related to the choice of the specified calorie level for determining the poverty line. Hence, there are two different types of objections. The first, made by Rao (1977) noted that in the consumption survey by the NSSO in 1971-72. There were many households below the expenditure level corresponding to an average of 2,250 k. calories intake who would be called poor but who in fact obtained 2,250 k. calories or more from the food they consumed. While in the expenditure categories above the poverty line so determined there were many households who obtained less than 2,250 k. calories per capita per day from the food they consumed. Rao found this perplexing: that some poor were over-nourished whereas some non-poor were under-nourished. Consequently, he considered the procedure followed by Dandekar-Rath as not correct. As Dandekar (1981) has pointed out, Rao's difficulty in this matter arose out of confusion between poverty and under-nutrition. To quote Dandekar in this respect: 'want of adequate income, howsoever defined, is poverty; deficiency of energy, appropriately defined, is under-nutrition'. The proper way to interpret the poverty line income is that the population living on levels of income lower than this 'lived on such levels of consumer expenditure that, judged by average standards of household management, it could not provide for itself diet adequate even in respect of



calories. There would certainly be some households among the poor defined by a certain expenditure level, who with better household management and better priorities of expenditure did provide for themselves diets adequate at least in respect of calories. The contrary is also true.” “There is nothing paradoxical in this. Indeed ..... poverty and under-nutrition are two different, though related phenomenon” (Dandekar, 1981).

Sukhatme (1978) also appears to make the same confusion between poverty and under-nutrition when he compares the Dandekar-Rath approach with that by the Arthur Bowley for England. As Dandekar (1981) has pointed out, Dandekar-Rath used the classification of the households on the basis of per capita monthly expenditure which was relevant for calculating incidence of poverty, and not according to per capita calorie availability which is relevant for under-nutrition.

Sukhatme (1978) raised another objection to the use of 2,250 k. calories per capita as the requirement of an average Indian. Sukhatme says that “this is an average, and around this average there is a distribution of individuals according to their per capita calorie intake, a part of which is because of inter-individual and another part due to intra-individual variation in energy needs. Inter-individual variation means that the energy intake of even normally healthy and active individuals with similar body weight and occupation varies, implying that some individuals are more efficient machine than others. Intra-individual variation means that energy intake of an individual engaged in similar activity and maintaining body weight varies from day to day”. It is only such individual variations other than what is normal (in the statistical sense) around the mean that can be considered, at the lower end of the mean, to be having less calories than needed. Using this logic, Sukhatme says that the ‘minimum’ calorie needs of a reference Indian (a consumer unit) will not be 2,750 k. calories (approximately equivalent to 2,250 k. calories per person), but 2,300 k. calories per consumer unit. And, therefore, on the basis of consumption survey by the NSSO in 1971-72, the percentage of poor in rural India will not be 46.6 per cent as would be case following Dandekar-Rath method, but only 20 per cent. Dandekar (1981) accepted Sukhatme’s legitimate point about inter-and intra-individual differences about calorie needs. But thereafter Dandekar’s differences with Sukhatme were on grounds of statistical methods.

### 3.3 B S Minhas (1993)

Minhas (1993) attempted a behaviouristic approach to the estimation of the calorie level for calculation of rural and urban poverty using the 1983 Consumer Expenditure Survey data of the NSS for the purpose. In this survey, he points out, the meals surveyed to non-members of the household on the occasion of ceremonies and at other times as well as to employees (like casual labourers on farm and non-farm work of the household) were included in the consumption expenditure as also quantities consumed by the households while these occasional dinners were not counted as part of the household; similarly, food eaten by the members of the household either as guests or employees of other households were not taken into account in the consumption of the household to which these persons belonged. Only the meals purchased by the members of the family were included in the household's consumption account. Naturally, calorie estimation of such sample household on the basis of the reported consumption data would not give a correct picture of the total calorie intake by the household. It would be necessary to exclude the meals consumed by the non-members of the household in the household during the month and include the meals consumed by the members of the household outside the total consumption basket of the household in order to estimate the level of calorie intake by the members of the household. The 1983 consumer expenditure survey contained information about the total number of meals served to guests and employees of the household and the member of meals consumed by the members of the household outside, the meals purchased by them as well as the total number of meals consumed in the household separately during a month. This provides a basis for correcting the food/calorie intake by the members of the surveyed household. Minhas first arranges the surveyed households according to their reported calorie intake, and then just adjusts the calorie intake in each group by deducting the calorie value of meals fed to non-members and adding the calorie values of meals consumed by members in each household to obtain the percentage of households who move to lower calorie groups. Not unexpectedly, the percentage of households moving to higher calorie groups gradually declines as one moves to higher calorie classes, and the reverse trend is observed with the percentage of households moving to lower calorie classes. Minhas considers the calorie level at which the meals received and meals given out by households on an average just

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balance to be significant. The households above this level are net givers of food and therefore are considered by him to be food abundant households, and those below this level are considered as food deficient households. The poverty line may, according to him, be defined at this 'net zero displacement' level. Naturally, this level varies for different states. For states like Gujarat, Karnataka or Himachal Pradesh this zero net displacement was seen to be the lowest in the country, lying between 1800 and 1900 k. calories. Minhas considers this to be a level below which any Indian will experience the onset of hunger. This level of calorie intake he puts at 70 per cent of the recommended 2,750 k. calories for a consumer unit.

But there lies a difficulty with this behavioural approach. If the overwhelming proportion of the households were both giving and taking meals, then this approach may turn out to be meaningful. But, if a substantial proportion of the households neither gave nor received meals or only gave or only received meals then the problem will arise. In regard to these later groups of households, can anything be said about the level at which food abundance begins? In the 47<sup>th</sup> and 48<sup>th</sup> rounds of consumer expenditure survey about 19% of the rural households reported taking any meal outside the household and only 4% reported performing any ceremonies in the household which would involve feeding outsiders. Thus it appears that the overwhelming proportion of sample households neither received nor gave prepared meals. Under such circumstances, it is difficult to accept the zero net displacement basis of only a small section of the sample population as a basis for ascertaining the food adequacy level of the population<sup>6</sup>.

### **3.4 The Planning Commission's Methodology**

The task force on projections of minimum needs and effective consumption demand (Planning Commission 1979) formalized the definition of poverty, and computed the incidence of poverty in rural and urban India for the year 1973-74. The official estimates are based on a calorie norm fixed at 2435 k. calories per capita per diem for rural areas and 2095 k. calories for urban areas (rounded off to 2400 and 2100 k. calories respectively). These norms were fixed on the basis of age-sex-occupational structure of

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<sup>6</sup> I am thankful to Vidwans for a discussion on this point.

the rural and urban population for the year 1982-83, and the corresponding energy allowances recommended by the Nutrition Expert Group (1969). Based on these norms, poverty lines for rural and urban areas were determined from the 28<sup>th</sup> round of NSS consumer expenditure data for the year 1973-74. The poverty line for the base year 1973-74 has been taken as the per capita expenditure level at which these calorie norms have been met, on an average for the country as a whole, as per the NSS household consumption expenditure survey for the corresponding year. The task force (1979) defined the poverty line as the per capita expenditure level at which the calorie norms were met on the basis of the All-India consumption basket for 1973-74. According to the observed consumer behaviour, Rs. 49.09 per capita monthly expenditure in rural areas corresponded to an intake of 2400 k. calories and Rs. 56.64 in urban areas to an intake of 2100 k. calories. Thus, Rs. 49.09 and Rs. 56.64 served as cut-off lines for dividing the poor from non-poor. The incidence of poverty was 56.4% in rural areas and 49% in urban areas.

Subsequently, the Planning Commission estimated the proportion and number of rural and urban poor for the years 1977-78, 1983, 1987-88 and 1993-94. The poverty line for the latter years have been obtained by updating the 1973-74 poverty lines to adjust for price changes. Thus, there has been a shift in the methodology from the direct method of poverty estimation into indirect method of poverty estimation after 1973-74.

The poverty line so defined needs updating overtime to take care of changes in the price levels. Initially the wholesale price index was used to reflect the price changes. However, private consumption deflator derived from the National Accounts Statistics (NAS) was recommended for this purpose by a study group on 'The Concept and Estimation of poverty line' (Perspective Planning Division, Planning Commission, 1984). The study group recommended the use of a price index approximately weighted by the consumption basket of the poor as an index for reflecting price changes relevant to the poor. The implicit private consumption deflator from NAS was found, at that time to be very close to such an index and hence it was used for adjusting the poverty line for the years 1977-78, 1983-84 and 1987-88.

In order to arrive at the estimate of the number of poor, Planning Commission has been making adjustment in the National Sample Survey (NSS) data on distribution of

households by consumption expenditure levels. Such an adjustment has been felt to be necessary because the aggregate private household consumption expenditure as estimated from the NSS data is different from the aggregate private consumption expenditure estimated in the National Accounts Statistics (NAS). It was considered desirable to have compatibility between the two sets of data in order to ensure consistency between the two important components of the plan model, i.e. the input-output table (based on NAS) and the consumption sub-model (based on NSS data). The procedure followed has been to adjust the expenditure levels reported by the NSS uniformly across all expenditure classes by a factor equal to the ratio of the total private consumption obtained from the NAS to that obtained from the NSS. The old NAS series was used for deriving the adjustment factor for the estimates up to the year 1983 and the new NAS series has been used for the 1987-88 estimates.

The poverty population is, thus, estimated by applying the updated poverty line to the corresponding adjusted NSS distribution of households by levels of consumption expenditure. To estimate the incidence of poverty at the state level, all-India poverty lines and the adjustment factors have been used on the state specific NSS distribution of households by levels of consumption uniformly across the states.

The Planning Commission's methodology to estimate state level poverty implicitly makes the following assumption. First, age-sex and occupation distribution of population in the states follows the all-India pattern. Hence, calorie requirements per capita are the same in different states. Second, the price structure of the consumption baskets and price trends across the states are identical. It has been pointed out that there are important inter-state differences in terms of population structures, activity status, climatic and topographical considerations, and so on, which would need to be reflected in calorie requirements. Accordingly, normative calorie requirements would differ from state to state. The consumption basket of the poor also differs significantly across the states. It is evident in the poverty line concept that non-food expenditures such as clothing, housing and fuel are not normatively estimated. The food habits will depend on local availabilities as well as on cultural and consumer preferences reflected in differing choices between vegetarian and non-vegetarian food-items, between fine and coarse food-grains and in the greater or smaller use of milk and milk products.

Ideally, the inter-state differences in population structure, activity composition, climatic and topographical price structure and their trends over time should be reflected in the state-specific poverty lines. On practical consideration, the Planning Commission had adopted the all-India calorie norms and used a common deflator for all the states for estimating the incidence of poverty. A number of states were of the view that given the current methodology, Planning Commission grossly underestimated their poverty status. There is therefore a need to streamline the methodology in this respect. In this context, it has been argued that there should be state-specific poverty lines reflecting the state-specific price differentials of the relevant consumption basket and 'state-specific' poverty lines to ensure consistency. It has been further argued, that in estimating the state-specific poverty lines, the state specific consumption basket associated with the calorie should be used.

It may however be noted that any meaningful comparison, whether longitudinal or latitudinal, of incidence of poverty would require the use of same consumption basket associated with the given calorie norm. If the state-specific consumption basket was used in the base year, it would no doubt provide a more meaningful comparison overtime of the poverty situation in that state. If the concern is to ensure comparability across states as well over time we need to adopt the same consumption basket for all the states. For this the obvious choice is all-India basket. On making such inter-state comparisons in any given year, we have take into account the fact that prices of different commodities in different states are not the same in any given year nor are the changes in prices similar to over the years. One of the members of the Planning Commission, S. Guhan, is of the view that it will be desirable for the Planning Commission to give a separate set of poverty estimates based on all-India calorie norms (for want of state-specific calorie norms), state level consumption baskets in the base year, and state level prices indices and deflators related to respective base year consumption basket at the state level.

The 'Expert Group' (Planning Commission 1993) recommended some major revisions in the methodology of poverty estimation. One recommendation was to give up the practice of adjusting NSS data to match the private consumption figure of NAS. The second recommendation was to update the 1973-74 poverty line according to the state-specific price changes, as reflected in the state level consumer price indices of

agricultural labourers and industrial workers. National poverty estimates would, then, be an aggregate of state level estimates, based on state-specific poverty lines. The Planning Commission accepted both the recommendations, and accordingly revised the estimates for all the years. The updated poverty lines for 1993-94 are Rs. 205.84 and Rs. 281.34 for rural and urban areas.

The Planning Commission has been estimating the incidence of poverty at national and state level using the methodology contained in the report of the Expert Group on Estimation of Proportion and Number of Poor (Lakdawala Committee) and applying it to consumption expenditure data from the large sample surveys on consumer expenditure, conducted periodically by the National Sample Survey Organization (NSSO). The NSSO has released the key results of the latest large sample survey data on consumer expenditure (55<sup>th</sup> Round), covering the period July 1999 to June 2000. Two sets of different distributions of consumer expenditure from the 55<sup>th</sup> Round have been reported because of experimenting with the method of data collection. In the earlier large scale surveys, the NSSO estimated monthly per capita consumption expenditure on the basis of responses using a 30-day recall period though data were collected for some of the non-food items using reference periods of both 30 days and 365 days from the same household. In the 55<sup>th</sup> Round, consumption expenditure on clothing, footwear, medical (institutional) and durable goods were collected by using a 365-day recall period. In the case of all other non-food items, the 30-day recall period was used as earlier. The data regarding consumption of food items were collected by using two different reference periods of last 30 days and last 7 days from the same household in that order. The two sets of data so collected were tabulated and the corresponding distribution of persons by monthly per capita consumption expenditure were included in the report, though the data based on 7-days reference period for the food-items were collected only for investigating the suitability of the shorter reference period. Since both consumer expenditure distributions have been published, the Planning Commission has estimated poverty from both distributions reported by the NSSO, using the accepted methodology. State poverty lines have been estimated using the original state specific poverty lines identified by the Lakdawala Committee and updating them to 1999-2000 prices using the Consumer Price

Index for Agricultural Labourers (CPIAL) for rural households and the Consumer Price Index for Industrial Workers for urban households.

**Table-3.1: Estimates of Poverty (HCR)**

Year	All-India	Rural India	Urban India
1973-74	54.9	56.4	49.0
1977-78	51.3	53.1	45.2
1983	44.5	45.7	40.8
1987-88	38.9	39.1	38.2
1993-94	36.0	37.3	32.4
1999-2000	26.1	27.1	23.6

Source: Planning Commission

**Table-3.2: Poverty Ratio at the state level (Rural Areas)**

States	1973-74	1993-94	1999-2000
Andhra Pradesh	48.41	15.92	11.05
Assam	52.67	45.01	40.04
Bihar	62.99	58.21	44.30
Gujarat	46.35	22.18	13.17
Haryana	34.23	28.02	8.27
Karnataka	55.14	29.88	17.3
Kerala	59.19	25.76	9.38
Madhya Pradesh	62.66	40.64	37.06
Maharashtra	57.71	37.93	23.72
Orissa	67.28	49.72	48.01
Punjab	28.21	11.95	6.35
Rajasthan	44.76	26.46	13.74
Tamil Nadu	57.43	32.48	20.55
Uttar Pradesh	56.3	42.28	31.22
West Bengal	73.16	40.80	31.85
All India	56.44	37.27	27.09

Source: Planning Commission

The consumer expenditure data of the 55<sup>th</sup> Round on a 30-day recall basis yields a poverty ratio for 1999-2000 of 27.09% in rural areas, 23.62% in urban areas and 26.10% for the country as a whole in 1999-2000. The corresponding figures from the 7-day recall period are 24.02% in rural areas, 21.59% in urban areas and 23.33% for the country as a whole. Table-1 presents the estimates of poverty calculated by the Planning Commission for the country covering the period 1973-74, 1977-78, 1983, 1987-88, 1993-94 and 1999-



2000 for which large-scale sample surveys were carried by the NSSO. Table-3.2 provides the estimates of poverty at the state levels for the periods 1973-74, 1993-94 and 1999-2000, covering rural areas of 15 major states.

### **3.5 J V Meenakshi and Brinda Viswanathan (2003)**

There is now a consensus that the post-reform period has witnessed a decline in income poverty, a conclusion based on the quinquennial consumer expenditure surveys conducted by the NSSO. Much less has been focused on the trends in calorie deprivation in India. It is now established that there has been a secular decline in calorie intakes in rural areas, amounting to approximately 70 calories per capita over the period 1983-1999/2000. This decrease in calorie intakes has translated into corresponding increases in headcount ratios of calorie deprivation. Against this background, J.V. Meenakshi and Brinda Viswanathan in their paper 'Calorie Deprivation in Rural India, 1983-1999/2000' claim that while the magnitude of income poverty has declined, that of calorie deprivation has increased. They highlight the central importance of the norm used to calculate head count ratios of calorie deprivation and demonstrates that the choice of norm significantly influences not just the magnitude of deprivation observed, but also the direction of its change. Furthermore, the direction of change is shown as being sensitive to the choice of poverty measure.

The study focuses on rural areas of 16 states, and on the changes that occurred during the period 1983 to 1999-2000. The analysis is based on household level (unit record) data from the consumer expenditure surveys conducted by the NSSO for the years 1983 and 1999-2000, corresponding to 38<sup>th</sup> and 55<sup>th</sup> rounds of NSSO. Calorie intakes are calculated by applying conversion factors to the quantities of a large number of commodities, which are reported as having been consumed by the sampled household during the preceding 30 years<sup>7</sup>.

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7. The general consensus is that the methodological changes in the 55<sup>th</sup> round (and in particular the use of two different recall periods) do not require adjustments or corrections to the cereal dominated calorie intake figures. Hence, none are attempted here.

The authors compute three measures of deprivation, using the well-known Foster-Greer-Thorbecke (FGT) class of indices (1984). Accordingly,

$$FGT(\alpha) = (1/H) \sum_{h=1}^q (g^h / z); \text{ where } g^h = z - m^h$$

is the gap between the caloric norm ( $z$ ) and the  $i^{\text{th}}$  individual's caloric intake ( $m^h$ );  $H$  is the total population and  $q$  is the member of calorie-deprived persons. When  $\alpha = 0$ , the index collapses to the familiar head-count ratio of people with insufficient caloric intakes, henceforth referred to as HCR. When  $\alpha = 1$ , the index measures the average deficit of calories with respect to the norm, weighted by the proportion of those who are thus deprived. When  $\alpha = 2$ , the index measures the severity of deprivation, as it gives a higher weight to those who are most deprived – whose intakes are far below the norm used.

The summary statistics relating to average caloric intake, caloric deprivation and income poverty shows that in 1983, average intakes level below 2400 calories in all but six states and level above the norm only in northern region. By 1999-2000, intakes had declined in all states except Kerala, Orissa and West Bengal. These declining intake levels have translated into increased head count of caloric deprivation. Even in absolute terms, head count ratios of caloric deprivation are far higher than those based on income poverty. For example, in 1999-2000 the HCR of caloric deprivation in Rural Andhra Pradesh was 81 per cent, although the income head count ratio was only 11 per cent. Thus, it appears that income poverty has declined though caloric poverty would appear to have increased. In principle, the determination of the poverty line is anchored to the cost of a food basket that would provide the requisite calories. Therefore, one would expect both classes of measures to yield similar results, at least qualitatively. Clearly, this is not the case.

### 3.6 Angus Deaton (2003)

Deaton used the price indexes to calculate a new set of poverty lines, by state and sector, and over time, and calculate head count ratios based on them. The starting point is the official rural all-India poverty line for the 43<sup>rd</sup> Round, 1987-88. This is Rs. 115.70 per head for 30-days. Rural poverty lines for each state are obtained by multiplying this

base poverty line by rural price indices for each state relative to all-India. Finally, the urban poverty lines, for each state as well as for all-India, are calculated from the rural poverty lines by scaling up the respective urban relative to rural price indexes. In all cases, Deaton uses the relevant Tornqvist price indexes. To move to the 50<sup>th</sup> Round, the all-India rural line, Rs. 117.50 is scaled up by the Tornqvist index for rural-India for the 50<sup>th</sup> round relative to the 43<sup>rd</sup> round, 1.698 to give an all-India rural poverty line for the 50<sup>th</sup> round. This number is then used to generate an all-India urban poverty line, and state urban and rural poverty lines, following exactly the same procedure as for the 43<sup>rd</sup> round. Finally, poverty lines for the 55<sup>th</sup> round are calculated in the same way from an all India rural poverty line, which is the 50<sup>th</sup> round all India rural poverty line scaled up by the inflation rate between the two surveys. 1.545<sup>8</sup>.

Angus Deaton ('Adjusted Indian Poverty Estimates for 1990-2000') develops a procedure for adjusting the 55<sup>th</sup> round consumption estimates so as to re-establish temporal consistency. Because the 55<sup>th</sup> round questionnaire was unchanged for a subset of consumer items, and expenditures on these items are highly correlated with total expenditure, it is feasible to use the expenditures on these items to predict total expenditure levels and hence progress in poverty reduction. In an attempt to correct the data, Deaton (2001) has exploited the fact that there were some goods (viz. the high-frequency non-food consumption items) in the 55<sup>th</sup> round that used the same (30 day) recall period as in previous surveys. These goods account for about one-fifth of mean consumption. Deaton estimates the distribution of total consumption as if there had been no change in survey design under two key assumptions<sup>9</sup>. The first assumption is that the marginal distribution of the goods with the common 30-day, recall period is unaffected by the change in survey design. The second assumption is that the distribution of total

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<sup>8</sup>. See Table-I, column 6; Computing Prices and Poverty Rates in India, 1999-2000, By Angus Deaton, Princeton University.

<sup>9</sup>. Similarly, see Tarozzi (2001). The Deaton and Tarozzi methods share common features with the method proposed by Lanjouw and Lanjouw (2001) to deal with survey non-comparability. The Lanjouw-Lanjouw method assumes that the Engel Curve for the commonly observed consumption components is intertemporally stable. This will hold under somewhat weaker assumptions used by Deaton and Tarozzi.

consumption conditional on consumption of common-recall goods has not changed over time and so can be inferred from 1993-94 50<sup>th</sup> round.

