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# Issues in Setting Absolute Poverty Lines

**Nanak Kakwani**

**Asian Development Bank**

Regional and Sustainable Development Department

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# **Issues in Setting Absolute Poverty Lines**

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## I. INTRODUCTION

1. One of the early studies on poverty was done by Rowntree (1901), who defined families as being in primary poverty if their total earnings were insufficient to obtain the “minimum necessities of merely physical efficiency.” He estimated the minimum money costs for food that would satisfy the average nutritional needs of families of different sizes. To these costs, he added the rent paid and certain minimum amounts for clothing, fuel, and sundries to arrive at a poverty line of a family of given size. A family was identified as poor if its total earnings were less than its poverty line. This approach to measuring poverty may be called the “income approach.” It identifies the poor on the basis of monetary income or consumption. It measures the degree of lowness of income or consumption in the society.

2. The income approach views poverty as income (or consumption) deprivation. A poverty situation emerges when some sections of a society have so little income that they cannot satisfy their minimum basic needs as defined by the poverty line. But income is not the only kind of deprivation that people may suffer. Although income deprivation may give rise to several other kinds of deprivation, people may suffer deprivation in many aspects of life even if they possess adequate command over monetary resources or commodities. Lowness of well-being is more important than lowness of income. Thus, Sen (2000) correctly argues that poverty should be viewed as the deprivation of basic capabilities rather than merely as lowness of income.<sup>1</sup>

3. Poverty, viewed in terms of capability deprivation, encompasses not only material deprivation (measured by income or consumption) but also other forms of deprivation, such as unemployment, ill health, lack of education, vulnerability, powerlessness, and social exclusion. This comprehensive notion of poverty opens up a broader range of policies that governments can follow in order to reduce poverty. If it is found that there is an acute deprivation in the area of health, then obviously it is easier to make policies to reduce this deprivation. If poverty is measured only in terms of income deprivation, then the policy focus should be on increasing people’s income, which may eventually reduce the health deprivation. The most effective way to reduce poverty is to make policies and projects that deal directly with the specific kinds of deprivation that have been identified using the capability deprivation approach. It is also possible that the lowness of income may be the main cause of the specific deprivation. In such situations, a combination of policies that enhance people’s income and reduce the specific deprivation may be appropriate. It is not suggested that in the pursuit of the capability deprivation approach, the income approach should be abandoned. Both approaches can supplement each other.

4. Regardless of which approach is taken, the issue for policy research purposes is what yardstick to use to measure poverty. This paper is concerned with the measurement of income poverty, which measures people’s deprivation in income or consumption relative to some standard or poverty line. The poverty line specifies the society’s minimum standard of living to which everybody should be entitled. A person is identified as poor if he or she cannot enjoy this minimum. Thus, a poverty line that identifies the poor is the starting point of any poverty analysis. Once the poverty line is

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<sup>1</sup> This approach is also known as a multidimensional approach to measuring poverty. The United Nations Millennium Development Goals (MDGs) are an example of the capability deprivation approach to monitoring poverty.

determined, one can construct poverty profiles, which provide overall estimates of poverty; the distribution of poverty across sectors, geographical regions and socioeconomic groups; and a comparison of key characteristics of the poor with those of the nonpoor. The method of setting the poverty line can greatly influence poverty profiles, which are the key to the formulation of poverty reduction policies. Obviously, setting the poverty lines is not a straightforward exercise and often is most contentious. It involves many conceptual and practical problems that are important from the point of view of policy but are not often addressed because of their complexity. This paper attempts to address these problems and suggests operationally feasible solutions.

5. There are two main approaches to measuring poverty. First is the “relative approach,” which defines the poverty line in relation to the average standard of living enjoyed by a society. Depending upon the objective of analysis, this approach, based on some notion of relative deprivation, may not be appropriate for developing countries, especially if the concern is more with the absolute standard of living. In a developing economy, it is desirable to ensure in the first instance that nobody in the society has a standard of living below the socially accepted minimum standard. This leads us to the second approach known as the “absolute approach.” It implies that all individuals on the poverty line should have the same standard of living irrespective of their individual circumstances. This approach also implies that the real poverty line is fixed over time (unless changed explicitly). The poverty lines used in many countries do not generally meet these basic requirements. The standard of living implied by the poverty lines used by many developing countries varies across regions and time. Thus, we may come across anomalous situations in which the wealthier regions may show higher poverty than the poorer regions, which may result in giving greater benefits to the nonpoor than the poor. This can lead to misallocation of government resources, which poor countries cannot afford.

6. The main focus of this paper is on the development of absolute poverty lines. It introduces a methodology to construct poverty thresholds that are consistent in terms of maintaining a fixed minimum standard of living across regions and to some extent take account of differences in people’s consumption patterns. With this perspective, the paper briefly reviews poverty lines of several countries in the Asian region. It is concluded that most countries in Asia do not have consistent poverty lines and, therefore, identification of the genuinely poor may be problematic. Inconsistent poverty lines can also lead to highly biased estimates of the incidence of poverty.

7. The paper also deals with international comparisons. The World Bank produces estimates of the number of poor in the world on a \$1-a-day poverty line based on purchasing power parity. However, the \$1-a-day poverty line is not consistent either within or between countries. Suggestions are made for its improvement so that poverty estimates are comparable across countries as well as across regions and areas (rural and urban) within countries.

## **II. SOME BASIC PROPERTIES OF ABSOLUTE POVERTY LINES**

8. Because a poverty line specifies a society’s minimum standard of living, it should be fixed across all individuals, that is, horizontally equitable, which means that all

individuals should be treated equally.<sup>2</sup> However, individuals differ with respect to their basic needs and live in different geographical regions that face different prices. Thus, the same poverty line should not and cannot apply to all individuals. In order to achieve horizontal equity, the poverty line should be adjusted for individual circumstances, so that all the individuals on the poverty line have the same standard of living irrespective of their circumstances.

9. What are the important individual circumstances that should be taken into account? First, individuals vary with respect to their age and sex and, therefore, their food and nonfood requirements are different. For instance, children require less food than adults in order to maintain an adequate nutritional standard. Similarly, women may require less food than men.

10. Ravallion and Bidani (1994) define a poverty profile to be inconsistent if one of two households deemed to have exactly the same standard of living but located in different regions is classified as poor and the other is not. Consistency requires that the real poverty line be fixed across all regions.

11. The real poverty line is the nominal poverty line adjusted for regional differences in cost of living. In order to maintain consistency, the difference in regional poverty lines for persons with the same needs should be entirely attributed to differences in regional costs of living.

12. The absolute approach to measuring poverty also implies that the real poverty line is fixed over time. The poverty line should only change over time because of changes in prices. This property implies that the poverty line should be adjusted over time by means of the true cost of living index, so the observed differences in the poverty line measure the real change in the poverty line. Thus, the standard of living implied by the poverty line does not change over time.

### III. NUTRITIONAL REQUIREMENTS

13. A food poverty line may be constructed using the nutritional requirements of individuals. The first step in the construction of poverty lines is to specify the food requirements of individuals or families. An individual may be regarded as nonpoor if he or she has access to adequate food. An individual is assumed to have access to adequate food if he or she has access to an adequate source of nutrition. The latter, according to Lipton (1988), is a good indicator of quality of life. Health, shelter, education, and even mobility, are all reflected in nutritional status, although not in a linear or otherwise simple way.

14. The determination of nutritional requirements of individuals or families is a difficult task. In order to maintain the required physical efficiency, an individual requires several nutrients in adequate amounts, in proper combination, and at appropriate times (Gopalan 1992). The Food and Agriculture Organization of the United Nations (FAO) has been concerned with the issue of determining the nutritional norms of individuals in different age and sex groups. These norms vary from country to country (and between groups within a country) depending on such factors as race and climatic conditions.

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<sup>2</sup> Two individuals with the same standard of living should both be considered either poor or nonpoor.

15. Can these country-specific FAO norms be used to construct a food basket for poverty measurement? The norms are constructed in order to judge whether or not a particular population is adequately nourished. And the concept of absolute poverty should be closely related to malnutrition in the population. If a person is not able to be nourished with a given resource, it is clearly evidence of poverty.

16. On the basis of individual caloric norms, the World Bank estimated that 34% of the world population in 1980 did not have sufficient energy intake through their diets. FAO has also been active in producing estimates of the extent of under-nutrition in the world. It estimated that 23% of the world population was undernourished in 1979–1980. These proportions may have been highly underestimated because they did not take account of any activity other than maintenance of bodily functions. They have been severely criticized on the grounds that nutritional requirements vary both interpersonally, i.e., from person to person even of the same age, sex, and physical activity level, and intra-individually, i.e., for the same individual at different times (Sukhatme 1977; Srinivasan 1981; Kakwani 1988). Srinivasan (1981) argued that the conceptual basis underlying these estimates is faulty.

17. The measurement of malnutrition in the population is indeed problematic. Still, as Sen (1980) argued, “malnutrition can provide a basis for a standard of poverty without poverty being identified as the extent of malnourishment; the level of income at which an average person will be able to meet his nutritional requirements has a claim to be considered as an appropriate poverty line even when it is explicitly recognized that nutritional requirements vary interpersonally around that average.”

18. The nutritional needs of individuals may be used as a starting point to construct food baskets for poverty measurement. It must be emphasized that these needs of individuals depend on several factors such as age, sex, and activity levels. Therefore, there cannot be a single caloric norm for all people living in a given country.

19. Because nutritional norms vary from country to country depending on race, climatic conditions, etc., it is important that norms appropriate for the country being studied be adopted.

20. Nutrients are conventionally divided into six categories: calories, proteins, carbohydrates, fats, vitamins, and minerals. A diet is balanced if the various nutrients appear in it in their required quantities. Ideally, the construction of food poverty lines must take account of all six nutrients. However, this is almost an impossible task and the present paper focuses on calorie (energy) deficiency. Research suggests that in many countries of Asia, diets are such that protein requirements are satisfied if caloric needs are met (Sukhatme 1977).

#### **IV. DIRECT CALORIE INTAKE METHOD**

21. Some household expenditure surveys provide information on quantities of food consumed. These food quantities can be converted into calories using conversion factors that are generally available from national nutritional authorities. The calories consumed in a household, divided by household size, give the household's per capita calorie intake. A household is identified as poor if its per capita calorie intake is less than

its per capita calorie requirement. This method is called the direct calorie intake (DCI) method (Asra and Santos-Francisco 2001).

22. The DCI method is simple to apply if household survey data include information on quantities of food, which is generally not the case for most countries. This method was used in Bangladesh until 1991–1992 and is still being used in Sri Lanka. Using the DCI method, the Bangladesh Bureau of Statistics estimated absolute poverty based on a daily intake of 2,122 calories of energy per capita per person and hard core poverty based on per capita per day intake of 1,805 calories of energy. Table 1 presents these estimates.

