A NEW MEASUREMENT OF POVERTY IN THAILAND

by N. Kakwani
School of Economics
The University of New South Wales
Sydney 2052 Australia
and
Medhi Krongkaew
Faculty of Economics
Thammasat University
Bangkok 10200, Thailand

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1. Introduction

During the past two decades, Thailand has achieved a very impressive economic growth. Between 1980 and 1990, Thailand's GDP (gross domestic product) grew at an annual rate of 8 per cent and continued to grow during the 1990s. The GDP per capita reached a level of US$2100 in 1993 - characterizing Thailand as a middle-income country.

Many economists have expressed concern whether the benefits of economic growth are reaching the poor. The growth process underway in most developing countries, it has been suggested, are such that incomes of the poor increase more slowly than the average (Ahluwalia, Carter and Chenery 1979). Thailand, with 60.2 million population 1995 provides an excellent case study to test whether rapid economic growth trickles down to the poor and if so, what such degree of "trickle down" is.

The main objective of the present paper is to provide a detailed measurement of poverty in Thailand. The measurement of poverty involves two distinct problems. First is the specification of the poverty line, threshold income below which one is considered to be poor. Once the poverty line is determined, the second problem is that of constructing an index which would measure the degree of poverty. The second problem relates to aggregating the poverty situation of individuals into a single poverty measure. This problem has attracted considerable attention from economists.[1] (Sen 1976, Takayama 1979, Kakwani 1980, 1984, Vaugham 1987, Foster, Greer and Thurbecke 1984). The poverty line defines the minimum acceptable standard of living of a society. It is indeed a difficult task to specify a poverty line because the minimum standard of living is influenced by several variables, many of which are not easy to quantify.

Although the problem of specifying the poverty is the more fundamental problem of poverty measurement, relatively little serious research has been done on it. Thus, the main focus of the present paper is to construct new poverty lines for Thailand.

The World Bank (1980) was the first to pioneer the technique of estimating poverty line for Thailand based on nutritional adequacy of the average Thai people. This poverty line has been widely adopted (Medhi 1985, 1987, World Bank (1985), Medhi and Pranee (1985) and Sukanya Somchai (1988)). To compare poverty over time, the general approach has been to adjust the original World Bank poverty incomes for 1976 upward by using necessary price indices. Medhi (1989) has questioned this approach on the grounds that the World Bank poverty line based on the consumption pattern of the Thai population in 1970 is not relevant any more. According to him, a more accurate estimate of poverty income reflecting changes in population structure, consumption patterns, and

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[1] For a survey of this issue see Kakwani (1996).

minimum nutritional requirements is necessary if we want to really understand the nature and extent of poverty in the environment of rapid economic growth, in Thailand.

The most serious drawback of the World Bank poverty line (and also of Medhi's new poverty line) is that it provides a single poverty line for all households irrespective of their needs. So our main objective is to drive a set of new poverty lines which adequately take into account the differing needs of people living in a household. In the process of formulating these poverty lines, we have taken into account nutritional requirements of the Thai population and the price differences between the regions and areas (urban and rural). The poverty thresholds developed in this paper vary with household size and composition reflecting differing needs of the household members. These thresholds are then utilized to measure poverty in Thailand. The study makes use of the three latest socio-economic surveys conducted in Thailand during the years 1988, 1990 and 1992. These are nation-wide surveys covering all private, non-institutional households residing permanently in municipal areas, sanitary districts and villages.

2. Absolute or Relative Poverty

One of the earlier studies on poverty was done by Rowntree (1901), who defined families as being in primary poverty if their total earnings are insufficient to obtain the "minimum necessities of merely physical efficiency". He estimated the minimum money cost for food which 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. This poverty line based on the concept of physical subsistence is called the "absolute" approach to measuring poverty.

An alternative approach to measuring poverty is the "relative approach" which is defined in relation to the living standard of a particular society at a particular time (Atkinson 1974, p.48). This approach is based on the concept of "relative deprivation" which denotes the feeling of deprivation relative to others.[2]

The relative approach is widely used in the rich industrialized countries. For example, Fuchs (1969) in the United States defined the poverty line to be equal to one-half of the median family income. Drewnowski (1977) suggested that the poverty line should be equal to the mean income of the society. Under this definition, the poor are those who gain when income becomes more evenly distributed and the non-poor are those who lose. In Australia, the Commission of Inquiry into poverty (1975) suggested that a household consisting of head, dependent wife and two children will be in poverty if its income falls short of 56.6 per cent of seasonally adjusted weekly earning for Australia. The poverty line under this approach changes in accordance with the average earning of the wage and salary earners.

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[2] The term "relative deprivation" was coined by Stouffer (1949) and subsequently developed by Merton (1957) and Runciman (1966). This term is used here in a narrower sense, meaning a level of income sufficiently low to be regarded as creating hardship in terms of society's current living standards.

The relative approach has serious drawbacks. The most severe criticism of the relative approach is that it may show a reduction in poverty when people's income may be falling all round resulting in a fall of the standard of living of the poor as well as the non-poor. A reduction (or increase) in poverty will show up only if there is a change in the relative income distribution. A poverty measure based on a relative approach is, in fact, a measure of inequality. Poverty should then be viewed as an issue of inequality. If that is our view of poverty, then it is unnecessary to specify poverty lines. Instead, we should look at various measures of inequality. Poverty is distinct from inequality. Sen (1983) has put this view as

> A sharp fall in general prosperity causing widespread starvation and hardship must be seen by an acceptable criterion of poverty as an intensification of poverty. But the stated view of poverty 'as an issue of inequality' can easily miss this if the relative distribution is unchanged and there is no change in the differences between the bottom 20 or 10 per cent and the rest of the society.

Under the relative approach, poverty is completely insensitive to economic growth if the inequality of income does not improve. The only way to reduce poverty will be to reduce inequality. Thus, Thailand's impressive economic growth will play absolutely no role in reducing poverty. This we regard as unacceptable.

Rejection of relative views of poverty must not be confused with being indifferent to the contemporary standard of living of the society. The poverty line should, of course, take into account current standards of living and should only be defined in relation to the living standards of a particular society at a particular time. The poverty threshold must change gradually as the standard of society adapts itself to new conditions. The relative approach implies that the poverty threshold should change monthly or quarterly as data become available. The standard of living of a society is more stable than what is indicated by monthly or quarterly changes in economic situations.

In this study, we follow the "absolute" approach in which the poverty line is fixed in real terms. It means that a person on the poverty line in period t (z_t) should have exactly the same standard of living as the person on the poverty time in period t' (z_t'). Thus, the poverty line should change over time by means of an overall true cost of living index, so that the observed differences in poverty measure the real change in poverty (corrected for price changes).

3. Nutritional Requirements

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 the non-poor if he or she has an access to adequate source of food. We assume that an individual has access to

adequate food if he or she has access to adequate source of nutrition. According to Lipton (1988), "access to adequate source of nutrition" is a good indicator of quality of life; health, shelter, education, even mobility, are all reflected in nutritional status, although not in a linear or otherwise simple way.

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 (such as protein, fat, carbohydrates and calories) in adequate amounts, in proper combination and at appropriate times (Gopalan 1992). The 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 even different groups within a country) depending on factors such as race, climatic conditions, etc.

The question arises as whether these country specific FAO norms can be used to construct a food basket for poverty measurement. These 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. A malnourished person should surely be judged as poor because he or she has failed to meet the basic biological requirements.

Some attempts have been made to measure malnutrition using the FAO norms (Reutlinger and Selowsky (1976)). This approach has been severely criticised on the grounds that nutritional requirements vary both inter-personally 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 points in time (Sukhatme (1977), Srinivasan (1981) and Kakwani (1989, 1992)).

The measurement of malnutrition in a population is indeed problematic. Still as Sen (1980) argues, "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 recognised that nutritional requirements vary interpersonally around that average".

The nutritional needs of individuals will be our starting point to construct food baskets for poverty measurement. It must be emphasised that these needs of individuals depend on several factors such as age, sex and activity levels. And, therefore, there cannot be a single food basket for all people living in Thailand. Since the nutritional norms vary from country to country depending on factors such as race, climatic conditions, etc., it is important that we adopt the norms which are appropriate for the Thai population. Fortunately these norms are available for different groups of the population of Thailand (Department of Health, Ministry of Health Care 1989).