Rather than estimating per capita expenditure as a first stage and then going on to estimate poverty, Deaton uses a direct procedure as follows. Denote the logarithm of household total expenditure per head by  $x$ , and the logarithm of total expenditure per head on 30-day goods by  $m$ . The logarithm of poverty line is written as  $Z$ , and everything is measured in constant price rupees. If the head count ratio is denoted by  $p$ , then

$$P = F(Z) , \quad (1)$$

where  $F(Z)$  is the cumulative distribution function of the logarithm of per capita expenditure (pce).  $F(Z)$  is simply the fraction of people who live in households with a logarithm of pce less than the logarithm of the poverty line, or just the fraction of people who live in households with pce less than the poverty line.

We are interested in using the amount of  $m$  to predict the level of poverty. Consider then the probability of being poor conditional on spending  $m$  on 30-days goods,  $F(Z/m)$ . The equation can be written as

$$P = \int_0^{\infty} F(Z/m) g(m) dm = E_m [ F(Z/m) ] , \rightarrow (2)$$

where  $g(m)$  is the density function of the logarithm of expenditure on 30-day goods  $m$ . Equation (2) gives us the probability of being poor overall, given expenditure on 30-day goods. The head count ratio for the population as a whole is the average of this probability over everyone.

Equation (2) cannot be evaluated using data from the 55<sup>th</sup> round any more than can equation (1). However, if there are grounds to suppose that the probability of being poor conditional on  $m$ ,  $F(z/m)$ , is constant over time, and if the density of  $m$ ,  $g(m)$  is the same in the 55<sup>th</sup> round as it would have been with a traditional schedule, then we can use the actual marginal distribution of  $m$  from 55<sup>th</sup> round together with the conditional head count function  $F(z/m)$  from an earlier round to compute corrected head count estimates. In particular, Deaton uses the 50<sup>th</sup> round to compute the head count conditional on  $m$  and estimate the 55<sup>th</sup> round poverty rate according to

$$\hat{P}_{55} = \int_0^{\infty} \hat{F}_{50}(Z/m) \hat{g}_{55}(m) dm = \hat{E}_{55} [ \hat{F}_{50}(Z/m) ] , \rightarrow (3)$$

where the ‘hats’ denote estimates, and the subscripts denote the relevant NSS rounds. According to (3), we use the probabilities of being poor given expenditure on 30-day goods, estimated from the 50<sup>th</sup> round, and combine them with the distribution of expenditures on 30-day goods from the 55<sup>th</sup> round, expenditures that were collected in a comparable way in the 50<sup>th</sup> and 55<sup>th</sup> rounds. Put differently, we can observe directly expenditures on 30-day goods in the 55<sup>th</sup> round. These tell us something about poverty in that round. Exactly what can be calculated by using each household’s 30-day expenditures to calculate its probability of being poor, given the relationship between being poor and 30-day expenditures from the 50<sup>th</sup> round, and then averaging over all households to get the estimated poverty count.

However, equation (3) would be valid under the following two assumptions. The first assumption is that the density of  $m$  is the same in the 55<sup>th</sup> round as it was actually conducted as it would have been had the 55<sup>th</sup> round been run in the traditional way. The second assumption is about the stability from the 50<sup>th</sup> to the 55<sup>th</sup> round of the Function  $F(z/m)$  and its validity depends, among other things, on the stability of the Engel Curve relating the logarithm of expenditures per capita on 30-day goods to the logarithm of total household expenditure per capita. If this Engel Curve is stable over time, and the distribution of households around the Engel Curve does not change, then the fraction of people who are poor at any given level of  $m$  will be constant. Note that it is not required that expenditure on 30-day goods be a fixed ratio of total expenditure, only that the relationship between them remain stable.

Applying the above method, Deaton’s adjusted poverty estimates are somewhat higher than the official 30-day estimates. For all-India, the official estimate of 27.1 per cent is replaced by 30.2 per cent. Instead of there being a drop in rural poverty since 1993-94 of 10.2 percentage points, the adjusted figures show a reduction of only 7.0 percentage points, so that a little more than two-thirds of the official reduction appears to be real.

## Chapter-4

### Critique of the Indirect Method of Poverty Estimation

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#### 4.1 Introduction

Estimates of poverty in India are typically normative, namely based on a minimum calorie intake norm. The calorie norms were fixed at 2,400 calories per person per day for rural areas and 2,100 calories per person per day for urban areas by the Task Force constituted by the Planning Commission in 1979. This group accepted the calorie intake norms recommended by the Nutrition Expert Group (1968) according to 14 age-sex categories. The census based activity pattern, according to age and sex (differing for rural and urban populations), was superimposed on the (projected) 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 uniform calorie norms (Dubey and Gangopadhyay 1998). Based on these norms, poverty lines for rural and urban areas were determined using the 28<sup>th</sup> round of NSS consumer expenditure data for the year 1973-74. These poverty levels came out to be Rs. 48.09 per capita monthly expenditure in rural areas and Rs. 56.64 in urban areas. The incidence of headcount poverty was estimated to be 56.64 per cent in rural areas and 49 per cent in urban areas in 1973-74 (Mehta and Venkataraman, 2000), by applying the poverty lines to the ogive (cumulative frequency distribution) of persons below the specified expenditure levels.

There are two quite distinct methods of measuring poverty on the basis of a minimum calorie intake. One is to check the set of people who do not satisfy the minimum calorie intake at every point of time that consumption expenditure data are collected and work out the corresponding required expenditure for satisfying the calorie norms. This may be called the direct method. The second method may be called the indirect method and involves the calculation of the per capita monthly total expenditure at which the specified minimum nutritional needs are satisfied in particular base year (which was 1973-74) and, assuming that the same consumption basket as in 1973-74 prevails also at later dates, applying a price index to update the original poverty lines

(without reference to actually changing consumption pattern). While the Planning Commission (and much of the literature on poverty estimation) has used the indirect method to measure headcount poverty in India, some scholars have also estimated poverty by the direct method which not only incorporates current consumption data but also allows for an independent check on how well the indirect method is doing in capturing the actual calorie intake at later periods than the base year of 1973-74.

The indirect method of poverty estimation uses the concept of a Laspeyres Index. The quantities of foods people consumed in 1973-74 are retained unchanged (thus assuming an invariant consumption basket) and the 1973-74 poverty lines are updated by using a price index. However, the price index used itself has varied and given rise to widely varying estimates even with this indirect method. It is not clear why the Expert Group had originally recommended taking an invariant consumption basket. As a matter of fact the consumption basket has been changing over time and we find that based on the direct method total per capita expenditure required to attain the minimum calorie norm has been consistently higher than the price-adjusted base year poverty line. Moreover, the divergence has increased over time quite sharply. As a result the actual calorie intake associated with indirectly estimated poverty line has fallen far below any norm (Mehta and Venkataraman, 2000). This chapter explores these issues and specifically undertakes the direct estimation of poverty by states, comparing with the official estimates.

This chapter is divided into two sections. Section 4.2 explains the fundamental criticisms of the indirect method used by the Planning Commission and many other researchers. This also explains the increasing divergence between the estimates by the direct method and the indirect method. Section 4.3 explains the incidence of headcount poverty using the NSS 55<sup>th</sup> Round based on the direct method.

## **4.2 Fundamental Critiques of the Official Method of Poverty Estimation**

There has been a considerable debate on the 'true' measure of poverty in India. The debate has centred around four sets of issues three of which relate to the official indirect method of estimating poverty, while the fourth issue is qualitatively different because it questions the indirect method of estimation and advocates the direct method.

The three issues are: (i) whether the growth in household average consumption implied by the National Sample Surveys (NSS) captures the 'true' growth in private consumption in the 1990s (Bhalla, 2000a, 2000b, 2000c); (ii) whether the price deflators used by the Planning Commission to generate national and state-specific poverty lines overstate the actual rate of inflation (Deaton and Torozzi 1999); and (iii) whether the 30-day recall period used in most NSS surveys understate household food expenditure (Visaria 2000).

The fourth issue relates to whether the official poverty lines no longer correspond to the original definitions based on nutritional needs for Calories (Mehta and Venkateraman 2000; henceforth MV). The first three imply a lower rate of poverty than that actually reported by the Planning Commission, while the fourth implies a higher rate of poverty. The fourth criticism is that however measured, the procedure of the indirect method is itself not appropriate for capturing poverty as direct inspection of the consumption data implies a much higher poverty rate both for rural and urban areas as compared to the Planning Commission's estimates. Thus, for 1993-94, the Planning Commission estimated rural and urban poverty ratios at the all India level to be 37.2 per cent and 32.4 per cent respectively. In contrast, using recalculated poverty lines based on calorie norms of 2400 calories per capita per day (pcpd) for the rural population and 2070 calories pcpd for the urban population, MV estimates that rural and urban poverty rates for this year at the all-India level are 75 per cent and 54.4 per cent respectively. The finding for rural poverty is particularly striking as it implies a doubling of the poverty rate. MV's estimates are based on highly aggregated grouped expenditure data at the all-India level published by the National Sample Survey Organization (NSSO). MV's contention is that official poverty lines constructed by the Planning Commission are underestimating 'true' poverty in rural India. There are strong supports for MV's thesis that estimates of rural poverty obtained from direct method are much higher than those obtained from the head-count ratios based on official state-specific poverty lines. This finding is inconsistent with the observations of most commentators that poverty has at worst stagnated in the last decade and more likely declined. We then explore possible explanations for this significant discrepancy in the poverty rates implied by the calorie norm and those implied by the official poverty lines.



A line of argument relevant to the measurement of poverty comes from the finding that calorie consumption at the poverty line had fallen by the 50<sup>th</sup> round in 1993-94 to 1968 and 1890 kcal per capita per day in rural and urban areas (Mehta and Venkataraman 2000)<sup>1</sup>. Much attention is focus on the unit of calories that are appropriate to a poverty line (ibid, and Osmani 1991), and some to whether it is appropriate at all to anchor poverty measurements in calorie consumption (Ravallion 1998). Nevertheless, there are strong arguments that measurements of absolute poverty over time in a given country with relatively unchanging demographic, anthropometric and activity profiles, can be based on a constant calorie consumption (Mehta and Venkataraman op it). This is especially the case for rural areas.

The Planning Commission used an indirect method of gauging whether a household was capable of meeting the minimum calorie intake. Thus, it arrived at a per capita monthly expenditure (on all items, food and non-food) that at which households in that year obtained the calories required to satisfy the nutrition norm given the prices prevailing in 1973 (this is what is defined to be the poverty line), and given economy wide demographic characteristics and expenditure patterns (e.g., taking account of the propensity to buy non-food items at the poverty line). As we have already mentioned, this came out to be Rs. 49.05 per person per month in 1973 prices for rural areas. Subsequent updating of the poverty line has essentially involved the adjustment of these values by a price index, using state-wise price deflators for the rural and urban population. At some stage the Planning Commission shifted from using the CPIAL (Consumer Price Index for Agricultural Labourers as inflator to using the implicit GDP inflator, which also significantly lowered the poverty line and poverty estimates.

From the above discussion it is clear that the headcount ratio obtained from the official poverty line may deviate strongly from poverty line obtained from a direct estimate of calorie deficiency if the actual pattern of consumption expenditure is changing over time, if the price deflators used by the Planning Commission does not

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<sup>1</sup> Specifically, these are the mean calorie consumption of the expenditure groups into which the poverty line falls in the published results. Later we estimate calorie consumption at the poverty line from a calorie expenditure function. For the 1993-94 NSS survey our group results do not exactly correspond with the NSS published data, but they are sufficiently similar for the purposes of this paper.

capture the true change in the prices of commodities that comprise the household's consumption bundle and if actual poverty of producers is rising because of falling prices. The idea that only rising prices lead to rising poverty assumes that everyone is a buyer and ignores the fact that producers may be impoverished by falling prices.

It is widely agreed that 'poverty' in India declined considerably during the decades of the 1970s and the 1980s. The disagreement centres around the 1990s, for which the annual NSS consumer expenditure surveys till 1999-2000 (i.e., the 55<sup>th</sup> round) suggest a rising trend in the poverty ratios based on direct method. However, the government claims that poverty declined from 56.9 per cent in 1973-74 to 57.2 per cent in 1993-94 and to 27 per cent in 1999-2000 in rural India, and from 49 per cent to 32.4 per cent and 23.5 per cent respectively for the urban India. We would like to point out that, given the definition of 'poverty line', the Planning Commission's poverty estimates are non-comparable over long-periods. Any conclusions drawn from such long-term comparisons are, therefore, inadmissible.

Even the revised estimates of the Planning Commission do not conform to the definition of 'poverty lines' formalized by the 'Task Force'. This is because the updated poverty lines do not correspond to the calorie norms of 2400 kcal and 2100 kcal. The divergence is too large to be ignored.

The official poverty line for 1999-2000 is Rs. 327.50 for rural-India. The national level poverty line is implicitly derived from the national poverty ratio. As can be seen from the Table-4.1 and Graph-4.1, the calorie intake in the corresponding expenditure group is only 1868 calories for rural areas. The expenditure group corresponding to 2400 kcal is Rs. 525-615. The average monthly expenditure in this expenditure group is Rs. 565. Therefore, the poverty lines for conforming to nutritional norms would be approximately at these levels. Poverty ratio for the rural India would then be 74.5%. Accordingly, 74.5 per cent of rural population did not have adequate purchasing power to afford 2400 kcal per capita per diem. We do not claim to give an exact poverty lines and poverty ratios. It has been an attempt to show how far off the mark the existing official estimates are.

It has been shown by Mehta and Venkatraman that percentage of population below the calorie norms is substantially larger than the percentage of population below the updated

poverty lines. The Planning Commission estimated the rural all-India poverty ratio at 27 per cent for the year 1999-2000 during the consumer expenditure survey data of the 55<sup>th</sup> round using 30-day reference period. However, poverty ratio calculated on the basis of direct method turns out to be 74.5 per cent for the same year. Thus, the incidence of poverty based on calorie norms is substantially higher than the one based on the updated poverty lines. This increasing divergence between the direct and indirect estimates is far too large to be ignored. This shows a severe problem for the credibility of the methodology of continuing with the indirect method.

One way for justifying the use of an updated poverty line would be that if, at the poverty line, the nutritional requirements are not satisfied, it is because the people have willingly chosen to sacrifice their calorie intake in order to improve their quality of life and quality of food. The implicit assumption is that with Rs. 205 in 1993-94 it would be possible to choose the same consumption basket as with Rs. 49 in 1973-74, and fulfil the calorie requirements if people so liked. Thus the assumption is that between 1973-74 and 1993-94, new opportunities have opened up new choices but the old choices have not been eliminated.

Meththa and Venkatraman examined in detail the consumption basket at the rural poverty lines in 1973-74 and tried to ascertain whether the decreased calorie intake has indeed been accompanied by improved quality of life and food, and whether the options chosen by people in 1973-74 are still open to them. They argue that a large part of expenditure is not voluntary, but is due to the foreclosing of earlier choices and a compulsive interaction with markets. We can, then, sum up at the rural poverty line people have been compelled to change their consumption basket due to price and non-rice structural changes.

We would also take into account the fact that, in past two decades, the rural poor have lost access to common property resources like pastures, forests, ponds and rivers which facilitated a free or partially free supply of items like firewood, for cooking, grass and leaves for animal fodders, and items of direct consumption like small fish, root vegetables, fruits etc. This would rule out any increase in the qualities of non-cereal food items. The quantity of these non-cereal food items is so small to begin with, that it becomes impossible to reduce it further. The demand for these complementary food

items then effectively becomes inflexible. Naturally, the share of expenditure increases under these heads. Relatively, the demand for cereals become flexible, and resources are diverted away.

To sum up, the direct inspection of calorie equivalent of quantities consumed by different expenditure classes was carried out by the Planning Commission using the 28<sup>th</sup> round of the NSS for 1973-74, a date which is now three decades in the past. For this, the per capita monthly expenditure whose food expenditure part, gave 2400 calories per diem in rural areas and 2100 in urban areas at that time, was obtained and this was called the poverty line income through more correctly it is poverty line expenditure. However, no such attempt has been made for similar direct inspection of the calorie equivalent of changing expenditure, even though the relevant NSS data were there for many years, exactly in the same form as for the year 1999-2000 given in table-4.1. Instead, in order to estimate poverty for later years, it was assumed that the quantities people consumed, hence the pattern of consumer expenditure, remained unchanged from 1973-74, and a price index was applied to the old poverty line to update it. The new rounds of consumer expenditure data, has been used not for directly revising the poverty line, but only to the extent that they were used to read off what percentage of persons came below the poverty level, estimated indirectly by applying a price index to the old poverty level. Thus the method used amounts to a Laspeyres index with quantities in a base year which by now is three decades in the past, and with adjustment being done only for price change. It is very disheartening to note that the present day Planning Commission and academic estimates are based on a three decade old consumption pattern relating to 1973-74. It raises the question of seriousness of the methodology adopted by the Planning Commission.

There had been no dearth of criticisms of the indirect method of poverty estimation. It hardly makes any sense to assume an unchanged consumption pattern for it has changed considerably over time and not necessarily owing to voluntary reasons: labourers are no longer paid wages as grain and meals (not fully valued earlier), and now have to purchase food against money wages; common property resources giving free goods have disappeared so that fuel and fodder have to be purchased all impacting on the quantities of food that can be purchased by the poor out of a given income

(Suryanarayana 1996). As a result, a considerably larger total expenditure is actually required than before, so that its food component can satisfy the calorie norm. The price adjusted poverty line is therefore found to correspond to an actual calorie intake which would over time, is further below the original calorie norm (thus the 1999-2000 indirectly estimated official poverty line of Rs. 327.50 per month corresponds to less than 1900 calories per diem as inspecting Graph-4.1 shows. The direct estimate gives a poverty line of Rs. 565 (see table-4.17), over 60% higher than the official one.

The increasing divergence in the poverty estimates by the direct and indirect methods have been pointed out by many scholars. Rohini Nayyar (1991) had carried out an early analysis of the divergence of the results using both the direct and indirect and indirect methods for the two different years in the 1970s compared to a base year in 1961-62. The following lengthy quotation from p.38 of Nayyar (1991) clearly sets out the issue: "Let us now compare the two sets of poverty estimates for 1970-1 and 1977-8 –one based on the actual consumption data, as in table 3.4, the other based on the inflated poverty line which was constructed by using the CPIAL against the 1961-2 poverty line and set out in tables 3.12a and 3.12b. There appears to be considerable discrepancy between these two sets of estimates. The former shows that 56.6 per cent of the rural population in India lived below the poverty norm of 2200 calories in 1970-1 whereas the latter yields an estimate of only 40.9 per cent for the same year. Again, for 1977-8 the corresponding ratios are 54.6 per cent and 35.7 per cent. In the case of some states the differences are even greater....In all cases the estimates of rural poverty based on an inflated poverty line are lower than those from direct estimation of poverty from consumption data." The author had explicitly concluded that "there is no doubt that the poverty estimates based on actual consumption data and set out in Table 3-4 are superior to those derived from a price-adjusted poverty line, particularly as the use of a deflator (price-index) poses many problems..." (Nayyar 1991, p-38). She also pointed out that the two methods gave results which while different (the difference was 15.7% and 19% of the population in 1970-71 and 1977-78) did give similar rankings, suggesting that the poverty ratios by the two methods moved in the same direction over time. "However there is significant correlation between the two sets of estimates. For 1970-1 the coefficients of Spearman's rank correlation are 0.89 and 0.84 with the poverty norm of

2200 and 2000 respectively, both significant at the 1% level; for 1977-8 the corresponding correlation coefficients are 0.90 and 0.85.” (ibid.) We would address the question whether this conclusion holds in the decade of 1990s.

M.H.Suryanarayana (1996) had strongly criticised the assumption of an invariant consumption basket used in the official estimates. He pointed out that over time wage payments had become monetized: while kind wages in grain in the sixties were valued at farm gate prices, with the transition to cash wages the labourers had to buy grain at retail prices. So even with an apparently unchanged income a larger amount of money would have to be spent on obtaining the same quantity of grain as before. For the many items like firewood and fodder have become monetized, while they could be gathered free earlier and were not fully valued. Thus, consumption baskets of the poor had undergone an enforced change, when grain consumption could fall if other items were in inelastic demand.

Mehta and Venkatraman (2000) gave the 1993-94 NSS consumption expenditure groups and calorie groups, which showed that approximately 69.7% the rural population were below the group with an average of 2410 calories. Thus this direct estimate for rural areas included an additional 32.5% of the rural population excluded by the official indirect estimate of poverty (which was 37.2%), a difference far too large to be ignored.

The Planning Commission has estimated the poverty ratio for the year 1999-2000 (i.e. the 55<sup>th</sup> Round) at 27 per cent for the rural-India. Note that the consumer expenditure survey data for the 55<sup>th</sup> Round were collected on the basis of two different recall periods i.e. 7-day and 30-day recall periods. This estimate of poverty is based on the 30-day recall period. However, the poverty ratio based on the direct method for the same year using the same recall period is estimated to be 74.5 per cent as can be seen from Table-17. Thus, the divergence between the direct method and the indirect method for the year 1999-2000 turns out to be 47.5 per cent, again a difference far large to be ignored.

Utsa Patnaik (2003) has pointed out that all these criticisms by Suryanarayana, Nayyar and Mehta and Venkataraman have been ignored by the official and academic poverty estimators who use the indirect method. A number of academics (A. Deaton, K. Sundram and S.D. Tendulkar, S. Bhalla and others) have recently published the papers

estimating poverty for 1999-2000 by the indirect methods, which they had presented at a conference (see Economic and Political Weekly, January 25-31, 2003). There is scope for variation in results among them as different price indices can be used. The estimate by A. Deaton using new price indices places the rural poverty percentage in India at 25%, even lower than the official 27% (Deaton 2003 b). The official Planning Commission (Rs. 328) and Deaton, b (Rs. 303) price-index updated poverty line for monthly per capita expenditure for 1999-2000, gives a daily calorie intake which is 1868 or less, as the inspection of our table-1 in the next section shows. To meet the 2400 calories norm, Table-17 shows that a person needed to spend at least Rs. 565 per month or Rs. 19 daily. The Planning Commission is asking us to believe that people could survive on a mere Rs. 11 daily while Deaton's estimate means that Rs. 10 daily is considered quite enough. It follows that poverty ratio is sensitive to the use of a price index as the lower rise in price index would reduce the poverty percentage dramatically. The implication of the indirect method used by the researchers/Planning Commission is that the calorie standard is thereby drastically diluted and the original concept of poverty based on nutritional norm, itself is being altered.

