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The Role of Agricultural Growth in Poverty Reduction in Indonesia^{*}

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The Role of Agricultural Growth in Poverty Reduction in Indonesia

Abstract

Indonesia experienced a rapid reduction in poverty during the strong economic growth pre-crisis period. By estimating the impact of sectoral economic growth components on consistently measured poverty rates across regions and over time, this study finds that agricultural growth is the largest factor behind the poverty reduction. Agricultural growth accounts for 66 percent of the reduction in overall poverty, 55 percent of the reduction in urban poverty, and 74 percent of the reduction in rural poverty. The growth of industrial sector – which has been the emphasis of Indonesian development strategy – has statistically significant impact only on reducing urban poverty. Even so, the impact is much smaller than the impact of agricultural growth. This implies that efforts to push productivity and growth in the agricultural sector – where most of the poor have a livelihood – is the most effective channel to reduce poverty. Furthermore, redirecting industrialization process to put more emphasis on developing integrated agro-industries with strong linkages to agriculture will certainly help in reducing poverty.

I. Introduction

Before hit by the recent economic crisis starting in mid 1997, Indonesia was considered as one of the most successful countries in the world in the endeavor to reduce poverty. The proportion of population living below the “official” poverty line dropped from around 40 percent in 1976 to around 11 percent in 1996. In absolute number, even though the total number of population increased from around 135 million in 1976 to around 200 million in 1996, the number of officially poor population decreased markedly from around 54 million people to around 22.5 million people during the same period.³

There are methodological questions as to whether BPS poverty rates are comparable over time as well as across urban-rural areas – which will be addressed later in this study. Nevertheless, this clearly point out that Indonesia has experienced a rapid reduction in poverty during the pre-crisis period. In fact, if anything, the BPS methodology undermines the rate of reduction in poverty over time as BPS updated the standard of living represented by the poverty lines from time to time.⁴

The rapid reduction in poverty in Indonesia has generally been attributed to the pre-crisis high economic growth experienced by the country. Prior to the crisis, Indonesia was one of the most rapidly growing economies in the world. Between 1986 and 1996, the average of real GDP growth was more than 7 percent per year. Furthermore, other social indicators also improved significantly during the pre-crisis period: life expectancy increased, infant mortality rates fell, and school enrollment rates rose. In addition, the provision of basic infrastructure – water supplies, roads, electricity, schools, health facilities – also rose significantly.

However, beginning in mid 1997 Indonesia was struck by a currency crisis, which by the first half of 1998 had already developed into a full blown economic and political crisis, exacerbated by a natural disaster (*El Nino* drought). During this crisis period, the Indonesian people witnessed the value of their currency fell to as low as 15 percent of its pre-crisis value in less than one year, an economic contraction by an unprecedented magnitude of 13.7 percent in 1998, skyrocketing domestic prices and particularly those of food,⁵ mass rioting in the capital Jakarta and a few other cities, and culminated in

³ BPS (2000).

⁴ Pradhan *et al.* (2001).

⁵ The general inflation rate was 78 percent in 1998, while food prices escalated by 118 percent.

the fall of the New Order government – which had been in power since mid 1960s – in May 1998.⁶

The social impact of the crisis, in particular on poverty, was substantial. An estimate indicates that the national poverty rate increased from around 16 percent in February 1996 to 27 percent in February 1999.⁷ During the period, the number of urban poor doubled, while the rural poor increased by 75 percent. Another study which tracks down poverty rate over the course of the crisis shows that the poverty rate increased by 164 percent from the onset of the crisis in mid 1997 to the peak of the crisis around the end of 1998.⁸

This has raised a question on the sustainability of poverty reduction achieved during the pre-crisis high economic growth era. In particular, the emphasis of development on industrialization has been questioned. During the crisis period, the agriculture sector fared much better than the other sectors. In 1998, when real output shrank from the level in the previous year by unprecedented magnitudes of 9.2 percent in the industrial sector, 18 percent in the trade sector, and 19.6 percent in the services sector respectively, the output of the agriculture sector only slightly fell by 0.7 percent. In the following year, the agriculture sector led the recovery by growing positively at 2.1 percent, helped by the industrial sector which grew by 1.4 percent, while the trade and services sectors were still in negative growth territory of 0.4 and 1.5 percent respectively.

This has led some to hypothesize that had Indonesia not industrialized “too fast” and instead focused on strengthening its basis in the agriculture sector, the country would not have been hurt so much by the economic crisis. Furthermore, had the country based its development strategy through developing the agricultural sector, the poverty reduction achieved would have been greater and more sustainable than that has been experience.

This line of thinking is based on the notion that it is not only the rate of economic growth itself which is important, but also the “quality of growth” is equally important.⁹ One criterion for determining the quality of growth, though certainly not the only one, is its effects on the poor.¹⁰ What kinds of growth are most beneficial for the poor and hence most effective in reducing poverty? In search for an answer to this question, some researchers have

⁶ The story of the Indonesian economic crisis and its possible proximate and deep causes has been told many times in academic (e.g. McLeod, 1998), official (e.g. World Bank, 1999), and journalistic (e.g. Blustein, 2001) accounts.

⁷ See Pradhan *et al.* (2001).

⁸ See Suryahadi *et al.* (2000).

⁹ See Thomas *et al.* (2000).

¹⁰ Warr (2002).

focused on the composition of economic growth.¹¹ Since in most poor countries the majority of the poor live in rural areas and are employed in agriculture, it seems logical that growth of agriculture is more important for poverty reduction than growth of industry or services.¹²

The findings, however, have been mixed. Ravallion and Datt (1996) find that for the case of India indeed the growth of agricultural sector has been most effective in reducing poverty. They showed that 85 percent of the reduction in poverty in India was due to agricultural growth. On the other hand, Warr and Wang (1999) find that in Taiwan it is the growth of the industrial sector which has the largest impact on poverty reduction. Different still, Warr (2002), by pooling the data from four Southeast Asian countries (Thailand, Indonesia, Malaysia, and the Philippines), finds that it is the growth of the services sector which accounts for the largest reduction in poverty in these countries.

Given the concentration of the poor in the agricultural sector, the finding of Warr (2002) that poverty reduction in Indonesia has been driven mainly by the growth of services instead of agriculture contradicts the intuition, although not entirely implausible. It is very likely that the result was driven by the fact that data analyzed was a pooling of data from four countries. Therefore, it is quite possible that the finding reflects more on the situation in other countries, but less so for Indonesia. *Hence, this study aims to re-assess the role of agricultural growth on poverty reduction as has been experienced by Indonesia. Specifically, this study re-estimates the elasticity of poverty reduction – measured using common indicators such as poverty headcount and poverty gap indices – with respect to agricultural versus non-agricultural growth, using data from Indonesia only. In addition, this study also estimates the marginal contribution of being employed in agriculture to the probability of being above poverty line, controlling for other relevant socio-economic factors, including community level variables.*

The rest of this paper is organized as follows. Chapter two describes the sources of data analyzed in this study. Chapter three discusses the role of agriculture in rural economy. Chapter four calculates the trends in poverty in Indonesia based on a consistently set standard of living and taking into account variations in prices both across regions and over time as well as estimates the marginal contribution of being employed in agriculture to the probability of being poor. Chapter five evaluates the impact of agricultural growth on poverty reduction in comparison with that of non-agricultural sectors. Chapter six provides an account of Indonesia's past efforts in

¹¹ See, for example, Ravallion and Datt (1996), Warr and Wang (1999), Warr (2002).

¹² Dollar and Kray (2000), however, find that economic growth is associated with increases in incomes of the poor. Therefore, they argue that any growth is good for the poor.

reducing poverty. Chapter seven provides the conclusion and derives policy implications from the findings of this study.

II. Data

The main data source for the calculations of poverty in Indonesia is the Consumption Module of SUSENAS (the National Socio-Economic Survey) collected by Statistics Indonesia (*Badan Pusat Statistik* or BPS). SUSENAS is a nationally representative household survey, covering all areas of the country. The Consumption Module of SUSENAS is conducted every three years, specifically collecting information on very detailed consumption expenditures from around 65,000 households. Although SUSENAS was started in 1976, this study can only have access to the data collected in 1984, 1987, 1990, 1993, 1996, and 1999.