The nutrients we consume 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 the six nutrients. This will almost be an impossible task. Our focus in this study will be on calorie (energy) deficiency. Recent research in this area suggests that in many countries of Asia, diets are such that protein requirements could be expected to be met if calorie needs were met.

The energy requirement of an individual depends on the four factors: age, sex, weight and activity level. We may write this relationship in a functional form as

$$R_i = (\alpha_i + \beta_i w_i) \cdot a_i \tag{1}$$

where R_i is the calories per day required by the ith individual whose weight is w_i and the activity level is a_i. α_i and β_i depend on the age and sex of the ith individual. The values of α_i and β_i for Thailand have been computed as

Sex	Age	α_i	β_i
Male	20 - 29	679	15.3
	30 - 50	879	11.6
	60 +	487	13.5
Female	20 - 29	496	14.7
	30 - 50	829	8.7
	60 +	596	10.5

The activity level is measured in terms of the basal metabolic rate (BMR). When BMR = 1, it means that the body is completely at rest (or zero activity level). We divided the male and female into three groups.

Group I: Those involved in mental kind of labour activities with very light physical activity. For males, BMR = 1.55 and for females, BMR = 1.56.
Group II: Those involved in average physical activity level (medium work). The values of BMR for males and females are 1.78 and 1.64 respectively.
Group III: Those involved in high labour activities. The values of BMR for males and females are 2.10 and 1.82 respectively.

The formula (1) indicates that the calorie requirements of individuals are highly sensitive to the physical activity levels of individuals. For instance, males in the age group 20-29 with BMR = 1.78 require 2787 calories per day whereas the males of the same age but with BMR of 2.1 require 3289 calories per day. Thus, the physical activity levels of individuals should be an important factor in the determination of the minimum food basket. But unfortunately, this information is not available for each individual so the ideal solution is beyond our reach.

In this paper we take account of activity levels in a partial way. We assumed that the people living in rural areas have to indulge in a greater level of physical activity than

the people living in urban areas. Thus, we calculated the nutritional requirements of the rural people using higher levels of BMR factor.

Table 1 presents the required calories per day of individuals with different age, sex and activity levels. It can be seen from the table that calorie requirements vary substantially with age, sex and activity levels of individuals. The children do need much less calories than the adults. Also, males require considerably more calories than females. This strongly suggests that we cannot and should not use the one calorie norm for all individuals. The members of different households have different energy needs. In the specification of the poverty line, it is of crucial importance to distinguish households of different size and composition (also their location).

During the past two decades, the World Bank has made many contributions to poverty research in Thailand. In fact it was the first to pioneer the technique of determining poverty line for Thailand based on nutritional adequacy. Although the World Bank line is widely used by researchers, it has a serious deficiency. It uses the same norm of 1978 calories per day for all individuals, irrespective of their age, sex and activity levels. This approach implicitly assumes that every individual in Thailand has exactly the same calorie requirements. In view of results given in Table 1, this assumption is clearly not defensible.

The World Bank poverty line developed in the 1970s cannot be very useful in the present time because of changes in the population structure, particularly an increase in the number of persons in the more active population groups. In 1994, Medhi re-estimated the average calorie requirement by taking into account the population structure prevalent in Thailand in 1988. He arrived at an average calorie requirement of 2034 calories per day. He also assumed that the calorie requirement is the same for every individual. This means that the poverty among households with children will be overestimated and among those with adults, particularly males, will be underestimated.

In the present study, we recognize the fact that the households differ with respect to caloric needs. Accordingly, we allocated the calorie requirements as set out in Table 1 to each household according to the age and sex of each individual living in it. Thus, the per capita calorie requirement so obtained will be different for different households because of the differences in the household composition.

To obtain the average nutritional requirements of the population, we need to aggregate the per person calorie requirement of each household in the sample. This aggregation was performed by means of the weighted average method with the weights equal to population weights given to each sampled household. Table 2 provides the per capita calorie requirement for each region and the whole kingdom.

It can be seen from Table 2 that the Thai population requires an average 2241 calories of energy per person per day. As expected, the average requirement of people living in rural areas is higher than those living in urban areas. Even within rural and urban areas, there are differences in average requirements among the regions.

The World Bank's and Medhi's estimates of average calorie requirements are 1978 and 2034, respectively. It means that our average is about 13 per cent higher than of the World Bank and about 10 per cent higher than that of Medhi. It should be noted that the average calorie requirement depends on the population structure. Our estimates are based on the population structure prevalent in 1992 whereas the World Bank's estimate is based on the population structure in 1974. The World Bank's estimate is clearly outdated. Although Medhi's estimate is based on the 1988 population structure, which is not so unreasonable but he did not take account of differences in activity levels of the people living in urban and rural areas.

4. Food Poverty Lines

Having determined the calorie requirements of people of different age and sex, the next task is to find the food basket which would meet these requirements. There can be several food baskets which meet individuals' nutritional needs. One can obtain such a basket using the linear programming technique. This approach is not advisable. 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 World Bank's poverty line is based on the food basket which was constructed in the 1970s. This basket is not relevant for the contemporary Thailand because of a substantial change in patterns of consumption over the last twenty years. In the construction of a new poverty line, Medhi (1994) utilized a new food basket which was obtained from a small survey called "The Third National Nutrition Survey of Thailand 1986" conducted by the Ministry of Public Health. This basket is highly aggregated. It has only twenty one items of food. The most strange thing about the basket is that it does not include chicken and duck meats at all. The chicken meat is widely eaten by Thai people (even those who are poor). It seems that this basket is not at all representative of the Thai people's consumption patterns.

The Department of Business Economics, Ministry of Commerce in Thailand uses consumption baskets for the purpose of computing price indices. These are detailed baskets consisting of 321 items of household consumption. In these baskets, there are 125 food items covering almost all items of food consumed by the population. These baskets are available for every region separately for rural and urban areas. They are based on the survey data and are appropriate for the task in hand. The Department of Business Economics also provided us with average prices of each item in the baskets. This allowed us to compute the spatial price indices which are presented in Table 3 (Kakwani 1996).

The spatial price indices measure the relative costs of living in different regions and areas. The index value for Bangkok in 1992 is set equal to 100. The values of the index for other regions and areas are relative to Bangkok in 1992. For instance, the value of index for the urban areas of the Northeastern region is 88.9 in 1992. It means that the

cost of living in the Northeastern region in 1992 is 88.9 per cent of the cost of living in Bangkok in 1992.

We have computed the spatial price index separately for food and non-food items. For instance, the cost of food in the urban areas of the Southern region in 1988 is 79.8 per cent of the cost of food in Bangkok 1992. These indices (given in Table 3) are comparable across the regions, area and over time. In the next section we would utilize this table in determining the poverty lines for the non-food items.

Given the average prices of the food items, we could compute the average cost of food basket in different regions and areas. To determine the cost of energy (which can be expressed as calories derived from each baht spent on food), we need to know the amounts of calories provided by each of the baskets. These baskets give the 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 World Bank and Medhi used the conversion factors derived from the US Food and Drug Administration. These conversion factors are not applicable to Thailand because the type of food consumed in Thailand is very different from that consumed in the United States. We need to apply energy conversion factors which are relevant for the Thai food. Fortunately, the nutritive values of Thai foods were provided to us by the Nutrition Division in the Department of Health, Ministry of Public Health (1994). We used these conversion factors to calculate the amounts of calories provided by each basket. Given the costs of these baskets (computed at the average regional prices), we could compute the calories provided by each baht of expenditure on food. The estimates are presented in Table 4. The interpretation of the tables is as follows.

The food basket for the rural central region in 1992 will buy 195 calories per baht in the rural areas of the central region but the same basket will buy 163 calories per baht in the urban areas of the central region. The difference between 195 and 163 is attributed to the price differences between the rural and urban areas of the central region. If we use the food basket for the urban central region, we will obtain only 111 calories per baht in the rural central region and 109 calories per baht in the central urban region. This shows that the cost of energy depends on what basket is chosen. The columns 6 and 12 in the table give the average calories obtained per baht when we use the average of all rural and urban baskets, respectively. If we use the average of all rural baskets, we would obtain 181 calories per baht in the rural central area whereas the average urban basket will buy only 112 calories per baht in the rural central area. These results clearly suggest that the rural population is receiving its energy at a much lower cost than the urban population. It means that the urban population tends to be consuming more expensive food items than the rural population.