### **4.3 Direct Estimation of Head-Count Poverty, 1999-2000**

The data on the distribution of persons and average expenditures by different expenditure classes are available in NSSO, Report No.454 on Household Consumer Expenditure in India-Key Results. From this we plot the OGIVE, namely the cumulative percentage of persons below the specified expenditure levels. The data on average calorie intake by expenditure classes is available in Report No. 471 on Nutritional Intake in India. From this we can plot the cumulative frequency of persons against per capita calorie levels. Note that there has been two different recall periods (30-day and 7-day) in use for NSS 55<sup>th</sup> Round. Here, we have taken the 30-day recall period in use for plotting the cumulative distribution functions. The two relations enable us to read off the expenditure associated with different calorie norms. However, we are interested here in estimating poverty for rural India as well as in rural areas of the 15 major states. This includes the rural areas of Andhra Pradesh, Assam, Bihar, Gujarat, Haryana, Karnataka, Kerala, Madhya Pradesh, Maharashtra, Orissa, Punjab, Rajasthan, Tamil Nadu, Uttar

Pradesh and West Bengal. Table 4.1 shows data on average expenditure, average calorie intake and distribution of persons (including cumulative percentage of persons) by expenditure classes for rural all-India. Table 4.2 to Table 4.16 show the data on average expenditure, average calorie intake and distribution of persons by each expenditure class for the above-mentioned 15 major states (rural areas).

Graph (4.1) shows the proportion of persons lying below the calorie norms of 2400 kcal, 2200 kcal and 2000 kcal for rural all-India using the data given in Table 4.1. This can be directly observed by the inspection of the two curves. Curve (1) plots cumulative percentage of persons against the upper end of the expenditure class. Here cumulative percentage of persons is taken on the horizontal axis and the expenditure (Rs) is taken on the vertical axis. Curve (2) plots the per capita per diem intake of calorie against the average monthly per capita expenditure (Rs). Here, per capita per diem intake of calorie is taken on the horizontal axis and average monthly per capita expenditure (Rs) is taken on the vertical axis. For the states of Kerala, Maharashtra and Tamil Nadu the per capita per diem intake of calorie for 2400 kcal falls in the expenditure class of Rs. 950 and more. So we do not have the upper end of this expenditure class. The NSS 55<sup>th</sup> Round data does not provide us the upper end of this expenditure class. However, the average expenditure is given by the NSS for this expenditure class. So we have assumed that the average is same as the mid-point of the class to approximate the upper limit of the class.

There has been considerable controversy regarding the choice of calorie norm to use it as a dividing line between the poor and non-poor. The ICMR recommended that 2400 calories be regarded as the minimum for an average Indian<sup>2</sup>. The FAO uses a cut-off of 1810 calories for India to represent the lower-end range of food requirements. There are of course those who argue against the use of any norm at all. For instance, P V Sukhatme (1993) has argued that the body's adaptation mechanism enable those with lower body weights to metabolise a lower amount of calories more efficiently, thus invalidating the use of a biologically-derived nutrient norm. So we have chosen two alternative calorie norms of 2200 calories and 2000 calories for estimating poverty in rural India based on direct method of poverty estimation.

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<sup>2</sup> Dandekar and Rath. Op, cit.



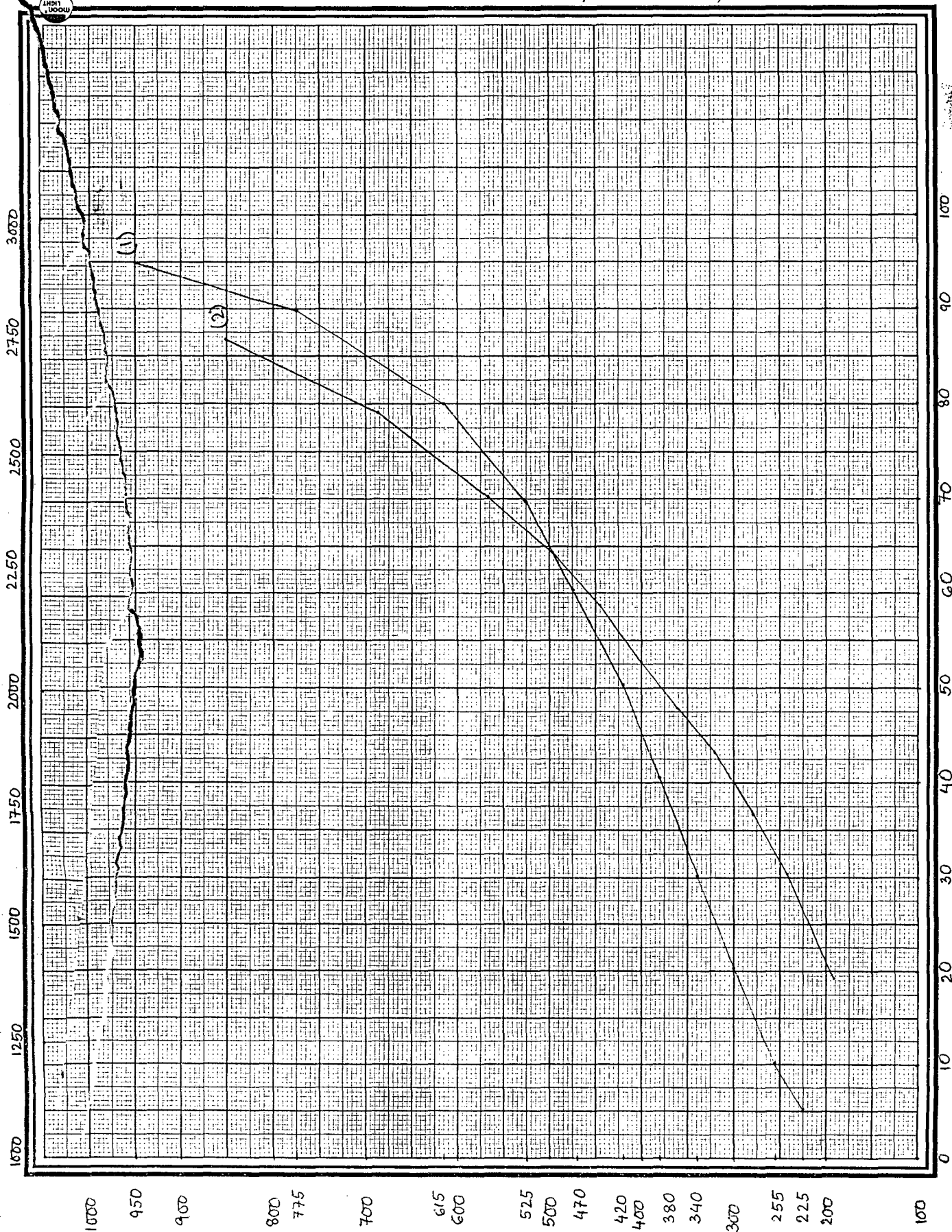
**Table-4.1: Expenditure GroupWise Calorie intake and Distribution of Persons, 1999-2000, All India (Rural)**

Expenditure Class (Rs)	Average Expenditure (Rs)	Per capita per diem intake of calorie	Percentage number of persons	Cumulative percentage of persons
000-225	191	1383	5.1	5.1
225-255	242	1609	5.0	10.1
255-300	279	1733	10.1	20.2
300-340	321	1868	10.0	30.2
340-380	361	1957	10.3	40.5
380-420	400	2054	9.7	50.2
420-470	445	2173	10.2	60.4
470-525	497	2289	9.3	69.7
525-615	567	2403	10.3	80.0
615-775	686	2581	9.9	89.9
775-950	851	2735	5.0	94.9
950+	1344	3178	5.0	99.9
all classes	486	2149	100	-

Source: NSS 55<sup>th</sup> Round, 1999-2000, Report Numbers 454 and 471.

Using the direct method of poverty estimation for the year 1999-2000, the incidence of headcount poverty for rural-India based on the calorie norm of 2400 kcal is estimated to be 74.5 per cent that corresponds to monthly per capita expenditure of Rs.565 (from Graph-4.1). On the other hand, using the indirect method of poverty estimation the Planning Commission estimated the incidence of headcount poverty for rural-India for the year 1999-2000 to be 27.09 per cent that corresponds to the monthly per capita expenditure of Rs. 327.56. Thus we get a difference in the estimates of headcount poverty (by these two methods) for rural-India for the year 1999-2000 which is of the magnitude of 47.5 per cent. Again using the direct method for the year 1999-2000, the incidence of headcount poverty for rural-India based on the calorie norms of 2200 kcal and 2000 kcal is estimated to be 58 per cent and 40 per cent respectively and the associated monthly per capita expenditure are Rs. 455 and Rs. 380 respectively (from Graph-4.1).

Graph - 4.1 : Cumulative Distribution Function ; Rural-India, 1999-2000



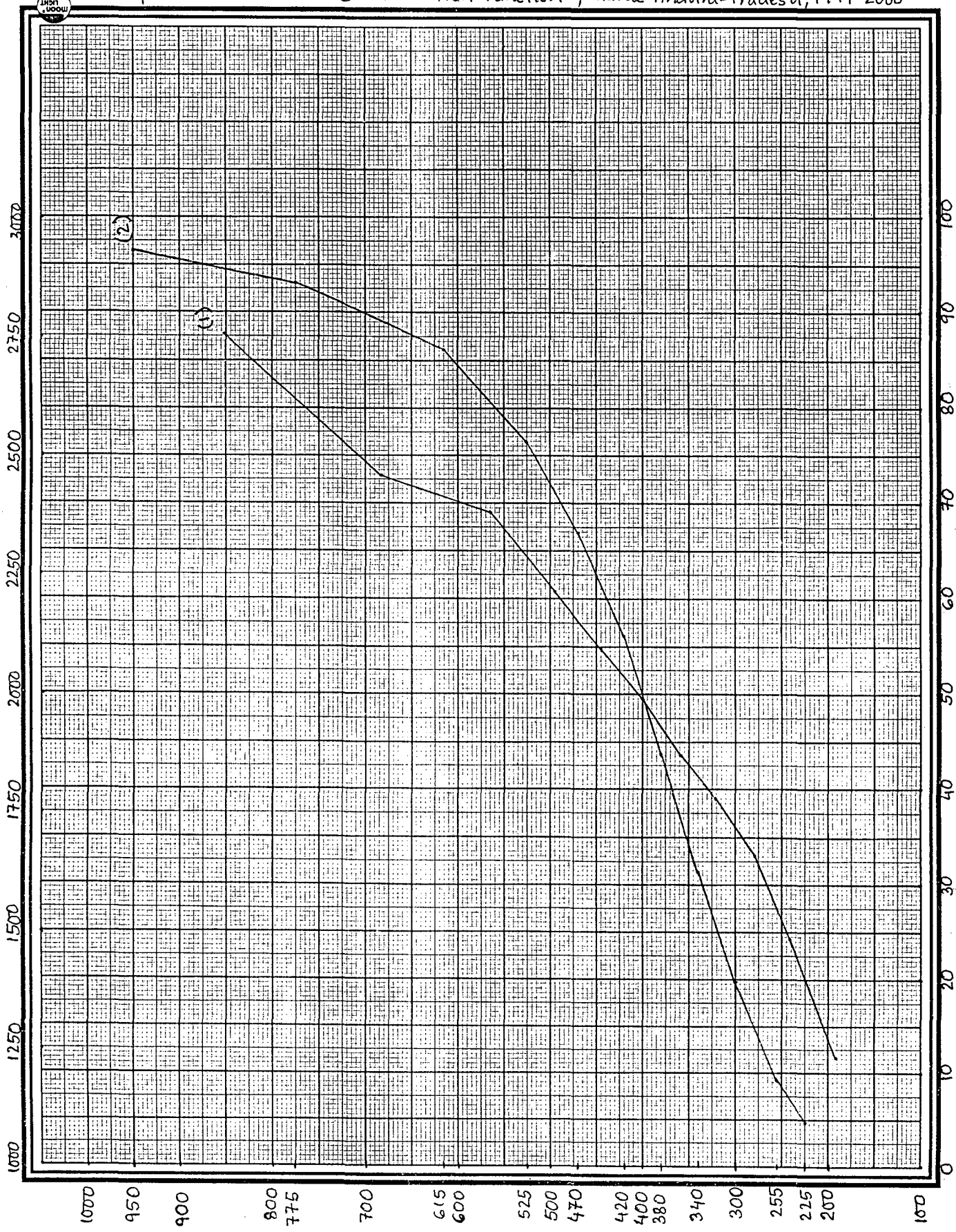
**Table-4. 2: Expenditure Groupwise Calorie intake and Distribution of Persons, 1999-2000, Andhra Pradesh (Rural).**

Expenditure Class (Rs)	Average Expenditure (Rs)	Per capita per diem intake of Calorie	Percentage number of persons	Cumulative percentage of persons
000-225	186	1232	4.8	4.8
225-255	241	1488	4.4	9.2
255-300	279	1662	10.5	19.7
300-340	321	1780	11.7	31.4
340-380	359	1871	12.5	43.9
380-420	400	1990	12.2	56.1
420-470	445	2096	10.8	66.9
470-525	495	2212	9.5	76.4
525-615	565	2381	9.7	86.1
615-775	684	2458	7.0	93.1
775-950	852	2754	3.4	96.5
950+	1299	2954	3.7	100.2
all classes	454	2021	100	-

Source: NSS 55<sup>th</sup> Round, 1999-2000, Report Numbers 454 and 471.

Using the direct method of poverty estimation for the year 1999-2000, the incidence of headcount poverty for rural-Andhra Pradesh based on the calorie norm of 2400 kcal is estimated to be 84 per cent that corresponds to monthly per capita expenditure of Rs.595 (from Graph-4.2). However, using the indirect method of poverty estimation the Planning Commission estimated the incidence of headcount poverty for rural-Andhra Pradesh for the year 1999-2000 to be 11.05 per cent that corresponds to the monthly per capita expenditure of Rs. 262.94. Thus we get a difference in the estimates of headcount poverty (by these two methods) for rural-Andhra Pradesh for the year 1999-2000 which is of the magnitude of 73 per cent. Again using the direct method for year 1999-2000, the incidence of headcount poverty for rural-Andhra Pradesh based on the calorie norms of 2200 kcal and 2000 kcal is estimated to be 70.5 per cent and 52 per cent respectively and the associated monthly per capita expenditure are Rs. 490 and Rs. 405 respectively (from Graph-4.2).

Graph - 4.2: Cumulative Distribution Function ; Rural Andhra-Pradesh, 1999-2000



**Table-4.3: Expenditure GroupWise Calorie intake and Distribution of Persons, 1999-2000, Assam (Rural)**

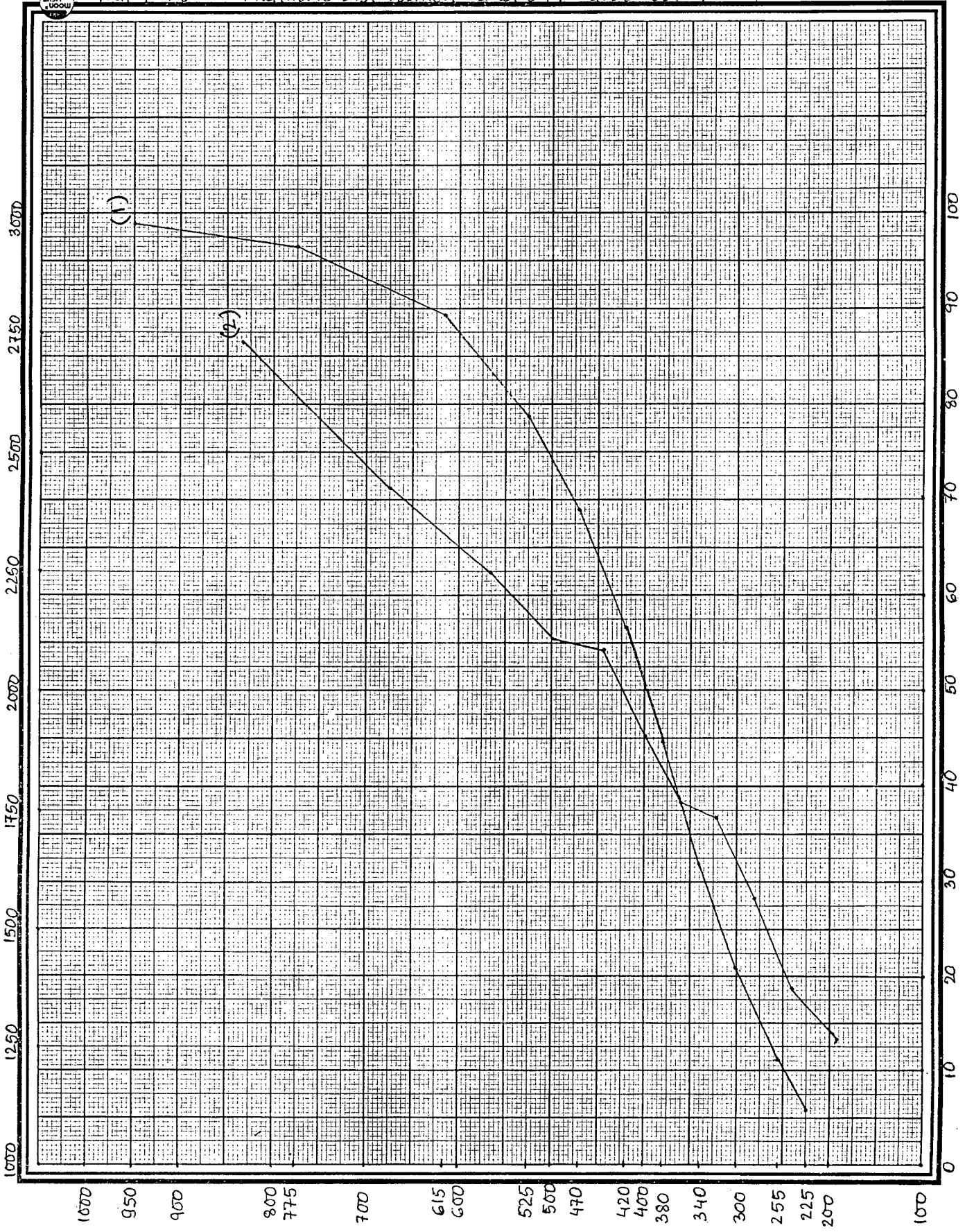
Expenditure Class (Rs)	Average Expenditures (Rs)	Per capita per diem intake of calorie	Percentage number of persons	Cummulative percentage of persons
000-225	192	1265	5.8	5.8
225-255	241	1376	5.3	11.1
255-300	280	1563	9.6	20.7
300-340	322	1734	11.2	31.9
340-380	360	1767	12.8	44.7
380-420	399	1904	11.9	56.6
420-470	444	2084	12.4	69.0
470-525	497	2109	9.7	78.7
525-615	565	2248	10.6	89.3
615-775	675	2424	7.2	96.5
775-950	834	2730	2.4	98.9
950+	1265	2803	1.1	100
all classes	426	1915	100	-

Source: NSS 55<sup>th</sup> Round, 1999-2000, Report Numbers 454 and 471.

Using the direct method of poverty estimation for the year 1999-2000, the incidence of headcount poverty for rural-Assam based on the calorie norm of 2400 kcal is estimated to be 91 per cent that corresponds to monthly per capita expenditure of Rs.660 (from Graph-4.3). However, using the indirect method of poverty estimation the Planning Commission estimated the incidence of headcount poverty for rural-Assam for the year 1999-2000 to be 40.04 per cent that corresponds to the monthly per capita expenditure of Rs. 365.43. Thus we get a difference in the estimates of headcount poverty (by these two methods) for rural-Assam for the year 1999-2000 which is of the magnitude of 51 per cent. Again using the direct method of poverty estimation for the year 1999-2000, the incidence of headcount poverty for rural-Assam based on the calorie norms of 2200 kcal and 2000 kcal is estimated to be 81 per cent and 57.5 per cent respectively and the associated monthly per capita expenditure are Rs. 545 and Rs. 425 respectively (from Graph-4.3).



Graph-4-3: Cumulative Distribution Function; Rural Assam, 1999-2000



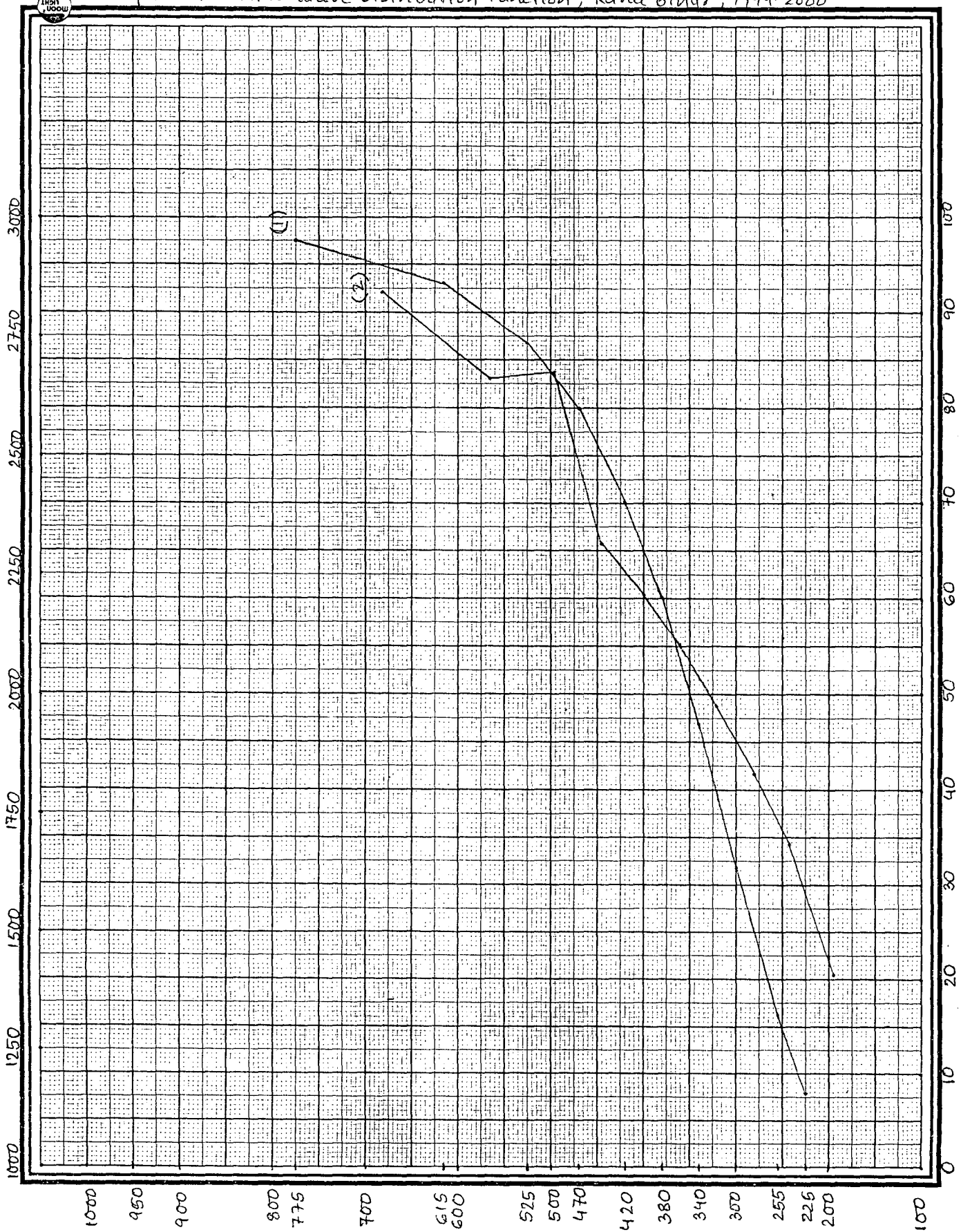
**Table-4.4: Expenditure Groupwise Calorie intake and Distribution of Persons, 1999-2000, Bihar (Rural)**

Expenditure Class (Rs)	Average Expenditure (Rs)	Per capita per diem intake of calorie	Percentage number of persons	Cummulative percentage of persons
000-225	195	1410	7.9	7.9
225-255	242	1683	8.3	16.2
255-300	279	1832	15.7	31.9
300-340	321	1977	15.0	46.9
340-380	361	2104	13.2	60.1
380-420	400	2209	10.0	70.1
420-470	445	2313	9.9	80.0
470-525	496	2677	6.7	86.7
525-615	566	2660	6.4	93.1
615-775	682	2841	4.4	97.5
775-950	836	3217	1.6	99.1
950+	1299	3487	1.1	100.2
all classes	385	2121	100	-

Source: NSS 55<sup>th</sup> Round, 1999-2000, Report Numbers 454 and 471.