This study also utilizes the data from Core SUSENAS, which is conducted every year in the month of February, collecting information on the characteristics of over 200,000 households and over 800,000 individuals. The sample of households in the Consumption Module of SUSENAS is a randomly selected subset of the 200,000 households in the Core SUSENAS sample of the same year.

In addition, this study also uses the data of Regional Gross Domestic Product (RGDP) and Regional Consumer Price Index (RCPI), both published by BPS. In line with the SUSENAS data, the RGDP data used are started from 1984 until 1999. For real RGDP, starting from the 1993 data BPS uses a new 1993 prices, while for the earlier series they used the 1983 prices. To get a consistent series of real RGDP, the earlier series are converted to the 1993 prices. Meanwhile, the RCPI data are based on urban prices only.

III. The Role of Agriculture in Rural Economy

Industrialization was the heart of economic development strategy adopted by the Indonesian New Order government during its tenure in power from late 1960s to late 1990s. This is true during both its earlier period up until the mid 1980s which emphasized import substitution strategy as well as during its later period which emphasized export orientation strategy. As a consequence, the role of the agricultural sector in the national economy has continuously declined during the whole period, which is briefly discussed in the first section of this chapter. Nevertheless, agriculture remains an important source of livelihood for a large number of households, in particular in rural areas. This is discussed in the second section of this chapter.

A. The Macro Picture

Indonesia entered a rapid economic growth phase following the launching of its first five-year development plan in 1969. Since then the country's economy has undergone significant changes. With an average real GDP growth of around seven percent annually during the pre-crisis period, Indonesia holds its place with the other rapidly growing East Asian economies. Since it started from a very low initial condition, however, its per capita income remains still far below its neighboring countries in absolute terms. In 1967, Indonesia's per capita income was around US\$ 50 and it was one of the poorest countries in the world (Agrawal, 1996). Hill (1996) estimates that between 1965 and 1991 the real GDP per capita increased from 190 to 610, measured in 1991 US\$, which constitutes growth of 4.6 percent annually.

Since the late 1960s, economic development in Indonesia can be divided into three phases. The first is from the late 1960s to mid 1970s, where Indonesia's "New Order" regime embraced trade and investment policies which were remarkably open for the period. In 1967, a foreign investment law that guaranteed foreign investors the right to repatriate capital and profits was passed. In 1970, there were reforms that reduced the existing barriers to goods trade and foreign borrowing by unifying the multiple exchange rate system and abolishing most of the exchange controls on capital and current account transactions. According to Aswicahyono *et al.* (1996), the government's adherence to reasonably open trade and investment policies during this period was a legacy of the abrupt change in economic policy beginning in the mid 1960s.

The second phase is from the mid 1970s to the mid 1980s, where Indonesia adopted an inward-looking import-substitution strategy. Awash with revenue from oil exports, the government was eager to build capital intensive industries to replace imports. In addition, it spent a large sum of money in building infrastructure. Not surprisingly, the role of the public sector in the economy's growth was dominant during this period. Aswicahyono *et al.*

(1996) argue that this change of policy resulted from tremendous internal pressure on the government to embark on a more interventionist path, especially in the area of industrial policy.

The third phase started in mid 1980s when the Indonesian economy started to open again. This was an indirect result of the large drop in oil prices that began in the early 1980s (Hill, 1996). Because the oil revenue shrank quickly, the government faced a sudden external imbalance. The import substitution strategy had left the Indonesian industries inefficient and unable to compete in the world market at the maintained exchange rate. A combination of this and general decline in primary commodity prices raised the premium on foreign exchange. In 1986, the import substitution strategy was therefore discarded and replaced with export orientation, followed by a devaluation of the exchange rate and combined with deregulation in the domestic economy.

During three decades of economic development starting in the early 1970s, the Indonesian economy underwent substantial structural change. Notable of this change is the reduction in the importance of the agricultural sector in the Indonesian economy. Table 1 compares the share of agriculture in Gross Domestic Product (GDP) and its share in employment from 1971 to 2000. The shares of the agricultural sector in both GDP and employment have declined throughout the period. However, it appears that the reduction in agricultural GDP share has been much faster than its employment share. This is apparent from the declining ratio of GDP to employment share from 0.67 in 1971 to 0.38 in 2000.

Table 1. GDP and Employment Shares of Agriculture in Indonesia, 1971-2000 (%)

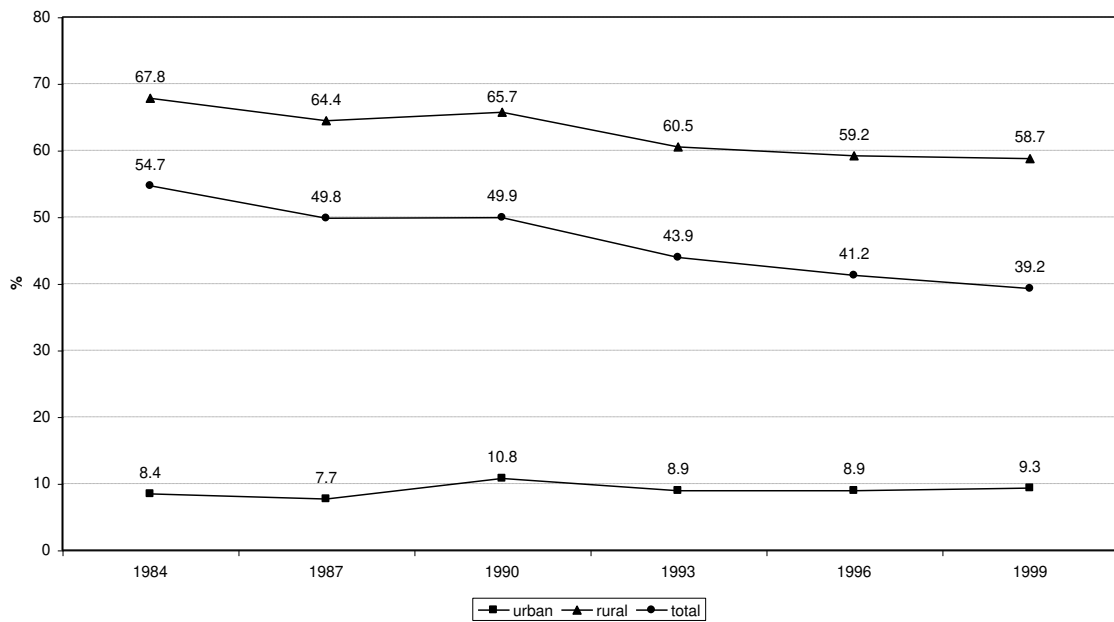
	1971	1980	1990	2000
Gross Domestic Product	45	25	22	17
Employment	67	55	50	45
Ratio of GDP to employment share	0.67	0.45	0.44	0.38

Source: BPS, Statistik Indonesia (various years).

B. Agriculture and Household Livelihood

The macroeconomic picture discussed in the previous section clearly indicates that the role of the agricultural sector in the national economy has declined along with the industrialization of the economy. This is also reflected at the household level. Figure 1 shows the proportion of agricultural households – defined as households which derive most of their incomes from the agricultural sector – from the total households in both rural and urban areas. The data used in this figure is calculated from SUSENAS.