**Table 1: Percentage of Poor in Bangladesh, Estimated by the DCI Method**

Year	Absolute Poverty			Hard Core Poverty		
	Rural	Urban	National	Rural	Urban	National
1985–1986	54.7	62.6	55.7	26.3	30.7	26.9
1988–1989	47.8	47.6	47.8	28.6	26.4	28.4
1991–1992	47.6	46.7	47.5	28.3	26.3	28.0
1995–1996	47.1	49.7	47.5	24.6	27.3	25.1
2000	42.3	52.5	44.3	18.7	25.0	20.0

Source: Bangladesh Bureau of Statistics.

23. Absolute poverty at the national level was about 56% in 1985–1986 and decreased to 48% in 1988–1989, remaining stable until the 2000 survey, when it fell further to 44%. Hard core poverty fluctuated more during the period surveyed. An important observation is that urban poverty is much higher than rural poverty. For instance, in 2000, urban absolute poverty was estimated to be 52%, while rural absolute poverty was only 42%. This result is counterintuitive. In most countries in the world, poverty has been found to be much higher in rural than in urban areas. Why is Bangladesh different?

24. The DCI method, although simple, suffers from a serious consistency problem. Two households consuming the same number of calories may have vastly different standards of living (one household may have a much higher per capita income or expenditure than another household). Thus, identification of households as poor on the basis of calorie intake can be misleading. Many rich households may be identified as poor and many poor households may be identified as nonpoor. This is the case in Bangladesh: the DCI method underestimates poverty in rural areas and overestimates poverty in urban areas. This example shows that by using an inconsistent method of setting a poverty line, vastly wrong policy prescriptions can be made about poverty reduction. The DCI method cannot be recommended for measuring poverty.

## V. FOOD ENERGY INTAKE METHOD

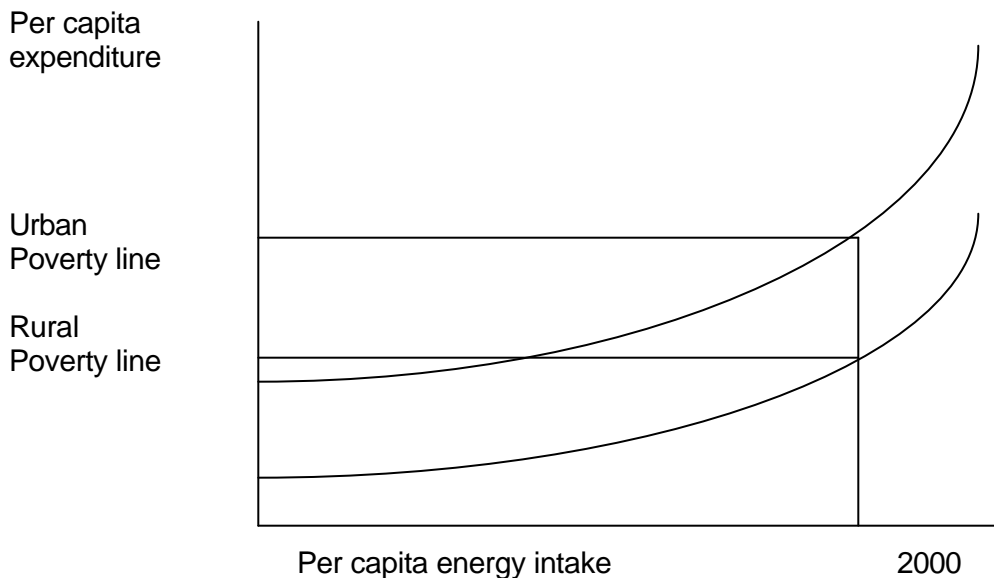
25. Greer and Thorbecke (1986) proposed a method of computing the food poverty line at which a person's food energy intake is just sufficient to satisfy a given required quantity of his or her daily calories. They estimated the following cost-of-calorie function:

$$\ln(X) = a + bC + u \quad (1)$$

where  $X$  is the expenditure on a basket of food that is actually consumed by a person,  $C$  is the number of calories that are obtained from that food basket, and  $u$  is the error term. If the population is divided into  $k$  homogeneous groups or regions, then one can estimate equation (1) for each of these regions. If  $R$  is the recommended calorie requirement, which is the same for all regions, then the food poverty line is estimated separately for each region as

$$Z = \exp(\hat{a} + \hat{b}R)$$

where  $\hat{a}$  and  $\hat{b}$  are the coefficient estimates of  $a$  and  $b$ , respectively. A person is identified as poor if his or her food expenditure is less than that needed to meet the food poverty line. This poverty line can be interpreted as the food expenditure level at which a typical individual's nutritional needs are met. Separate food poverty lines are estimated for groups or regions having similar tastes and preferences and facing uniform prices.



26. People also require some basic nonfood items of consumption. Thus, the poverty line must also include basic nonfood items in addition to basic food items. To determine the total poverty line,  $X$  could be used to represent income or total expenditure. In such a case, equation (1) would represent the inverse of the Engel's type demand curve for calories, when prices and tastes are constant. The corresponding poverty line could then be interpreted as the total income or expenditure level at which a typical individual's nutritional needs are met (Greer and Thorbecke 1986). Ravallion and Bidani (1994) call this approach the food energy intake (FEI) method. The method, with some variations, has been used in many countries (Dandekar and Rath 1971; Osmani 1982; Satya 1989; Ercelawn 1991).

27. The FEI method is simple and has modest data requirements. The separate poverty lines estimated for each group or region reflect the differences in regional costs of living as well as in food preferences. However, regions may differ with respect to their standard of living and their food preferences may then also be different. People living in

richer regions generally have more expensive tastes and, therefore, will buy fewer calories per unit of currency than will people living in poorer regions. Thus, the food poverty line for the richer regions will be higher than that for the poorer regions. The FEI method violates the consistency requirement of a poverty line. This may lead to a situation where the richer regions are reported to have a higher incidence of poverty than the poorer regions. The FEI method cannot separate the effect of differences in regional costs of living from that of differences in living standards across the regions. To separate the two effects, regional costs of living indices are needed. This issue is taken up later in this paper.

## VI. COUNTRY EXAMPLES USING THE FEI METHOD

28. Despite its serious violation of consistency, FEI is still the main method used in many countries to establish poverty lines. This section provides a brief evaluation of some examples in South Asia.

### A. India

29. India was probably the first country to use the FEI method for its poverty lines. The process of constructing poverty lines began in 1962 by a distinguished working group set up by the Planning Commission, Government of India.<sup>3</sup> This working group arrived at poverty lines of Rs20 and Rs25 per capita per month for rural and urban areas, respectively. The group did not strictly relate these norms to nutritional requirements. Later, Dandekar and Rath (1971) estimated rural and urban poverty lines using the FEI method. The official Indian poverty line came into existence in 1979, when the report of Task Force on Projections of Minimum Needs and Effective Consumption Demand was published. The Task Force recommended separate poverty lines for urban and rural areas. These poverty lines were estimated utilizing the 28<sup>th</sup> Round (1973–1974) national standards survey data by applying inverse linear interpolations to the data on average per capita monthly expenditure and the associated calorie contents of respective food items separately for rural and urban areas.

30. The Task Force felt that the rural population would require a minimum of 2,435 calories per person per day, and the urban population would require a minimum of 2,095 calories per person per day. The different calorie norms were suggested because it was perceived that people in rural areas tended to do more physical work than people in urban areas.

31. A single poverty line was suggested for all persons in rural (or urban) areas. Thus, it was assumed that every individual in rural (or urban) areas had exactly the same calorie requirements. However, calorie requirements do vary from person to person, depending on age, sex, climatic conditions, etc. Applying an average calorie norm to every individual gives biased estimates of poverty incidence because all individuals do not have the same caloric needs.

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<sup>3</sup> The Working Group consisted of Professor D. R. Gadgil, Dr. M. N. Ganguli, Dr. P. S. Lokanathan, M. R. Masani, Ashok Mehta, Pitamber Pant, Professor V. K. R. V. Rao, Sriman Narayan, and Anna Sahib Sahasrabuddhe.

32. The Task Force estimated that on average, a total expenditure of Rs49.09 per capita per month in 1973–1974 prices satisfied a calorie requirement of 2,435 per capita per day in the rural areas and Rs56.64 per capita per month satisfied a calorie requirement of 2,095 per capita per day in the urban areas. The per capita food expenditure in the rural and urban areas would be Rs39.4 and Rs42.6 per month, respectively.

33. In order to maintain consistency, the difference in calorie costs between rural and urban areas should be entirely attributable to difference in food costs between the two areas. The costs per calorie in rural and urban areas were estimated to be Rs0.54 and Rs0.68, respectively, implying that food costs in the urban areas were about 26% higher than in rural areas. However, Deaton (2001) showed that urban food prices on average are about 15% higher than rural food prices. This clearly suggests that the poverty line adjusted for prices is higher in urban areas than in rural areas. Thus, the poverty line in India is clearly not consistent in the sense that a household with a per capita expenditure equal to the poverty line in urban areas has a higher standard of living than a household with a per capita expenditure equal to poverty line in rural areas. It follows that poverty in urban areas is not comparable with poverty in rural areas, which implies that poverty incidence cannot be calculated at the national level. Despite this, the Planning Commission still produces national estimates of poverty.

34. How does the inconsistency in the poverty line affect poverty incidence? The proportions of poor in urban and rural areas in 1999–2000 according to Planning Commission estimates were 23.5% and 27%, respectively. Deaton (2001) made the appropriate adjustment to costs of living differences between urban and rural areas and calculated that the proportions of poor were only 9.5% and 21.5%, respectively. The official poverty estimate exaggerated the incidence of poverty, particularly in urban areas.

35. The Indian poverty line was computed on the basis of the 1973–1974 food consumption basket. The poverty line needs to be updated for changes in price levels relevant to the consumption of people around the poverty line. This updating can be done in two ways.

- (i) The poverty line as estimated for the base year (1973–1974) can be updated using consumer price indices.
- (ii) A fresh poverty line can be calculated from the latest available consumer expenditure survey using the FEI method.

36. These two methods can give vastly different results. The first method allows for changes in prices while keeping the consumption basket associated with the poverty line in the base year constant. Thus, the method keeps the real poverty line constant over time and, therefore, provides consistent (or comparable) poverty estimates over time. The second method allows for changes in prices as well as in the contents of the consumption basket, provided that the food items meet the calorie norms. If there has been a change in consumption behavior because of a shift in consumer preference, this method could produce a quite different poverty line. Consumption behavior can change over time if a country has enjoyed rapid economic growth, which shifts the real poverty line upwards. The incidence of poverty would show an apparent increase despite the fact that everyone has become better off. Thus, the second method does not give

poverty estimates that are comparable over time. The Indian poverty line is updated using the first method, which is a legitimate procedure.