Using the direct method of poverty estimation for the year 1999-2000, the incidence of headcount poverty for rural-Bihar based on the calorie norm of 2400 kcal is estimated to be 77 per cent that corresponds to monthly per capita expenditure of Rs.457 (from Graph-4.4). However, using the indirect method of poverty estimation the Planning Commission estimated the incidence of headcount poverty for rural-Assam for the year 1999-2000 to be 44.30 per cent that corresponds to the monthly per capita expenditure of Rs. 333.07. Thus we get a difference in the estimates of headcount poverty (by these two methods) for rural-Bihar for the year 1999-2000 which is of the magnitude of 33 per cent. Again using the direct method of poverty estimation for the year 1999-2000, the incidence of headcount poverty for rural-Bihar based on the calorie norms of 2200 kcal and 2000 kcal is estimated to be 64.5 per cent and 39.5 per cent respectively and the associated monthly per capita expenditure are Rs. 398 and Rs. 345 respectively (from Graph-4.4).

Graph-4.4: Cumulative Distribution Function; Rural Bihar, 1999-2000





**Table 4.5: Expenditure Group Wise Calorie intake and Distribution of Persons, 1999-2000, Gujarat (Rural)**

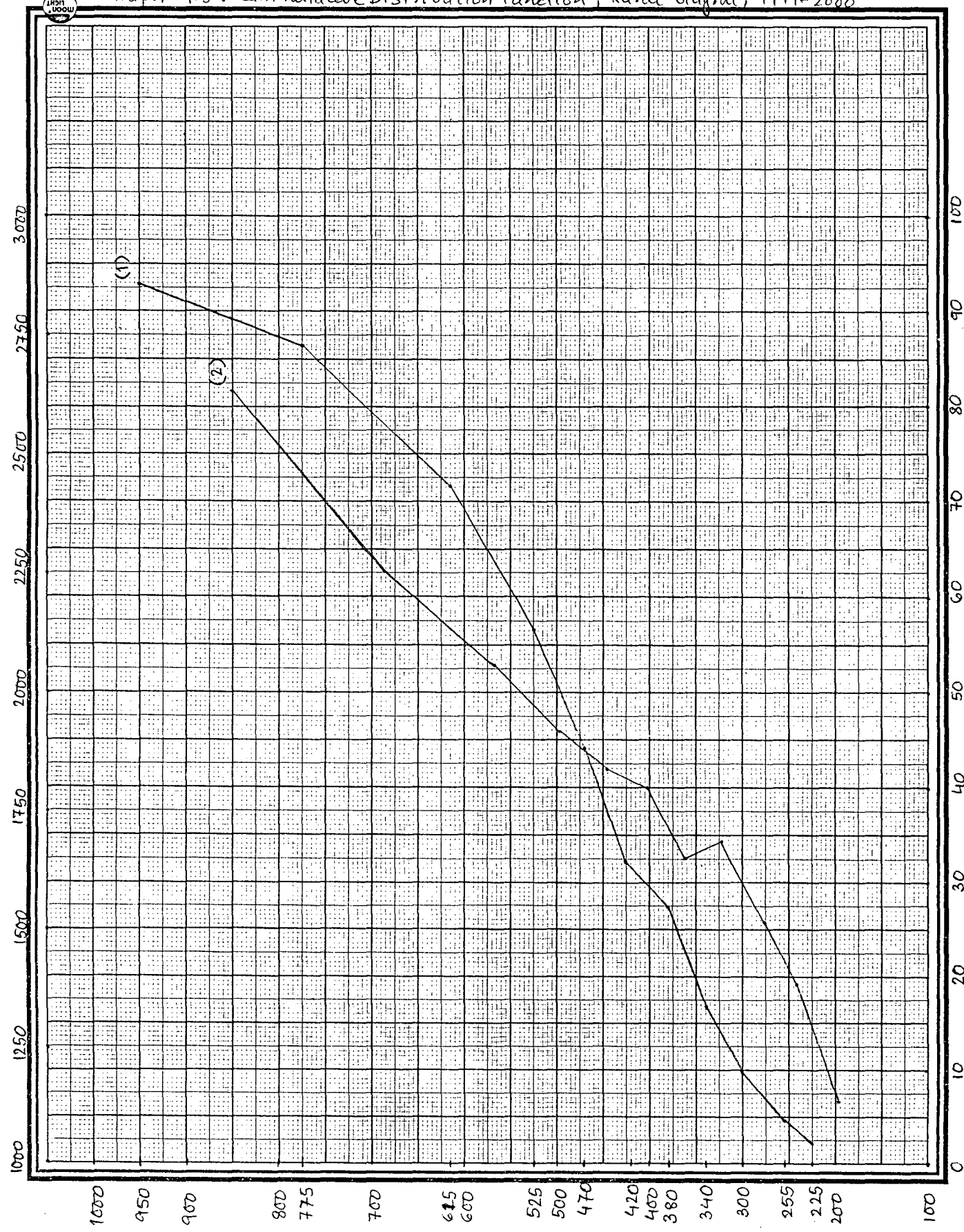
Expenditure Class (Rs)	Average Expenditure (Rs)	Per capita per diem intake of calorie	Percentage number of persons	Cummulative percentage of persons
000-225	197	1132	2.3	2.3
225-255	242	1384	2.3	4.6
255-300	276	1518	5.3	9.9
300-340	323	1684	6.9	16.8
340-380	361	1652	8.1	24.9
380-420	402	1800	7.4	32.3
420-470	445	1839	11.8	44.1
470-525	498	1917	12.5	56.6
525-615	568	2057	15.0	71.6
615-775	687	2254	14.8	86.4
775-950	851	2633	6.5	92.9
950+	1251	2749	7.0	99.9
all classes	551	1986	100	-

Source: NSS 55<sup>th</sup> Round, 1999-2000, Report Numbers 454 and 471.

Using the direct method of poverty estimation for the year 1999-2000, the incidence of headcount poverty for rural-Gujrat based on the calorie norm of 2400 kcal is estimated to be 83 per cent that corresponds to monthly per capita expenditure of Rs.735 (from Graph-4.5). However, using the indirect method of poverty estimation the Planning Commission estimated the incidence of headcount poverty for rural-Gujrat for the year 1999-2000 to be 13.17 per cent that corresponds to the monthly per capita expenditure of Rs. 318.94. Thus we get a difference in the estimates of headcount poverty (by these two methods) for rural-Gujrat for the year 1999-2000 which is of the magnitude of 70 per cent. Again using the direct method of poverty estimation for the year 1999-2000, the incidence of headcount poverty for rural- Gujrat based on the calorie norms of 2200 kcal and 2000 kcal is estimated to be 73.5 per cent and 59.5 per cent respectively and the associated monthly per capita expenditure are Rs. 635 and Rs. 540 respectively (from Graph-4.5).



Graph-4.5 : Cumulative Distribution Function ; Rural Gujrat, 1999-2000



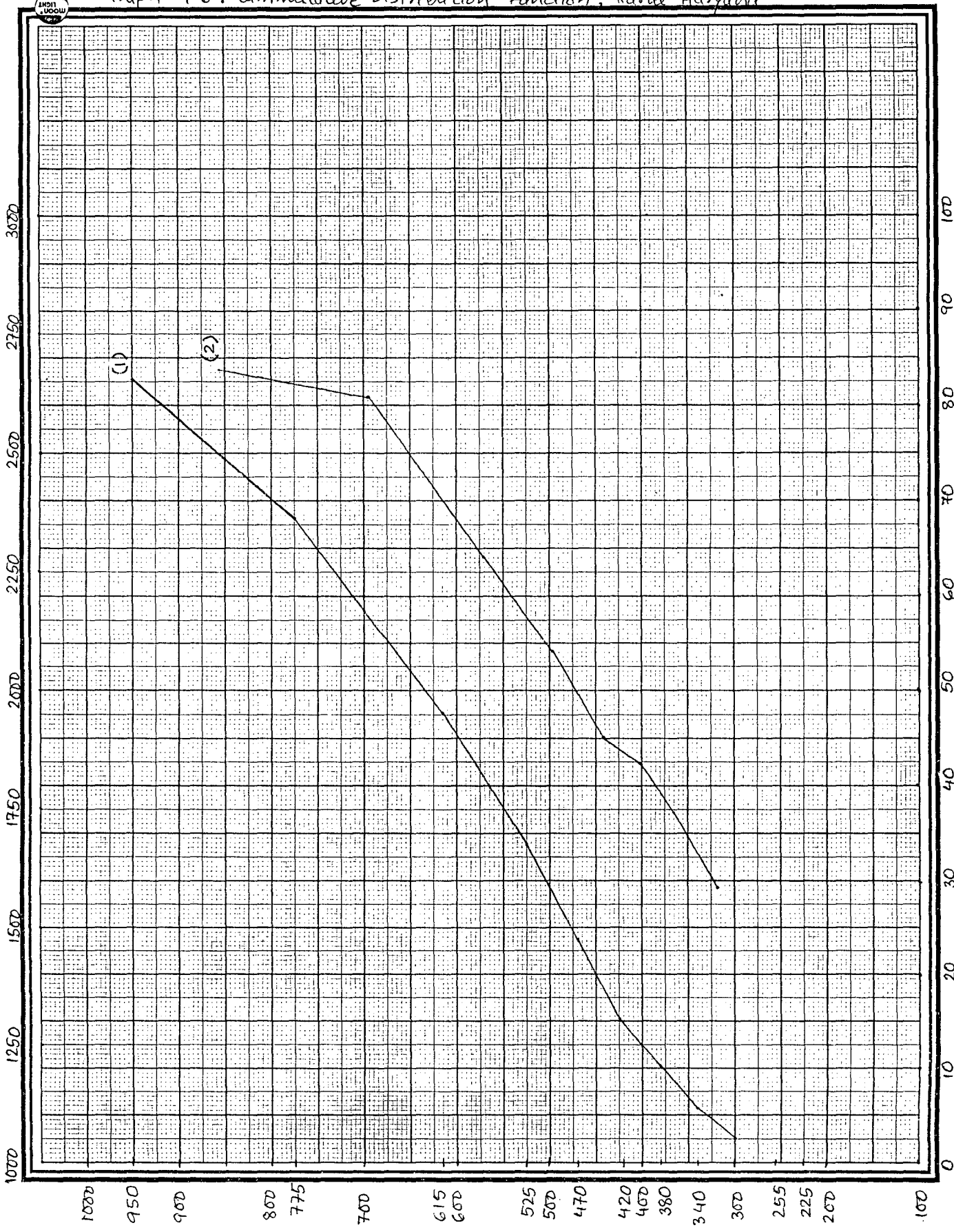
**Table-4. 6: Expenditure Group Wise Calorie intake and Distribution of Persons, 1999-2000, Haryana (Rural)**

Expenditure Class (Rs)	Average Expenditure (Rs)	Per capita per diem intake of Calorie	Percentage number of persons	Cummulative percentage of persons
000-225	173	-	0.7	0.7
225-255	238	-	0.5	1.2
255-300	287	-	1.5	2.7
300-340	318	1587	3.0	5.7
340-380	365	1745	4.5	10.2
380-420	401	1847	5.0	15.2
420-470	442	1902	8.6	23.8
470-525	498	2081	10.1	33.9
525-615	570	2281	13.7	47.7
615-775	695	2618	20.6	68.3
775-950	857	2676	14.4	82.7
950+	1306	3373	17.5	100.2
all classes	714	2455	100	-

Source: NSS 55<sup>th</sup> Round, 1999-2000, Report Numbers 454 and 471.

Using the direct method of poverty estimation for the year 1999-2000, the incidence of headcount poverty for rural-Haryana based on the calorie norm of 2400 kcal is estimated to be 47.5 per cent that corresponds to monthly per capita expenditure of Rs.615 (from Graph-4.6). However, using the indirect method of poverty estimation the Planning Commission estimated the incidence of headcount poverty for rural-Haryana for the year 1999-2000 to be 8.27 per cent that corresponds to the monthly per capita expenditure of Rs. 362.81. Thus we get a difference in the estimates of headcount poverty (by these two methods) for rural-Haryana for the year 1999-2000 which is of the magnitude of 37 per cent. Again using the direct method of poverty estimation for the year 1999-2000, the incidence of headcount poverty for rural-Haryana based on the calorie norms of 2200 kcal and 2000 kcal is estimated to be 36 per cent and 24 per cent respectively and the associated monthly per capita expenditure are Rs. 540 and Rs. 470 respectively (from Graph-4.6).

Graph-4.6: Cumulative Distribution Function: Rural Haryana



**Table-4.7: Expenditure GroupWise Calorie intake and Distribution of Persons, 1999-2000, Karnataka (Rural)**

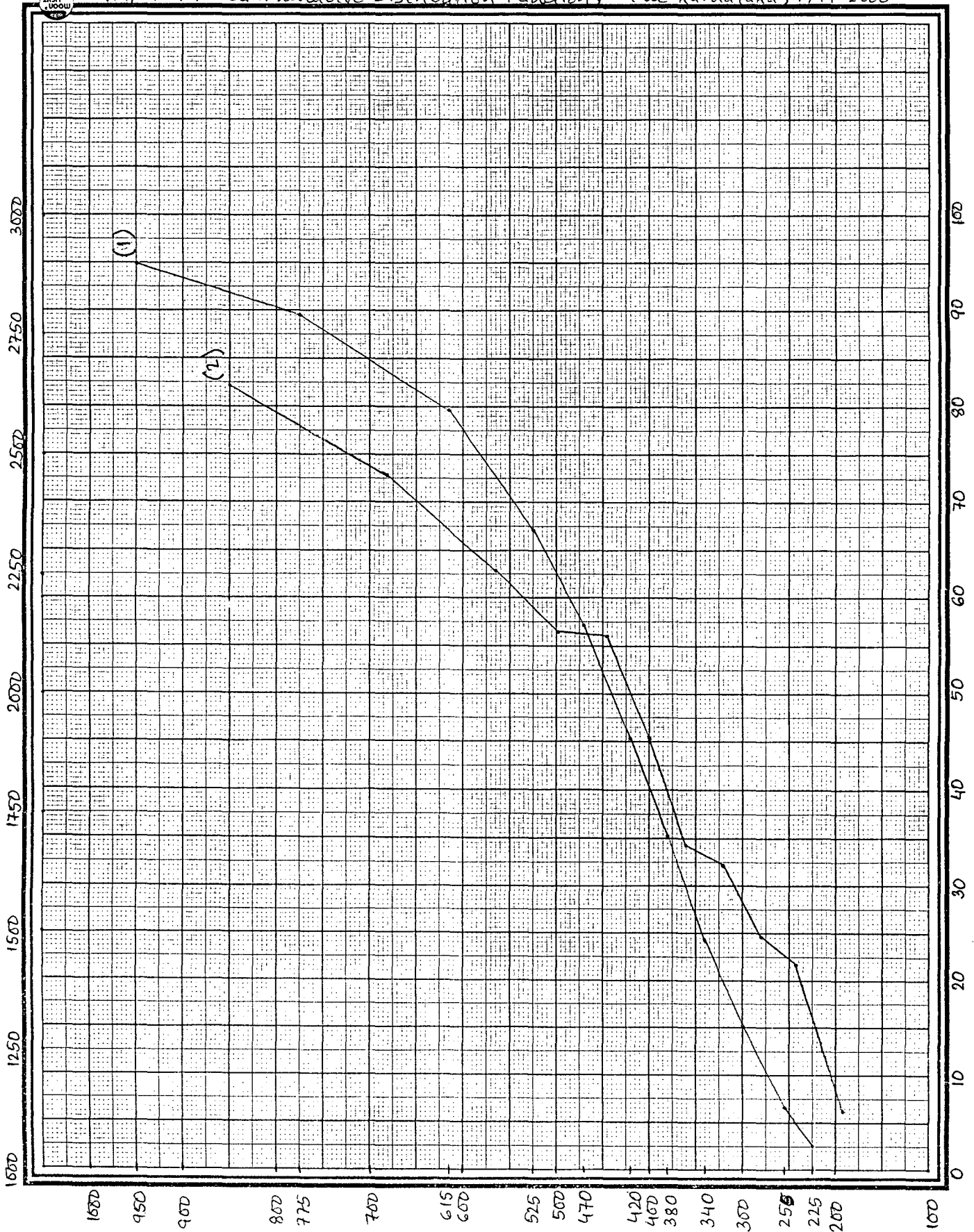
Expenditure Class (Rs)	Average Expenditure (Rs)	Per capita per diem intake of calorie	Percentage number of persons	Cummulative percentage of persons
000-225	192	1125	2.7	2.7
225-255	243	1435	3.9	6.6
255-300	280	1493	8.6	15.2
300-340	321	1646	9.1	24.3
340-380	360	1685	11.0	35.3
380-420	400	1908	10.0	45.3
420-470	445	2121	11.8	57.1
470-525	499	2130	10.1	67.2
525-615	565	2258	12.5	79.7
615-775	681	2458	9.8	89.5
775-950	850	2645	5.4	94.9
950+	1303	3973	5.1	100.0
all classes	500	2028	100	-

Source: NSS 55<sup>th</sup> Round, 1999-2000, Report Numbers 454 and 471.

Using the direct method of poverty estimation for the year 1999-2000, the incidence of headcount poverty for rural-Karnataka based on the calorie norm of 2400 kcal is estimated to be 82 per cent that corresponds to monthly per capita expenditure of Rs.650 (from Graph-4.7). However, using the indirect method of poverty estimation the Planning Commission estimated the incidence of headcount poverty for rural-Karnataka for the year 1999-2000 to be 17.38 per cent that corresponds to the monthly per capita expenditure of Rs. 309.59. Thus we get a difference in the estimates of headcount poverty for rural-Karnataka for the year 1999-2000 which is of the magnitude of 64.5 per cent. Again using the direct method of poverty estimation for the year 1999-2000, the incidence of headcount poverty for rural-Karnataka based on the calorie norms of 2200 kcal and 2000 kcal is estimated to be 69 per cent and 45 per cent respectively and the associated monthly per capita expenditure are Rs. 535 and Rs. 420 respectively (from Graph-4.7).