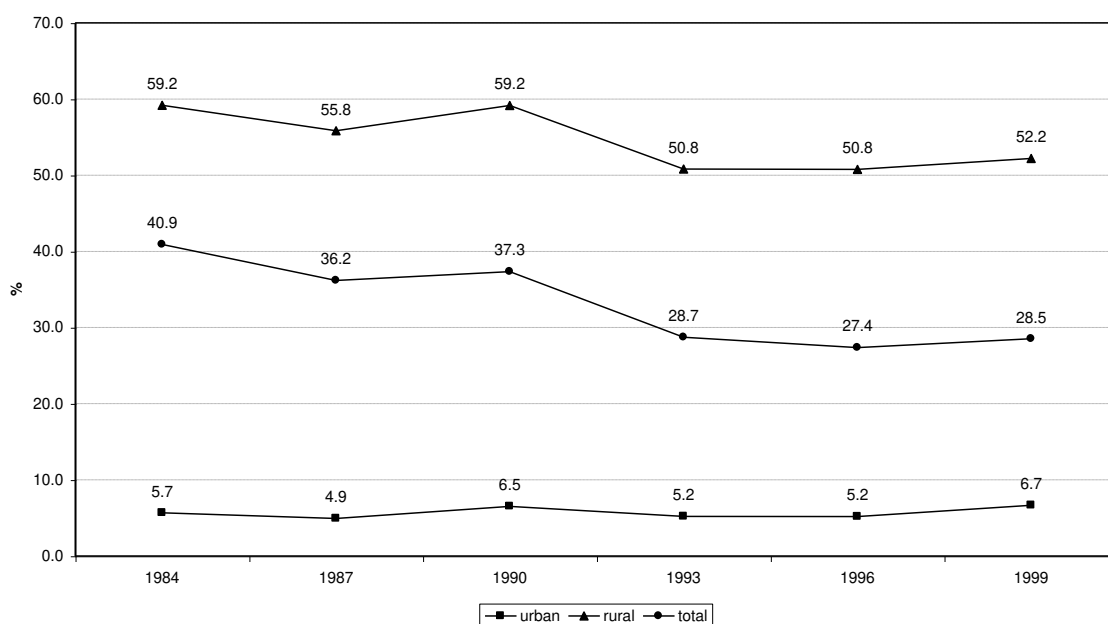
Figure 1. Proportion of Agricultural Households in Indonesia, 1984-1999



Consistent with the national employment data in Table 1, Figure 1 shows that nationally the proportion of agricultural households declined from around 55 percent in 1984 to 39 percent in 1999. Interestingly, most of the decline was driven by the decline in rural areas, while the proportion of agricultural households in urban areas was relatively stable between 8 and 10 percent. Nevertheless, in 1999 around 59 percent of rural households still derived most of their incomes from the agricultural sector. This indicates that agriculture still constitutes the most important source of livelihood for the majority of rural Indonesians.

Figure 2 shows the total incomes of all agricultural households as a proportion of total incomes of all households.¹³ The data used in this figure is also calculated from SUSENAS. Even though declining, the numbers in this figure indicate that the role of agricultural income at the household level, particularly in rural areas, is much greater than those suggested by the GDP share of the agricultural sector shown in Table 1. While in urban areas the incomes of agricultural households only make up between 5 and 7 percent of the incomes of total households, in rural areas the proportion is still more than 50 percent.

Figure 2. Share of Agricultural Households Income from Total Households Income



¹³ This is just a proxy for agricultural income as agricultural households derive some of their incomes from non-agricultural sectors and *vice versa* non-agricultural households derive some of their incomes from agriculture.

IV. Poverty Trends and Sectoral Profile of Poverty

The method for measuring poverty has always been subjected to controversies.¹⁴ This is due to both definitional issues as well as the implications which may arise from the results of a poverty measurement exercise. The definition of poverty has evolved over time from the narrow definition of inability to fulfill the basic needs to incorporate broader aspects of life such as health and education, and more recently to include socio-political dimensions such as voicelessness in the making of decisions that affect one's own life.¹⁵ Meanwhile, counting the poor can also become the subject of controversies when the numbers calculated are used for practical policy purposes, such as allocating budget.

A. Measuring Poverty

Despite acknowledging that there are more to poverty than simply the inability to fulfill the basic needs, this study uses the most widely used measure of poverty, which is the current consumption expenditure deficit. In this measure, a household is categorized as poor if its per capita consumption expenditure is less than a specified threshold, which is popularly known as the "poverty line".

At the surface, this method looks very simple. However, this simplicity is deceptive, as setting an absolute "poverty line" is a complex exercise. Even if one begins by accepting that the poverty line will be based on food expenditures necessary for nutritional adequacy and some allowance for "essential" non-food items, one still needs to answer to many questions. What level of nutrition is "adequate"? What mix of food commodities are to be included in a food poverty basket to achieve adequacy? What level of non-food purchases are "essential"? Ultimately there are no correct answers to any of these questions as each is a social convention. But any proposed method for providing answers should be complete, internally consistent, and provide a credible case for its particular choice of social convention.¹⁶

The poverty measures analyzed here are the Foster-Greer-Torbecke (FGT) poverty indices (Foster *et al.*, 1984). This class of poverty measures is highly regarded because it meets all the axioms desirable in consumption-based poverty measures and contains a parameter α that can be set according to society's sensitivity to the income distribution among the poor.

¹⁴ See Sen (1981) and Ravallion (1994).

¹⁵ See Narayan (2000), Narayan *et al.* (2000), and World Bank (2000).

¹⁶ Pradhan *et al.* (2001).

Specifically, the FGT family of poverty measures is summarized by the formula:

$$P(\alpha) = \left(\frac{1}{N} \right) \sum_{i=1}^q \left(\frac{z - c_i}{z} \right)^\alpha \quad (1)$$

where N is the number of all households, z is the poverty line, c_i is the per capita consumption (or income) of the i 'th poor household, q is the number of poor households, and α is the weight attached to the severity of household poverty (or the distance from the poverty line).

When $\alpha = 0$, the FGT measure collapses to the headcount index, or $P(0)$, i.e. the proportion of the population that is below the poverty line. This measure, while useful for general poverty comparisons, is insensitive to differences in the depth of poverty in the sense that households far below the poverty line receive the same weight as households just below the poverty line. Moreover, as Deaton (1997) points out, it serves as an unsatisfactory indicator of welfare, for it is possible for this measure to indicate a decrease in poverty headcount when some very poor households become even poorer and some not so poor households' expenditures increase sufficiently to push these households above the poverty line.

This shortcoming is overcome by assigning higher values to the parameter α . When $\alpha = 1$, the FGT measure gives the poverty gap, or $P(1)$, a measure of the average depth of poverty and indicates the population averaged money gap by which the consumption of the poor falls short of the poverty line. When $\alpha = 2$, the FGT index is called the poverty severity index, or $P(2)$. The $P(2)$ measure differs from the $P(1)$ measure because it assigns relatively more weight than the $P(1)$ measure to individuals whose expenditures are further away from the poverty line and thus in more severe poverty.

B. Official Poverty Measurement in Indonesia

Statistics Indonesia (BPS) is the government body which calculates the official poverty figures in Indonesia. They base their calculations on the data collected through the three yearly Consumption Module of SUSENAS (the National Socio-Economic Survey), with a sample of around 65,000 households selected randomly from all over the country. The questionnaire in this detailed consumption module includes a total of 229 food and 110 non-food items.

BPS poverty line is consisted of two parts: the food poverty line and the non-food poverty line.¹⁷ The food poverty line is set to achieve a caloric intake of 2,100 calories per person per day. The value of this caloric intake is

¹⁷ See BPS (2002).

calculated based on the consumption of a food poverty basket, which is consisted of 52 food commodities, by a pre-specified reference population. The reference population is consisted of all households within a range of nominal per capita expenditure, which is determined subjectively. The next step from here is to calculate the mean of actual caloric intake and the value of the food poverty basket consumed by the reference population. Then the food poverty line is calculated by multiplying the actual value of the food poverty basket consumption by the ratio of 2,100 to the actual caloric intake.

Meanwhile, the non-food poverty line is obtained by first calculating the mean of actual consumption of a non-food poverty basket, which is consisted of 27 non-food commodities, by the reference population. Then, for each commodity a scaling factor is independently determined to indicate the portion of the commodity consumption which is deemed essential.¹⁸ The range of the scaling factor is determined between 0 and 1. This scaling factor is then multiplied to the actual value of consumption of each commodity. The non-food poverty line is the sum of these values across the 27 commodities. Finally, the poverty line is obtained by summing up the food poverty line and the non-food poverty line.