37. Until the early 1990s, India had two official poverty lines, for rural and urban areas, respectively. Given India's size and diversity, a single poverty line for the entire rural area and another for the entire urban area is not appropriate because of regional differences in costs of living. Realizing this deficiency, the Expert Group appointed by the Planning Commission in 1993 suggested the creation of state-specific poverty lines. To accomplish this task, it was necessary to estimate the spatial price indices that would measure the costs of living differences across the states. The state-wise spatial price indices were calculated based on the observed all-India consumption patterns of the 20–30% of the population around the poverty line in 1973–1974, which constituted the weighting diagram of each state. The cost of living indices for each state were then computed separately for rural and urban areas using the state prices. The all-India rural poverty line of Rs49.63 at 1973–1974 prices was adopted as the base, which, adjusted for the state-wise rural costs of living indices, provided the rural poverty lines for each state. A similar exercise was done for urban areas using the all-India urban poverty line of Rs56.76 for the 1973–1974 base year. The poverty lines for subsequent years were computed using state-specific consumer price indices that are available separately for urban and rural areas. Table 2 presents the state poverty lines for 1973–1974, 1993–1994, and 1999–2000.

**Table 2: Indian State Poverty Lines, in Rupees**

	Rural			Urban		
	1973–1974	1993–1994	1999–2000	1973–1974	1993–1994	1999–2000
Andhra Pradesh	41.71	163.02	262.94	53.96	278.14	457.40
Assam	49.82	232.05	365.43	50.26	212.42	343.99
Bihar	57.68	212.16	333.07	61.27	238.49	379.78
Gujarat	47.10	202.11	318.94	62.17	297.22	474.41
Haryana	49.95	233.79	362.81	52.42	258.23	420.20
Him.Pradesh	49.95	233.79	367.45	51.93	253.61	420.20
J&K	46.59	233.79	367.45	37.17	253.61	420.20
Karnataka	47.24	186.63	309.59	58.22	302.89	511.44
Kerla	51.68	243.84	374.79	62.78	280.54	477.06
Madhya Pradesh	50.20	193.10	311.34	63.02	317.16	481.65
Maharashtra	50.47	194.94	318.63	59.48	328.56	539.71
Orissa	46.87	194.03	323.92	59.34	298.22	473.12
Punjab	49.95	233.79	362.68	51.93	253.61	388.15
Rajasthan	50.96	215.89	344.03	59.99	280.85	465.92
Tamil Nadu	45.09	196.53	307.64	51.54	296.63	475.60
U.P.	48.92	213.01	336.88	57.37	258.65	416.29
W.B.	54.49	220.74	350.17	54.81	247.53	409.22
All India	49.63	205.84	327.56	56.76	281.35	454.11

Source: Planning Commission, Government of India 1993.

38. Poverty lines do vary across states. The differences are entirely attributed to the differences in costs of living in different states, which ensures comparability of poverty estimates across the states. It is obvious that if a single rural (or urban) poverty line for all states were used, the state and national poverty estimates would be highly biased. Comparison of poverty estimates over time would not be valid because people living in

different states face different inflation rates. Hence, the new methodology, adopted by the Expert Group, produces superior rural and urban poverty estimates. It is unfortunate that the Expert Group did not address the issue of comparability of poverty estimates between rural and urban areas. A serious implication of this neglect is that national poverty estimates (such as head count ratio), which are obtained as the weighted average of rural and urban poverty estimates, cannot be computed. This is because India uses different price indices for urban and rural areas. The two poverty lines deviate because inflation rates in urban and rural areas are different.

## **B. Pakistan**

39. Pakistan's Planning Commission also uses the FEI method to estimate its poverty lines, which are based on a calorie requirement of 2,550 calories per equivalent adult per day for both rural and urban areas. The recommended level of calorie intake is converted into a food poverty line by using the calorie food consumption function—regressing calorie intake on food expenditure and identifying the expenditure consistent with the required level of calorie intake. Rural and urban poverty lines are constructed separately. As pointed out earlier, the FEI method does not give consistency between rural and urban areas because it does not keep the same real poverty line across the two areas. The poverty line in urban areas will most likely be higher than in rural areas; consequently the incidence of poverty in urban areas will be overestimated.

40. Indian poverty lines are updated over time using separate urban and rural consumer price indices. In Pakistan, poverty lines are updated using the calorie food consumption function in each period. Prices are not used in updating the poverty lines. This means that poverty lines in Pakistan are not consistent over time; meaningful comparison of poverty incidence in different periods cannot be made.

41. On the basis of the Planning Commission's poverty lines, the proportion of poor in Pakistan increased at the national level by 2.9% annually between 1993–1994 and 1996–1997, the increase being 4.8% in urban areas and 2.4% in rural areas (Table 3). If the poverty line in 1996–1997 is updated by the rate of inflation measured by the consumer price index, the proportion of poor is seen to decrease at an annual rate of 0.3% at the national level. The urban areas show an average annual decline of 9.5% in the proportion of poor, while in rural areas there is an annual increase of 2.6% (Table 3). Thus, the two methods of measuring poverty give dramatically different results. The correct procedure to update the poverty lines is by the consumer price index, which maintains the real poverty line over time. As pointed out, the FEI method-based regression model cannot separate the effect of change in prices from effect of change in the standard of living and, therefore, overestimates the poverty line in the terminal year, resulting in biased estimates of changes in the incidence of poverty over time. The Pakistan poverty line is neither consistent over time nor over regions and areas.<sup>4</sup>

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<sup>4</sup> Pakistan has recently adopted a new official poverty line of PRs670 per person per month in 1998–1999 prices. The poverty line will be applied to both rural and urban areas. It will be a consistent poverty line only if the food and nonfood costs of living are the same in both rural and urban areas, which is very unlikely. Thus, Pakistan's new official poverty line is also not consistent.

**Table 3: Poverty Line and Proportion of Poor in Pakistan**

<b>Variable</b>	<b>1993–1994</b>	<b>1996–1997</b>	<b>Annual Change (%)</b>
<b>Official Poverty Line (PRe)</b>			
Urban	463	668	11.1
Rural	384	567	11.9
<b>Proportion of Poor Based on Official Poverty Lines (%)</b>			
Urban	27.4	32.6	4.8
Rural	35.8	39.2	2.4
Whole country	33.3	37.2	2.9
<b>Inflation-adjusted Poverty Line (PRe)</b>			
Urban	463	648	10.0
Rural	384	538	10.0
<b>Proportion of Poor Based on Inflation-adjusted Lines (%)</b>			
Urban	27.4	17.0	-9.5
Rural	35.8	39.5	2.6
Whole country	33.3	32.8	-0.3

Source: Author's calculations.

## VII. THE COST OF BASIC NEEDS

42. Rowntree's (1901) approach to specifying poverty lines based on the concept of "physical efficiency" measures poverty in terms of lack of command over basic consumption items that are essential for maintaining physical efficiency. This approach is now called the cost of basic needs (CBN) method of setting poverty lines (Ravallion and Bidani 1994). The poverty line is the sum of food and nonfood costs in a basic consumption basket.

### A. Food Poverty Line

43. The first step in the construction of a food poverty line is to determine the calorie requirements of people of different age and sex. These calorie requirements are generally available from nutritional authorities. The calorie requirements of the Thai population, shown in Table 4, were obtained from Thailand's Ministry of Public Health.

**Table 4: Calorie Requirement per Day by Age and Sex in Thailand**

<b>Age</b>	<b>Male</b>	<b>Female</b>
1–3 years	1,200	1,200
4–6 years	1,450	1,450
7–9 years	1,600	1,600
10–12 years	1,850	1,700
13–15 years	2,300	2,000
16–19 years	2,400	1,850
20–29 years	2,787	2,017
30–59 years	2,767	2,075
60 years and more	1,969	1,747

Source: Thailand's Ministry of Public Health.

44. It can be seen that calorie requirements vary substantially with age and sex. Children need fewer calories than adults. Also, males require considerably more calories than do females. Most studies on poverty specify a single calorie requirement for everyone in the population (for instance 2,100 calories per person per day). In this approach, for example, the incidence of poverty will likely be overestimated among families with children and underestimated for couples without children.

45. Having determined the calorie requirements of people of different age and sex, the next task is to find the food basket that would meet these requirements. There can be several food baskets that meet individuals' nutritional needs. One can obtain such a basket using the linear programming technique to calculate the cheapest sources of food meeting the nutritional requirements. This approach is not advisable because the solution from the linear programming model may not be compatible with the consumption pattern of the population. For the food basket to be realistic, it should reflect the consumption pattern of the population. The determination of such a basket is discussed below.

46. If  $\mathbf{q}$  is the quantity vector for a given food basket and  $\mathbf{c}$  is a vector that converts quantities of food into calories, then, denoting  $\mathbf{c}'$  as the transpose of vector  $\mathbf{c}$ ,  $\mathbf{c}'\mathbf{q}$  is the total number of calories that would be obtained from this basket. Further, if  $\mathbf{p}'$  is the transpose of the vector for prices for the given food basket, the total cost of the basket is  $\mathbf{p}'\mathbf{q}$ . Then the cost per calorie,  $m$ , is given as

$$m = \mathbf{p}'\mathbf{q} / \mathbf{c}'\mathbf{q}.$$

47. It is obvious that the different baskets will give different calorie costs. A food basket with expensive items will give fewer calories than that with cheaper food items. Rich people tend to have a more expensive food basket than poor people.

48. The per capita food poverty line of a household is calculated by multiplying the per capita calorie requirement of a household by  $m$ . Clearly, different households will have different per capita food poverty lines.

49. Determination of the food poverty line depends critically on the calorie cost, which needs to be estimated for every group or region. The following methodology is proposed (Kakwani and Son 2001).

50. Suppose there are  $k$  regions or areas within a country, and

$\mathbf{q}_i$  is the vector of quantities of the food basket in the  $i$ th region; and  
 $\mathbf{p}_i$  is the vector of food prices in the  $i$ th region, then

$$m_{ij} = \mathbf{p}_j' \mathbf{q}_i / \mathbf{c}' \mathbf{q}_i.$$

This is the calorie cost that would be incurred by consuming the  $i$ th region food basket at the food prices of the  $j$ th region, where  $i$  and  $j$  vary from 1 to  $k$ . The calorie cost of the  $i$ th region is  $m_{ii}$ , which will vary across regions for two reasons. First, the regional food costs are different. The calorie cost will be higher in more expensive (higher food cost) regions. Secondly, the standard of living varies across the regions. The people in richer

regions tend to have more expensive food tastes, resulting in a higher per-calorie cost. Thus,  $m_{ii}$  estimated separately for each region cannot be used to estimate the region's food poverty line because the effect of prices cannot be separated from the effect of standard of living, which, as argued earlier, can give rise to a situation where the richer regions have a higher real food poverty line than the poorer regions thus, violating the basic consistency property of absolute poverty lines.