Since the rural baskets are more cost efficient than the urban baskets, it will be appropriate to adopt the rural baskets as a basis for constructing poverty lines. In the construction of these poverty standards it is important that all people at the poverty line irrespective of whether they live in urban or rural areas should have the same standard of living. It seems that the urban population on average has a higher standard of living than

the rural population. In order to be equitable to both the rural and urban populations, we must adopt the same consumption basket for the two populations. It seemed appropriate, therefore, to adopt the average of all the rural baskets because they are cost efficient in providing the calories. We must, of course, make adjustment for price differences which exist between the regions in rural and urban areas.

Next, we need to compute the per month food costs of households that would meet their average calorie requirements. These costs can be obtained by dividing the calorie requirements of households by the calorie per baht as given in the column 6 of Table 4 (using the average of all rural baskets). Note that the cost to the household depends on the location of the household (the region and the area). These costs are in fact the food poverty lines.

5. Non-Food Basket

Having decided upon the food basket, the next problem is of making an allowance for non-food consumption. Suppose q is the quantity vector of food basket, purchasable at price vector p, then one can set the poverty line as

$$z = (1 + h)p'q \qquad (1)$$

where h is the scalar which makes allowance for spending on non-food consumption items. It can be seen that h is equal to the ratio of the cost of non-food basket to the food basket. To measure poverty in the United States, Orshansky (1965) specified h to be equal to 2, which is equivalent to saying that the poor households should spend about 33 per cent of their total expenditure on food.

The above procedure of constructing non-food poverty line is based on the famous Engel law which states that households that spend the same proportion of total expenditure on food enjoy the same level of welfare. This law must hold only if households face the same relative prices of food and non-food items. If h is fixed at the same value for all households, it would imply that poverty is completely insensitive to the prices of non-food basket. This would cause problems when we measure poverty over time (even across the regions and areas).

Suppose $\overline{q}$ is the vector of non-food basket purchasable at the price vector $\overline{p}$, then the poverty line will be given by

$$z = p'q + \overline{p}'\overline{q} \qquad (2)$$

which on comparing with (1) gives

$$h = \frac{\overline{p}'\overline{q}}{(p'q)} \qquad (3)$$

Suppose in the subsequent period, the price vector of the food basket changes from p to p* and that of the non-food basket from $\overline{p}$ to $\overline{p}*$, then in order to buy the same basket (food and non-food), we need to incur z* expenditure which is given by

$$z^* = p'^*q + \overline{p}'^*\overline{q} \qquad (4)$$

which should be the true poverty line in the second period. But if we used (1) as the poverty line, then adjusting it for price changes we would obtain a poverty line

$$\tilde{z}* = (1+h)p'*q \tag{5}$$

where h is given in (3). The difference between $\tilde{z}*$ and $z*$ will then be given by

$$\tilde{z}* - z* = (I - \bar{I})\bar{p}'\bar{q} \tag{6}$$

where

$$I = \frac{p'*q}{p'q} \text{ and } \bar{I} = \frac{\bar{p}'*\bar{q}}{\bar{p}'\bar{q}}$$

I and $\bar{I}$ are the Laspeyres price indices for food and non-food items in the basket. It can be seen from (6) that poverty will be overestimated when the food prices increase at a faster rate than the non-food prices.

In the determination of the non-food component of the poverty lines, it is essential to take into account the differences in food and non-food prices in different regions and areas. The value of h should not be the same for all regions and areas. So, we fix the value of h for Bangkok in 1972 and then estimate its value for other regions and areas, taking into account differences in food and non-food prices.

Suppose p and $\bar{p}$ are the price vectors for food and non-food items in Bangkok in 1992, then h for Bangkok in 1992 will be given

$$h = \frac{\bar{p}'\bar{q}}{p'q}$$

which is the ratio of costs of non-food and food baskets, which gives the total poverty line for Bangkok 1992 as

$$z = p'q(1+h) \tag{8}$$

where $p'q$ is the food poverty line in Bangkok in 1992.

Suppose p_{it} and $\bar{p}_{it}$ are the price vectors of the food and non-food items in the ith region at time t, then

$$h_{it} = \frac{\bar{p}'_{it}\bar{q}}{p'_{it}q} \tag{9}$$

is the ratio of costs of non-food to food baskets in the ith region at time t. Further, suppose s_{it} and $\bar{s}_{it}$ are the spatial price indices of food and non-food items for the ith region at time t, respectively then we have

$$s_{it} = \frac{p'_{it}q}{p'q} \text{ and } \bar{s}_{it} = \frac{\bar{p}'_{it}\bar{q}}{\bar{p}'\bar{q}} \tag{10}$$

which are given in Table 3. Using (7), (10) into (9), immediately gives

$$h_{it} = \frac{\bar{s}_{it}h}{s_{it}} \tag{11}$$

which yields the total poverty line for the ith region at time t as

$$z_{it} = p'_{it}q.\left(1 + \frac{\bar{s}_{it}}{s_{it}} \cdot h\right) \tag{12}$$

where $p'_{it}q$ is the food poverty line for the ith region in year t. This equation can be used to convert food poverty lines into total poverty lines.

In equation (12), h is the only variable which is unknown. We fixed the value of h (for Bangkok in 1992) to be equal to .67, which corresponds to the proportion of food to total expenditure equal to .60. We have made the value judgement that in Bangkok, the poor people should not spend more than 60 per cent of their income on food. The ratio of food to total expenditure will vary from region to region because of differences in non-food to food prices.

Table 5 presents the proportions of food to total expenditures used to estimate the total poverty lines. It can be seen that the variation in the ratio of food to total expenditure is not much. The observed differences are due to differences in non-food to food prices.

In the estimation of minimum non-food expenditure, Medhi (1994) used the actual proportions of food to total expenditures of households in the bottom quintile in each region and area from the 1988 SES. These proportions are shown below.

Ratios of Food to Total Expenditure by Regions and Areas

Region	Rural	Urban
Northern	59.98	53.48
Northeast	59.73	53.56
Central	56.94	52.09
Southern	63.17	58.01
Bangkok	-	49.30
Bangkok vicinity	59.45	51.24

Source: Medhi (1994)

It can be seen from the above table (by Medhi)that the ratio of food to non-food expenditures varies widely across the regions and areas. The ratio in urban areas is much higher than in the rural areas. Bangkok has the lowest ratio of 49.30 per cent. These wide differences in the ratio cannot be explained by differences in relative prices of food and non-food items. The different values of the ratio are attributable only to the differences in the standard of living in different regions. The table shows that Bangkok has the highest standard of living. If we use these ratios it would imply that the people at the poverty line in Bangkok will have a higher standard of living than the people at the poverty line in other regions (such as rural central). This clearly is not acceptable.

Having determined the poverty lines for each household (which vary from household to household), we computed the average poverty line income for each region, area and the whole kingdom using the weighted averages with weights proportion to the

population weight attached to each sample household. The results are presented in Table 6. The average poverty line income in 1988 for the whole kingdom is computed to be 511 baht per person per month. The average urban and rural poverty lines incomes were obtained as 602 and 476 bath per person per month, respectively.

The World Bank poverty lines in the same year for the rural and urban areas were obtained as 340 and 517 baht, respectively. This suggests that the poverty estimates on the basis of the World Bank poverty lines will be much lower than those based on our poverty lines. Medhi (1994)'s estimates of urban and rural poverty line incomes in 1988 are 865 and 572, respectively. These estimates are much higher than our estimates and will yield much higher levels of poverty.

6. Ultra Poor

According to Lipton (1988), we may define ultra-poor as those who have total income so low that, if typically allocated, it leaves them at significant risk of undernutrition due to poverty. For these people, physical personal maintenance is unstable. Some disturbances of income or outlay will put these people to much higher risks of some form of personal depreciation: severe illnesses or physical or mental malfunctioning or in extreme cases death.

How should we identify ultra-poor as described by Lipton (1988). This is indeed a difficult question to answer. Lipton, however, provided the answer. He defined ultra-poor are those who spend more than 80 per cent of outlay on food, yet meet below 80 per cent of the dietary energy requirements - of their age, sex and activity levels.