Although BPS has published the results of their calculations on the number of the poor in Indonesia since 1976, these numbers cannot be used as the basis for the analysis in this study for two reasons. First, BPS applies its poverty calculation method separately for urban and rural areas. This means that the resulting poverty lines for urban and rural areas represent different and not comparable welfare levels. Second, BPS each time repeat its poverty calculation method wholly, independent of its calculations in the previous years. This means that the poverty lines obtained each year again represent different and not comparable welfare levels. Due to these two drawbacks, the BPS poverty numbers are not comparable across regions and over time. Therefore, for the purpose of this study, an alternative source of poverty calculations which provides consistent and comparable welfare level has to be found from elsewhere.

C. Consistent Poverty Estimates

To overcome the regional comparability problem, alternative sources that can be identified are Bidani and Ravallion (1993), Cheshier (1998), and Pradhan *et al.* (2001). These three studies provide poverty figures for Indonesia which are based on a single poverty basket and, hence, represent comparable poverty measures across regions. Since Pradhan *et al.* (2001) provides the poverty figures for the latest year available, 1999, this study is

¹⁸ This is based on a basic needs commodities survey (*Survei Paket Komoditi Kebutuhan Dasar* – SPKKD).

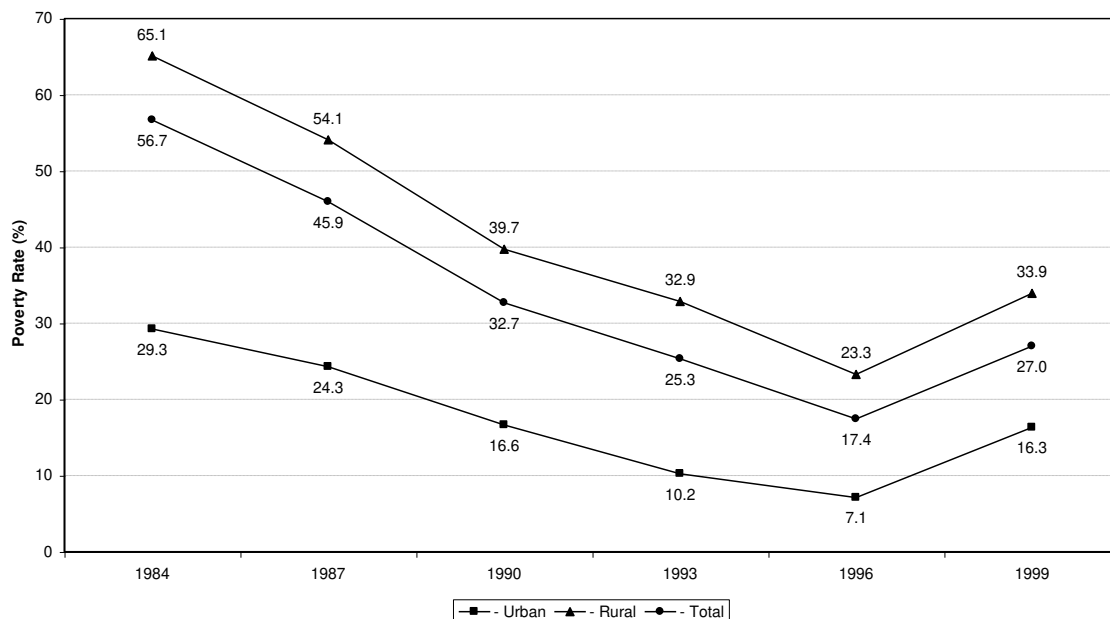
selected as the basis for calculating poverty figures used in the present study. Pradhan *et al.* (2001) use the same 52 commodities in the food poverty basket as BPS, but use the food-share based Engel curve method for calculating the non-food poverty basket.

In terms of comparability over time, however, there is no alternative source readily available. This means that a consistent time series of poverty figures has to be calculated, using the 1999 poverty figures from Pradhan *et al.* (2001) as the basis. To calculate the poverty figures in the previous years, first it is necessary to construct a deflator which will be used to deflate the 1999 poverty lines to the previous years. Following Suryahadi *et al.* (2000), this deflator is a re-weighted consumer price index (CPI) to reflect the share of food in the poverty basket. While the CPI has a 40 percent food share, this poverty line deflator has an 80 percent food share.

Pradhan *et al.* (2001) calculate nominal poverty lines separately for urban and rural areas within each province. Ideally, each of this region specific poverty line is deflated using also region specific poverty line deflator. However, since the CPI in Indonesia is only available for urban areas, there is only one poverty line deflator available for each province. Therefore, both urban and rural poverty lines within one province are deflated using the same urban-based provincial poverty line deflator. The regional poverty lines obtained through this method are then applied to the Consumption Module SUSENAS data to calculate the poverty figures in the pre-1999 years.

The results of the calculations for poverty headcount, aggregated at the national level, are shown in Figure 3. There was clearly a sharp reduction in both urban and rural poverty in Indonesia between 1984 and 1996. Despite continuously growing population, total poverty headcount dropped from 56.7 percent in 1984 to 17.4 percent in 1996, a reduction by 39.3 percentage points in a twelve-year period. During the same period, urban poverty fell by 22.2 percentage points from 29.3 percent in 1984 to 7.1 percent in 1996, while rural poverty fell by 41.8 percentage points from 65.1 percent in 1984 to 23.3 percent in 1996.

Figure 3. Headcount Poverty Rate



However, the crisis has evidently reversed the course of poverty reduction of the previous decade. Poverty in both urban and rural areas increased again between 1996 and 1999. The total poverty rate in 1999 was 27.0 percent, while urban and rural poverty rates were 16.3 and 33.9 percent respectively. In fact, reflecting the severity of the crisis, these 1999 total, rural, and particularly urban poverty levels are even higher than their respective 1993 levels. This implies that in terms of poverty headcount, the lost time due to the crisis is more than six years.

Other poverty measures calculated, the poverty gap index and the poverty severity index, are shown in Figures 4 and 5 respectively. Their trends show the same pattern as the poverty headcount. In both urban and rural areas, both poverty indices fell significantly during the period between 1984 and 1996, but increased again between 1996 and 1999.