51. It has been argued that the choice of the basic needs basket should take account of the people's consumption patterns in each region. Ravallion and Bidani (1994) call this specificity, which implies that there should be a separate food basket for each subgroup or region. Yet, this would violate the consistency of the poverty lines in terms of maintaining a constant standard of living across the regions. Thus, there can be a conflict between consistency and specificity.

52. In estimating the calorie cost, a control is needed for regional differences in the standard of living. One method of control is to determine the region-specific food baskets that yield the same number of calories and the same level of utility. Suppose that all regional food baskets  $\mathbf{q}_i$  have been normalized to yield the same number of calories  $R$  given by

$$R = \mathbf{c}'\mathbf{q}_i \text{ for all } i \quad (2)$$

and  $u(\mathbf{q}_i)$  is the utility level (standard of living) an individual living in the  $i$ th region derives (enjoys) by consuming the  $\mathbf{q}_i$  basket, which is different for different regions and, therefore, reflects the consumption pattern of the  $i$ th region, then if

$$u(\mathbf{q}_i) = u_z \text{ for all } i = 1, 2, \dots, k \quad (3)$$

where  $u_z$  is the utility level that is enjoyed by a person on the food poverty line, and which is the same for every region, then the food poverty line for the  $i$ th region, will be given by the cost function

$$z_{fi} = e(\mathbf{p}_i, u_z) \quad (4)$$

which is the minimum food cost that a household incurs in order to enjoy the  $u_z$  level of utility. The latter can be interpreted as the standard of living of a household on the food poverty line. Equation (4) implies that if a control is made for the standard of living, the differences in food poverty lines are entirely because of regional price differences. In other words, if two regions have the same price vectors, they should have the same food poverty lines. From this, it is obvious that if the two regions have the same price vectors, they will have the same calorie cost.

53. If the regional food baskets satisfy requirements (2) and (3), then  $m_{ii}$  estimated separately for each region can legitimately be used to estimate the food poverty line for each region because different baskets are used for each region while the same standard of living (measured by  $u_z$ ) in each region is maintained. This procedure is not empirically feasible. We cannot determine a  $\mathbf{q}_i$  for each region that would satisfy requirement (3) unless  $\mathbf{q}_i$  is the same for all regions. Thus, it is impossible to satisfy both consistency and specificity requirements of poverty lines. What is the solution?

54. Kakwani and Son (2001) have proposed an alternative to estimate the  $j$ th region's calorie cost by the following averaging method.

$$\log m_j = \sum_{i=1}^k f_i \log(m_{ij}) \quad (5)$$

where  $m_i$  and  $f_i$  are the calorie cost and population share of the  $i$ th region, respectively.

55. As argued, the regional differences in calorie costs should be entirely attributed to differences in regional costs of living. This implies that if any two regions have the same price vectors for food, they should give the same calorie cost. This requirement is indeed satisfied by the calorie cost given in (5). Another attractive feature of this method is that the weight given to the standard of living of a region is proportional to the population of that region, which means that every person in the society is given the same weight irrespective of where the person resides. Then, multiplying  $m_j$  by the required calories ( $R$ ) gives the food poverty line for the  $j$ th region.

56. This method controls for regional differences in the standard of living by fixing the real calorie cost across the regions, but satisfies the specificity requirement only partially. The regional calorie costs are determined by the weighted average of the costs of baskets in different regions, where the weight is proportional to the region's population so that specificity is satisfied partially. Thus, Kakwani-Son's proposed method, which can easily be made operational, addresses to some extent the conflict that can arise between consistency and specificity.

57. There is an alternative method, based on constructing an average national basket, given by

$$\mathbf{q}^* = \sum_{i=1}^k f_i \mathbf{q}_i \quad (6)$$

in which the average national basket is the weighted average of individual regional baskets. Then, the calorie cost of the  $i$ th region is given by

$$m_{ij}^* = \mathbf{p}_j' \mathbf{q}^* / c' \mathbf{q}^* \quad (7)$$

which, on multiplying by the required calories ( $R$ ), gives the food poverty line for the  $i$ th region. Note that the consistency requirement is satisfied because if any two regions have the same food price vectors, the calorie costs in these regions will be the same. The specificity issue is satisfied partially because an average national basket is used for calculating the calorie cost. Empirical analysis shows that the Kakwani-Son and the national basket method in (6) give almost identical results; both satisfy the basic property of consistency. Thus, either of the two methods may be used.

58. Ravallion (1998) proposed a method of addressing the specificity issue. He suggested that a food basket for each region based on the average consumption of a reference group fixed nationally in terms of per capita expenditure, be determined. The reference group could be selected from people in the third decile nationally, ranked in terms of per capita income or expenditure. This method assumes that all persons who belong to the third decile nationally enjoy the same standard of living but have different

consumption patterns because of they live in different regions. Thus, the approach fixes the standard of living but not the composition of the food basket in each region. This approach has a serious problem. Although the people that fall in the third decile may have the same per capita income or expenditure—which is also doubtful because they live in different regions—they face different costs of living. Consequently, their standard of living is not the same. Thus, this approach also violates the consistency requirement of poverty lines.

## **B. Nonfood Poverty Line**

59. The determination of a nonfood poverty line is more difficult than that of a food poverty line. Only those nonfood items that are deemed absolutely essential should be included.

60. One approach is to specify some nonfood items of consumption that are deemed essential, for instance, adequate clothing, shelter, education, and medical services. However, this approach, which can be viewed as arbitrary and subject to controversy, is generally not used. Although the concept of poverty is subjective, its measurement should be as objective as possible in order to make poverty comparisons over time and across socioeconomic and demographic groups. Thus, the following approach, based on Engel's law, is suggested.

61. Suppose  $\mathbf{q}$  is the quantity vector of food basket, purchasable at price vector  $\mathbf{p}$ . The total poverty line ( $z$ ) can be expressed as

$$z = \mathbf{p}'\mathbf{q}/h$$

where  $h$  is the proportion of total expenditure spent on food. To measure poverty in the United States, Orshansky (1965) specified  $h$  to be equal to 0.33, which is equivalent to saying that the poor households should spend about 33% of their total expenditure on food.

62. This procedure is based on the famous Engel's law, which states that households that spend the same proportion of total expenditure on food enjoy the same level of standard of living. This law must hold only if households face the same relative prices of food and nonfood items. If  $h$  were fixed at a time, it would imply that poverty is completely insensitive to the prices of the nonfood basket. This would cause problems when poverty is measured over time (even across regions and areas).

63. In the determination of the nonfood component of the poverty lines, it is essential to take into account the differences in food and nonfood prices in different regions and areas. The value of  $h$  should not be the same for all regions and areas. Its value should vary across regions depending on the relative food and nonfood prices in different regions. Fixing the value of  $h$  for one region in a certain period immediately gives the nonfood poverty line for that region (from the region's food poverty line). The nonfood poverty line for other regions can then be estimated using the nonfood costs of living indices for different regions. This procedure ensures that the real nonfood poverty line is the same in all regions.

64. Fixing the food to total expenditure ratio at a certain value may be regarded as ad hoc. Ravallion (1998) suggested estimating the nonfood poverty line using the idea

that if a person's total income is just enough to reach the food threshold, anything that this person spends on nonfood items can be considered to be basic nonfood needs. The idea is quite attractive and can be implemented easily. According to this idea, the nonfood poverty line is the household's nonfood expenditure at which the household's total expenditure is equal to the food poverty line. At this point, the household's income is just sufficient to buy only the nutritionally adequate food basket and any expenditure a household incurs on nonfood would be absolutely essential expenditure. This defines the nonfood poverty line as the absolutely essential expenditure on items other than food.

65. Because the food poverty line proposed above varies across households, even within regions, it is not possible to use Ravallion's approach to calculate the Engel ratio. The following modification is proposed.

- (i) First, calculate the food welfare of a household, defined as the per capita household income multiplied by 100, divided by the household-specific per capita food poverty line.
- (ii) Arrange the households in ascending order of food welfare using the household survey data.
- (iii) Select the households whose food welfare lies between 90 and 110.<sup>5</sup>
- (iv) Calculate the ratio of food to total income for the individuals belonging to these households, which yields the nonfood poverty line.

66. Thus, the proposed poverty line is sensitive to changes in both food and nonfood prices. This procedure ensures that the real food and nonfood poverty lines will be constant across all regions and areas, resulting in consistent poverty lines. However, the procedure requires regional nonfood costs of living indices, which need to be estimated. This estimation procedure is discussed in the next section.

67. Ravallion and Bidani (1994) proposed the use of a regression model in order to estimate the nonfood component of the poverty line. Their model takes the form

$$h_i = \mathbf{a} + \mathbf{b} \ln\left(\frac{y_i}{z_i^f}\right) + \sum_{j=1}^n \mathbf{f}_j D_{ij} + x_i \mathbf{p} + \mathbf{n}_i$$

where  $h_i$  is the food share of household expenditure for  $i$ th household,  $y_i$  is the per capita consumption expenditure of the  $i$ th household,  $z_i^f$  is the food poverty line for the  $i$ th household, and  $x_i$  is the vector of other exogenous variables (for example, demographic variables). Because nonfood prices were unavailable, they introduced dummy variables for regions and urban and rural areas to capture differences in relative prices, differences in the level of public services, and other differences that were not observed. They used this model to estimate the Engel ratio separately for each region and areas by means of the regional and area dummy variables. Given the region-specific food poverty lines and the Engel ratios for each region, the total poverty lines for each region

<sup>5</sup> According to Ravallion, selected households should have an income equal to the food poverty line, which means households at the point where the household food welfare is equal to 100. Since it is impossible to calculate the ratio of food expenditure to income at a point, it is reasonable to select a range in the neighbourhood of 100, here a range of 90 to 110 was chosen.

can be obtained (by dividing the food poverty line by the Engel ratio for each region). Is this procedure legitimate?

68. The regional dummy variables capture the effect of relative regional costs of living as well as other factors that affect the household standard of living. The model cannot separate the effects of regional costs of living from the other variables in the absence of regional cost-of-living indices. To obtain a consistent set of regional poverty lines, it is essential to know the spatial price indices for both food and nonfood items of consumption. No regression model can solve the problem if the values of these indices are unknown.

## VIII. WHAT IS THE BEST PRACTICE FOR SETTING A POVERTY LINE?

69. The previous sections evaluated the alternative methodologies of setting a poverty line in several Asian countries, which showed that poverty lines used in many countries are not consistent. This section lays down the various steps involved in the construction of a consistent and empirically feasible poverty line.

### Step 1: Specifying the Calorie Requirement

70. Most studies on poverty specify the same calorie norms for everybody in the population. For instance, 2,100 calories per person per day has been used in the Lao People's Democratic Republic and 2,550 in Pakistan. Variation in calorie requirement with age and sex has been addressed in, for example, Thailand (see Table 4). These requirements are generally available for each country.