Graph-4.7: Cumulative Distribution Function; Rural Karnataka, 1999-2000



**Table-4.8: Expenditure GroupWise Calorie intake and Distribution of Persons, 1999-2000, Kerala (Rural)**

Expenditure Class (Rs)	Average Expenditure (Rs)	Per capita per diem intake of calorie	Percentage number of persons	Cummulative percentage of persons
000-225	200	-	0.6	0.6
225-255	243	-	0.6	1.2
255-300	281	1119	1.5	2.7
300-340	324	1285	3.2	5.9
340-380	359	1389	4.0	9.9
380-420	401	1500	5.4	15.3
420-470	447	1555	8.5	23.8
470-525	497	1708	10.3	34.1
525-615	570	1827	12.3	46.4
615-775	690	2053	19.4	65.8
775-950	853	2242	13.8	79.6
950+ <sup>3</sup>	1474	2618	20.4	100
all classes	766	1982	100	-

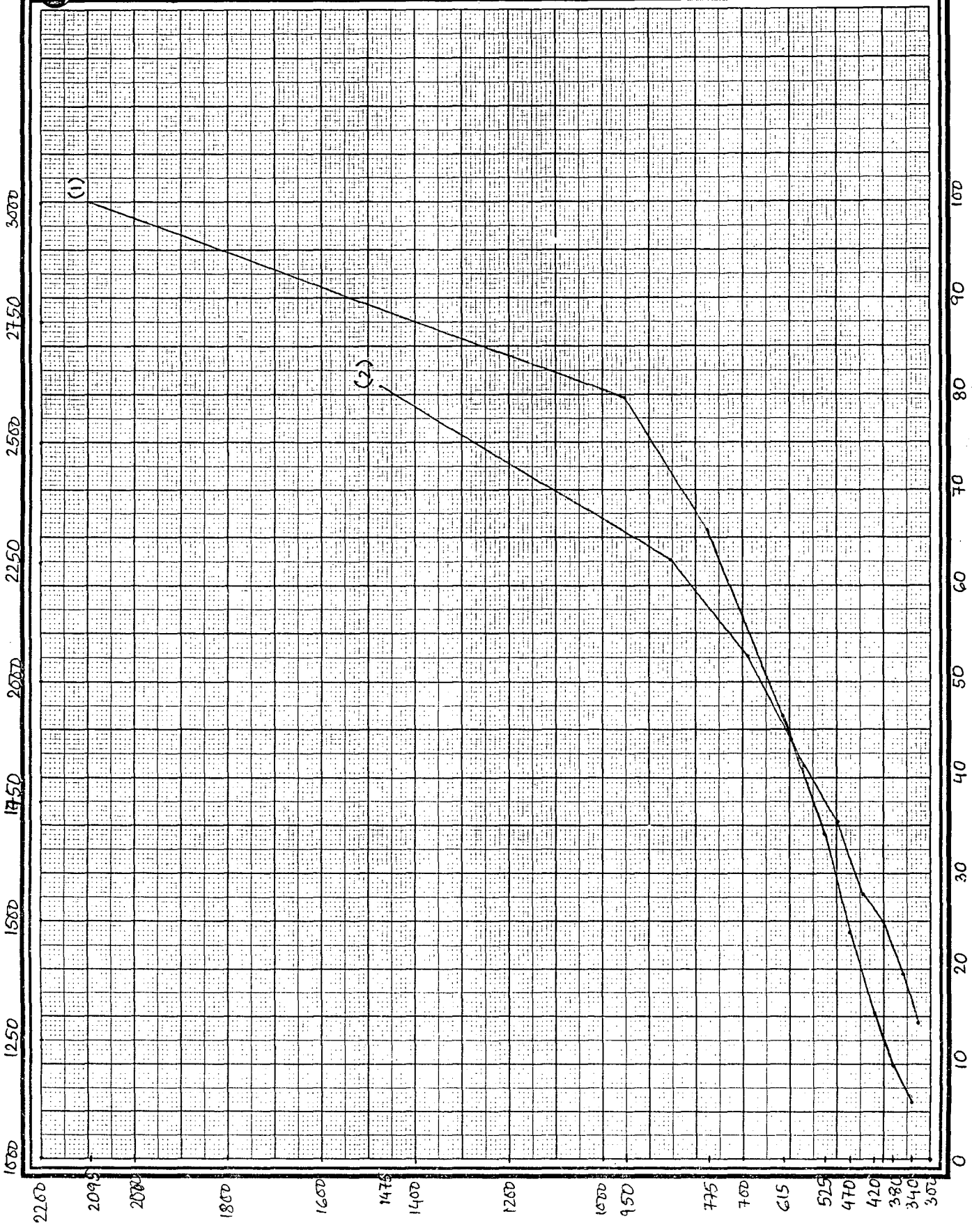
Source: NSS 55<sup>th</sup> Round, 1999-2000, Report Numbers 454 and 471.

Using the direct method of poverty estimation for the year 1999-2000, the incidence of headcount poverty for rural-Kerala based on the calorie norm of 2400 kcal is estimated to be 82.5 per cent that corresponds to monthly per capita expenditure of Rs.1105 (from Graph-4.8). However, using the indirect method of poverty estimation the Planning Commission estimated the incidence of headcount poverty for rural-Kerala for the year 1999-2000 to be 9.38 per cent that corresponds to the monthly per capita expenditure of Rs. 374.79. Thus we get a difference in the estimates of headcount poverty for rural-Kerala for the year 1999-2000 which is of the magnitude of 73 per cent. Again using the direct method of poverty estimation for the year 1999-2000, the incidence of headcount poverty for rural-Kerala based on the calorie norms of 2200 kcal and 2000 kcal is estimated to be 68.5 per cent and 52 per cent respectively and the associated monthly per capita expenditure are Rs. 810 and Rs. 660 respectively (from Graph-4.8).

<sup>3</sup> The upper end of this expenditure class estimated to be Rs.2095.



Graph-4.8: Ammulative Distribution Function; Rural Kerala, 1999-2000





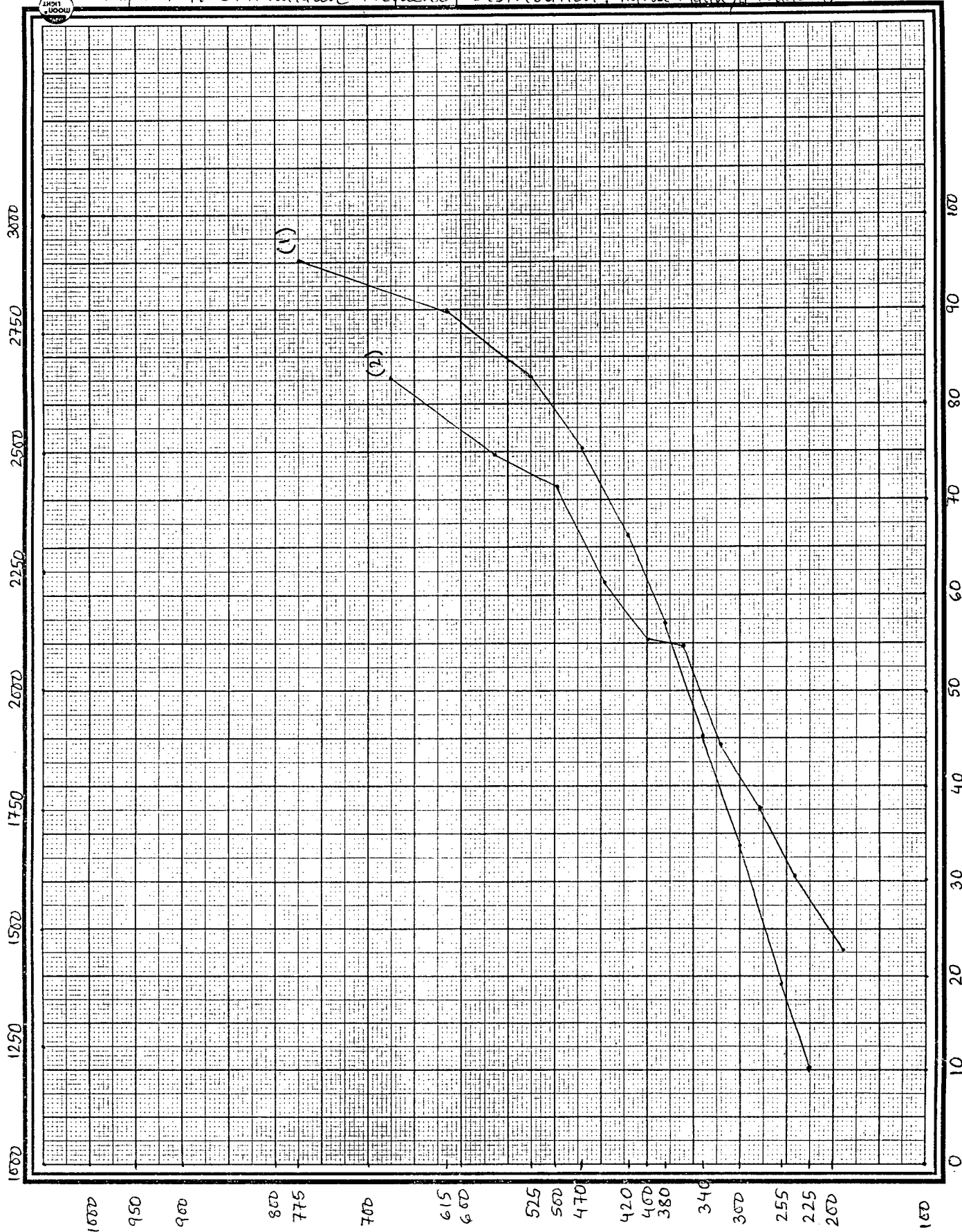
**Table-4.9: Expenditure Group Wise Calorie intake and Distribution of Persons, 1999-2000, Madhya Pradesh (Rural)**

Expenditure Class (Rs)	Average Expenditure (Rs)	Per capita per diem intake of calorie	Percentage number of persons	Cummulative percentage of persons
000-225	189	1454	10.3	10.3
225-255	241	1612	9.0	19.3
255-300	278	1757	14.5	33.8
300-340	320	1888	11.5	45.3
340-380	360	2095	11.8	57.1
380-420	399	2106	9.2	66.3
420-470	446	2226	9.1	75.4
470-525	497	2429	7.5	82.9
525-615	564	2493	6.9	89.8
615-775	676	2655	5.5	95.3
775-950	859	2882	2.4	97.7
950+	1329	3685	2.2	99.9
all classes	402	2062	100	-

Source: NSS 55<sup>th</sup> Round, 1999-2000, Report Numbers 454 and 471.

Using the direct method of poverty estimation for the year 1999-2000, the incidence of headcount poverty for rural-Madhya Pradesh based on the calorie norm of 2400 kcal is estimated to be 78.5 per cent that corresponds to monthly per capita expenditure of Rs.490 (from Graph-4.9). However, using the indirect method of poverty estimation the Planning Commission estimated the incidence of headcount poverty for rural-Madhya Pradesh for the year 1999-2000 to be 37.06 per cent that corresponds to the monthly per capita expenditure of Rs. 311.34. Thus we get a difference in the estimates of headcount poverty (by these two methods) for rural-Madhya Pradesh for the year 1999-2000 which is of the magnitude of 41.5 per cent. Again using the direct method of poverty estimation for the year 1999-2000, the incidence of headcount poverty for rural-Madhya Pradesh based on the calorie norms of 2200 kcal and 2000 kcal is estimated to be 69.5 per cent and 46.5 per cent respectively and the associated monthly per capita expenditure are Rs. 435 and Rs. 345 respectively (from Graph-4.9).

Graph-4.9: Cumulative Frequency Distribution: Rural Madhya Pradesh, 1999-2000.



**Table-4.10: Expenditure Group Wise Calorie intake and Distribution of Persons, 1999-2000, Maharashtra (Rural)**

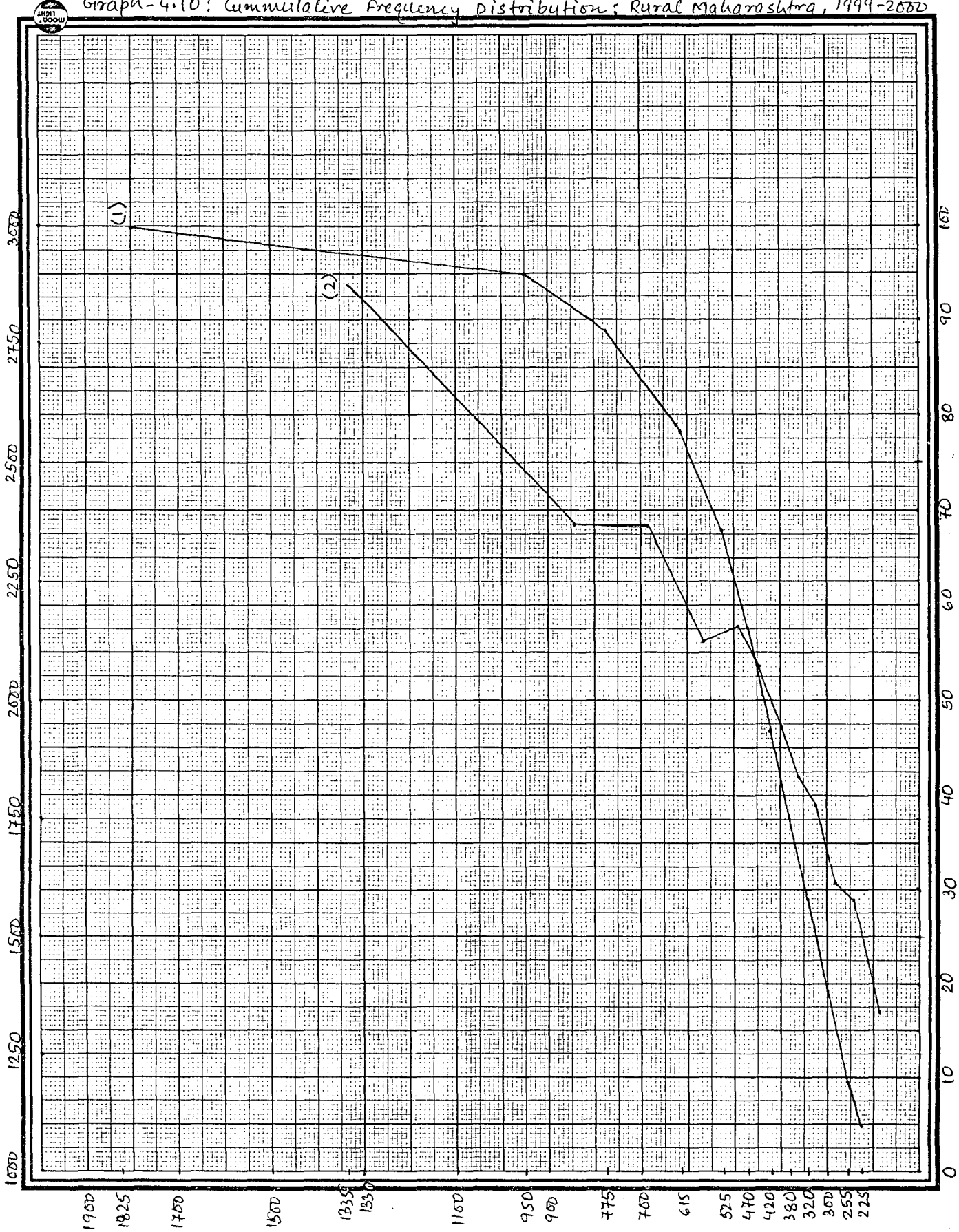
Expenditure Class (Rs)	Average Expenditure (Rs)	Per capita per diem intake of calorie	Percentage number of persons	Cummulative percentage of persons
000-225	187	1337	4.7	4.7
225-255	242	1577	4.8	9.5
255-300	281	1615	9.7	19.2
300-340	322	1780	9.7	28.9
340-380	360	1838	8.7	37.6
380-420	399	1943	9.2	46.8
420-470	445	2070	10.8	57.6
470-525	496	2152	10.2	67.8
525-615	567	2125	10.4	78.2
615-775	684	2366	10.5	88.7
775-950	843	2369	6.2	94.9
950+ <sup>4</sup>	1335	2876	5.1	99.9
all classes	497	2012	100	-

Source: NSS 55<sup>th</sup> Round, 1999-2000, Report Numbers 454 and 471.

Using the direct method of poverty estimation for the year 1999-2000, the incidence of headcount poverty for rural-Maharashtra based on the calorie norm of 2400 kcal is estimated to be 92 per cent that corresponds to monthly per capita expenditure of Rs.870 (from Graph-4.10). However, using the indirect method of poverty estimation the Planning Commission estimated the incidence of headcount poverty for rural-Maharashtra for the year 1999-2000 to be 23.72 per cent that corresponds to the monthly per capita expenditure of Rs. 318.63. Thus we get a difference in the estimates of headcount poverty (by these two methods) for rural-Maharashtra for the year 1999-2000 which is of the magnitude of 68 per cent. Again using the direct method of poverty estimation for the year 1999-2000, the incidence of headcount poverty for rural-Maharashtra based on the calorie norms of 2200 kcal and 2000 kcal is estimated to be 76.5 per cent and 46 per cent respectively and the associated monthly per capita expenditure are Rs. 600 and Rs. 420 respectively (from Graph-4.10).

<sup>4</sup> The upper end of this expenditure class estimated to be Rs.2095.

Graph-4.10: Cumulative Frequency Distribution, Rural Maharashtra, 1999-2000



**Table-4.11: Expenditure Group Wise Calorie intake and Distribution of Persons, 1999-2000, Orissa (Rural)**

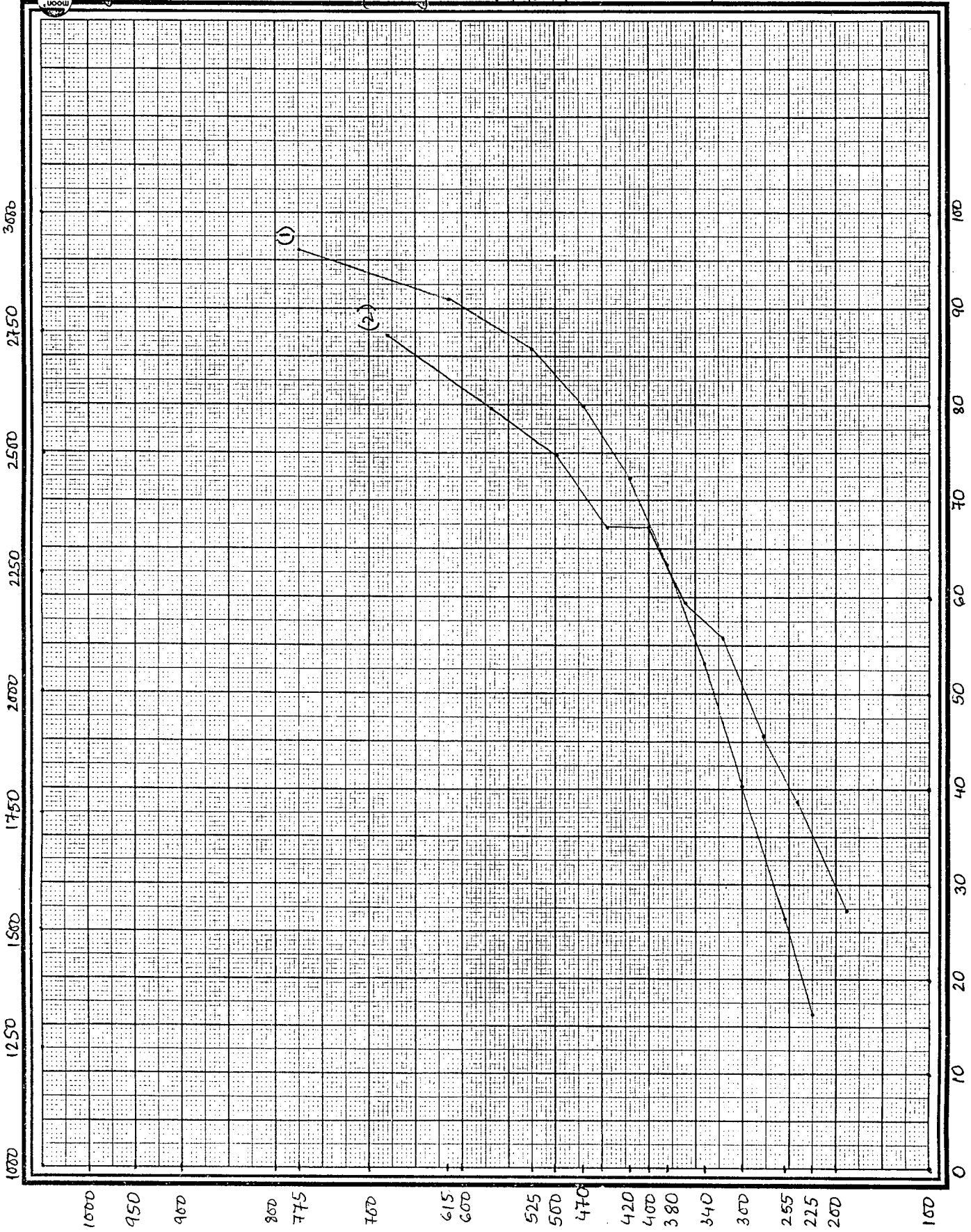
Expenditure Class (Rs)	Average Expenditure (Rs)	Per capita per diem intake of Calorie	Percentage number of persons	Cummulative percentage of persons
000-225	188	1545	16.2	16.2
225-255	240	1773	10.2	26.4
255-300	278	1911	13.9	40.3
300-340	320	2117	12.9	53.2
340-380	360	2189	10.2	63.4
380-420	400	2346	8.9	72.3
420-470	443	2344	7.6	79.9
470-525	498	2499	5.8	85.7
525-615	569	2591	5.3	91.0
615-775	680	2742	5.1	96.1
775-950	861	2894	1.9	98.0
950+	1147	3151	1.9	99.9
all classes	373	2119	100	-

Source: NSS 55<sup>th</sup> Round, 1999-2000, Report Numbers 454 and 471.

Using the direct method of poverty estimation for the year 1999-2000, the incidence of headcount poverty for rural-Orissa based on the calorie norm of 2400 kcal is estimated to be 80 per cent that corresponds to monthly per capita expenditure of Rs.475 (from Graph-4.11). However, using the indirect method of poverty estimation the Planning Commission estimated the incidence of headcount poverty for rural-Orissa for the year 1999-2000 to be 48.01 per cent that corresponds to the monthly per capita expenditure of Rs. 323.92. Thus we get a difference in the estimates of headcount poverty (by these two methods) for rural-Orissa for the year 1999-2000 which is of the magnitude of 32 per cent. Again using the direct method of poverty estimation for the year 1999-2000, the incidence of headcount poverty for rural-Orissa based on the calorie norms of 2200 kcal and 2000 kcal is estimated to be 60 per cent and 39 per cent respectively and the associated monthly per capita expenditure are Rs. 365 and Rs. 295 respectively (from Graph-4.11).