To compute ultra-poverty lines, we multiplied the energy requirements by age, sex and region as given in Table 1 by .80. The cost of calories is given in Table 4. Thus, the food poverty lines for households were obtained by dividing their calorie requirements (for the ultra-poor) by the calories obtained per baht. To determine the non-food components of poverty lines, we assumed that in Bangkok, the ultra-poor should spend at least 80 per cent of their outlay on food. So we selected the value of h (defined in (3)) for Bangkok in 1992 to be equal to .25. The values of h for other regions and areas were computed using the formula given in (11).

Table 6 presents the poverty lines for the poor and the ultra-poor. The average poverty line for the ultra poor for the whole kingdom in 1992 is computed to be equal to 391 baht per person per month, which is about the 60 per cent of the average poverty line for the poor.

7. The Measurement of Poverty in Thailand

To analyze poverty, we need to measure the economic welfare of each household in the society. Although money income is widely used to measure economic welfare, it has

many serious drawbacks. The major drawback is that it excludes several in-kind transfers, imputed rent, home production, voluntary leisure, and net worth or wealth. Exclusion of these factors can substantially alter the true economic status of the individuals living in the household, and as a consequence, biased estimates of the distribution of economic welfare may emerge.

The income concept used in the present study is fairly comprehensive. It includes

(i) wages and salary, tips, bonuses, etc.
(ii) net profits from farming and non-farming
(iii) property income such as land rent
(iv) royalties, interest and dividends
(v) current transfers received such as assistance payments, pensions, scholarships and grants
(vi) non-money income (income in kind) which includes the value of goods and services received as part of pay, home-produced and consumed (including rental value of owner occupied dwelling or received free from other sources.

The economic welfare of households is determined not only by their income but also by their needs as well. Since households differ in size, age composition and other characteristics, it is expected they will have different needs. Clearly, then, the measurement of economic welfare should take into account the differing needs of the households.

The usual procedure to take account of needs is to calculate equivalent adult income. Since in this study, we have constructed new poverty lines which adequately take account of the differing needs of people living in a household, it will be appropriate to measure the household welfare by the ratio of per capita income of a household to the per capita poverty line income of that household. This measure of welfare can be interpreted as the per centage of excess income households have over their poverty lines and takes into account the differing needs of households and price differences among the regions and areas of Thailand. If x_i is the per capita income of the ith household and z_i is the poverty threshold (of the ith family), then $y_i = x_i/z_i$ is the appropriate measure of the ith family's welfare. If $y_i < 1$, the ith family is classified as poor.

When the index of family welfare is constructed, the next step is to determine the welfare of the individuals in the family. In this paper, the individual welfare was derived by assigning every individual in household a value equal to the per capita welfare level of that household (Kakwani 1986). If there are severe intrahousehold inequities in the distribution of food and non-food items, poverty and inequality will both be underestimated. This problem could not be corrected because of non-availability of information concerning the intra-household distribution of resources.

Once we have decided on a suitable index of economic welfare for individuals, the next step is to aggregate the individual welfares into a single index of poverty. There are several such indices available in the literature (see for instance, Sen (1976), Kakwani

(1980), Foster, Greer and Thorbecke (1984). Our analysis in the paper is based on two important indices of poverty which are briefly described below.

Let x_i be the per capita net income of the ith household and z_i be the poverty threshold for that household, then the ith household is classified as poor if $x_i \leq z_i$. Let us define a variable l_i:

$$l_i = 1 \quad \text{if} \quad x_i \leq z_i$$

$$= 0, \quad \text{otherwise}$$

then obviously $\sum_{i=1}^{n} l_i$ will be the number of poor households (where n being the total number of households in Thailand). Since we assume that all persons living in a household enjoy exactly the same standard living, so if a household is classified as poor, then all persons living in that households will also be classified as poor. If a_i is the proportion of persons living in the ith household (a_i is obtained from the population weight attached to the ith sample household), then H given by

$$H = \sum_{i=1}^{n} a_i l_i$$

will be the proportion of poor persons in Thailand. H is called the head count ratio and is the most widely measure of poverty.

The head count ratio is a crude measure of poverty because it does not take into account the income gap among the poor. An alternative measure is the poverty gap ratio which is defined as

$$g = \sum_{i=1}^{n} a_i l_i \left(1 - y_i\right)$$

where $y_i = \dfrac{x_i}{z_i}$. This measure will provide adequate information about the intensity of poverty if all the poor are assumed to have exactly the same y_i (which is the ratio of the income to the poverty threshold of the ith household). If y_i is not same for all poor households, then one can have a class of measures

$$FGT = \sum_{i=1}^{n} a_i l_i \left(1 - y_i\right)^{\alpha}$$

where $\alpha > 1$. This class of poverty measures is similar to the one suggested by Foster, Greer and Thorbecke (1984).

The FGT measure of poverty distinguishes among the poor according to how far below the poverty line their income falls and can be therefore considered as a measure of depth of poverty. In this paper, it will suffice to use only the two poverty measures, viz. head-count ratio and poverty gap ratio.

It must be emphasized that we have used the poverty threshold z_i which is different for different households depending on the needs of individuals within the households. The variation in z_i is also due to the fact that households located in different regions and areas face different price levels. All other studies which have been conducted in Thailand use a single poverty line for all households (see for instance, Medhi (1985), World Bank (1985) and Medhi and Pranee (1985), Sukanya and Somchai (1988) and recently a study

sponsored by the Asian Development Bank (1996). All these studies will yield biased estimates because they implicitly assume that all the households irrespective of their age and sex composition have exactly the same needs. These studies also assume that price levels in different regions and areas are exactly the same. Table 3 giving spatial price indices shows that price levels differ substantially across the regions and areas. Rural areas are generally cheaper than urban areas. Among urban areas, the Bangkok metropolitan area is the most expensive. If adjustment for price differences is not made, poverty will be underestimated in urban areas (particularly Bangkok) and overestimated in rural areas.

To compare poverty over time, it is essential to adjust the poverty line for price changes over time. Traditionally, the poverty line is adjusted yearly by applying the overall CPI. This procedure is wrong because it does not take account of changes in relative prices of food and non-food items. Our procedure makes this adjustment by explicitly using the relative prices of food and non-food items of consumption.

In Thailand, retail prices of commodities are published only for the municipalities and therefore there are no published prices for villages (rural areas). Poverty lines are adjusted by municipal CPI. The Asian Development Bank study (1996) attempted to refine this deficiency by using retail prices in the Northern region as proxy for rural prices. This procedure is also not satisfactory because the Northern region has advanced economically during the last decade. In the present study, we have used actual average prices of food and non-food items (330 items of consumption) prevalent in rural and urban areas of various regions.

To estimate poverty levels accurately, we need to use unit record data which are readily available in Thailand (at least for the years 1988, 1990 and 1992). Still many studies (including the most recent study sponsored by the Asian Development Bank, ADB) use the group data to produce poverty estimates.

These grouped data are published in SES books, showing frequency distribution by income classes. Some cases, the mean per capita incomes are not given and need to be estimated. The ADB sponsored study used the World Bank computer program POVCAL to estimate poverty measures. Although this program provides the estimates of mean per capita incomes, these estimates are highly unreliable.

The data as reported in SES books are grouped according to the per capita household incomes. These data can only provide the percentage households that are poor and not the percentage of persons. The ADB sponsored study used a strange formula to calculate the percentage of persons below the poverty line. The poverty estimates produced in this study are highly unreliable. A considerable amount of information is lost when the unit record data are grouped. In the present paper we use the unit record data which were available to us from the NSO office.

In order to estimate the incidence of poverty for the whole population, the weight given to the sampled household in each socioeconomic survey is very important because the wrong or incorrect weight would give wrong or misleading information about the

population being studied. Normally the National Statistical Office who has been conducting all the socioeconomic surveys in Thailand since 1962 does give population weights in each of its survey. However, it was discovered that the weights given by the NSO, at least in the three surveys that we will use in this study did not add up to the total population of the year under study. So new weights have been constructed for use in this study. The new weights differ slightly from the original NSO weights but they are definitely more robust as they correspond to the actual population and can be worked back to the original sampled raw data.