71. From surveys, the age and sex of all persons within the household are known. These data are used to calculate the per capita calorie requirement of each sampled household, using the country-specific calorie requirements given by age and sex.

### Step 2: Cost of Calories

72. To calculate the cost of calories, a food basket representative of the population of the poor must be specified. At this stage, the proportion of the population that is poor is unknown. As a first approximation, the basket of the population that belongs to the lowest 30% or 40% of the national population ranked by per capita consumption is chosen. This basket gives expenditure on each food item, which provides the total cost of the basket.

The next step is to calculate the calories that would be obtained from this basket. This can be calculated from the quantities of each food item in the basket (determined by dividing the expenditure on each item by its average market price). The calorie conversion factors for each food item are usually available from the country's nutritional authorities. Given these conversion factors, the total number of calories that would be obtained from the food basket can be calculated. The calorie cost is then calculated as equal to the total cost of the basket divided by the total number of calories obtained from the basket. This is the calorie cost at the national level.

### Step 3: Construction of Spatial Price Indices

73. Suppose there are three regions and six commodities. Of these six commodities, suppose four are food (cereals, milk and milk products, vegetables, and other food) and two are nonfood (clothing and other nonfood). A national basket, corresponding to the consumption pattern of the lowest 30% or 40% of the population, has been determined. As a first approximation, it is assumed that this national basket represents the consumption pattern of the poor in the population. The budget shares provided by the national basket are presented in Column 2 of Table 5. The average prices of the six commodities in the three regions are given in the last three columns (which are obtained from market surveys and are collected by national statistical offices). Column 3 gives the average national prices of the commodities, which are the average of prices in the three regions (obtained by averaging the regional prices given in columns 4, 5, and 6).

74. Given the average prices for each region and the national average prices of each commodity, the regional price indices are calculated. These are the commodity prices in each region as a percentage of average national prices, which set the national price indices of each commodity at 100. The regional price indices are presented in Table 5. The weighted averages of the regional price indices (with the weights proportional to the budget shares in the national basket) provide the regional spatial price indices relative to the national price level. These spatial price indices are computed separately for food, nonfood, and total food and nonfood. It can be seen that, for instance, the spatial food price index in region 1 is 117, which implies that food prices in region 1 are 17% higher than the national food prices. In nonfood prices, region 1 is 3% cheaper than the national nonfood prices.

**Table 5: Calculation of Spatial Price Indices**

Commodity	National Basket	National Average Prices	Average Prices by Regions		
			1	2	3
Cereals	35	37	40	30	40
Milk and milk products	10	33	50	20	30
Vegetables	10	33	20	50	30
Other food	15	33	50	30	20
Clothing	5	15	20	10	15
Other nonfood	25	17	15	20	15
<b>Regional Price Indices</b>					
Cereals	35	100	109	82	109
Milk and milk products	10	100	150	60	90
Vegetables	10	100	60	150	90
Other food	15	100	150	90	60
Clothing	5	100	133	67	100
Other nonfood	25	100	90	120	90
<b>Spatial Price Index</b>					
Food	70	100	117	90	93
Nonfood	30	100	97	111	92
Total	100	100	111	96	93

Source: Author's calculations.

75. Note that this methodology of computing spatial price indices is fairly easy to implement. The average market prices of disaggregated commodities are known, which is usually the case. Many studies compute the spatial price indices using expenditure surveys that collect data on both expenditure and quantity. For each recorded purchase of each commodity, a unit value is calculated by dividing the reported expenditure by the reported quantity. Thus, each household has a different unit value. Deaton and Tarozzi (2000) used the median unit value for each region to compute spatial price indices.

76. There are two problems with the use of unit values. First, the quantities are not available for a large number of nonfood items of consumption. Thus, spatial nonfood price indices, which are needed to obtain consistent nonfood poverty lines, cannot be calculated. Secondly, unit values are affected by the choice of quality. The richer households tend to buy superior quality so they pay more for the same good. For instance, “a kilo of the best steak costs a great deal more than does a kilo of stewing beef” (Deaton and Taroxxi 2000, p. 288). If the richer regions pay higher prices because of superior quality, their poverty line, when adjusted for prices, will be higher, implying a higher incidence of poverty there. The result may be inconsistent poverty lines. Hence, in the construction of poverty lines, it is preferable to use market prices.

#### **Step 4: Food Poverty Lines for Regions**

77. Suppose that the cost of 1,000 calories at the national level is Rs5.5 (step 2), then the per-month food poverty line at the national level is Rs346.5 ( $2,100 \times 30 \times 5.5/1,000$ ). This per-month food poverty line satisfies the requirement of 2,100 calories per person per day at the national level. The food poverty line for each region is then determined by scaling up the national food poverty line in proportion to the spatial price index. Thus, the food poverty lines for regions 1, 2, and 3 in Table 5 are Rs404.3, Rs312.5 and Rs322.7, respectively (Table 6).

#### **Step 5: Nonfood Poverty Line**

78. The nonfood poverty line is the household’s nonfood expenditure at which the household’s total expenditure is equal to the food poverty line. To calculate the nonfood poverty line at the national level, first calculate the Engel ratio following the four steps described in the previous section.

79. The nonfood poverty line at the national level is then calculated as equal to the national nonfood poverty line divided by the Engel ratio. Suppose the nonfood poverty line at the national level is estimated at Rs150 per month. To calculate the nonfood poverty line in each region, the national nonfood poverty line of Rs150 per month is scaled up in proportion to the spatial price index for nonfood as calculated in step 3. This gives nonfood poverty lines for regions 1, 2, and 3 as Rs145.8, Rs166.7, and Rs137.5, respectively (Table 6). The total poverty line in each region is the sum of the food and nonfood poverty line. The last row in Table 6 gives the Engel ratios. The ratio varies from one region to another depending on the relative food and nonfood prices in each region.

**Table 6: Calculation of Hypothetical Food and Nonfood Poverty Lines**

	National	Region 1	Region 2	Region 3
Food poverty line (Re)	346.5	404.3	312.5	322.7
Nonfood poverty line (Re)	150	145.8	166.7	137.5
Total poverty line (Re)	496.5	550.2	479.2	460.2
Engel ratio	69.8	73.5	65.2	70.1

Source: Author's calculations.

### Step 6: Updating the Poverty Line

80. The updating of poverty lines over time should be done using the consumer price indices for each region. The construction of poverty lines takes account of relative food and nonfood prices. The separate food and nonfood consumer price indices for each region should be used for updating the poverty lines.

## IX. THE ONE-DOLLAR-A-DAY POVERTY LINE

81. In order to make international comparisons of poverty, the World Bank's World Development Report 1990 chose the \$1-a-day standard, measured in 1985 international prices and adjusted to local currency using purchasing power parity (PPP). PPP exchange rates, such as those from the Penn World Tables, are used because they take into account the local prices of goods and services that are not traded internationally. But PPP rates were not designed for making international poverty comparisons; they were mainly designed for comparing aggregates from national accounts. As a result, there is no certainty that an international poverty line measures the same degree of deprivation across countries.

82. \$1-a-day is an arbitrary poverty line. The World Bank researchers chose it to make rough-and-ready international comparisons. It became popular because of its simplicity. However, a poverty line specifies a society's minimum standard of living to which everybody in that society should be entitled. It is a concept that is very country specific. Every society has its own views on what constitutes a minimum standard of living. Moreover, calorie requirements differ from one country to another, so the imposition of \$1-a-day standard on every country may not be sufficient to satisfy the country-specific minimum calorie requirements.

83. In order to make international comparisons of poverty, an international poverty line is needed that to some extent corresponds to the socially accepted minimum standard of living in the countries being compared. The World Bank claims that the \$1-a-day (in constant 1985 PPP dollars) poverty line is typical of prevailing poverty lines in low-income countries, while for middle-income countries, a \$2-a-day poverty line may be more appropriate.

84. In the 1990 World Development Report, the World Bank used the following steps to produce international poverty estimates.

- (i) The \$1-a-day poverty line was converted to local currency using 1985 exchange rates obtained from the Penn World Tables, which gave a comparable poverty line in local currency in each country in 1985.
- (ii) The 1985 poverty line was updated to the survey year using the best available consumer prices in the country (different countries have different survey years).
- (iii) The updated poverty lines were then applied to the distribution of consumption per person obtained from country-specific household surveys to calculate the proportion of poor in each country.
- (iv) The number of poor was calculated for each country, using population projections.
- (v) Finally, world and regional poverty counts were obtained by adding the number of poor across countries.

85. The World Bank's estimates of the number of poor are widely quoted by policymakers, academics, and international organizations. The earlier estimates were based on 22 household surveys, one for each of 22 countries, and model-based extrapolations for other countries (Ravallion 2001). The World Bank has since expanded the database, providing nearly 300 surveys conducted in some 90 countries. It is now possible to measure the change in international poverty over time.

86. The World Bank has also made improvements in PPP exchange rates for consumption. These rates are superior to the earlier ones in terms of coverage of countries and are based on price and consumption baskets collected by the 1993 International Comparison Project (ICP). The new PPP conversion rates are now available for 110 countries, while the earlier Penn World Tables provided the PPP rates for only 60 countries. The two sets of PPP are not comparable with each other.

87. While the new and improved PPP for 1993 are welcome, they also raise some difficulties. A question that arises is: what should be the poverty line in 1993 PPP dollars that is comparable with \$1-a-day poverty line in 1985 PPP dollars? The inflation rate in the United States between 1985 and 1993 was roughly about 50% (about 5.5% per annum), meaning that the \$1-a-day poverty line in 1985 would be equivalent to \$1.50 a day in 1993, which, as Ravallion (2002) correctly points out, is well above the median of the 10 lowest poverty lines. Thus, it would cease to be a poverty line typical of the poor countries. Consequently, the World Bank determined a new poverty line of \$1.08 per day at 1993 prices, which is the median of the lowest 10 poverty lines. In its calculations of global poverty, the World Bank has recalculated the number of poor based on this new poverty threshold, which is still referred to as the \$1-a-day poverty line (Chen and Ravallion (2000).

88. How do the new estimates differ from the earlier estimates? Chen and Ravallion (2000) showed that although the aggregate head count ratio did not differ much in the two methods, there were notable differences in the regional composition of poverty. The change of methodology increased the proportion of poor in subSaharan Africa from 39.1% to 49.7%, while in Latin America, the proportion of poor fell from 23.5% to 15.3%. In the Middle East and North Africa, the proportion of poor decreased from 4.1% to

1.9%. Chen and Ravallion (2000) argued that these changes in poverty count are largely because of the changes in PPP exchange rates. The new method also gave different results on the magnitude of poverty reduction during the comparable period of 1987–1993.