Fig-4.11 : Cumulative Frequency Distribution : Rural - Orissa, 1999-2000



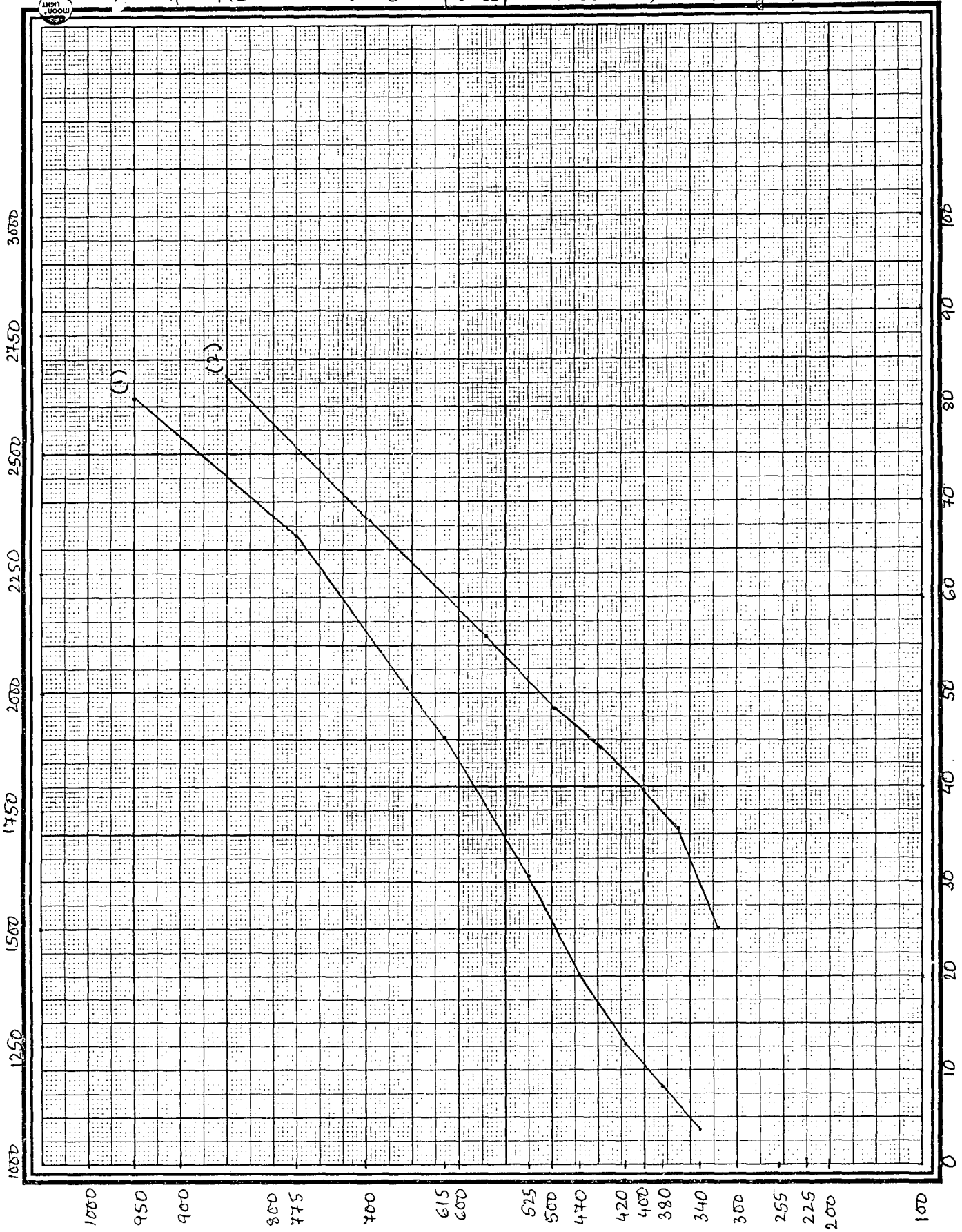
**Table 12: Expenditure GroupWise Calorie intake and Distribution of Persons, 1999-2000, Punjab (Rural)**

Expenditure Class (Rs)	Average Expenditure (Rs)	Per capita per diem intake of calorie	Percentage number of persons	Cummulative percentage of persons
000-225	180	-	0.1	0.1
225-255	244	-	0.5	0.6
255-300	279	-	1.2	1.8
300-340	320	1502	2.0	3.8
340-380	362	1712	4.5	8.3
380-420	400	1792	4.4	12.7
420-470	447	1881	7.4	20.1
470-525	498	1968	10.5	30.6
525-615	571	2120	14.6	45.2
615-775	695	2361	21.3	66.5
775-950	851	2668	14.2	80.7
950+	1348	3295	19.2	99.9
all classes	742	2381	100	-

Source: NSS 55<sup>th</sup> Round, 1999-2000, Report Numbers 454 and 471.

Using the direct method of poverty estimation for the year 1999-2000, the incidence of headcount poverty for rural-Punjab based on the calorie norm of 2400 kcal is estimated to be 58.5 per cent that corresponds to monthly per capita expenditure of Rs.715 (from Graph-4.12). However, using the indirect method of poverty estimation the Planning Commission estimated the incidence of headcount poverty for rural-Punjab for the year 1999-2000 to be 6.35 per cent that corresponds to the monthly per capita expenditure of Rs. 362.68. Thus we get a difference in the estimates of headcount poverty (by these two methods) for rural-Punjab for the year 1999-2000 which is of the magnitude of 32 per cent. Again using the direct method of poverty estimation for the year 1999-2000, the incidence of headcount poverty for rural-Punjab based on the calorie norms of 2200 kcal and 2000 kcal is estimated to be 45 per cent and 28.5 per cent respectively and the associated monthly per capita expenditure are Rs. 610 and Rs. 515 respectively (from Graph-4.12).

Graph-4.12 : Cumulative Frequency Distribution; Rural Punjab, 1999-2000





**Table-4.13: Expenditure GroupWise Calorie intake and Distribution of Persons, 1999-2000, Rajasthan (Rural)**

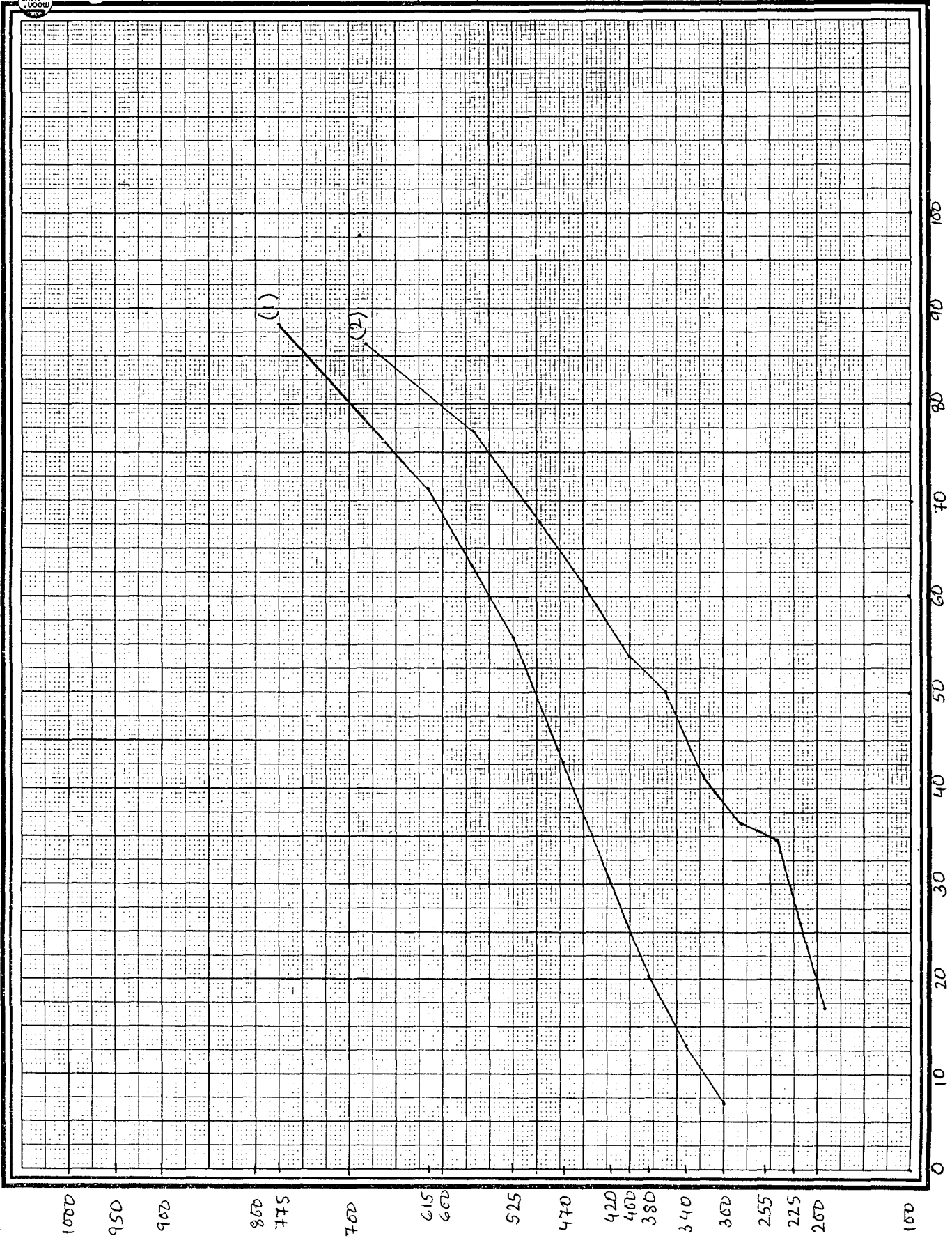
Expenditure Class (Rs)	Average Expenditure (Rs)	Per capita per diem intake of Calorie (Kcal)	Percentage number of persons	Cummulative percentage of persons
000-225	193	1338	1.0	1.0
225-255	243	1693	1.3	2.3
255-300	280	1727	4.7	7.0
300-340	322	1828	6.0	13.0
340-380	362	2003	7.3	20.3
380-420	400	2075	9.8	30.1
420-470	447	2217	12.6	42.7
470-525	496	2353	13.1	55.8
525-615	567	2543	15.5	71.3
615-775	683	2724	17.1	88.4
775-950	844	3083	6.2	94.6
950+	1243	3839	5.4	100
all classes	549	2425	100	-

Source: NSS 55<sup>th</sup> Round, 1999-2000, Report Numbers 454 and 471.

Using the direct method of poverty estimation for the year 1999-2000, the incidence of headcount poverty for rural-Rajasthan based on the calorie norm of 2400 kcal is estimated to be 53.5 per cent that corresponds to monthly per capita expenditure of Rs.515 (from Graph-4.13). However, using the indirect method of poverty estimation the Planning Commission estimated the incidence of headcount poverty for rural-Rajasthan for the year 1999-2000 to be 13.74 per cent that corresponds to the monthly per capita expenditure of Rs. 344.03. Thus we get a difference in the estimates of headcount poverty (by these two methods) for rural-Rajasthan for the year 1999-2000 which is of the magnitude of 40 per cent. Again using the direct method of poverty estimation for the year 1999-2000, the incidence of headcount poverty for rural-Rajasthan based on the calorie norms of 2200 kcal and 2000 kcal is estimated to be 36 per cent and 16 per cent respectively and the associated monthly per capita expenditure are Rs. 445 and Rs. 360 respectively (from Graph-4.13).



Graph-4.13: Cumulative Frequency Distribution; Rural Rajasthan, 1999-2000.



**Table-4.14: Expenditure GroupWise Calorie intake and Distribution of Persons, 1999-2000, Tamil Nadu (Rural)**

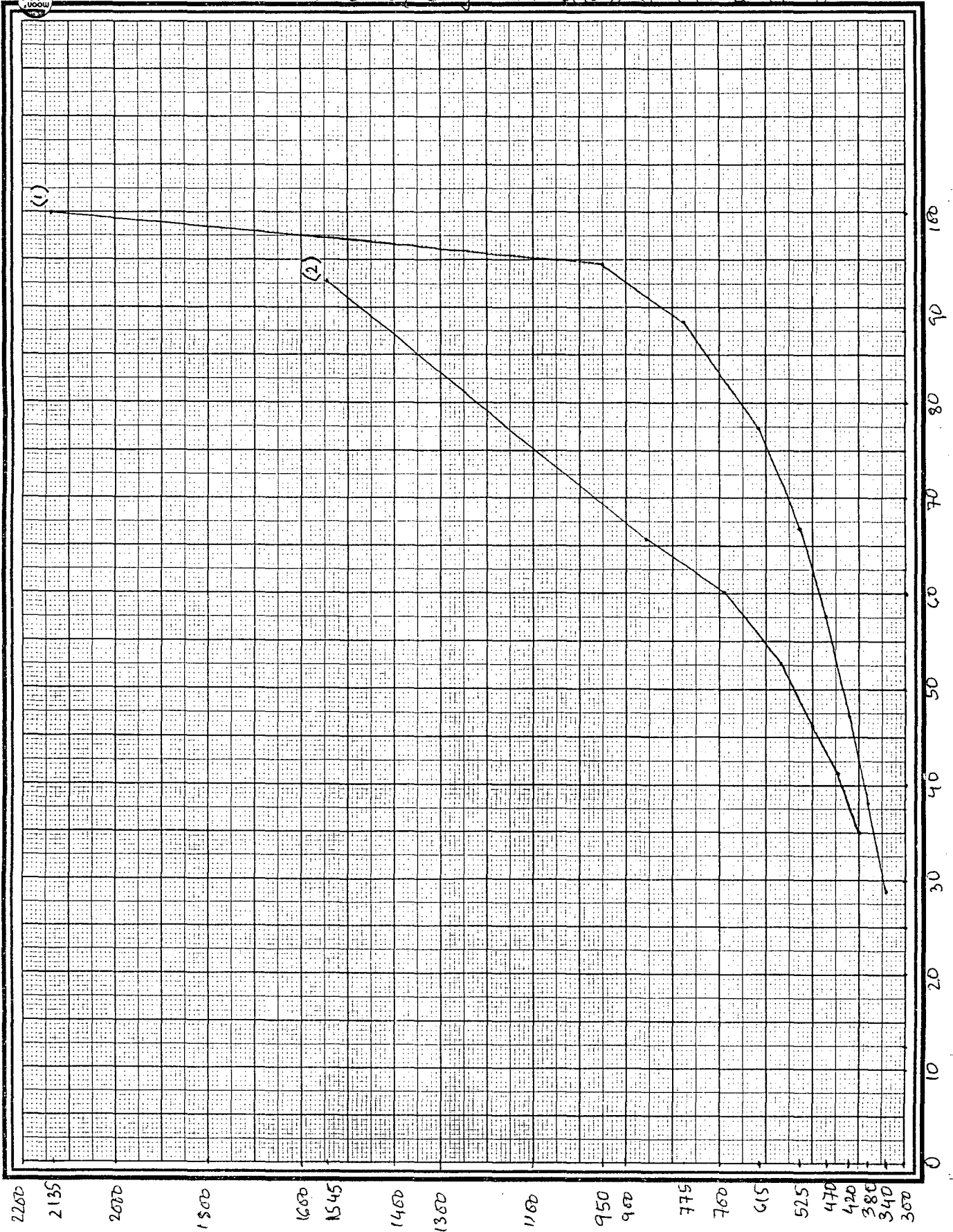
Expenditure Class (Rs)	Average Expenditure (Rs)	Per capita per diem intake of calorie	Percentage number of persons	Cummulative percentage of persons
000-225	187	1093	4.7	4.7
225-255	240	1278	4.6	9.3
255-300	277	1383	9.3	18.6
300-340	321	1543	10.2	28.8
340-380	361	1618	9.4	38.2
380-420	400	1701	9.0	47.2
420-470	445	1823	10.4	57.6
470-525	499	1922	9.2	66.8
525-615	568	2054	10.6	77.4
615-775	689	2202	11.0	88.4
775-950	857	2314	6.1	94.5
950+ <sup>5</sup>	1544	2855	5.5	100
all classes	514	1826	100	-

Source: NSS 55<sup>th</sup> Round, 1999-2000, Report Numbers 454 and 471.

Using the direct method of poverty estimation for the year 1999-2000, the incidence of headcount poverty for rural-Tamil Nadu based on the calorie norm of 2400 kcal is estimated to be 94.5 per cent that corresponds to monthly per capita expenditure of Rs.970 (from Graph-4.14). However, using the indirect method of poverty estimation the Planning Commission estimated the incidence of headcount poverty for rural-Tamil Nadu for the year 1999-2000 to be 20.55 per cent that corresponds to the monthly per capita expenditure of Rs. 307.64. Thus we get a difference in the estimates of headcount poverty (by these two methods) for rural-Tamil Nadu for the year 1999-2000 which is of the magnitude of 74 per cent. Again using the direct method of poverty estimation for the year 1999-2000, the incidence of headcount poverty for rural-Tamil Nadu based on the calorie norms of 2200 kcal and 2000 kcal is estimated to be 82 per cent and 68.5 per cent respectively and the associated monthly per capita expenditure are Rs. 685 and Rs. 540 respectively (from Graph-4.14).

<sup>5</sup> The upper end of this expenditure class estimated to be Rs.2135.

Graph - 4.14 : Cumulative Frequency Distribution, Rural Tamil Nadu, 1999-2000



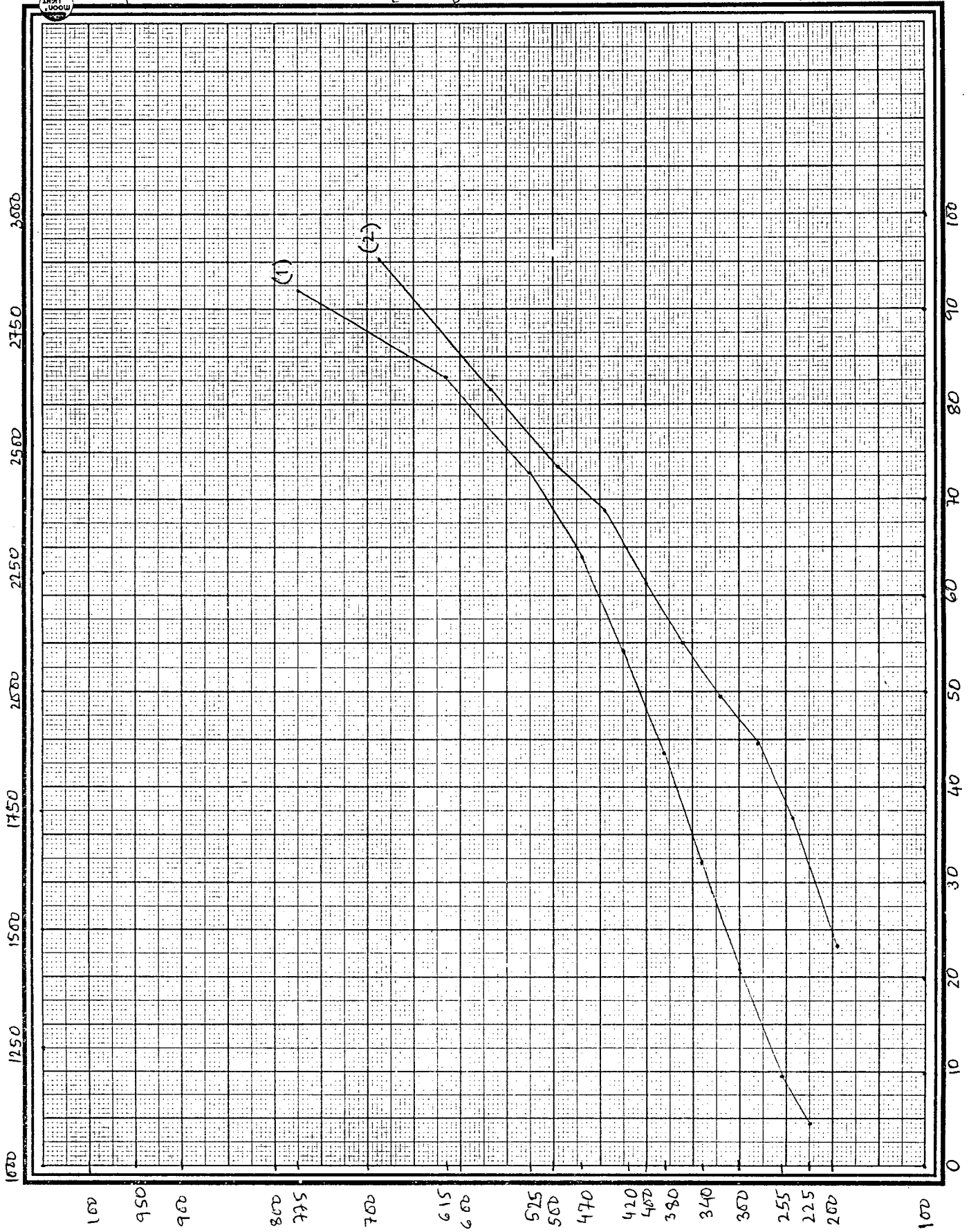
**Table-4.15: Expenditure Groupwise Calorie intake and Distribution of Persons, 1999-2000, Uttar Pradesh (Rural)**

Expenditure Class (Rs)	Average Expenditure (Rs)	Per capita per diem intake of calorie	Percentage number of persons	Cummulative percentage of persons
000-225	195	1466	4.4	4.4
225-255	243	1734	5.1	9.5
255-300	279	1893	11.3	20.8
300-340	320	1990	11.3	32.1
340-380	361	2100	11.5	43.6
380-420	400	2226	10.6	54.2
420-470	444	2375	9.8	64.0
470-525	496	2470	8.8	72.8
525-615	566	2631	10.1	82.9
615-775	687	2907	9.1	92.0
775-950	852	3190	4.3	96.3
950+	1386	3815	3.6	99.9
all classes	467	2327	100	-

Source: NSS 55<sup>th</sup> Round, 1999-2000, Report Numbers 454 and 471.

Using the direct method of poverty estimation for the year 1999-2000, the incidence of headcount poverty for rural-Uttar Pradesh based on the calorie norm of 2400 kcal is estimated to be 61 per cent that corresponds to monthly per capita expenditure of Rs.455 (from Graph-4.15). However, using the indirect method of poverty estimation the Planning Commission estimated the incidence of headcount poverty for rural-Uttar Pradesh for the year 1999-2000 to be 31.22 per cent that corresponds to the monthly per capita expenditure of Rs. 336.88. Thus we get a difference in the estimates of headcount poverty (by these two methods) for rural-Uttar Pradesh for the year 1999-2000 which is of the magnitude of 30 per cent. Again using the direct method of poverty estimation for the year 1999-2000, the incidence of headcount poverty for rural-Uttar Pradesh based on the calorie norms of 2200 kcal and 2000 kcal is estimated to be 47 per cent and 27.5 per cent respectively and the associated monthly per capita expenditure are Rs. 400 and Rs. 325 respectively (from Graph-4.15).

Graph-4.15: Cumulative Frequency Distribution, Rural Uttar Pradesh, 1999-2000.