8. Poverty by Regions and Areas

Thailand is divided into six regions. Each region is further divided into three community types:

1.   Municipal areas
2.   Sanitary districts
3.   Villages.

      We classified municipal areas and sanitary districts as urban areas, and villages as rural areas. The poverty estimates by regions and areas are presented in Tables 6, 7, 8, 9 and 10. The following conclusions emerge from the Tables.

1.   In 1988, 36.4 per cent of Thailand's population was identified to be poor. This figure reduced to 31.3 in 1990 and to 27.6 in 1992. The percentage of ultra-poor in 1988 were 13.8 which reduced to 10.4 in 1990 and to 8.8 in 1992. These results suggest that Thailand is making a considerable progress in poverty reduction. The high economic growth enjoyed by Thailand during the 1988s and 1990s is trickling down to the poor. This conclusion is supported by both the head-count and poverty gap measures.

2.   Poverty in urban areas is much higher than in rural areas. In 1992, 34.8 per cent population was poor in rural areas whereas in urban areas, only 9 per cent population was poor.

        Ultra-poverty was also much higher in rural areas. Fortunately the progress made in poverty reduction in rural areas is higher than that in urban areas. Between 1988 and 1990, the percentage of poor was reduced by 5.7 per cent points in rural areas whereas the poverty reduction in urban areas was 3 percentage points during the same period. These results suggest that the benefits of economic growth are spreading in both rural and urban areas. The greater progress in poverty reduction in rural areas may be due to rural development programs started during the 1980s and 1990s. We will focus on this issue in greater detail in another forthcoming study.

3.   The incidence of poverty is highly uneven across regions. In the Northeastern region, rural poverty in 1988 was as high as 56.6 per cent, which reduced to 48.4

per cent in 1992. Ultra-poverty is also found to be extremely high in the Northeastern region. This is the region with the highest concentration of population. In 1992, 19.96 million people lived in the region. It is interesting that this region also had the lowest growth of economic welfare between 1988 and 1990 (its growth was only 3.9 per cent). However, in the 1990-92 period, it improved its growth rate to 7.4 per cent (Kakwani 1996). This improvement in growth rates in the 1990-92 period is also indicated by higher progress made in poverty reduction during this period. The poverty reduced by 4.2 percentage points in the 1990-92 period whereas in the 1988-90 period, the poverty reduced by 3.4 percentage points.

It is interesting to note that the ultra-poverty in the Northeastern region reduced by 6.1 percentage points in the first period (1988-90) whereas in the second period (1990-92), the reduction was only 1.8 percentage points despite the fact that the economic growth rate was higher in the second period compared to that in the first period. This shows that the relationship between economic growth and poverty reduction will be weaker for ultra-poverty compared to that for poverty. The relationship between poverty reduction and economic growth will be explained in a separate paper.

4.   The poverty in Bangkok and its vicinity is the lowest. In 1992, only 1.9 per cent people lived in poverty in Bangkok whereas in the Northeastern region, 46 percent population was poor in the same year. This shows that there exists enormous disparity of income among the regions. Bangkok and its vicinity is also experiencing faster economic growth. It means that the disparity between regions will continue to increase unless the government intensifies poverty reduction efforts in the poorer areas of Thailand. We will attempt to identify the provinces which would require urgent attention from the government.

5.   Bangkok vicinity experienced a growth rate of 29.7 per cent in the 1988-90 period. However, this growth tempo was not sustained in the subsequent period. The annual growth rate in Period 2 was only 3.6 per cent. It is understandable to have the highest growth rate in the Bankgok vicinity because most of manufacturing factories are located in the region. It is difficult to explain why the strong growth in the first period did not sustain in the second period. The progress made in poverty reduction in the first period is also the highest in the Bangkok vicinity but this progress slowed down in the second period. This suggests that there is a positive correlation between poverty reduction and economic growth. The slowing down of poverty reduction in the second period may be attributed to the slowing down of economic growth (in the second period). It seems that the very high economic growth in the Bangkok vicinity does not seem to be converted fully to the reduction in ultra-poverty. The economic growth alone will not be sufficient to make a significant progression in reducing ultra-poverty.

9. Poverty by Socio-Economic and Demographic Characteristics of Households

This section focuses on the results of a breakdown of aggregate poverty according to various socioeconomic and demographic characteristics of households. The household characteristics considered are sex and age of household head; household size; education level and occupation of household head and number of earners in the household.

Household Size

The household size is an important demographic variable that has an impact on poverty. Table 11 shows that poverty increases monotonically with the household size. This conclusion holds for both poor and ultra-poor. For instance, the percentage of poor among one-person households was 3.1 per cent in 1992 but among households with 7 or more persons, the percentage of poor was 38.1 per cent in the same year.

Why poverty is much higher among large households is a difficult question to answer in this study, but from the policy point of view, this is an important issue to explore. An interesting result that emerges from Table 10 is that reduction in poverty is higher among larger households in both periods of observation. Although this is encouraging, still additional poverty alleviation policies are needed to reduce poverty among larger households.

Sex of Household Head

In 1992, 16.84 per cent of Thailand population lived in households headed by women. These households are likely to be relatively poorer. But this is not indicated by the results given in Table 12. In 1992, 28.8 per cent of the population was poor in the male-headed households whereas in the female-headed households only 21.6 per cent of the population was poor. This is indeed a very surprising result because it has been hypothesized that in many countries - both developing and industrial - female-headed households are poorer than those headed by males. But a review of the South Asian materials by Visaria and Paul (1980) showed that this was generally not the case. To investigate this matter further, we compiled the proportion of female-headed households in various regions and observed that female-headed households are disproportionately located in Bangkok and its vicinity, which are considerably richer than other regions of Thailand.

It is interesting to note that the reduction in the percentage of poor living in female-headed households is slightly higher than that in male-headed households. This pattern changes however when ultra-poverty is considered.

Occupation of household head

Occupation was defined as the type of work performed by a person at his job. Generally a person held only one job. During the last 52 weeks if the person had more than one job, the job at which he worked for the greater number of weeks was recorded.

We divided the households according to eight major occupations:

1. Professional, technical and related workers.
2. Administrative, executive and managerial workers.
3. Clerical and related workers
4. Sales workers.
5. Service workers.
6. Agricultural, animal husbandry and forest workers, fishermen and hunters.
7. Labourers.
8. Economically inactive workers, which includes common labourers, unskilled workers, houseworkers, students, retired workers, disabled workers, unemployed workers, beggars.

It can be seen from Table 13 that poverty among household heads as agriculturists is the highest. In 1988, 50.4 per cent of the population in these households was poor. This figure reduced to 44.4 per cent in 1990 and to 42.1 per cent in 1992. The other household group which has a very high level of poverty is the one whose household heads are economically inactive. It is not surprising to find this group as suffering of severe poverty, but the surprising thing is that the agriculturalist household (who are economically active) have considerably higher poverty than households who are economically inactive. This observation requires some further analysis which will be done in another detailed study to be undertaken by the authors.

Education of the Household Head
We divided the households into five categories according to the education of the household head. It was observed that 84.44 per cent of Thailand population lived in households whose head was educated no more than at primary level. This shows that much needs to be done to improve education levels in Thailand. The results in Table 14 suggest that poverty decreases monotonically with the education of the household head. People living in households whose head has no formal education suffer from severe poverty. In 1988, 48 per cent of the population was poor in these households; it reduced to 41.2 per cent in 1992.

In the Northeastern region, about 85 per cent of the population lived in households whose head had only primary education whereas this figure for Bangkok was about 53 per cent. This suggests that the education level in the Northeastern is very low (lowest among all regions) which may be the major cause of its highest poverty. The expansion of education in the Northeastern region may prove to be an incentive for a policy to reduce poverty in Thailand.