89. The conflicting results that emerge by using different PPP exchange rates raise an important question: is it really possible to make legitimate international comparisons of poverty? To be able to make cross-country poverty comparisons, it is essential to have a poverty line that is consistent between countries. Putting it differently, two individuals on the poverty line should have exactly the same minimum standard of living, no matter which country they live in. Fixing the poverty line in US dollars does not guarantee consistency of the poverty line because, in order to compute poverty in each country, the poverty line in local currency must be known. The conversion of the \$1-a-day poverty line to local currency is done by means of PPP exchange rates. If differences in PPP exchange rates are entirely attributable to differences in prices faced by the poor, then the \$1-a-day poverty line will be consistent across countries and legitimate international comparisons of poverty can be made. Unfortunately, PPP exchange rates do not provide poverty lines that are consistent across countries. They were not designed to make international poverty comparisons.

90. Deaton (2001) has expressed a strong concern about producing head count numbers. He argues that “If revisions can have such enormous effects, it is difficult to place much confidence in any set of poverty estimates, either of levels or of changes, even those based on the latest and best set of PPP exchange rates...the World Bank should back away from its current too-concentrated focus on income headcount numbers.” Srinivasan (2001) goes further: “Global counts have little meaning and even less policy relevance. Abandoning them and focusing on national and sub-national poverty analysis that goes beyond headcounts would be sensible course to follow.”

91. Deaton’s and Srinivasan’s concerns about producing international counts of the poor are understandable but abandoning these completely is not desirable. Global poverty estimates can play an important role in monitoring the level of and change in poverty at the global level. It is true that an in-depth analysis of country-specific poverty profiles is more useful for understanding the nature of poverty and for devising poverty reduction strategies than just producing global counts, but global counts can be used as a powerful tool to create political awareness to give priority to poverty reduction. To achieve this awareness, it is essential to produce accurate and credible poverty counts. What is required is to produce PPP rates for the poor that will take account of the consumption patterns of and prices faced by the poor. These PPP rates need to be developed for one period only and then updated for other years using appropriate consumer price indices. Although it is not easy to devise accurate PPP for the poor because of the vast diversity of consumption patterns across countries, organizations such as World Bank can take up this challenging task to arrive at least at a “plausible” PPP that would be widely acceptable.

92. \$1-a-day is a single poverty line for everyone in a country. Yet, we cannot and should not have the same poverty line for all individuals because all individuals are different with respect to their basic needs, and live in different geographical regions facing different prices. In order to achieve horizontal equity, the poverty line should be adjusted for individual circumstances, so that all the individuals on the poverty line have the same standard of living irrespective of their circumstances. A single poverty line,

such as \$1-a-day, would then be highly inconsistent. Hence, poverty estimates obtained within countries would be highly biased, and it follows that global poverty estimates, which are obtained by aggregating the individual country estimates, would also be biased.

93. In Section 8, we presented six steps to construct consistent poverty lines within countries. The poverty estimates based on these poverty lines are not internationally comparable because the real value of average poverty line has not been kept at the same level in each country. The following steps to make country-specific poverty lines comparable across countries are suggested.

**Step 1.** Using the six steps in Section 8, construct poverty lines within each country. These steps provide a per capita poverty line for each sampled household that varies across households depending on the household size and composition, and regional costs of living.

**Step 2.** Calculate the average per capita poverty line for the whole country. This will be equal to the weighted average of the per capita household poverty lines, with weight equal to the population that is represented by each sample household.

**Step 3.** Rescale the per capita poverty line of each household by multiplying it by \$1-a-day poverty line converted to local currency and dividing it by the average per capita poverty line for the whole country as calculated in Step 2. This step will set the average per capita poverty line for the country equal to the international poverty line.

**Step 4.** Calculate the poverty parameters, such as head count ratio, from the rescaled country-specific poverty line.

These four steps provide poverty estimates that are comparable across countries as well as across regions and areas (rural and urban) within countries.

## X. CONCLUDING REMARKS

94. People are defined as poor if they do not have sufficient income to satisfy their minimum basic needs. The poverty line defines the minimum basic needs of the people. This is the threshold income below which one is considered to be poor. Thus, the specification of the poverty line is of crucial importance in identifying the poor.

95. The main focus of this paper has been on explaining the development of absolute poverty lines. The paper has argued that the relative approach based on some notion of relative deprivation is not appropriate for developing countries. In the latter, concern is more with the absolute than the relative standard of living in order to ensure that nobody in the society has a standard of living below the socially accepted minimum.

96. Governments have limited resources for poverty reduction programs. It is important that their programs are targeted to the poor or the neediest in the society. The poverty line should be as accurate as possible so that only genuinely poor are identified for targeting the resources. This paper has discussed various methodologies in an attempt to construct accurate poverty lines.

97. The poverty line specifies a society's minimum standard of living; thus, it should be fixed across all individuals, that is, it should be horizontally equitable. Because all individuals are different with respect to their basic needs, and because they live in different geographical regions facing different prices, there should not be a single poverty line for all individuals. In order to achieve horizontal equity, the poverty line should be adjusted for individual circumstances, so that all the individuals on the poverty line have the same standard of living irrespective of their circumstances.

98. The main contribution of this paper has been to discuss different methodologies to construct poverty thresholds that are consistent in terms of maintaining a fixed minimum standard of living across regions, taking into account to some extent the differences in people's consumption patterns. An evaluation of poverty lines of several Asian countries—India, Pakistan, Bangladesh, Nepal, and Thailand—is presented. It is concluded that most countries in Asia do not have consistent poverty lines and, therefore, identification of genuinely poor may be problematic. These inconsistent poverty lines can lead to highly biased estimates of the incidence of poverty.

99. The poverty line is of critical importance in construction of poverty profiles, which show how poverty varies across various subgroups in a society, such as regions, communities, employment sectors, or households' demographic characteristics. These profiles attempt to answer such questions as what is the nature and extent of poverty? What are the characteristics of the poor? Where do the poor live and what do they do? How is poverty changing over time? What is the impact of various government programs on poverty reduction? It is needless to emphasize the usefulness of these profiles in formulating projects and programs to benefit the poor. The consistency of poverty lines can be critical in obtaining accurate poverty profiles.

100. The poverty profiles constructed on the basis of a poverty line show how much various socioeconomic and demographic groups in a society suffer from income (or consumption) deprivation. As pointed out, lowness of income is not the only deprivation people may suffer. People may suffer deprivation in many aspects of life, such as through unemployment, ill health, lack of education, vulnerability, gender discrimination, and social exclusion. Poverty should be viewed as the deprivation of basic capabilities, of which material deprivation (measured by lowness of income or consumption) is one aspect. The United Nations Millennium Development Goals (MDGs) attempt to capture the multidimensional notion of poverty, which includes deprivation in material as well many other basic capabilities. To be able to formulate poverty reduction strategies, it is important to understand the interrelationship between the various forms of deprivation that people are likely to suffer. The poverty lines identify the poor. Once the persons who are poor or those who are materially deprived are identified, then it is important to know in which basic capabilities and to what degree the poor are deficient compared to the nonpoor. This information is very useful in targeting basic services in e.g., education, health, and nutrition, to the poor.

101. The relationship between income poverty and deprivation in basic capabilities (or lowness of well-being) has seldom been explored. The main reason for this neglect is that household income and expenditure surveys, which form the basis for measuring income or consumption poverty, do not generally contain information to measure well being. For instance, the indicators underlying the MDGs are generally not available in any one survey. These indicators have to be estimated from several data sources, which can vary widely in both scope and quality. Most countries will have great difficulty in

monitoring poverty based on the MDGs. To accomplish this, these countries will need multipurpose surveys that provide information on people's basic capabilities.

102. This paper has also dealt with the issue of making international comparisons. The World Bank produces its estimates of the number of the poor in the world on the basis of \$1-a-day poverty line. But the poverty line is a concept that is very country specific. Every society has its own views on what constitutes a minimum standard of living. Moreover, because calorie requirements differ from one country to another, the imposition of \$1-a-day standard on every country may not be sufficient to satisfy an individual country's specific minimum calorie requirements. An in-depth analysis of country-specific poverty profiles is more useful for understanding the nature of poverty and for devising a poverty reduction strategy than just producing global counts of the poor. The \$1-a-day poverty line is not consistent within or between countries. Suggestions are made for improvement of poverty estimates to be comparable across countries as well as across regions and areas (rural and urban) within countries.

103. A clear message that emerges is that spatial price indices play a key role in the determination of consistent poverty thresholds across regions. In the literature, regression models have been used to estimate region-specific poverty thresholds. It is argued that no regression model can separate the effect of regional costs of living from the effect of standard of living. To obtain a consistent set of regional poverty lines, it is essential to know the spatial price indices for both food and nonfood items of consumption. The poverty literature has given little attention to this issue.

104. The absolute approach to measuring poverty implies that the real poverty line is fixed over time. It should change over time only because of changes in prices. This property implies that the poverty line should be adjusted over time by means of a consumer price index, so the observed differences in the poverty line measure the real change in the poverty line. Most countries do produce a consumer price index but it is usually not constructed to measure poverty. A good idea would be to construct a separate price index for the poor that takes into account their consumption pattern and is also consistent with a particular measure of poverty that needs to be minimized. Such a price index should be published along with the usual consumer price index in order to learn exactly how the poor are affected, relative to the whole population, by rises in prices.

105. One may argue that setting up a poverty line is so complicated that, for simplicity, it would be better to focus on the people in the lowest one or two quintiles. This approach may sound simple, but it is not. The construction of quintiles may be as simple or as complicated as the construction of poverty lines. If the quintiles are constructed by, say, per capita income or consumption, the assumption is made that any two households in the society, if they have the same per capita income (or consumption), enjoy exactly the same standard of living irrespective their circumstances. This assumption cannot be justified because households differ widely with respect to their needs, where they live, and what they do. The poverty line becomes complicated because we make adjustments for these individual household differences. A poverty line can be a simple concept if all these adjustments are not made, but in that case, the result is inconsistent poverty profiles.

106. The Asian Development Bank (ADB) has adopted poverty reduction as its overarching goal. All its loans and technical assistance are expected to contribute to the

reduction of poverty. How can the present paper be useful in designing and preparing a project? This is indeed a critical issue for ADB. There is no readymade formula that can be used to prepare a project. A poverty map is needed and can be constructed if detailed household surveys have been made and the appropriate poverty lines for different regions are known. The poverty line is the most basic parameter for any poverty analysis. With this information, a project can be sited so as to achieve a maximum reduction in poverty. The multipurpose household surveys allow simulation of various scenarios that can help to design a project. The research personnel of ADB should help the project officers make these simulations. At present, project staff use only secondary information on poverty, which is not sufficient to do proper cost-benefit analysis of projects. To formulate and evaluate projects and programs in a way that achieves maximum reduction in poverty within given resource constraints, a deeper understanding of the causes and consequences of poverty is needed. This paper has found that many developing countries in the Asian region have inconsistent poverty lines and that inconsistent poverty lines can lead to erroneous conclusions about the nature of poverty. Thus, it is important that ADB pay special attention to developing consistent poverty lines for its member countries.