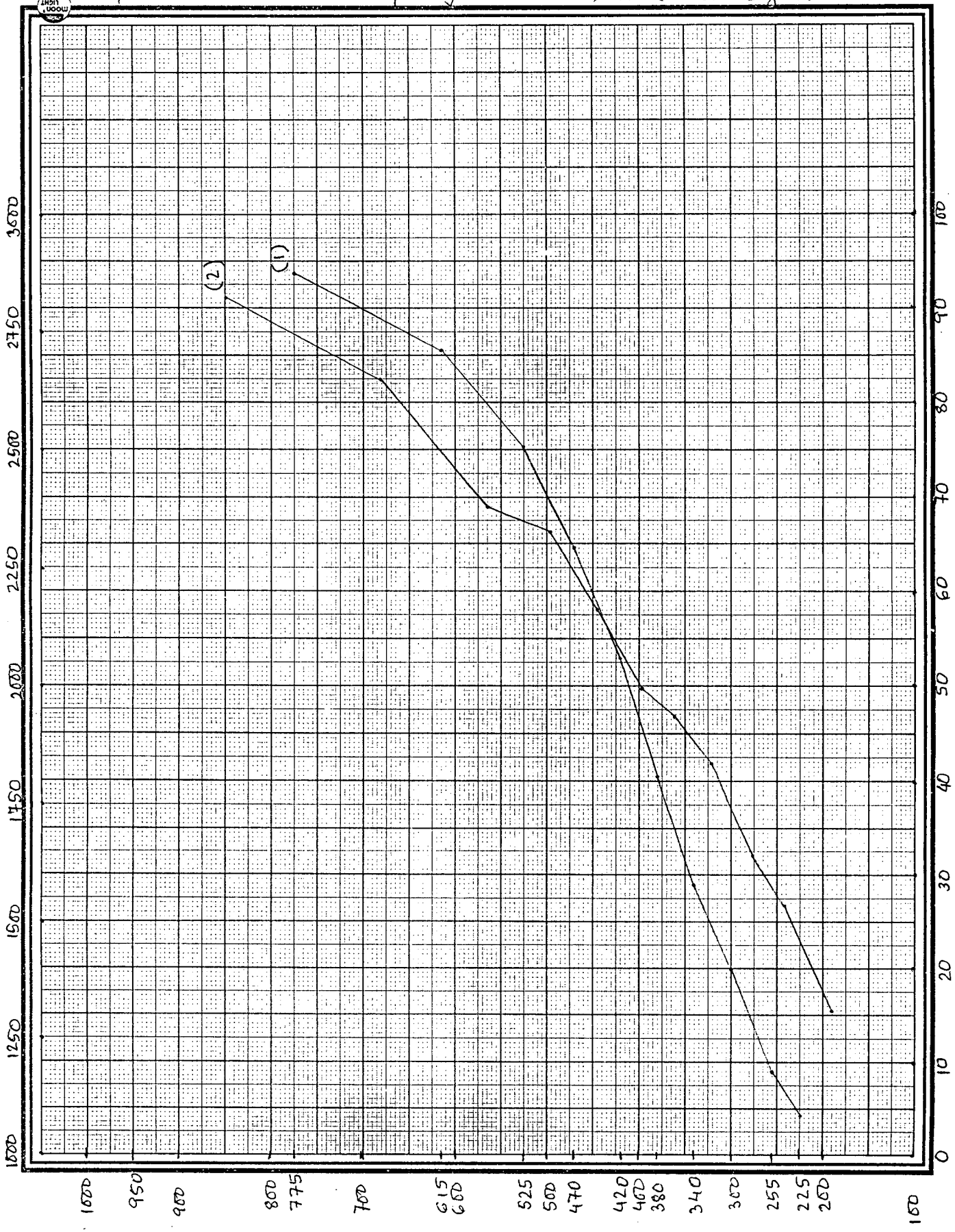
**Table-4.16: Expenditure Groupwise Calorie intake and Distribution of Persons, 1999-2000, West Bengal**

Expenditure Class (Rs)	Average Expenditure (Rs)	Per capita per diem intake of calorie	Percentage number of persons	Cummulative percentage of persons
000-225	190	1309	4.3	4.3
225-255	243	1535	4.6	8.9
255-300	277	1641	11.0	19.9
300-340	321	1837	9.0	28.9
340-380	362	1935	11.6	40.5
380-420	398	1994	12.4	52.9
420-470	445	2160	11.7	64.6
470-525	496	2325	10.6	75.2
525-615	564	2379	10.4	85.6
615-775	681	2648	8.2	93.8
775-950	849	2821	3.5	97.3
950+	1320	3285	2.7	100.0
all classes	455	2095	100	-

Source: NSS 55<sup>th</sup> Round, 1999-2000, Report Numbers 454 and 471.

Using the direct method of poverty estimation for the year 1999-2000, the incidence of headcount poverty for rural-West Bengal based on the calorie norm of 2400 kcal is estimated to be 81 per cent that corresponds to monthly per capita expenditure of Rs.575 (from Graph-4.16). However, using the indirect method of poverty estimation the Planning Commission estimated the incidence of headcount poverty for rural-West Bengal for the year 1999-2000 to be 31.85 per cent that corresponds to the monthly per capita expenditure of Rs. 350.17. Thus we get a difference in the estimates of headcount poverty (by these two methods) for rural-West Bengal for the year 1999-2000 which is of the magnitude of 49 per cent. Again using the direct method of poverty estimation for the year 1999-2000, the incidence of headcount poverty for rural-West Bengal based on the calorie norms of 2200 kcal and 2000 kcal is estimated to be 61 per cent and 47 per cent respectively and the associated monthly per capita expenditure are Rs. 455 and Rs. 400 respectively (from Graph-4.16).

Graph-4.16 : Cumulative Frequency Distribution; Rural West Bengal, 1999-2000.





**Table-4.17: Summary statistics of Headcount Ratio and required expenditure corresponding to the different calorie norms:**

States (Rural)	HCR based on the calorie norm of 2400 kcal	HCR based on the calorie norm of 2200 kcal	HCR based on the calorie norm of 2000 kcal	HCR according to the Planning Commission
Andhra Pradesh	84 (595)	70.5 (490)	52 (405)	11.05 (262.94)
Assam	91 (660)	81 (545)	57.5 (425)	40.04 (365.43)
Bihar	77 (455)	64.5 (400)	39.5 (345)	44.30 (333.07)
Gujrat	83 (735)	73.5 (635)	59.5 (540)	13.17 (318.94)
Haryana	47.5 (615)	36 (540)	24 (470)	8.27 (362.81)
Karnataka	82 (650)	69 (535)	45 (420)	17.38 (309.59)
Kerala	82.5 (1105)	68.5 (810)	52 (660)	9.38 (374.79)
Madhya Pradesh	78.5 (490)	69.5 (435)	46.5 (345)	37.06 (311.34)
Maharashtra	92 (870)	76.5 (600)	46 (420)	23.72 (318.63)
Orissa	80 (475)	60 (365)	39 (295)	48.01 (323.92)
Punjab	58.5 (715)	45 (610)	28.5 (515)	6.35 (362.68)
Rajasthan	53.5 (515)	36 (445)	16 (360)	13.74 (344.03)
Tamil Nadu	94.5 (970)	82 (685)	68.5 (540)	20.55 (307.64)
Uttar Pradesh	61 (455)	47 (400)	27.5 (325)	31.22 (336.88)
West Bengal	81 (575)	61 (455)	47 (400)	31.85 (350.17)
All-India	74.5 (565)	58 (455)	40 (380)	27.09 (327.56)

Note: Figure in brackets shows the expenditure levels for satisfying the given calorie norms.

The above table shows the summary of the incidence of headcount poverty based on the direct method in rural-India and in the rural areas of 15 major states subject to the three different calorie norms of 2400 kcal, 2200 kcal and 2000 kcal. It follows from the table that the headcount poverty based on the calorie norm of 2400 kcal is more than 90 per cent for three states, namely, in Tamil Nadu, Maharashtra and Assam. Similarly, the incidence of headcount poverty is more than 80 per cent in six states, namely, in Andhra Pradesh, Gujrat, Kerala, Karnataka, West Bengal and Orissa. The incidence of headcount poverty is more than 70 per cent in the states of Madhya Pradesh and Bihar. The incidence of headcount poverty is the lowest in Haryana, followed by Punjab, Rajasthan and Uttar Pradesh. Thus, the incidence of headcount poverty as estimated by the direct

method is substantially higher than the estimates of poverty as estimated by the Planning Commission for the year 1999-2000.

Even with the lowest calorie norm of 2000 calories the average poverty ratios by the direct method remains much higher than the official poverty ratios – 40% at the all-India level compared to 27.1% by the official estimate. However for a few individual states like Bihar, Orissa and Uttar Pradesh the direct method yields a lower poverty ratio indicating that the depth is relatively less in these states, while the adverse gap is very large for other states like Andhra Pradesh, Kerala, Gujrat, Tamil Nadu and Assam

**Table-4.18: Ranking of states**

States (Rural)	Ranks based on the calorie norm of 2400 kcal	Ranks based on the calorie norm of 2200 kcal	Ranks based on the calorie norm of 2000 kcal	Ranks based on the Planning Commission's estimates
Andhra Pradesh	84 (12)	70.5 (11)	52 (11)	11.05 (4)
Assam	91 (13)	81 (14)	57.5 (13)	40.04 (13)
Bihar	77 (5)	64.5 (7)	39.5 (6)	44.30 (14)
Gujrat	83 (11)	73.5 (12)	59.5 (14)	13.17 (5)
Haryana	47.5 (1)	36 (1)	24 (2)	8.27 (2)
Karnataka	82 (9)	69 (9)	45 (7)	17.38 (7)
Kerala	82.5 (10)	68.5 (8)	52 (12)	9.38 (3)
Madhya Pradesh	78.5 (6)	69.5 (10)	46.5 (9)	37.06 (12)
Maharashtra	92 (14)	76.5 (13)	46 (8)	23.72 (9)
Orissa	80 (7)	60 (5)	39 (5)	48.01 (15)
Punjab	58.5 (2)	45 (3)	28.5 (4)	6.35 (1)
Rajasthan	53.5 (3)	36 (2)	16 (1)	13.74 (6)
Tamil Nadu	94.5 (15)	82 (15)	68.5 (15)	20.55 (8)
Uttar Pradesh	61 (4)	47 (4)	27.5 (3)	31.22 (10)
West Bengal	81 (8)	61 (6)	47 (10)	31.85 (11)
All-India	74.5	58	40	27.09

The above table shows the ranks of states on the basis of the incidence of headcount poverty. From this we can calculate the Spearman's rank correlation coefficient. The rank correlation coefficient between the poverty ratio based on the direct method using the calorie norm of 2400 kcal and the poverty ratio as estimated by the Planning Commission is estimated to be 0.171. Similarly, the rank correlation

coefficients between the poverty estimates based on direct method subject to the calorie norms of 2200 kcal and 2000 kcal with the poverty estimates by the Planning Commission are estimated to be 0.236 and 0.075 respectively. As we had noted earlier, Rohini Nayyar had found a high degree of positive correlation between the two methods of estimating poverty. By 1999-2000 however we find that the rank correlation coefficient has dropped to a very low value as mentioned above. Now we will check the level of significance for the above values of the rank correlation coefficients ( $r'$ ) i.e.,  $r_1' = 0.171$ ,  $r_2' = 0.236$ ,  $r_3' = 0.075$ .

### **Test of significance of the rank correlation coefficient $r'$**

Following the discussions in Koutsoyiannis (1973), the statistical significance of the Spearman's rank correlation coefficient can be tested by the following procedure. If the population  $\rho$  is zero, the distribution of  $r'$  can be approximated with a normal curve having the mean 0 and the standard deviation  $1/\sqrt{n-1}$ , that is  $r' \sim N(0, \sigma_{r'})$ .

The null and alternative hypotheses are

$$H_0 : \rho = 0 \text{ and } H_1 : \rho \neq 0$$

Given the form of the alternative hypothesis, we apply a two-tail test. We will use the Z statistics for the test that define the two-tail test at 5 per cent level of significance.

$$(a) \text{ We reject } H_0 \text{ if } r' < (-1.96)/\sqrt{n-1}, \text{ or if } r' > (+1.96)/\sqrt{n-1}$$

$$(b) \text{ (We accept } H_0 \text{ if } (-1.96)/\sqrt{n-1} \leq r' \leq (+1.96)/\sqrt{n-1}$$

Here,  $n = 15$  and  $(+) 1.96/\sqrt{n-1} = 0.524$  and  $(-) 1.96/\sqrt{n-1} = (-) 0.524$

Test-1:  $r_1' = 0.171$

We find that  $(-) 0.524 < r_1' < (+) 0.524$

Test-2:  $r_2' = 0.236$

We find that  $(-) 0.524 < r_2' < (+) 0.524$

Test-3:  $r_3' = 0.075$

We find that  $(-) 0.524 < r_3' < (+) 0.524$

Thus, we accept the null hypotheses  $H_0: \rho = 0$  at 5 per cent level of significance based on the results of the above three tests. This shows that there is no correlation between the direct method and indirect method of poverty estimation for the year 1999-2000.

## Chapter-5

### Macroeconomic Indicators Explaining Poverty in Rural India

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#### 5.1 Introduction

We will now focus on the factors that are expected to affect the incidence of poverty. Since the Indian literature is mainly on rural poverty, our discussion will focus on the rural sector. Much of the literature has tended to focus on two types of variables: some measure of agricultural output or productivity and some price variable. Although the level and growth of agricultural production per capita of rural population is an important variable determining level of welfare in a predominantly agricultural rural community, it is also obvious that such a relationship would be affected by whether agricultural growth is accompanied by increasing inequality and whether there are other sources of rural incomes. The link between poverty and prices is even more complex. While early work on the determinants of rural poverty chose some measure of agricultural output per capita, some researchers find agricultural output per hectare to be the measure of agricultural performance better correlated with poverty decline.<sup>1</sup>

The Abhijit. Sen model (Sen 1996) regresses head count measures of poverty for the period 1960-61 to 1993-94 at the all-india level in both urban and rural areas against per capita agricultural and non-agricultural incomes, the first defined per head of the agricultural population and the second defined per head of the total population. Here both the income variables are significantly negatively associated with poverty incidence in both rural and urban areas, and in both cases the agricultural income variable appears more important (see table-8; Sen 1996). Next, the per capita non-agricultural income variable is split into per capita income from trade and transport (an indicator of commercialization) and other non-agricultural incomes. In this case, agricultural incomes continue to be negatively related to poverty, but now there is a difference between the urban and rural equations. In urban areas, commercialization variable appears to reduce poverty while the remaining non-agricultural incomes have a positive effect. But exactly

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<sup>1</sup> See, for example, Ravallion, M and G Dutt: 'growth and Poverty in Rural India' Background Paper to the 1995 World Development Report, WPS 1405, World Bank, Washington, DC, 1995.

the opposite pattern appears in rural areas. Next, a public expenditure variable (development expenditure per capita, i.e., government expenditure less interest payments and expenditure on defence and administration) is included in the model. This variable is strongly significant, reducing poverty in both rural and urban areas, with its coefficient almost double in rural as compared to urban areas.

On including an inflation term in the model, this is found to have an insignificant effect on poverty in both rural and urban areas. Replacing the inflation term with a relative price variable (the relative price of cereals to all commodities in the wholesale price index) does however make a difference. This variable turns out to be highly significant in both areas, and also serves to reduce the significance of the public expenditure variable, which however continues to be significant. Thus, as far as price variable is concerned, the relative price effect is more important than the effect of inflation per se. The importance of the relative price and of non-agricultural factors cast strong doubts on simple agricultural output/ inflation paradigm as emphasized by many researchers.

This regression exercise was repeated for the state-level data, in the form of a pooled time series and cross-section analysis with data up to 1992. In this exercise, poverty is regressed against agricultural output per rural person, state per capita SDP, a relative food price index calculated by dividing the index of food price in the CPIAL by the SDP deflator, and per capita real state development expenditure. All variables except the per capita SDP were significant, but, in addition, the inflation term was small and just crossed the significance level. The relative food price variable was easily the most statistically significant variable and it was also the most important in terms of its impact. The next important variable was state development expenditure, followed by agricultural output.

## **5.2 Agricultural Sector in the 1990s**

Agriculture continues to be the most crucial sector of the Indian economy. Agriculture sector still lies at the center stage of the Indian economy so that any situational change in this sector, positive or negative, has a multiplier effect on the entire economy. As we are focusing on the poverty in rural India in the nineties, we will take

into account those factors that explain the nutrition poverty in rural India during the nineties. Here we will consider factors such as agricultural output growth rate, per capita availability of foodgrains, employment situation in the agriculture sector, public development expenditures in the rural areas in the 1990s in this section. The next section particularly explains the case of huge food stocks with the government whereas the nutrition poverty is so high in the rural India as discussed in the last chapter. In this discussion we will rely mainly on the argument developed by U.Patnaik (2003, 2004) and by M.Swaminathan (2002) who have both focussed on the question of food stocks and the PDS given the background of economic reform policies.

By July 2003, public grain stocks had declined substantially compared to July 2002 when they had reached 63 million tonnes, nearly 40 million tonnes in excess of buffer norms.. But “this decline is mainly because in a severe drought year the government has exported a record of 12.4 million tones of food-grains out of stocks with heavy subsidy, thus revealing its preference for subsidizing foreign buyers rather than creating sufficient purchasing power for poor in India through additional food-for-work programmes to enable them to absorb what has been actually exported... Such unprecedented exports out of mountainous food stocks has been the socially irrational outcome of the policies followed by the government in the last six years in particular “ (Patnaik 2002).

The basic reasons for such an abnormal public stocks build-up and the associated fall in food availability for the population are analysed by Patnaik (2003) to be three-fold in nature: first, contractionary, income deflating macroeconomic reform policies, second trade liberalization altering cropping patterns and importing global price declines into Indian markets from 1997. These two have led to the severe employment decline, income decline and hence fall in aggregate demand for a large segment of the population – especially the rural population. Third, this has been combined with “the institutional denial to the poor, of access to food owing to targeting in the Public Distribution System (PDS) from 1997-98”. (ibid.) The targeted PDS has divided the population into two groups below the poverty line (BPL) and above the poverty line (APL). This system of targeting has led to the exclusion of millions of actually poor from those defined as poor and entitled to a BPL ration card.

Patnaik (2003) points out that the build-up of abnormal stock levels has taken place over a period when the food-grains output growth rate has reduced markedly and has dropped below the population growth rate (even though the latter itself is slightly falling – see following Table-5.1) leading to a fall in annual net output per head. The table shows that all growth rates exceeded the population growth rate in the 1980s while all growth rates have fallen below it in the 1990s. The important factor behind the drop in foodgrain output growth is the drastic decline in real public investment that has occurred in agriculture over a long period.

**Table-5.1: Decline in Growth Rate of Agricultural Output During 1990s to Below Population Growth Rate**

Period	Food-grains	Non Food-grains	All Crops	Population
1980-81 to 1989-90	2.85	3.77	3.19	2.1
1990-91 to 2000-01	1.66	1.86	1.73	1.9

Source: Economic Survey, 2001-02, p. 189 also quoted in Patnaik 2003.

It is pointed out by Patnaik (2003) that “The level of net output and absorption per head in the early nineties itself was hardly adequate for meeting nutritional requirements given the existing highly skewed distribution of food in our society, reflecting the highly skewed distribution of incomes. The early nineties output and availability level of 177 to 178 kg. per head (see Table-5.2), was about half the current availability level in China at the same date (325 kg.) and about one-fifth of the current availability level in the USA (850 kg.). .... Normally when there is fall in per capita output in the country, we observe that stocks are being drawn down and net imports taking place, in order to maintain availability per head at an unchanged level. But we are faced with an opposite situation in India over last six years, that despite falling per capita output, there are both rising net exports as well as huge addition to stocks year after year. This is a highly abnormal situation reflecting the unprecedented magnitude of demand-deflation in the economy, especially the rural sector, in last six years.” (Ibid.)



**Table-5.2: Three-Year Average of Annual Per Capita Food-grains Output and Availability in India in the Nineties**

Three Year Period Ending in	Net Output Per Head		Net Availability Per Head			
	Cereals (Kg.)	Food-grains	Cereals (Kg.)	Pulses (Kg.)	Food-grains	
					Kg/year	Gms/day
1991-92	163.43	178.77	162.8	14.2	177.0	485
1994-95	166.74	181.59	160.8	13.5	174.3	478
1997-98	162.98	176.81	161.6	12.6	174.2	477
2000-01	164.84	177.71	151.7	11.5	163.2	447
Individual Year						
2000-01	157.79	167.43	141.42	9.64	151.06	414
2001-02	165.40	177.01	146.76	11.61	158.37	434
2002-03*	140.54	150.09	140.54	9.55	150.09	411

Change in Per Capita Availability, %

Triennium ending 1991-92 to Triennium ending 1997-98 -1.6

Triennium ending 1997-98 to individual year 2002-03 -12.8

Total change, 1991-02 to 2002-03\* -15.2

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Source: Table 2 & 3: Food Stocks and Hunger, Patnaik (2003) p. 24, 21

As the emphasis on the crucial variable of food availability and its behaviour in the nineties occurs in the papers by Patnaik (2003,2004) and not elsewhere, we are quoting from the 2003 paper at length below:

“The important point to note is that the availability decline has been far greater than output decline taking both on a per head basis. The absorption, or availability of food-grains in the economy is officially defined as net output (gross output less one eighth on account of seed, feed and wastage), plus net imports and minus net addition to public stocks; this is divided through by population to give per head availability. Per capita availability is defined here as given in Annual Economic Survey but the results have been expressed in kilograms per year rather than grams per day. It is important to mention here that the figure of availability covers absorption of food-grains for all purposes – not only direct consumption but also indirect consumption, for example as processed items and as feed for commercial production of livestock products. As can be seen from table-5.2, by the triennium ending in 2000-01, average annual availability of cereals per head was 11.1 kg. lower, and of pulses 2.7 kg. lower, given a total decline of 13.9 kg. for food-grains, compared to the triennium ending in 1991-92. Availability has been dropping slowly in the nineties up to 1997-98, after which the decline was very fast. This has been the result of drastic decline in sales to the public from the Public Distribution System (PDS) and consequent cumulative addition to stocks, further aggravated by net exports. The issue of PDS has been discussed in details in the next section.

These abnormal stocks are the result of a very large increase in inequality of access to food in the India society. This increased inequality of access to food can be explained by two factors such as (a) loss of purchasing power through unemployment and income deflation for a substantial section of the population and (b) targeting in the Public Distribution System. The cut in purchasing power of the poorer majority of the population, especially in villages is the outcome of contractionary, public expenditure reducing economic reform policies in the 90s resulting in a collapse of rural employment growth and hence income growth. Also, sharply falling farm prices for commercial crops both globally and locally from 1996-97, reducing farmers incomes resulted in declining purchasing power”. (ibid.)