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Table1: Energy requirement per day by age, sex and region

Person types	Age	Weight	BMR factor	Required Calories
Children	1 to 3	12	-	1200
	4 to 6	16	-	1450
	7 to 9	22	-	1600
Rural male	10 to 12	29	1.75	1850
	13 to 15	42	1.68	2300
	16 to 19	54	1.6	2400
	20 to 29	58	2.1	3289
	30 to 59	58	2.1	3264
	60 +	58	1.78	2261
Urban male	10 to 12	29	1.75	1850
	13 to 15	42	1.68	2300
	16 to 19	54	1.6	2400
	20 to 29	58	1.78	2787
	30 to 59	58	1.78	2767
	60 +	58	1.55	1969
Rural female	10 to 12	33	1.64	1700
	13 to 15	28.5	1.59	2000
	16 to 19	25.5	1.53	1850
	20 to 29	50	1.82	2239
	30 to 59	50	1.82	2302
	60 +	50	1.64	1837
Urban female	10 to 12	33	1.64	1700
	13 to 15	28.5	1.59	2000
	16 to 19	25.5	1.53	1850
	20 to 29	50	1.64	2017
	30 to 59	50	1.64	2075
	60 +	50	1.56	1747

Table 2 : Required Calories per person per day
by Area and Region 1992

Region	Rural	Urban	Total
North	2316	2102	2275
Northeast	2274	2086	2252
Center	2311	2109	2259
South	2260	2079	2223
Bangkok	-	2142	2142
Bangkok Vicinity	2366	2132	2215
Total	2291	2116	2241

Table 3 : Spatial Price indices

Region	All commodities		
	1988	**1990**	**1992**
Urban Areas			
Bangkok	77.9	84.5	100.0
Central	73.4	79.7	89.4
Northern	75.5	80.2	87.7
Northeastern	74.0	79.8	88.9
Southern	75.2	83.4	94.5
Rural Areas			
Central	70.5	76.6	87.5
Northern	71.8	76.4	85.7
Northeastern	70.6	76.1	87.3
Southern	70.7	78.4	92.4
	Non-Food items		
Urban Areas	**1988**	**1990**	**1992**
Bangkok	81.7	90.2	100.0
Central	74.9	82.5	94.5
Northern	77.5	81.6	93.4
Northeastern	78.0	84.8	97.1
Southern	79.8	89.3	99.4
Rural Areas			
Central	68.7	75.7	88.1
Northern	68.5	72.1	83.4
Northeastern	70.9	77.2	89.2
Southern	69.9	78.1	88.6
	Food items		
Urban Areas	**1988**	**1990**	**1992**
Bangkok	75.2	80.5	100.0
Central	72.3	77.7	85.7
Northern	74.1	79.2	83.5
Northeastern	71.1	76.2	83.0
Southern	71.9	79.2	90.9
Rural Areas			
Central	71.8	77.1	87.0
Northern	74.3	79.4	87.3
Northeastern	70.3	75.4	86.0
Southern	71.4	78.6	95.2

Table 4 : Calories Obtained per Baht

Ave Price	Basket	Rural areas						
		Central	Northern	Northeastern	Southern	**Ave rural**	Bangkok	Cen
1992								
Rural areas								
Central		195	168	194	168	181	103	11
Northern		200	179	206	164	187	111	11
Northeastern		197	174	206	164	185	100	10
Southern		196	164	191	174	182	103	11
Urban areas								
Bangkok		157	135	147	134	143	94	10
Central		163	140	150	140	148	101	10
Northern		168	148	163	140	155	100	10
Northeastern		166	145	163	139	153	95	10
Southern		157	132	141	138	142	95	10
1990								
Rural areas								
Central		230	198	227	198	213	121	12
Northern		234	208	237	185	216	129	13
Northeastern		233	205	237	197	218	115	12
Southern		224	188	214	195	205	117	12
Urban areas								
Bangkok		175	150	164	153	161	104	11
Central		186	162	174	161	171	116	12
Northern		195	173	190	157	179	114	12
Northeastern		189	166	184	161	175	109	11
Southern		174	147	156	152	157	107	11
1988								
Rural areas								
Central		250	216	249	214	232	135	14
Northern		254	227	261	197	235	134	14
Northeastern		255	225	261	213	238	126	13
Southern		246	207	237	212	225	134	14
Urban areas								
Bangkok		183	163	175	161	171	120	12
Central		203	177	191	174	186	130	13
Northern		211	189	210	168	194	119	12
Northeastern		207	182	202	174	191	119	12
Southern		190	162	172	166	173	122	13

Table 5: Ratio of food to total expenditure (%)

Region	1988	1990	1992
Urban Areas			
Bangkok	58.0	57.2	60.0
Central	59.2	58.5	57.6
Northern	58.9	59.3	57.3
Northeastern	57.8	57.4	56.2
Southern	57.5	57.1	57.9
Rural Areas			
Central	61.0	60.4	59.7
Northern	61.9	62.3	61.1
Northeastern	59.8	59.4	59.1
Southern	60.5	60.1	61.7

Table 6 : Poverty Line by Area and Region

	1988			1990			
Region	**Rural**	**Urban**	**Total**	**Rural**	**Urban**	**Total**	**Ru**
Poor							
North	476	549	490	522	596	536	60
Northeast	471	565	482	520	619	531	62
Center	479	567	501	532	627	557	64
South	485	622	513	546	694	576	60
Bangkok	-	641	641	-	698	698	-
Bangkok Vicinity	491	623	566	568	691	651	65
Total	476	602	511	527	660	565	62
Ultra Poor							
North	291	326	298	319	355	326	36
Northeast	282	332	288	309	364	316	37
Center	289	338	302	320	369	333	38
South	292	366	307	329	406	345	36
Bangkok	-	379	379	-	408	408	-
Bangkok Vicinity	297	368	337	342	405	384	39
Total	287	356	306	317	388	337	37

Table 7 : Percentage of Poor and Ultra Poor

	1988			1990			
Region	**Rural**	**Urban**	**Total**	**Rural**	**Urban**	**Total**	**Ru**

	Poor						
North	37.9	27.6	35.9	29.1	18.1	26.9	32
Northeast	56.5	32.1	53.6	52.8	31.0	50.2	48
Center	30.2	18.3	27.2	24.3	16.6	22.2	18
South	41.8	19.9	37.4	35.0	21.1	32.2	26
Bangkok	-	5.1	5.1	-	3.3	3.3	-
Bangkok Vicinity	12.6	10.8	11.5	2.3	4.0	3.4	3.
Total	44.2	16.2	36.4	38.5	13.3	31.3	34
	Ultrapoor						
North	12.5	8.4	11.7	9.8	5.0	8.9	10
Northeast	24.1	12.0	22.7	17.3	11.5	16.6	15
Center	10.8	5.0	9.4	8.0	5.8	7.4	4.
South	15.6	5.3	13.5	12.0	6.3	10.8	10
Bangkok	-	1.1	1.1	-	1.0	1.0	-
Bangkok Vicinity	1.7	3.8	2.9	1.7	0.5	0.9	1.
Total	17.2	5.0	13.8	12.8	4.3	10.4	11

Table 8 : The Poverty Gap Measures

	1988			1990			
Region	**Rural**	**Urban**	**Total**	**Rural**	**Urban**	**Total**	**Ru**
	Poor						
North	11.8	8.6	11.2	9.1	5.2	8.3	9.
Northeast	20.1	11.0	19.0	16.6	10.7	15.9	15
Center	9.7	5.1	8.6	7.4	5.5	6.9	4.
South	14.1	5.9	12.4	11.3	6.5	10.3	8.
Bangkok	-	1.3	1.3	-	1.0	1.0	-
Bangkok Vicinity	2.6	3.3	3.0	1.1	1.2	1.2	1.
Total	15.0	5.0	12.2	12.1	4.3	9.9	10
	Ultrapoor						
North	3.0	1.8	2.8	2.3	1.1	2.0	2.
Northeast	6.0	2.8	5.6	3.8	3.2	3.7	3.
Center	2.7	1.2	2.3	2.1	1.7	2.0	1.
South	4.0	1.0	3.4	2.9	1.5	2.6	2.
Bangkok	-	0.4	0.4	-	0.3	0.3	-
Bangkok Vicinity	0.1	1.2	0.7	0.4	0.2	0.3	0.
Total	4.3	1.2	3.4	2.9	1.2	2.4	2.