Figure 4. Poverty Gap Index

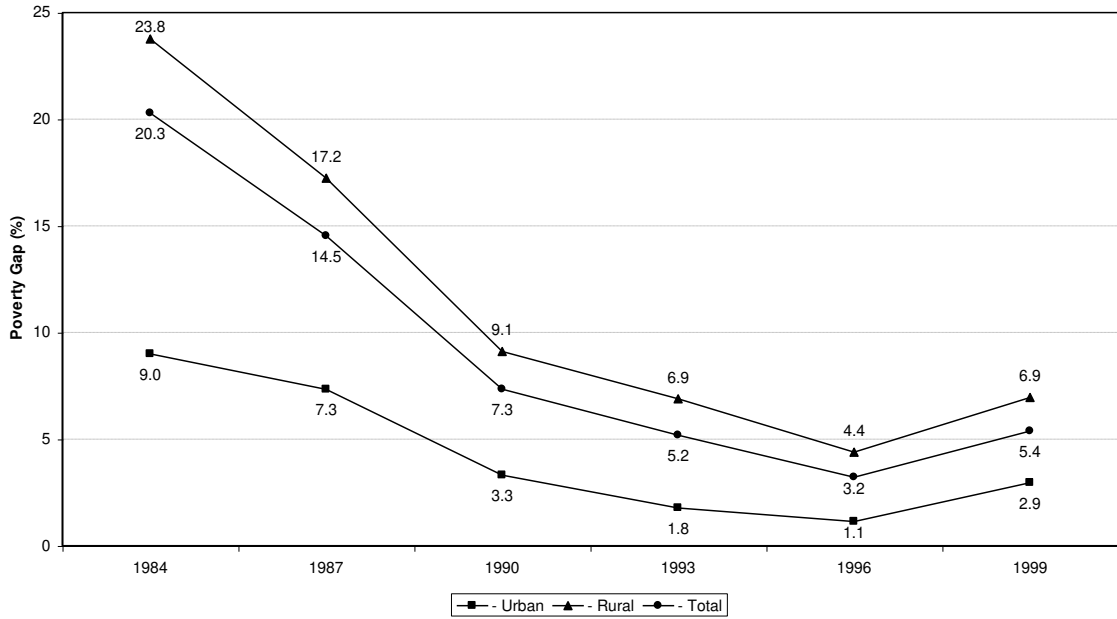
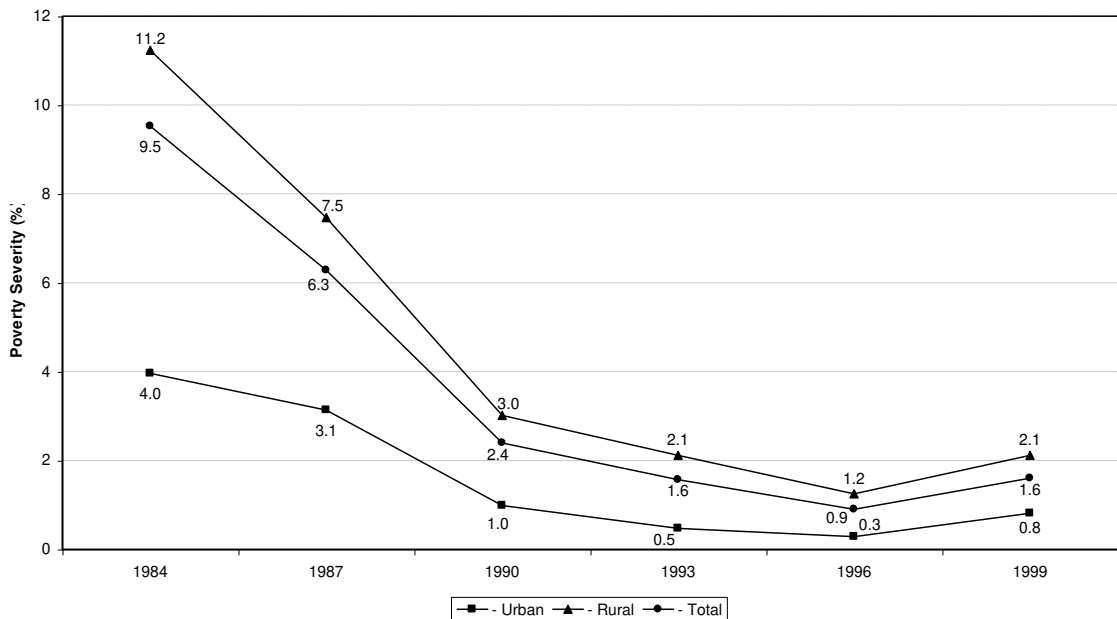


Figure 5. Poverty Severity Index



Poverty gap indicates the total expenditure deficit of the poor to the poverty line averaged over the whole population. The total poverty gap fell substantially by 17.1 percentage points from 20.3 percent in 1984 to only 3.2 percent in 1996. In urban areas, the gap fell by 7.9 percentage points from 9 percent to 1.1 percent and in rural areas fell by 19.4 percentage points from 23.8 percent to 4.4 percent during the same period. However, in 1999 the

total, urban, and rural poverty gaps increased again to reach 5.4, 2.9, and 6.9 percent respectively. Just like the poverty headcount, the crisis has brought back the poverty gap levels in 1999 even higher than their 1993 levels, notably in urban areas.

Poverty severity gives more weight to the poorest among the poor by squaring the expenditure deficit to the poverty line. The total poverty severity index also fell substantially from 9.5 percent in 1984 to 0.9 percent in 1996, a fall of 8.6 percentage points. During the same period, the poverty severity in urban areas fell by 3.7 percentage points from 4 to 0.3 percent, while in rural areas it fell by 10 percentage points from 11.2 percent to 1.2 percent. Like the other two poverty measures, the poverty severity has increased again in 1999 due to the crisis. However, only in urban areas it reached a level higher than its 1993 level.

While Figure 3 shows that the reduction in poverty headcount rate between 1984 and 1996 occurred at a relatively steady rate, Figure 4 and more so Figure 5 show that the reduction in higher dimension poverty measures occurred much faster during the 1980s than in the 1990s. This indicates that during the 1980s there was a progress in reducing more severe forms of poverty. This also indicates that there was a significant improvement in income distribution among the poor during this period.

D. Sectoral Profile of Poverty

It is well known that poverty in Indonesia is a phenomenon mainly found in rural areas, while in urban areas poverty is mainly found in the informal sector. Therefore, poverty in Indonesia is very much related to the agricultural sector. Table 2 shows poverty headcount rate and contribution to total poverty by main sector of occupation of household heads in 1987, 1996, and 1999.¹⁹ A comparison between the 1987 and 1996 sectoral profile of poverty will show how it is affected by growth, while the 1996 and 1999 comparison will show how it is affected by the crisis.

¹⁹ While the access to Consumption Module SUSENAS can be obtained starting from the 1984 data, the access to Core SUSENAS – which provides household characteristics – can only be obtained starting from the 1987 data.

Table 2. Poverty Headcount Rate and Contribution to Total Poor by Main Sector of Occupation in Indonesia, 1987-1999 (%)

Sector	Urban		Rural		Urban + Rural	
	Poverty Headcount	Contribution to total poor	Poverty Headcount	Contribution to total poor	Poverty Headcount	Contribution to total poor
1987:						
Agriculture	51.7	15.6	58.5	69.7	58.2	61.8
Industry	28.4	14.5	54.2	5.4	42.3	6.8
Services	21.2	69.9	44.6	24.9	32.9	31.4
Total	24.3	100.0	54.1	100.0	45.9	100.0
1996:						
Agriculture	20.7	25.1	29.9	76.0	29.2	68.6
Industry	7.1	13.2	18.1	5.7	12.6	6.8
Services	5.6	61.7	12.7	18.3	8.7	24.6
Total	7.1	100.0	23.3	100.0	17.4	100.0
1999:						
Agriculture	33.6	18.9	40.1	70.5	39.5	58.1
Industry	18.1	15.3	30.1	6.7	23.5	8.8
Services	14.1	65.9	23.5	22.7	17.8	33.1
Total	16.4	100.0	33.9	100.0	27.0	100.0

The table shows clearly that during the whole period between 1987 and 1999, in both urban and rural areas, the agricultural sector has always the highest poverty incidence compared to other sectors. In 1987, the poverty headcount rate in the agricultural sector was 58 percent, much higher than the poverty rates of 42 and 33 percent in the industrial and services sectors respectively. Disaggregation into urban and rural areas reveals a similar pattern.

In terms of contribution to total poverty, 62 percent of the poor have a livelihood in the agricultural sector. In rural areas, around 70 percent of all the poor were in the agricultural sector. In urban areas, however, because agricultural households made up only a small fraction of the total households, the poor in agricultural sector made up only 16 percent of all the poor. In these areas, most of the poor were found in the services sector, the sector where most urban informal workers employed.

High economic growth between 1987 and 1996 obviously provided broad-based benefits for the poor. As a result, the poverty headcount rate in the agricultural sector by 1996 was halved to 29 percent. However, it appears that poverty reduction in other sectors occurred even faster, so that the poverty rates in the industrial and services sectors in 1996 were only 13 and 9 percent respectively. As a result, despite the reduction in poverty incidence, the contribution of the agricultural sector to total poverty increased to 69 percent. Similarly, in urban and rural areas the contribution of the agricultural sector to poverty increased to 25 and 76 percent respectively.

The economic crisis reversed the declining trend in poverty and it occurred in all sectors, including agriculture. The poverty headcount rate in the agricultural sector increased again to reach 40 percent in 1999. In accordance with the urban and modern sector nature of the origin of the crisis, the proportionate increase in poverty in the industrial and services sectors was higher and the poverty rates in these sectors in 1999 reached 24 and 18 percent respectively. Consequently, the contribution of the agricultural sector to poverty declined to 58 percent for total poverty and respectively 19 and 71 percent for urban and rural poverty.