107. The methodology for constructing consistent poverty lines is empirically feasible. The following four types of data are needed:

- (i) price data by regions;
- (ii) nutrition requirements of the population;
- (iii) calorie conversion factors; and
- (iv) household expenditure survey results.

These data are available in most countries. To set up a good poverty monitoring system, regular household surveys are needed. Ideally, such household surveys should have modules on health, education, nutrition, employment, family planning, etc., so that the correlates of poverty can be studied. Implementation of the new methodology would not involve much cost and the countries would benefit by having a good poverty monitoring system that can help in formulating effective poverty reduction policies.

108. It may be emphasized that construction of a poverty line need be done only once every 5-10 years. It can be updated for other years using the appropriate consumer price indices. It does not require much more resources to construct a consistent poverty line than to construct an inconsistent poverty line. Good consumer price indices that take account of regional costs of living and consumption patterns of the poor are needed. Most developing countries have the basic price data. The need is only to refine the methodology of computing the appropriate price indices. The best practice of constructing a poverty line, proposed in this paper, is not at all resource intensive. The most difficult task is to convince national governments that the principle of "horizontal equity" is an essential requirement of a good poverty line. Once this is done, the database can be improved so that empirically feasible poverty lines that satisfy this principle can be made. This suggested principle is not new. It has been widely discussed in taxation literature.

109. The poverty line is a country-specific concept. It lays down the minimum requirement that every member of society must have. It may be argued that the poverty line in some sense is a commitment on the part government to provide resources to all those who fall below the poverty line so that nobody remains poor in the society. Thus,

the poverty line should be determined after carefully scrutinizing the resource position of the society, such that the choice of poverty line meets budgetary constraints. Fixing an unrealistically high poverty line that cannot be met by available resources is simply impractical. Placing it at an extremely low level is also dysfunctional because this does not ensure a minimum consumption standard for all. This argument raises an important methodological issue: Should the poverty line be endogenous or exogenous to an economy?

110. If poverty reduction were a luxury good, then obviously a country would indulge in it only if it could afford it. How much of this luxury we would want would depend on the nature of the poverty line—the higher the poverty line, the greater the consumption of this luxury. In this situation, the poverty line would be determined by how much a government could afford (or was willing) to make consumption transfers to individuals below the poverty line. In this case, the poor in a society would be determined endogenously by how much a government could afford or was willing to reduce poverty. This effectively means that the government would decide how much poverty it wanted to have. Thus, poverty would be something arbitrary, like beauty in the eyes of the beholder (Orshansky 1965).

111. Unfortunately, poverty is something real. It is the acute deprivation that people suffer when they cannot enjoy society's absolute minimum standard of living. The absolute minimum standard of living, which determines the incidence of poverty, should be determined exogenously. Policies that progressively reduce the incidence of poverty in the country should then be made. The government could follow a mixture of policies—it could provide those public goods that will inspire pro-poor growth; or it could design a fiscal system that is generally pro-poor but does not give rise to distortions in the economy. Alternatively, it could provide a consumption transfer to households below the poverty line. This transfer would be equal to the portion of the poverty gap that the government perceives the poor would be unable to receive through private transfers or dis-savings. The government should also monitor the impact of various policies on poverty reduction.

112. One could reverse the story in the previous paragraph and argue that, given expected growth and limits (both fiscal and institutional) on transfers, a government could define a poverty line that would allow growth and transfers sufficient to keep everyone above a target minimum level of living each year. This story is not very appealing. First of all, the society's minimum standard of living cannot change every year in line with economic growth and size of the government budget. Secondly, even if we knew in advance the country's growth rate, we would not know how the benefits of growth would be distributed to the poor, so the determination of the poverty line would be problematic. Moreover, many poverty reduction policies may not require an additional budget. The policies can be made pro-poor by merely changing the mix of various budget components.

Thus, the poverty line cannot be endogenous. It has to be determined exogenously, using nutritional requirements or criteria that are country specific. The poverty line should also take account of individual needs, which have to be assessed exogenously without being influenced by short-term changes in a country's economic situation.

113. The construction of a poverty line does involve some value judgements, but it cannot be regarded as arbitrary. The goal should be to make the construction of poverty

line as objective as possible so that the incidence of poverty can be monitored objectively. This paper has shown how this goal can be attained. It has provided a framework to assess the alternative methodologies that have been used in the construction of poverty lines. It has also laid down the various steps involved in the construction of a consistent and empirically feasible poverty line. The next step is to apply these methodologies to ADB's developing member countries.

## COUNTRY POVERTY LINES, BASED ON THE COST OF BASIC NEEDS METHOD

This Appendix evaluates some country-specific poverty lines.

### A. Bangladesh

1. Bangladesh has recently adopted a new poverty line, which was developed by the Bangladesh Bureau of Statistics and the World Bank. The cost of basic needs (CBN) method was used to estimate poverty lines at which the members of a household could be expected meet their basic needs. CBN poverty lines were estimated for the base year 1991–1992 and then updated to 1995–1996 and 2000 for changes in the cost of living using a price index. Thus, the real poverty line did not change over time, which ensured that poverty estimates could be compared over time. Because prices of some goods and services may vary between geographical areas, poverty lines were estimated at a disaggregated level. The country was divided into 14 different geographical regions, which reflected rural-urban and other geographical differences.

2. The food poverty line was estimated using a food basket, which consisted of 11 items: rice, wheat, pulses, milk, oil, meat, fish, potato, other vegetables, sugar, and fruits. It provided minimum nutritional requirements corresponding to 2,122 calories per day per person. The food basket did not include spices, which, although they do not provide any calories, are essential items of Bangladeshi cooking. Thus, the food poverty line is underestimated, resulting in biased poverty estimates. The Bangladesh poverty line also does not take account of differing needs of household members according to their age and sex. The assumption was made that all household members required the same calories irrespective of their age and sex.

3. To take account of regional cost of living differences, prices of each item in the food basket were estimated for each of the 14 regions using the unit prices from the 1991–1992 survey. Thus, market prices were not used in estimating the regional costs of living differences. As pointed out, unit prices do not give accurate estimates of market prices, which households actually face. The richer households tend to buy higher quality goods and, therefore, pay higher prices for the same goods, such that the richer regions will have higher real poverty lines than the poorer regions. To control for quality variation, a model is used that regresses unit prices from the survey data on such variables as total consumption, education, and occupation of the household head. This is an approximate method of controlling for the quality. It would be more appropriate to use market prices.

4. The nonfood poverty line was determined separately for each region using Ravallion's method (1998), which is the average amount spent on nonfood items by those households whose total consumption was equal to the food poverty line in the region. This method gives the lower nonfood poverty line for the region. An upper nonfood poverty line was estimated as the average amount spent on nonfood items by those households whose per capita food expenditure was equal to the food poverty line in each region. Thus, Bangladesh has two poverty lines—the lower being the sum of food poverty line and the lower nonfood poverty line, and the upper being the sum of the food poverty line and the upper nonfood poverty line. Within each region, the estimates of the cost of food needs are the same in the lower and upper poverty lines. The difference between the two lines is the result of the difference in estimation of the allowance for nonfood consumption. The lower poverty line incorporates a minimum

allowance for nonfoods (the typical nonfood spending of those who could just afford the food requirement), while the upper poverty line makes a more generous allowance (the typical nonfood spending of those who just attained the food requirement).

5. Bangladesh's regional nonfood poverty lines have a serious consistency problem. They are separately estimated for each region from the survey data with no attention paid to differences in costs of living in nonfood items. To obtain consistent nonfood poverty lines across the regions, regional nonfood costs of living indices must be known. Another major drawback of Bangladesh poverty lines is that they cannot be updated without having household survey data. Bangladesh conducts household surveys every 5 years, which means that poverty lines cannot be obtained in the periods when the household surveys are not available. The lower and upper poverty lines are presented in Table A1 below.

**Table A1: Poverty Lines in Bangladesh**

Geographic Area	1991–1992		1995–1996		2000	
	ZL	ZU	ZL	ZU	ZL	ZU
SMA Dhaka	480	660	574	791	649	893
Other urban Dhaka	399	482	480	580	521	629
Rural Dhaka	425	512	492	593	548	659
Rural Faridpur Tangail						
Jamalpur	432	472	484	529	540	591
SMA Chittagong	523	722	627	867	702	971
Other urban Chittagong	517	609	619	730	694	818
Rural Sylhet Comilla	432	558	499	644	572	738
Rural Noakhali Chittagong	438	541	522	645	582	719
Urban Khulna	482	635	552	727	609	803
Rural Barishal Pathuakali	413	467	494	558	546	616
Rural Khulna Jessore						
Kushtia	420	497	499	592	527	624
Urban Rajshahi	446	582	496	647	557	726
Rural Rajshahi Pabna	459	540	535	630	586	690
Rural Bogra Rangpur						
Dinajpur	426	487	468	535	510	582

ZL = lower poverty line; ZU = upper poverty line.

Amounts are in Tk per person per month.

Source: Bangladesh Bureau of Statistics.

## B. Nepal

6. Nepal's Living Standard Survey (NLSS) of 1996 is the main data source for poverty analysis in Nepal. This is a multimodular survey, developed by the World Bank, which contains information on a wide range of topics related to well-being and poverty. The official estimates of poverty in Nepal are based on the poverty line developed by three researchers from the World Bank (Lanjouw, Preeushi, and Zaidi 1996).

7. Food poverty in Nepal is anchored to a requirement of 2,124 calories per person per day. The same calorie requirement is applied to all persons in a household irrespective of their age and sex. The determination of the food poverty line requires a

food basket that is commonly consumed by the poor. The basket was based on observed consumption patterns of Nepali households in the second to fifth decile of per capita consumption distribution. There are 37 food items for which information on quantities consumed was available. The selected basket did not include all the food items and represented only 85% of total food spending. The basket provided only 1,736 calories per day so all quantities in the basket were uniformly scaled up by the ratio 2,124/1,736.

8. Having determined the food basket quantity, the food poverty line is simply equal to the cost of this basket. It was recognized that food items would have different prices in different regions of the country so each region has a different food poverty line. Instead of adjusting the food poverty line for the regional differences in food costs of living, per capita household consumption was adjusted for the regional price differences. The regional price indices presented in Table A2 use rural East Terai as the base, i.e., all consumption expenditures were adjusted to make the purchasing power of one rupee in the respective region comparable to that of one rupee in rural East Terai. This means that in calculating the cost of the food basket, average prices prevailing in rural East Terai should be used. The cost of the food basket in rural Terai prices was estimated as NRs2,637 per person per annum.