Table 9 : Change in Poverty (Measured by Head-count Ratio)

Region	Change between 1988-90			Change between 1990-92		
	Rural	Urban	Total	Rural	Urban	Total
Poor						
North	-8.8	-9.6	-9.0	3.7	-4.6	2.1
Northeast	-3.8	-1.0	-3.4	-4.3	-3.5	-4.2
Center	-5.9	-1.8	-5.0	-6.2	-8.9	-6.8
South	-6.8	1.1	-5.2	-8.9	-9.0	-8.9
Bangkok	0.0	-1.8	-1.8	0.0	-1.3	-1.3
Bangkok Vicinity	-10.3	-6.8	-8.1	0.7	-3.0	-1.7
Total	-5.7	-3.0	-5.1	-3.6	-4.3	-3.8
Ultrapoor						
North	-2.7	-3.3	-2.8	0.2	-1.2	-0.1
Northeast	-6.8	-0.5	-6.1	-1.7	-2.5	-1.8
Center	-2.8	0.8	-1.9	-3.4	-3.6	-3.4
South	-3.6	1.0	-2.7	-1.9	-2.1	-1.9
Bangkok	0.0	-0.1	-0.1	0.0	-0.4	-0.4
Bangkok Vicinity	-0.1	-3.3	-2.0	0.0	-0.2	-0.1
Total	-4.4	-0.7	-3.4	-1.6	-1.5	-1.6

Table 10 : Change in Poverty Measured by Poverty Gap Ratio

Region	Change between 1988-90			Change between 1990-92		
	Rural	Urban	Total	Rural	Urban	Total
Poor						
North	-2.7	-3.5	-2.9	0.4	-1.2	0.1
Northeast	-3.5	-0.3	-3.1	-1.4	-1.6	-1.4
Center	-2.3	0.5	-1.7	-2.5	-3.2	-2.6
South	-2.7	0.6	-2.1	-2.9	-2.6	-2.9
Bangkok	0.0	-0.3	-0.3	0.0	-0.4	-0.4
Bangkok Vicinity	-1.5	-2.1	-1.8	0.4	-0.9	-0.5
Total	-2.9	-0.7	-2.3	-1.4	-1.4	-1.4
Ultrapoor						
North	-0.7	-0.7	-0.7	0.2	-0.2	0.1
Northeast	-2.2	0.3	-1.9	-0.4	-1.0	-0.4
Center	-0.6	0.6	-0.3	-1.0	-1.1	-1.0
South	-1.1	0.5	-0.8	-0.3	-0.2	-0.3
Bangkok	0.0	-0.1	-0.1	0.0	0.0	0.0
Bangkok Vicinity	0.4	-1.0	-0.4	0.4	-0.1	0.1
Total	-1.3	0.0	-1.0	-0.4	-0.4	-0.4

Table 11 : Poverty by Household size

Household size (person)	% of Poor			Change in % of Poor		% Poverty	
	1988	1990	1992	1988-90	1990-92	1988	19
Poor							
1	4.6	4.4	3.1	-0.2	-1.3	1.1	1.
2	15.0	12.2	10.1	-2.8	-2.0	4.1	3.
3	24.2	20.1	18.4	-4.0	-1.8	6.7	5.
4	33.4	27.0	25.3	-6.4	-1.7	10.0	8.
5	38.3	31.8	32.1	-6.6	0.4	12.5	9.
6	44.8	38.3	37.3	-6.5	-1.0	15.8	12
7 or more	53.8	49.0	38.1	-4.8	-11.0	21.1	16
Total	36.4	31.3	27.6	-5.1	-3.8	12.2	9.
Ultrapoor							
1	0.7	1.8	1.4	1.1	-0.4	0.1	0.
2	3.7	2.8	1.7	-0.8	-1.1	1.1	0.
3	6.2	4.8	3.9	-1.3	-0.9	1.3	1.
4	9.7	8.4	7.3	-1.3	-1.0	2.3	1.
5	14.3	10.6	9.5	-3.7	-1.2	3.4	2.
6	18.2	13.9	14.0	-4.3	0.2	4.6	3.
7 or more	27.8	17.8	15.8	-10.0	-2.0	7.2	4.
Total	13.8	10.4	8.8	-3.4	-1.6	3.4	2.

Table 12 : Poverty by Sex of Household Head

Sex of Household Head	% of Poor			Change in % of Poor		% Poverty	
	1988	1990	1992	1988-90	1990-92	1988	19
Poor							
male	37.4	32.4	28.8	-5.0	-3.6	12.6	
female	31.6	26.3	21.6	-5.3	-4.7	10.3	
Total	36.4	31.3	27.6	-5.1	-3.8	12.2	
Ultrapoor							
male	14.4	10.6	9.2	-3.8	-1.4	3.5	
female	11.0	9.4	7.1	-1.6	-2.4	3.0	
Total	13.8	10.4	8.8	-3.4	-1.6	3.4	

Table 13 : Poverty by Occupation of Household Head

Occupation of Household Head	% of Poor			Change in % of Poor		% Poverty	
	1988	1990	1992	1988-90	1990-92	1988	19
Poor							
Professional and tec	2.7	1.1	1.2	-1.5	0.0	0.7	
Executives	0.0	2.9	2.0	2.9	-0.9	0.0	
Clerical workers	2.6	0.8	0.9	-1.8	0.1	0.7	
Sales workers	10.0	8.4	6.6	-1.7	-1.8	3.1	
Service workers	6.8	7.3	3.6	0.5	-3.7	1.4	
Agriculturists	50.4	44.4	42.1	-6.0	-2.3	17.2	
Labourers	16.2	12.2	7.7	-4.0	-4.5	4.7	
Economically inactiv	37.5	31.8	27.1	-5.6	-4.7	12.4	
Total	36.4	31.3	27.6	-5.1	-3.8	12.2	
Ultrapoor							
Professional and tec	0.8	0.0	0.5	-0.8	0.5	0.1	
Executives	0.0	2.9	0.0	2.9	-2.9	0.0	
Clerical workers	0.3	0.3	0.1	-0.1	-0.2	0.1	
Sales workers	3.4	1.6	1.1	-1.8	-0.5	0.8	
Service workers	1.1	1.3	1.5	0.2	0.3	0.2	
Agriculturists	19.8	15.0	14.0	-4.8	-1.0	5.0	
Labourers	4.8	3.4	2.2	-1.4	-1.2	1.3	
Economically inactiv	13.8	10.9	7.9	-2.8	-3.0	3.1	
Total	13.8	10.4	8.8	-3.4	-1.6	3.4	

Table 14 : Poverty by Education of Household Head

Education of Household Head	% of Poor			Change in % of Poor		% Poverty	
	1988	1990	1992	1988-90	1990-92	1988	19
Poor							
No formal education	48.0	42.2	41.2	-5.8	-1.0	16.7	
Primary	39.6	34.3	30.5	-5.3	-3.8	13.2	
Secondary	11.2	9.1	6.8	-2.1	-2.3	3.6	
Vocational	7.5	4.5	3.6	-3.0	-0.9	2.4	
University	0.1	0.1	0.6	0.1	0.4	0.0	
Total	36.4	31.3	27.6	-5.1	-3.8	12.2	
Ultrapoor							
No formal education	18.3	17.7	14.8	-0.6	-2.9	5.0	
Primary	15.1	10.7	9.7	-4.4	-1.1	3.7	

Secondary	3.5	4.1	1.5	0.6	-2.6	0.9
Vocational	2.4	0.7	0.3	-1.7	-0.4	0.7
University	0.1	0.0	0.0	0.0	0.0	0.0
Total	13.8	10.4	8.8	-3.4	-1.6	3.4

Table 15 : Poverty by Age of Household Head

Age of Household Head	% of Poor			Change in % of Poor		% Poverty	
	1988	1990	1992	1988-90	1990-92	1988	19
Poor							
Under 20	14.1	5.3	11.5	-8.8	6.1	4.7	1.
20-29	32.3	25.9	21.2	-6.5	-4.6	10.0	8.
30-39	35.8	30.7	27.1	-5.1	-3.7	12.2	9.
40-49	38.9	32.4	28.1	-6.5	-4.3	13.2	10
50-59	36.2	31.6	27.6	-4.5	-4.0	11.7	10
60-69	36.0	31.1	27.7	-4.9	-3.4	12.6	9.
70 and over	38.7	36.3	34.6	-2.4	-1.7	13.2	12
Total	36.4	31.3	27.6	-5.1	-3.8	12.2	9.
Ultrapoor							
Under 20	2.6	1.1	6.1	-1.6	5.0	2.0	0.
20-29	11.3	8.5	5.9	-2.8	-2.6	2.6	2.
30-39	13.8	10.3	8.9	-3.5	-1.4	3.4	2.
40-49	15.3	10.3	9.0	-5.0	-1.2	4.1	2.
50-59	13.0	10.7	8.3	-2.2	-2.4	3.0	2.
60-69	13.9	9.5	9.3	-4.4	-0.2	3.7	2.
70 and over	15.7	13.7	11.5	-2.0	-2.1	3.2	3.
Total	13.8	10.4	8.8	-3.4	-1.6	3.4	2.