E. Agriculture and the Probability of Being Poor

The data has shown that most of the poor in Indonesia have a livelihood in the agricultural sector. This raises a question of whether people who have a livelihood in the agricultural sector have a higher tendency to become poor compared to those who have a livelihood outside the agricultural sector. That is, controlling for other characteristics, what is the probability a household which has a livelihood in the agricultural sector will be poor.

To answer this question, Table 3 shows the results of estimating a probit model where the dependent variable is a dummy variable of whether a household is poor or not and the independent variables are various characteristics of the household, including whether or not the household is an agricultural household. The estimations were implemented again using data from SUSENAS for 1987, 1996, and 1999. As before, comparing the results between 1987 and 1996 estimations will show the impact of growth on the probability of being poor, while by comparing the results between 1996 and 1999 will show how the probability of being poor is affected by the crisis.

Table 3. The Probability of Agricultural Households to be Poor
(dependent variable: dummy variable of poor household)

Variables	1987	1996	1999
Agricultural household	0.1609** (27.75)	0.1064** (37.49)	0.1249** (32.85)
Urban location	-0.1607** (-25.20)	-0.0631** (-22.72)	-0.0759** (-20.23)
Household size	0.1628** (39.81)	0.0698** (28.18)	0.1150** (33.21)
Household size square	-0.0076** (-23.26)	-0.0035** (-16.02)	-0.0056** (-17.62)
Household head characteristics:			
- Female	0.0536** (4.67)	0.0533** (7.96)	0.1109** (11.71)
- Age	-0.0139** (-13.68)	-0.0067** (-13.33)	-0.0125** (-17.75)
- Age square	0.0001** (10.40)	0.0001** (12.45)	0.0001** (17.38)
- Married	-0.0122 (-1.22)	-0.0074 (-1.32)	0.0180* (2.34)
Household head education level:			
- Not completed primary school but literate	-0.1178** (-18.05)	-0.0266** (-4.74)	-0.0537** (-5.51)
- Completed primary school	-0.1773** (-25.97)	-0.0494** (-9.03)	-0.0819** (-8.48)
- Completed lower secondary school	-0.2499** (-30.92)	-0.0645** (-12.49)	-0.1139** (-12.39)
- Completed upper secondary school or higher	-0.3332** (-43.49)	-0.0452** (-8.02)	-0.1191** (-12.39)
Province dummy variables	Yes	Yes	Yes
Pseudo R-squared	0.3186	0.2125	0.1809
Number of observations	50956	59852	60601

Note: - The command use is DPROBIT in STATA.
- The coefficients are in terms of probability of being poor.
- Numbers in parentheses are z-values.
- ** is significant at 1 percent level.
- * is significant at 5 percent level.

Table 3 shows that in 1987, controlling for other household characteristics, agricultural households had a 16 percent higher probability of becoming poor compared to non-agricultural households. This is consistent with the higher incidence of poverty in the agricultural sector *vis a vis* other sectors shown in Table 2. More importantly, this shows that the higher incidence of poverty in the agricultural sector cannot entirely be explained by the characteristics – such as the education level – of those who work in this sector relative to those who work in other sectors.

Growth between 1987 and 1996 has brought down this probability of being poor. In 1996, agricultural households had 11 percent higher probability of becoming poor compared to non-agricultural households. This fall in the probability of being poor is in line with the reduction in poverty incidence in this sector during the period. However, the economic crisis has slightly increased again the probability to 12 percent in 1999.

This probably has to do with the reversed migration that occurred during the first year of the crisis. Many of those who lost jobs in the modern sector in urban areas returned to the rural areas and rejoined the agricultural workforce. As a result, the agricultural sector had to cope with a sudden increase in its labor absorption, forcing down the marginal productivity of labor in this sector.²⁰

²⁰ See Feridhanusetyawan (1999).

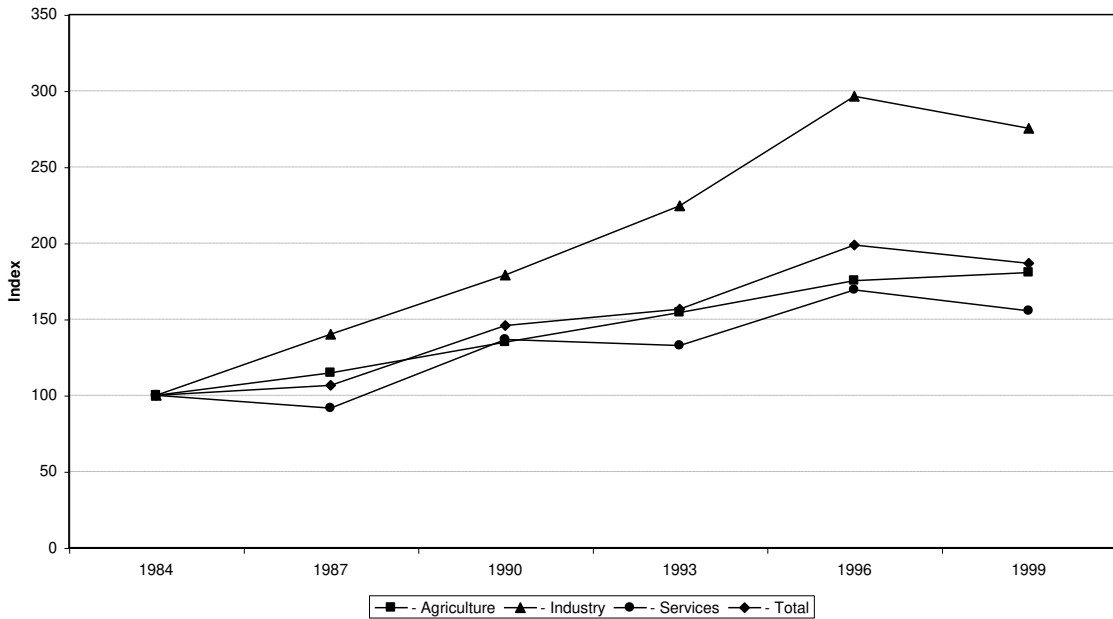
V. The Impact of Economic Growth on Poverty

The relationships between economic growth and poverty is one of the major themes in development literature and thinking in the 1990s. However, lack of sectoral emphasis in the macroeconomic approach gives little practical guidance to policy makers to make decisions about the allocation of public resources and sources of funds to finance public expenditures.²¹ The previous chapter shows that Indonesia experienced a fast reduction in poverty during high growth period in the 1980s and 1990s prior to the crisis. This chapter assesses how economic growth affects the observed reduction in poverty. In particular, whether sectoral composition of economic growth matters in determining its impact on poverty.

Figure 6 shows the indices of total and sectoral real GDP in Indonesia from 1984 to 1999. The figure shows that in the pre-crisis period between 1984 and 1996, the total real GDP doubled. In terms of sectoral growth, the figure clearly shows that the real GDP growth of the industrial sector was the fastest, so that by 1996 the real GDP of this sector was almost three times its size in 1984. Meanwhile, the real GDP of both the agricultural and services sectors grew slower than the total real GDP and much slower than that of the industrial sector. The real GDP of these two sectors in 1996 was around 1.75 times their size in 1984.

²¹ See Sarris (2001).

Figure 6. Index of Real GDP (1984 = 100)



A. Literature Review

The basic model to estimate the impact of economic growth on poverty can be defined as:

$$dP = \alpha + \beta \dot{y} + \varepsilon \quad (2)$$

where P refers to the level of poverty rate and dP refers to the change in poverty rate, \dot{y} represents the rate of economic growth (that is $\dot{y} = \frac{dY}{Y}$, with Y is the level of GDP and dY is its change), ε is the error term, while α and β are parameters to be estimated. In particular, the parameter of interest is β , which shows the percentage point change in poverty rate due to one percent GDP growth.