The collapse of employment in rural areas is indicated by a deceleration of employment growth or an increase in the rate of unemployment as can be seen from

Table-5.3. The unemployment rate increased from 5.99% in 1993-94 to 7.32 in 1999-2000 for all-India. This has been even worse for rural India.

**Table-5.3: Declining employment and rising unemployment scenario in the decade of 1990s (CDS Basis) (Person Years)**

	(Million)			Growth per annum (%)	
	1983	1993-94	1999-2000	1983 to 1993-94	1993-94 to 1999-2000
<b>All-India</b>					
Population	718.20	894.01	1003.97	2.00	1.95
Labour force	261.33	335.97	363.33	2.43	1.31
Work force	239.57	315.84	336.75	2.70	1.07
Unemployment rate (%)	(8.30)	(5.99)	(7.32)		
No. of unemployed	21.76	20.13	26.58	-0.08	4.74
<b>Rural-India</b>					
Population	546.61	658.83	727.50	1.79	1.67
Labour force	204.18	255.38	270.39	2.15	0.96
Work force	187.92	241.04	250.89	2.40	0.67
Unemployment rate (%)	(7.96)	(5.61)	(7.21)		
Number of unemployed	16.26	19.50	19.50	-1.19	5.26

Source: Economic Survey – 2002-03; p-218

**Table-5.4: Employment Growth (CDS basis) in Agriculture**

Year	Annual Growth (%)	Year	Employment (in million)
1983 to 1987-88	1.77	1983	151.35
1987-88 to 1993-94	2.57	1987-88	163.82
1983 to 1993-94	2.23	1993-94	190.72
1993-94 to 1999-2000	0.02	1999-2000	190.94

Source: Economic Survey 2002-03; p-218.

The rate for unemployment increased from 5.61% in 1993-94 to 7.21 in 1999-2000 for rural India. Similarly, we observe that growth rate of number of unemployed increased from -1.19% in 1993-94 to 5.26% in 1999-2000 for rural India. As per the results of the latest quinquennial survey of National Sample Survey Organization on Employment and Unemployment (55<sup>th</sup> Round, 1999-2000) the rate of growth of employment, on Current Daily Status (CDS) basis, declined from 2.7 per cent per annum in 1993-94 to 1.07 per cent per annum in 1994-2000 (Table-5.4). This decline in the rate of growth of employment during the 1990s was associated with a comparatively higher growth rate in GDP, indicating a decline in the intensity of production. The absolute number of unemployed as well as the incidence of unemployment (expressed in terms of unemployed as a percentage of labour force) increased during this period. The decline in the overall growth rate of employment in 1994-2000 was largely attributable to a near stagnation of employment in agriculture. As a result, the share of agriculture in total employment dropped from 60 per cent in 1993-94 to 57 percent in 1999-2000. Moreover, employment elasticity of output has gone down from 0.52 over the years 1983 to 1993-94 to 0.16 over 1993-94 to 1999-2000. Between 1983 and 1993-94, its employment elasticity was as high as 0.70 and now in the latter period of 1993-94 to 1999-2000, it has come down to 0.01 (Economic Survey, 2002-03).

Patnaik (2003) has focused on development expenditures and has argued that this total collapse of employment has been mainly the outcome of the reverse multiplier effects of the sharp fall in development expenditures in rural areas implemented under

reform policies as can be seen from Table-5.5. From 14.5% of GDP in the 7<sup>th</sup> Plan period before reforms began, rural development expenditures have crashed to less than 6% of GDP by 1997-98. The share of agriculture in GDP has declined because of collapse in output growth in that sector, directly owing to the sharp fall in development expenditures which includes the spending on vital infrastructure like irrigation and power, apart from employment generation programmes.

**Table-5.5: Decline in Public Development Expenditure in Rural Areas in Nineties (As percentage of GDP)**

Year	1985-90 (7 <sup>th</sup> Plan)	1991-92	1995-96	1997-98	2000-01
Rural development expenditure as per cent of GDP	14.5	11.7	6.0	5.6	5.9

Source: Food Stock and Hunger, Table-5, Patnaik (2003); p. 28. Primary source is RBI, Report on Currency and Finance and Economic Survey for various years.

Note: Rural Development Expenditures include expenditure on Agriculture, rural development, special areas programmes, irrigation and flood control, village industry, energy and transport.

### 5.3 Accumulation of Huge Food Stocks with the PDS

The second process leading to worse access to food on the part of the poor is implementation of targeting the food subsidy. From 1997-98, government gave up the earlier system of unconditional and universal access by households to the Public Distribution System, and thereby initiated “the institutional denial to the poor of access to cheap food”, owing to the system of APL-BPL introduced in the same year.

The rising exports of food-grains from India in the 1990s, despite strongly decelerating supply growth, owing to internal demand deflation, led to two episodes of sharply declining off take from the public distribution system (PDS). Table-5.6 presents the picture on food-grains allocation and off take under public distribution system.

**Table-5.6: Food-grains allocation and off take under PDS (million tones)**

Year	Wheat		Rice	
	Allocation	Off take	Allocation	Off take
1992-93	9.25	7.47	11.48	9.55
1993-94	9.56	5.91	12.41	8.87
1994-95	10.80	4.83	13.32	8.03
1995-96	11.31	5.29	14.62	9.6
1996-97	10.72	8.52	15.10	11.14
1997-98	10.11	7.08	2.83	9.90
1998-99	10.11	7.95	12.94	10.74
1999-2000	11.37	5.76	13.89	11.31
2000-01*	11.57	4.07	16.26	7.97
2001-02*	13.14	5.68	17.23	8.16
2002-03*	29.45	6.12	27.35	7.39

Source: Economic Survey, 2002-03, p-93.

In the first episode, issue prices of food-grains were nearly doubled (as can be seen from table-5.7) between 1991 and 1994, against the background of falling state development expenditures in rural areas and declining non-farm and other employment, which were already deflating mass demand. Issue prices were raised more than the procurement prices by government in order to cut the food subsidy. But this sharp increment in the issue prices backfired on the poor with the consequences of poor being priced out, sales dropping, and stocks building up in excess of buffer norms (as can be seen from Table-5.8) and a higher share of the subsidy simply going towards the cost of stockholding. Thus the government used the PDS stocks for export at the expense of rising nutrition poverty within the country, especially in rural areas.

Targeting was introduced from 1997-98 with different issue prices for the 'below poverty line' (BPL) and 'above poverty line' (APL) population. From 1998-99, issue price was again raised every year for the APL until, by 2000-01, it was higher by 85 per cent for wheat (from Rs. 450/quintal to Rs. 830/quintal).

**Table-5.7: PDS Issue Price of Wheat and Rice (Rs/quintal)**

Year	Wheat	%	Rice	% Change
1990-91	234	-	289	-
1991-92	280	19.7	377	30.4
1992-93	280	0.0	377	0.0
1993-94	330	17.9	437	15.9
1994-95	402	21.8	537	22.9
1995-96	402	0.0	537	0.0
1996-97	402	0.0	537	0.0
1997-98				
BPL	250	-	350	-
APL	450	-	700	-
1998-99				
BPL	250	0.0	350	0.0
APL	650	44.4	905	29.3
1999-2000				
BPL	250	0.0	350	0.0
APL	682	4.9	905	0.0
2000-01				
BPL	415	66.0	565	61.4
APL	830	21.7	1130	24.9
2001-02				
BPL	415	0.0	560	0.0
APL	610	-26.5	830	-26.5
2002-03 (July)				
BPL	415	0.0	565	0.0
APL	610	0.0	830	0.0

Source: Economic Survey, 2002-03, p-94.

**Table-5.8: Central Food-grains stocks and minimum buffer stock norms (million tones)**

Beginning of the month	Wheat		Rice		Total (Rice and Wheat)	
	Min. Norm	Actual Stock	Min. Norm	Actual Stock	Min. Norm	Actual Stock
Jan-1996	7.7	13.1	7.7	15.4	15.4	28.5
Jan-1997	7.7	7.8	7.7	12.9	15.4	20.0
-1998 (p)	7.7	6.8	7.7	11.5	15.4	18.3
-1999	8.4	12.7	8.4	11.7	16.8	24.4
-2000	8.4	17.2	8.4	14.2	16.8	31.4
-2001	8.4	25.0	8.4	20.7	16.8	45.7
-2002 (p)	8.4	32.4	8.4	25.6	16.8	58.0
-2003 (p)	8.4	28.8	8.4	19.4	16.8	48.2

(p) – provisional

Source: Economic Survey, 2002-03, p-92

This ballooning of food stocks in the last few years is because of a reduced outflow to the PDS during a period of rising procurement. The excess holding of stocks is a new phenomenon. There are a number of arguments put forward by the government to explain this unprecedented build-up of public food-grains stocks in the country all of which ignore the question of unemployment and decline in purchasing power. The Economic Survey 2001-02 states that excess stocks have arisen because minimum support prices (MSP) to farmers have been “too high” resulting in excessive procurement during 2001 despite fall in grain output. So the excess stocks are viewed as a surplus over what people wish to consume and they denote a “problem of plenty”, as the Economic Survey 2001-02 puts it. It says that the growth rate of superior cereals have been higher than population growth owing to too high administered prices of rice and wheat, and stocks have built up because all consumers voluntarily wish to reduce their intake of cereals and rather consume fruits, vegetables and animal products (milk, eggs, chicken, etc.) as their income rises. NSS data are quoted to show that there is a declining percentage share of food expenditure on cereals and a rising share on non-cereals over



time for almost all expenditure – fractile groups (and static for lowest fractiles). So there is a mismatch between what consumers want, and the actual output structure resulting in excess stocks (Economic Survey 2001-02, pp 118-130).

Even the distinguished economist Amartya Sen has given primacy to only one factor, procurement flows, and specifically to the “unrealistic high minimum support prices of food-grains” (Sen, 2001, p 13). Professor Amartya Sen, in his Nehru lecture, writes that “the very price system that generates a massive supply keeps the hands and mouths of the poorer consumers away from food” (Sen, 2001). Now whether procurement prices are ‘high’ or ‘low’ is being defined with compared to world price. Because the world prices of cereals has collapsed from 1996 onwards the Indian domestic price is now higher than world price. But the same authors never talked about ‘unrealistically low procurement price” when the world price was high and above procurement price, which was the case in the first half of the nineties and through most of the eighties.

To understand the present problem of accumulation of stocks, it is not the quantity procured per se that is to blame. After all, given the need to provide food to the vast numbers of undernourished and nutritionally vulnerable people in India, high levels of procurement are necessary, as Madura Swaminathan (2003) points out. The problem here is that the government has expanded neither the distribution system nor the purchasing power to ensure that the needy actually receive the food that it has procured. The public procurement of food-grain is used to meet buffer stock requirements and requirements of the public distribution system. If the excess stocks had been distributed to an adequate extent through the PDS or other welfare and employment programmes, then the procurement in the last few years would not have been “excessive”. In fact, procurement would have to be stepped up if the PDS were to provide nutritional support to the malnourished population of the country.

We would now turn to the crucial link between procurement and distribution through prices. This link appears to be a part of deliberate policy, to maintain procurement prices at the historically given levels, on the one hand, while altering the public distribution system or PDS in a fundamental way, through prices as well as administrative targeting, so as to exclude the majority from the existing system of food

security and hence to lower disbursement, on the other hand. This policy has weakened and discredited the entire institutional structure of the system of food security and brought it to a crisis point. It is now easy prey for the neo-liberal advocates of de-regulation and privatisation of the food economy and system of food security in India. Thus, the view that stocks are accumulating because procurement prices are set at their present levels is a narrow one, and one with potentially disastrous consequences for food security, national and individual as Swaminathan (2002) has pointed out.

The proponent of the view that demand deflation is the main culprit for stock build up, U.Patnaik points out: "The argument on MSP being "too high" ignores the fact stocks started building up from four years before the quoted rise in the MSP. The argument is not situated within other well known trends affecting grain sales, namely the continuously falling prices of non-food-grains crops like sugarcane and cotton grown in North India. Declared MSP was raised and a bonus given in 2001, followed by high procurement in the rabi 2002, and it was wrongly inferred that high MSP caused high procurement, without reference to any other facts. Here, we would argue that record procurement, higher by 5.3 million tones in the year 2000-01 compared to the preceding year, was rendered abnormal by the fact that it came out of a cereals output which was lower by nearly 11 million tones. This indicates the presence of distress sales of cereals by farmers already affected by crashing prices for their other commercial crops."

While a large part of the decline in off take and build-up of stocks is on account of demand deflation, a substantial part is definitely also on account of targeting. Given the imperfections in information, any programme of targeting involves errors of selection. The two types of errors, widely recognized in the literature, are errors of wrong exclusion or excluding the "poor" or deserving and errors of wrong inclusion or including the "rich" or non-deserving. Swaminathan (2003) points out that the targeted programmes are likely to have large errors of wrong exclusion. Including a few non-deserving persons is a less serious error than excluding the poor. If we are more concerned with errors of wrong exclusion, as we should be, and the target group is large and not clearly demarcated from the rest of the population, then a universal programme is likely to be more effective in reaching the target group than a narrowly targeted programme. These errors of wrong exclusion imply that nutritionally vulnerable persons

are excluded from the system of public provision of food, namely the public distribution system. The costs to society of excluding the needy are difficult to measure but clearly large for they include the impact on health, well being and productivity of one-half of the present population as well as future generations. To illustrate, low nutritional status affects the physical and mental development as well as the productive potential of a person. It also affects the next generation, as the likelihood of low birth weight babies being born is higher among undernourished mothers, and in this way the adverse effects of malnutrition are carried forward into the next generation. Errors of wrong inclusion, however, have only a financial effect via higher expenditure, and no adverse welfare effects. And the rich can always be taxed through other means (Swaminathan, 2003)

#### **5.4 Involuntary Dietary Diversification**

We would now turn into the paradoxes of recent data on food intake and nutrition in India. The data show a steady decline in consumption of cereals by households in almost all income classes and, at the same time, the persistence of chronic malnutrition on a mass scale. Many scholars have interpreted the fall in consumption of cereals as a welcome sign of diversification of diets, a shift away from cereals to meat, eggs, fruit, vegetables and so on (see Planning Commission, 2001).

Dietary diversification is associated with a falling share of cereals in total calories and a rising share of animal products. Patnaik (2002) points out that most economists writing on poverty using the indirect method, “suppress the fact that the NSS, the source of the share of spending figures showing ‘diversification’, also shows that per head daily total calorie intake (‘total’ in the sense of ‘from all foods’) has been falling in both rural and urban areas from already inadequate initial levels, and falling much more rapidly in the 1990s than before if we look at NSS data which are comparable, (namely excluding the controversial 55<sup>th</sup> round). Those economists who do reluctantly mention the falling calorie intake figures, tend to put forward the argument that there is a voluntary trade-off, of lower calories for a more diversified diet.” This is hardly credible, for as she points out, while the upper income groups can be expected to diversify diets voluntarily as their incomes rise, the lower income groups suffering more unemployment if they are workers

and falling incomes if they are farmers, cannot be expected to voluntarily diversify. They simply reduce their food intake and suffer nutrition loss.

The National Sample Survey on calorie intake over the two decades, 1972-73 to 1993-94, at the all-India level, shows that average calorie intake declined steadily in both rural and urban areas in this period. In rural areas, the average calorie intake fell from 2,266 kcal in 1972-73 to 2,221 in 1983 and 2,183 in 1993-94. In urban India, the calorie intake fell from 2,107 kcal in 1972-73 to 2,089 in 1983 and 2,071 in 1993-94. In both urban and rural areas, the average calorie intake is below the average norm used to define absolute poverty (2,400 kcal in rural areas and 2,100 kcal in urban areas). In fact, by 1993-94, the nutritional norm underlying the original poverty estimates was being satisfied by only about 30 per cent of rural persons and 40 per cent of urban persons (see table 15, Primary Exports and Food Absorption)). As we have already discussed at length, official poverty incidence is lower than this, mainly because the methodology of updating poverty line income assumes that the composition of the diet is unchanged. The more 'diversified' actual diet, however, which costs the 'poverty line' expenditure, is associated now with a substantially lower total calorie intake than before. Further the indirect method of updating an old poverty line with a price index also assumes that while inflation affects real incomes, deflation does not do so. But in reality fall in prices have been affecting incomes of farmers and their employment of hired labour.

It has been argued by Patnaik (2003) that despite growth in per capita income in India, there is on average an actual decline in daily per capita total calorie intake is logically compatible only with a substantial worsening of income distribution. The food-grains intake decline, which is the major reason for the calorie decline, has to be interpreted differently for the various expenditure fractiles. For the highest expenditure fractiles, say, the top one-sixty of the population we can expect a more diversified consumption basket associated with a constancy or rise in total calorie intake per head. It is quite likely that the NSS is not adequately capturing the actual food intake in these groups by not taking account of food consumed from sources outside the household. Even after declining, the direct food-grain intake for this group remains much higher than for the lower fractiles. In the lower expenditure fractiles, however, 'diversification' measured by shares reflects a worsening of nutritional status, for, while the calories

obtained from animal products is marginally higher, it fails to compensate for the large fall in calories from direct food-grains consumption and, therefore, is associated with lower total calorie intake. Thus, it is at best naïve and at worst criminal to talk of a diversification of diets when total calorie intake is low and falling.

## Chapter-6

### Concluding Remarks

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There are multiple factors that explain the agrarian crisis in India. The important factors are the sharp cutback in government expenditures in the 1990s, in particular, in the rural areas leading to decline in the growth rates of employment and incomes; and dismantling of the quantitative restrictions due to the trade liberalizing policies undertaken by the government. It has been pointed out by Patnaik (2001) that trade liberalisation leads to import of the depression in the global markets into the Indian economy particularly at a time when the global conditions of trade in primary commodities are not favourable. The impact of the income deflationary policies and trade liberalisation has been severe on the rural population of the country.

Our study has focused on the head count ratio of poverty for rural-India and rural areas of 15 major states based on the original definition of poverty (the direct method) and the one used by the Planning Commission (the indirect method) and many other academicians. The use of indirect method by the Planning Commission drastically diluted the calorie standard and the original concept of poverty based on nutritional norm is being altered. The poverty ratio based on these two methods differed quite significantly in the 1990s. The divergence in poverty ratios based on these methods is found to be 47.5 per cent (as discussed in the third chapter), a difference far too large to be ignored. The official poverty line of Rs 328 for the year 1999-2000 gives a total calorie intake 1890 or less, which is far below the original calorie norm of 2400 kcal for rural areas as recommended by the Nutrition Expert Group (1969). However, for the bottom 27 per cent of the population the average calorie intake corresponds to 1687 calories per capita per day.

We find that Deaton's estimate of poverty for rural-India at 25% corresponds to the total calorie intake of 1860 calories or less. However the average calorie intake for the bottom 25% of the population is estimated to be 1676 calories per capita per day which is only 70% of the calorie norm. Surjit Bhalla's poverty ratio of 12% corresponds to total calorie intake of 1690 or less which is even 700 calories less than the calorie norm of

2400 calories per capita per day. Moreover the average calorie intake for the bottom 12% of the population is only 1522 calories per capita per day which is even less than 65% of the calorie norm. This shows the severity of malnutrition of bottom 12% of the population. K Sundaram and S D Tendulkar's poverty ratio of 29% for rural-India corresponds to total calorie intake of 1900 calories and the average calorie intake for the bottom 29% of the population is only 1704 calories per capita per day which is 71 per cent of the calorie norm.

Moreover, quite apart from the problem of a far distant base year, the indirect method of updating an old poverty line using price indices now no longer captures even the trend of change correctly because the method can only reflect increase in poverty arising from rise in prices but fails to capture the increase in poverty arising from unemployment and income loss for producers suffering falling prices. The indirect poverty studies show the exactly opposite trend compared to the actual ground reality of worsening welfare owing to a higher percentage of persons moving below the calorie norm, hence rise in poverty.

We find that the divergence between the calorie-based measures and income-based measures are very large. This can be partially explained by the fact that the income poverty line was established nearly thirty years ago, by inspecting the actual data on that level of expenditure whose food expenditure component yielded the level of expenditure that would enable the purchase of a food basket providing 2400 calories. However, not only have tastes changed significantly since then and food baskets are more diversified today than they were then, additionally the economic environment has changed leading to involuntary diversification since a number of items of consumption are now monetized. Further the original idea that only inflation harms consumers did not take into account that deflation harms producers and reduces their consumption.

When the Expert Group of the Planning Commission had decided to assume an invariant consumption pattern it probably did not undertake fully the implication of doing so. Moreover the period then was one of high inflation and people were concerned with reducing real wages and earnings of fixed income earners. The very idea that poverty could increase with price deflation because producers in agriculture would suffer and with falling output prices reduce the hiring of labour leading to rising unemployment at

that time. But as we have seen the scenario in the last six years has been a deflationary one. Falling global prices have led to domestic price falls for export crops, while announced MSP even for foodgrains and domestically traded crops could not be maintained as the CACP Report for 2002-03 points out.

In such a situation the indirect method would produce 'perverse results' as Patnaik (2003) points out. The very price falls for crops which cause actual rise in poverty, gets reflected as a stagnant or decline in the overall price index and thereby a stagnant or declining 'poverty line' is calculated giving a spurious decline in poverty. For example the reason Deaton (b) gets an even lower poverty line than the Planning Commission is probably because he uses unit values (prices) computed from the household consumption data itself, and these are now lower than the GDP deflator.

Policies of structural adjustment and liberalization in the 1990s have had a critical impact on the policy of public distribution system. Driven by the goal of cutting food subsidies, there have been major changes in the policy with respect to the PDS, most importantly, the shift from a principle of universal coverage to a principal of targeting, accompanied by changes in the entitlements and prices. The system of targeting of the PDS on the basis of a narrow definition of absolute income poverty has failed, and is likely to continue to fail, in providing even minimal food security to the food insecure and nutritionally deprived population of our country.

The target group in India for a programme of minimal food security should comprise around 80 per cent of the population, and should exclude only the top 20 per cent. The present policy has excluded vast numbers of needy people from the ambit of the PDS. Given the scale of malnourishment and the short-term and long-term effects of malnutrition, a higher weight should be attached to errors that exclude the needy than to errors that include the rich.

We find that at the all-India level, 75 per cent of the rural population is found to have an intake below 2400 calories. Clearly where the major part of the population is below the calorie norm and undernourished and malnourished, targeting excludes the majority of the actually poor and going back to a universal public distribution system is an essential for enabling the deprived to access food.



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