Table 16 : Poverty by Type of Enterprise

Type of Enterprise	% of Poor			Change in % of Poor		% Poverty	
	1988	1990	1992	1988-90	1990-92	1988	19
Poor							
Agriculture	50.6	44.5	41.8	-6.1	-2.8	17.3	14
Mining and quarrying	22.6	21.5	43.3	-1.1	21.7	12.2	9.
Manufacturing	19.1	19.7	18.9	0.6	-0.8	5.7	6.

Electricity, gas and water	0.0	12.0	0.0	12.0	-12.0	0.0	4.
Construction	29.3	14.9	1.4	-14.4	-13.5	5.1	4.
Trades	12.8	9.8	7.7	-3.0	-2.1	3.8	2.
Services	17.4	13.8	9.3	-3.6	-4.5	5.8	3.
Transportation	22.6	19.6	10.0	-3.0	-9.6	6.6	6.
Other enterprises	24.3	11.5	7.5	-12.9	-4.0	3.9	1.
No enterprises	20.3	15.5	13.3	-4.7	-2.2	6.4	4.
Total	36.4	31.3	27.6	-5.1	-3.8	12.2	9.
Ultrapoor							
Agriculture	20.0	15.3	13.7	-4.7	-1.6	0.8	3.
Mining and quarrying	19.6	19.4	0.0	-0.1	-19.4	1.9	1.
Manufacturing	5.6	6.6	8.0	1.0	1.4	3.0	1.
Electricity, gas and water	0.0	0.0	0.0	0.0	0.0	3.9	0.
Construction	5.8	6.9	0.0	1.1	-6.9	3.9	0.
Trades	3.9	2.4	1.8	-1.5	-0.7	5.7	0.
Services	7.3	1.6	2.2	-5.7	0.7	6.4	0.
Transportation	4.7	5.0	1.4	0.3	-3.7	9.2	2.
Other enterprises	4.2	0.0	1.6	-4.2	1.6	6.8	0.
No enterprises	6.8	4.6	3.9	-2.2	-0.7	0.0	1.
Total	13.8	10.4	8.8	-3.4	-1.6	3.4	2.

Table 17 : Poverty by Earners

Earners	% of Poor			Change in % of Poor		% Poverty	
	1988	1990	1992	1988-90	1990-92	1988	19
Poor							
0	25.6	15.5	21.1	-10.1	5.6	6.5	4.
1	20.5	18.0	13.8	-2.5	-4.2	6.7	5.
2	33.7	29.6	25.5	-4.1	-4.1	11.0	9.
3	40.0	29.7	31.8	-10.3	2.2	13.4	9.
4	44.6	36.4	35.0	-8.2	-1.3	14.9	11
5 and more	53.6	49.5	38.9	-4.1	-10.6	19.6	16
Total	36.4	31.3	27.6	-5.1	-3.8	12.2	9.
Ultrapoor							
0	4.4	5.1	4.0	0.7	-1.1	0.8	1.
1	7.5	5.1	4.6	-2.4	-0.5	1.9	1.
2	12.3	9.9	7.4	-2.4	-2.5	3.0	2.
3	15.1	10.0	10.9	-5.1	0.9	3.9	2.
4	16.0	11.4	11.2	-4.6	-0.3	3.9	2.
5 and more	25.0	17.4	14.4	-7.6	-3.0	6.0	4.

Total	13.8	10.4	8.8	-3.4	-1.6	3.4	2.

Table 18 : Poverty by Tenure

Tenure	% of Poor			Change in % of Poor		% Poverty	
	1988	1990	1992	1988-90	1990-92	1988	19
Poor							
Owns house and land	41.5	35.5	31.8	-6.1	-3.6	14.1	11
Owns house and rented land	21.6	18.9	15.9	-2.8	-3.0	7.2	5.
Pays rent for house	13.0	8.6	5.2	-4.3	-3.5	3.9	2.
Receives rent free	20.8	15.9	10.9	-4.8	-5.0	5.9	4.
Total	36.4	31.3	27.6	-5.1	-3.8	12.2	9.
Ultrapoor							
Owns house and land	16.1	11.8	10.1	-4.3	-1.7	4.0	2.
Owns house and rented land	8.5	6.8	4.2	-1.7	-2.5	2.2	1.
Pays rent for house	4.1	2.4	2.0	-1.8	-0.4	1.3	0.
Receives rent free	5.3	4.4	5.0	-1.0	0.7	0.9	1.
Total	13.8	10.4	8.8	-3.4	-1.6	3.4	2.

Table 19 : Poverty by Social Class

Social Class	% of Poor			Change in % of Poor		% Poverty	
	1988	1990	1992	1988-90	1990-92	1988	19
Poor							
farm operator : owning less than 2 rai	73.0	24.2	43.9	-48.8	19.7	28.9	9.
farm operator : owning 2 to 4 rai	71.5	67.9	49.6	-3.6	-18.3	31.4	26
farm operator : owning 5 to 9 rai	65.9	65.0	59.8	-0.9	-5.1	23.6	23
farm operator : owning 10 to 19 rai	59.8	55.7	51.1	-4.1	-4.6	20.5	18
farm operator : owning 20 to 39 rai	44.4	39.6	43.4	-4.8	3.8	13.9	11
farm operator : owning 40 rai or more	19.7	21.6	24.3	1.9	2.6	5.8	5.
renters: rent less than 5 rai	68.1	62.3	35.9	-5.8	-26.4	26.3	25
renters: rent 5-19 rai	63.7	59.3	46.5	-4.4	-12.8	22.3	20
renters rent 20 rai or more	37.8	30.3	23.1	-7.5	-7.2	10.5	10
other farm operators	36.3	30.9	13.9	-5.5	-17.0	12.3	11
entrepreneurs	16.4	13.7	10.1	-2.7	-3.6	5.0	3.
professional	1.0	1.1	2.6	0.1	1.5	0.5	0.
labourers	60.7	52.7	46.0	-7.9	-6.7	21.3	15
other employees	15.0	12.6	9.3	-2.4	-3.3	4.2	3.
econm inactive receiving assistance or pensions	26.6	22.4	24.1	-4.2	1.7	7.5	6.
econom inactive receiving property	29.8	31.4	25.3	1.6	-6.2	6.4	13

income							
Total	36.4	31.3	27.6	-5.1	-3.8	12.2	9.
Ultrapoor							
farm operator : owning less than 2 rai	28.9	6.9	13.0	-22.0	6.1	12.5	2.
farm operator : owning 2 to 4 rai	44.7	32.6	19.0	-12.1	-13.7	12.7	8.
farm operator : owning 5 to 9 rai	27.8	26.5	27.7	-1.3	1.2	7.0	6.
farm operator : owning 10 to 19 rai	24.5	21.3	15.7	-3.1	-5.6	5.8	4.
farm operator : owning 20 to 39 rai	15.5	10.9	12.0	-4.6	1.1	3.2	2.
farm operator : owning 40 rai or more	5.7	4.2	6.1	-1.5	1.8	1.3	1.
renters: rent less than 5 rai	26.9	36.4	16.9	9.6	-19.5	9.0	6.
renters: rent 5-19 rai	25.2	24.2	21.5	-1.0	-2.7	6.7	5.
renters rent 20 rai or more	9.0	10.3	10.4	1.4	0.1	2.0	2.
other farm operators	13.5	15.4	1.8	1.9	-13.6	3.9	3.
entrepreneurs	5.6	3.1	2.9	-2.4	-0.3	1.3	0.
professional	0.7	0.7	0.4	0.0	-0.3	0.3	0.
labourers	23.8	16.3	14.0	-7.5	-2.2	6.3	3.
other employees	4.0	2.9	2.4	-1.0	-0.5	1.0	0.
econm inactive receiving assistance or pensions	7.5	5.8	6.4	-1.7	0.6	1.1	1.
econom inactive receiving property income	6.3	18.6	9.3	12.4	-9.3	1.0	5.
Total	13.8	10.4	8.8	-3.4	-1.6	3.4	2.