Using Indian national time-series data spanning from 1951 to 1991, Ravallion and Datt (1996) estimate various specifications and extensions of equation (2), but always forcing $\alpha = 0$ and the growth variable is measured in per capita term. They find that, during the period of analysis, 85 percent of the reduction in poverty in India was due to agricultural growth.

This finding is contrary to the finding of Quizon and Binswanger (1986, 1989). Using a partial equilibrium multimarket model for India, they show that the agricultural growth effects of the Green revolution did not benefit the rural poor. They show that the main way to help the poor is to raise non-agricultural incomes. Sarris (2001), however, criticizes their analysis since they only consider agricultural incomes and did not take into account

spillover effects to non-agricultural incomes. It is quite plausible that initial rises in agricultural incomes help increase the non-agricultural incomes, which eventually help the poor.

A contrary finding to Ravallion and Datt (1996) is found by Warr and Wang (1999). Using national time-series data of Taiwan, they find that in this country it is the growth of the industrial sector which has the largest impact on poverty reduction. Different still, Warr (2002), by pooling the data from four Southeast Asian countries (Thailand, Indonesia, Malaysia, and the Philippines), finds that it is the growth of the services sector which accounts for the largest reduction in poverty in these countries.

The findings that the impact of sectoral growth on poverty differs across countries is consistent with the finding of Timmer (1997). He finds that the impact of agricultural growth on poverty depends on income distribution. He finds that income inequality affects the elasticity of poverty reduction with respect to different types of sectoral growth. In countries where the relative income inequality is large, the “elasticities of connection” of per capita income of the bottom quintile with respect to both agricultural and non-agricultural labor productivity are very small and statistically insignificant. On the other hand, the elasticities for the top quintile are larger than one. In countries with small relative inequality, the elasticities are close to one for both bottom and top quintiles and slightly higher for agriculture. This implies that the contribution of agricultural growth to poverty reduction is a function of inequality, where more inequality leads to lower elasticity of connection.

B. Method

Ravallion and Datt (1996) and War and Wang (1999) obviously have the advantage of available time-series data spanning a sufficiently long period to make empirical estimations of equation (2). However, the availability of long time-series data in developing countries is not the norm. In most countries, sufficiently long period time-series data to perform meaningful statistical analysis is not available. This has forced Warr (2002) to pool the data from four Southeast Asian countries: Thailand, Indonesia, Malaysia, and the Philippines. Such an approach, however, requires a strong assumption that the elasticities of poverty reduction to economic growth are the same across countries, which in many cases may be implausible.

To circumvent the dual problems of the unavailability of sufficiently long time-series national level data and the implausibility of pooling data across countries, this study employs a panel data with provinces as the unit of observations. However, this requires some adjustments in estimating the model to take into account the effect of migration across regions. This adjustment is necessary for the following reason. Suppose a province experienced high economic growth for a long period, but at the same time it attracted a large number of poor people from other provinces to migrate to this province. On the other hand, suppose another province experienced recession for a long period, which forced many of its poor people to migrate

out to other provinces in search of better life. Without controlling for the effect of the inter-provincial migration, the data may suggest that economic growth has a positive correlation with poverty, suggesting economic growth is associated with poverty increase.

Let's suppose that a country has a T number of provinces. Let's define N as the total number of population and N^P as the total number of poor people in the country, while N_j and N_j^P refer to the number of population and number of poor people in each province respectively, so that $N = N_1 + N_2 + \dots + N_T$ and $N^P = N_1^P + N_2^P + \dots + N_T^P$. Since:

$$P = \frac{N^P}{N} = \frac{N_1^P + N_2^P + \dots + N_T^P}{N} \quad (3)$$

then:

$$P = \frac{N_1}{N} \frac{N_1^P}{N_1} + \frac{N_2}{N} \frac{N_2^P}{N_2} + \dots + \frac{N_T}{N} \frac{N_T^P}{N_T} = S_1 P_1 + S_2 P_2 + \dots + S_T P_T \quad (4)$$

where S_j is the share of population in province j and P_j is the poverty rate in province j . Equation (4) simply says that the national poverty rate is the average of provincial poverty rates weighted by the population share of each province.

Similarly the change in national poverty rate can be decomposed by the changes in provincial poverty rates. Totally differentiating equation (4):

$$dP = (S_1 dP_1 + S_2 dP_2 + \dots + S_T dP_T) + (P_1 dS_1 + P_2 dS_2 + \dots + P_T dS_T) \quad (5)$$

Equation (5) says that the change in national poverty rate is due to the changes in provincial poverty rates weighted by each province's population share and the changes in provincial population share weighted by each province's initial poverty rate. The terms in the second bracket identifies the change in national poverty rate due to differences in population growth across provinces – which may be due to differences in natural population growth as well as inter-provincial migration – and differences in each province's initial poverty rate.

Rearranging equation (5):

$$dP = (S_1 dP_1 + P_1 dS_1) + (S_2 dP_2 + P_2 dS_2) + \dots + (S_T dP_T + P_T dS_T) \quad (6)$$

Each bracket in equation (6) identifies the total contribution of each province to the change in national poverty rate. Equations (5) and (6) suggest that in estimating equation (2) using provincial panel data, it is necessary to control

for each province's population growth and initial poverty rate.²² Therefore, the model to be estimated becomes:

$$dP_j = \alpha + \beta \dot{y}_j + \gamma \dot{n}_j + \delta P_j + \varepsilon \quad (7)$$

where \dot{n}_j is the population growth at the province j .

To test the hypothesis that different sectoral growth affects poverty reduction differently, first let's decompose the total economic growth in each province into its sectoral components. Since $dY_j = dY_j^A + dY_j^I + dY_j^S$, then:

$$\dot{y}_j = \frac{dY_j}{Y_j} = \frac{Y_j^A}{Y_j} \frac{dY_j^A}{Y_j^A} + \frac{Y_j^I}{Y_j} \frac{dY_j^I}{Y_j^I} + \frac{Y_j^S}{Y_j} \frac{dY_j^S}{Y_j^S} = H_j^A \dot{y}_j^A + H_j^I \dot{y}_j^I + H_j^S \dot{y}_j^S \quad (8)$$

where the superscript $k = \{A, I, S\}$ indexes the agricultural, industrial, and services sector respectively and H^k is the sectoral share of GDP.

Substituting equation (8) into equation (7) result in the model of sectoral growth impact on poverty reduction:

$$dP_j = \alpha + \beta^A \left(H_j^A \dot{y}_j^A \right) + \beta^I \left(H_j^I \dot{y}_j^I \right) + \beta^S \left(H_j^S \dot{y}_j^S \right) + \gamma \dot{n}_j + \delta P_j + \varepsilon \quad (9)$$

If $\beta^A = \beta^I = \beta^S$, then equation (9) collapses to equation (7), suggesting that sectoral composition of economic growth does not matter to its impact on poverty. Otherwise, it does matter because the growth of each sector affects poverty differently. The advantage of this method is that the estimated elasticities encompass all direct and indirect effects of growth on poverty, including income distribution and general equilibrium effects.

C. Empirical Estimations

The SUSENAS databases are used to calculate the provincial level poverty measures, which are then merged with the regional GDP (RGDP) database to create a panel with province as the unit of observation. This provincial panel database is used to estimate the models of economic growth impact on poverty discussed above. The dependent variable is change in poverty,

²² Ravallion and Datt (1999) find that initial conditions do not affect the elasticities of poverty to farm yields and development spending. However, the non-farm growth process is more pro-poor in Indian states with initially higher farm productivity, higher rural living standards relative to urban areas, and higher literacy.

while the independent variables are either total GDP growth (equation (7)) or share weighted sectoral GDP growth (equation (9)), supplemented by population growth and initial poverty level as control variables. The estimation method used is the Ordinary Least Squares (OLS). The inclusion of initial poverty level as a control variable removes the need to control for individual province fixed-effects as this variable has the same value within a province across time period.