**Table A2: Regional Price Indices in Nepal**

	<b>Food Price Index</b>	<b>Housing Price Index</b>	<b>Nonfood items Price Index</b>	<b>Overall Price Index</b>	<b>Total Real Per Capita Consumption<sup>a</sup></b>
1. Kathmandu	1.33	1.76	1.39	1.39	17,262
2. Other urban	1.18	1.20	1.18	1.18	9,102
3. Rural West Hills	1.20	0.85	1.15	1.15	4,933
4. Rural East Hills	1.24	0.90	1.19	1.19	6,695
5. Rural West Terai	0.95	0.57	0.90	0.90	5,325
6. Rural East Terai	1.00	1.00	1.00	1.00	5,919
Budget Share for Total Population	56%	9%	35%		6,178

<sup>a</sup>In Group 6 "Rural Eastern and Central Terai" prices.  
Source: Lanjouw, Preeushi, and Zaidi 1996.

9. The nonfood poverty line was estimated from the NLSS, which is the average nonfood expenditure of those households whose per capita food expenditure was equal to the food poverty line. This method gave a nonfood poverty line of NRs1,767 per person per annum. The total poverty line, the sum of food and nonfood poverty lines, is thus NRs4,404 per person per annum. This is the real poverty line defined with respect to prices prevailing in rural Terai. The poverty lines in current prices can easily be calculated using the overall price index given in Table A2.

10. The poverty lines in Nepal are consistent provided that the regional price indices presented in Table A2 are correct. These indices were estimated from survey data using unit prices and their accuracy cannot be guaranteed because of differences in the quality of items purchased by households in the different regions.

### C. Thailand

11. The World Bank was the first to pioneer the technique of estimating poverty lines for Thailand based on nutritional adequacy of the average Thai. This poverty line, although widely adopted in Thailand until the early 1990s, suffered from many serious weaknesses: it used the same norm of 1,978 calories per day for all individuals, irrespective of their age and sex; it did not take into account the price differences between the regions and areas (urban and rural); and was completely insensitive to variation in prices of food and nonfood items in different regions and areas.

12. In 1998, Kakwani developed new poverty lines, which were officially adopted by the Thai government in 1999. These poverty lines are now used to monitor poverty in Thailand.

13. Thailand poverty lines use calorie norms that vary with age and sex. These norms, which are appropriate for the Thai population, are presented in Table 4 of this paper.

14. Unlike many other countries, Thailand uses market prices to estimate the regional costs of living indices. It uses nine different baskets, with separate baskets for rural and urban areas in five regions. These baskets, provided by the Department of Business Economics of the Thai Ministry of Commerce, contain prices and quantities of 321 items of household consumption, which included 125 food items covering almost all those consumed by the population. This information is sufficient to compute the spatial price indices for rural and urban areas within each region (northern; northeastern; central; and southern, including Bangkok and vicinity).

15. The spatial price indices were computed for the base year 1992.<sup>1</sup> The indices for other years were computed using rural and urban consumer price indices for food and nonfood items, which are available for each region.

16. Information on average prices and quantities provided by the Department of Business Economics was used to compute the cost of each of the nine food baskets in each area within each region. To determine the cost of energy (which can be expressed as calories derived from each baht spent on food), one needs to know the number of calories provided by each of the nine baskets. These baskets gave food consumption levels in kilograms per month, which were converted to grams per day. These values were then multiplied by the nutrient values for one gram of each food to arrive at the daily calorie content of the basket. The calorie conversion factors were supplied by the Nutrition Division of the Department of Public Health, based on typical Thai foods. Given the costs of these baskets, the number of calories per baht provided by each food basket was determined.

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<sup>1</sup> See Kakwani and Hill (2002) for details.

17. Rural baskets were more cost efficient than urban baskets. Thus, it was considered appropriate to adopt the average of rural baskets as a basis for constructing poverty lines. The same average food basket was used for all regions, which implies that the standard of living of people on the food poverty lines would be the same wherever they lived.

18. With the composition of the basket decided, the next step involved computing the per-month cost that would meet the calorie requirements of households. These costs could be obtained by dividing the calorie requirements of a household by the calories per baht that were obtained using the average rural basket, which gave the food poverty line for each region in 1992. The food poverty lines for other years were calculated using the food consumer price indices that were available for each region.

19. The nonfood poverty line was determined on the basis of Engel's law that households spending the same proportion of total expenditure on food enjoy the same level of welfare. It was assumed that poor people living in Bangkok should spend 60% of their income on food. Given the food poverty line, this ratio would immediately give the nonfood poverty line income for Bangkok. The nonfood poverty line for other regions and areas and over time was determined by using the spatial nonfood price indices. The total poverty line for each household was then obtained by adding the food and nonfood poverty lines. Table A3 presents the per capita per month food poverty line for households of different composition. These are the minimum basic needs of Thai people of different ages and sexes in November 1997. These figures can be updated over time using the regional food and nonfood consumer price indices, which are available monthly. Thus, the poverty line can be computed every month.

**Table A3: Minimum Basic Needs of Persons of Different Age and Sex by Regions November 1997 (baht per month)**

Age and Sex	Districts and Villages					Municipal Area				
	North	Northeast	Central	South	Bangkok	North	Northeast	Central	South	Bangkok
Children										
1 to 3	412	463	450	444	450	524	569	563	599	577
4 to 6	498	559	543	536	543	633	688	680	723	697
7 to 9	549	617	600	592	600	699	759	750	798	769
Males										
10 to 12	635	713	693	684	693	808	877	867	923	889
13 to 15	789	887	862	850	862	1,005	1,091	1,078	1,147	1,105
16 to 19	824	926	899	887	899	1,048	1,138	1,125	1,197	1,153
20 to 29	957	1,075	1,044	1,031	1,044	1,217	1,322	1,307	1,390	1,339
30 to 59	950	1,067	1,037	1,023	1,037	1,209	1,312	1,297	1,380	1,329
60+	676	759	738	728	738	860	934	923	982	946
Females										
10 to 12	583	656	637	629	637	743	806	797	848	817
13 to 15	686	771	750	740	750	874	948	938	998	961
16 to 19	635	713	693	684	693	808	877	867	923	889
20 to 29	692	778	756	746	756	881	957	946	1,006	969
30 to 59	712	800	778	767	778	906	984	973	1,035	997
60+	600	674	655	646	655	763	829	819	872	839

Source: New Poverty Thresholds for Thailand with Policy Applications, Indicators of Well-being and Policy Analysis, Development Evaluation Division, NESDB, Bangkok. 1998.

20. Poverty incidence was calculated by first determining the poverty line for each household from Table A3. A household was identified as poor if its per capita income was less than the per capita poverty line. The three poverty indicators, namely, head count ratio, poverty gap ratio, and severity of poverty index, derived from Foster, Greer, and Thorbecke (1980), are presented in Table A4.

**Table A4: Poverty Incidence in Thailand**

<b>Year</b>	<b>Percentage of Poor</b>	<b>Gap Ratio</b>	<b>Severity Index</b>	<b>Number of Poor</b>
1988	32.6	10.4	4.6	17.9
1990	27.2	8	3.3	15.3
1992	23.2	6.8	2.8	13.5
1994	16.3	4.3	1.7	9.7
1996	11.4	2.8	1.1	6.8
1998	13.0	3.3	1.2	7.9
1999	15.9	4.3	1.8	9.9

Source: Author's calculations.

21. It can be noted from Table A4 that the incidence of poverty in Thailand was declining very rapidly until the onset of the 1997 economic crisis, reaching 11.4% in 1996. The impact of the economic crisis was still evident in 1999, when the percentage of poor increased to almost 16%.

22. Thailand is a good example of a poverty line that is consistent across regions and over time. The poverty line is sensitive to changes in food and nonfood prices, which is highly desirable because changes in food and nonfood prices affect the poor differently. The Thai poverty line was constructed using consumption patterns of 1992. It may be time for Thailand to revise its poverty lines to take into account recent changes in consumption patterns.

#### **D. Philippines**

23. The Government of the Philippines has been deeply concerned about the high incidence of poverty. In 1986, it established a technical working group to determine the poverty line and poverty incidence. The National Statistical Coordination Board, which coordinates the activities of the working group, produces the official poverty estimates on a regular basis.

24. The official poverty line has been found to have some serious consistency problems. Balisacan (1999) correctly criticized the official poverty lines on the grounds of inconsistency, in the sense that the standard of living implied by them varies for each of the regions as well as over time. Another serious drawback of the official poverty lines is that they do not take into account the differing needs of household members.

25. The Philippines' official poverty line is based on the assumption that every individual in each household requires 2,000 calories per day, irrespective of his or her age and sex. To determine the food poverty line, it is necessary to know the calorie cost, i.e., to find the number of calories that could be obtained by spending one peso on food.

The calorie cost will obviously depend on the food basket chosen. The official approach to finding the calorie cost is to specify low-cost and nutritionally adequate food menus that would provide 2,000 calories per day to an individual. These menus are constructed separately for urban and rural areas and for each region. As a result, there are 30 such menus.

26. The menus for 1991, 1994, and 1997 were constructed on the basis of the food consumption survey conducted in 1988. These menus are typical of a Filipino diet and representative of each region. The individual items in the menus are valued using average actual prices but applying different prices for the bought and not-bought components.

27. The per capita cost of each of the 30 food baskets on a daily basis is computed by multiplying the quantities in the basket by the corresponding prices. The monthly costs are then computed by multiplying the per-day costs by 30.4. These costs provide 30 alternative food poverty lines for rural and urban areas for each of the 15 regions. The food poverty line for each province is the population-weighted average of the urban and rural lines. Thus, 15 different food poverty lines, one for each region, are used to compute poverty incidence in the Philippines.

28. The official food poverty line for each region reflects the consumption pattern of the people living in the region, which implies that the standard of living varies for each region. The line will be higher for richer regions because richer people tend to consume dearer food items, such as meat and seafood, that provide more expensive calories. By its construction, the official poverty line implies that the minimum standard of living is not uniform across regions: richer regions have higher food thresholds than poorer regions. Thus, the official poverty lines violate the basic properties of absolute poverty lines.

29. The official approach to estimating the nonfood poverty line is to estimate the ratio of food to total income separately for every region using the region-specific food thresholds. The ratio varies widely across regions. The richer regions have a smaller ratio than the poorer regions, resulting in higher total poverty lines for the richer regions. According to Engel's law, the richer regions, therefore, have a higher standard of living than the poorer regions. Hence, the official approach violates the basic idea that the society's minimum standard of living should be the same for every region. In order to maintain the same minimum standard of living across the regions, the ratio of food to total expenditure should vary only because of the regional differences in the relative prices of food to nonfood items of consumption, so that the real value of the food and nonfood components of total poverty are kept the same for every region and over time. The official nonfood poverty lines, estimated on the basis of estimated food to income ratios for each region, are inconsistent because they give higher real poverty lines for richer regions, implying that the richer regions have higher incidence of poverty than the poorer regions.

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