Table 4 presents the results of estimations using poverty headcount as the measure of poverty. Column heading “Total Growth” shows the results of estimations of equation (7), while column heading “Sectoral Growth” shows the results of estimations of equation (9). A precaution is warranted in interpreting the coefficients. The interpretation of the total GDP growth is straightforward. It shows the percentage point change in poverty due to one percent economic growth. However, the interpretation of the sectoral GDP growth is not so straightforward as the independent variables in equation (9) are sectoral economic growth weighted by their GDP share. If it is assumed that the whole economy is consisted of only a particular sector, then the weight of that sector is one and the weight of the other sectors are zero. In this case equation (9) will also collapse to equation (7). Hence, the coefficient of a particular sector GDP growth can be interpreted as the percentage point change in poverty due to one percent growth of that sector conditional on the whole economy is consisted only of that particular sector.

Table 4. The Impact of Economic Growth on Poverty Headcount

Independent Variables	Total Growth		Sectoral Growth	
	Coefficient	t-values	Coefficient	t-values
<i>Total Poverty Headcount:</i>				
Total GDP growth	-0.0254	-0.90		
Agricultural GDP Growth			-1.8595	-3.62 **
Industrial GDP Growth			-0.0664	-1.63
Services GDP Growth			0.0048	0.09
Total population growth	0.0653	2.37 *	0.1193	3.93 **
Initial poverty headcount	-0.1316	-2.96 **	-0.1085	-2.55 **
Constant	0.0189	0.78	0.0524	2.16 *
Number of observations	130		130	
F-test	5.43 **		7.16 **	
R-squared	0.1144		0.224	
<i>Urban Poverty Headcount:</i>				
Total GDP growth	-0.0095	-0.42		
Agricultural GDP Growth			-1.1254	-2.84 **
Industrial GDP Growth			-0.0624	-1.90 *
Services GDP Growth			0.0268	0.58
Urban population growth	0.0062	0.17	0.0474	1.23
Initial poverty headcount	-0.1497	-3.33 **	-0.1356	-3.13 **
Constant	0.0165	1.03	0.0352	2.16 *
Number of observations	130		130	
F-test	3.81 **		5.12 **	
R-squared	0.0832		0.1711	
<i>Rural Poverty Headcount:</i>				
Total GDP growth	-0.0230	-0.72		
Agricultural GDP Growth			-2.8789	-4.56 **
Industrial GDP Growth			-0.0598	-1.33
Services GDP Growth			0.0315	0.50
Rural population growth	0.0479	2.23 *	0.1046	4.45 **
Initial poverty headcount	-0.1373	-2.58 **	-0.1393	-2.85 **
Constant	0.0320	1.00	0.1066	3.22 **
Number of observations	125		125	
F-test	4.2 **		7.95 **	
R-squared	0.0942		0.2505	

Notes: ** = significant at 1 percent level

* = significant at 5 percent level

The results of estimations indicate that the coefficient of total GDP growth is negative – indicating that economic growth is poverty reducing – but statistically insignificant. This is true for total, urban, as well as rural poverty. The sectoral economic growth, however, conveys a different story. The coefficients of agricultural, industrial, and services GDP growths are clearly significantly different from each other. This means that the sectoral composition of economic growth does matter in determining the impact of economic growth on poverty.

Agricultural growth has negative and statistically significant coefficients for total, urban, and rural poverty and the magnitudes of the coefficients are much larger than those of the other sectors. Industrial growth also has negative coefficients, but only statistically significant for urban areas. Meanwhile, services growth has positive but relatively small and insignificant coefficients. These coefficients indicate that agricultural growth has the strongest impact on reducing total, urban, and rural poverty. Industrial growth also tends to reduce poverty, but its impact is significant only on reducing urban poverty. Finally, it appears that services growth has no impact on poverty. This finding clearly contradicts the finding of Warr (2002) that services growth is important in reducing poverty in Indonesia.

Using poverty gap, Table 5 shows the results of estimations of the same models. Like poverty headcount, the impact of total GDP growth on poverty gap is negative but statistically not significant. In terms of sectoral growth, agricultural growth again has the strongest, negative, and statistically significant impact on total, urban, and rural poverty gap. Industrial growth also has negative impact but none of its coefficients in reducing total, urban, and rural poverty gap is statistically significant. As in poverty headcount, services growth is of no consequence to poverty gap.

Table 5. The Impact of Economic Growth on Poverty Gap

Independent Variables	Total Growth		Sectoral Growth	
	Coefficient	t-values	Coefficient	t-values
<i>Total Poverty Gap:</i>				
Total GDP growth	-0.0068	-0.49		
Agricultural GDP Growth			-0.6605	-2.54 **
Industrial GDP Growth			-0.0200	-0.97
Services GDP Growth			0.0039	0.14
Total population growth	0.0332	2.46 *	0.0524	3.41 **
Initial poverty gap	-0.1690	-4.23 **	-0.1535	-3.87 **
Constant	0.0045	0.52	0.0177	1.84
Number of observations	130		130	
F-test	8.5 **		7 **	
R-squared	0.1683		0.2202	
<i>Urban Poverty Gap:</i>				
Total GDP growth	-0.0030	-0.41		
Agricultural GDP Growth			-0.2624	-2.01 *
Industrial GDP Growth			-0.0129	-1.19
Services GDP Growth			0.0044	0.29
Urban population growth	0.0000	0.00	0.0097	0.77
Initial poverty gap	-0.1707	-4.44 **	-0.1660	-4.37 **
Constant	0.0035	0.76	0.0082	1.67
Number of observations	130		130	
F-test	6.64 **		5.31 **	
R-squared	0.1365		0.1764	
<i>Rural Poverty Gap:</i>				
Total GDP growth	-0.0039	-0.25		
Agricultural GDP Growth			-1.0244	-3.13 **
Industrial GDP Growth			-0.0191	-0.82
Services GDP Growth			0.0185	0.57
Rural population growth	0.0274	2.59 **	0.0476	3.91 **
Initial poverty headcount	-0.1729	-3.92 **	-0.1641	-3.84 **
Constant	0.0082	0.78	0.0326	2.63 **
Number of observations	125		125	
F-test	7.62 **		7.24 **	
R-squared	0.1589		0.2333	

Notes: ** = significant at 1 percent level

* = significant at 5 percent level

Finally, Table 6 shows the results of estimations of the models of economic growth impact on poverty using poverty severity as the measure poverty. Like poverty headcount and poverty gap, total GDP growth has negative but statistically insignificant impact on poverty severity. Furthermore, sectoral growth does not have statistically significant impact on poverty severity, except for agricultural growth in rural areas.

Table 6. The Impact of Economic Growth on Poverty Severity

Independent Variables	Total Growth		Sectoral Growth	
	Coefficient	t-values	Coefficient	t-values
<i>Total Poverty Severity:</i>				
Total GDP growth	-0.0022	-0.26		
Agricultural GDP Growth			-0.2079	-1.25
Industrial GDP Growth			-0.0079	-0.60
Services GDP Growth			-0.0028	-0.15
Total population growth	0.0169	2.01 *	0.0229	2.34 *
Initial poverty severity	-0.1820	-4.31 **	-0.1730	-4.02 **
Constant	0.0011	0.24	0.0060	1.06
Number of observations	130		130	
F-test	7.9 **		5.21 **	
R-squared	0.1582		0.1737	
<i>Urban Poverty Severity:</i>				
Total GDP growth	-0.0013	-0.39		
Agricultural GDP Growth			-0.1018	-1.69
Industrial GDP Growth			-0.0044	-0.88
Services GDP Growth			0.0009	0.12
Urban population growth	0.0008	0.16	0.0047	0.80
Initial poverty severity	-0.1807	-4.96 **	-0.1782	-4.91 **
Constant	0.0008	0.42	0.0027	1.23
Number of observations	130		130	
F-test	8.25 **		5.82 **	
R-squared	0.1642		0.1899	
<i>Rural Poverty Severity:</i>				
Total GDP growth	-0.0012	-0.13		
Agricultural GDP Growth			-0.4545	-2.30 *
Industrial GDP Growth			-0.0078	-0.56
Services GDP Growth			0.0090	0.46
Rural population growth	0.0157	2.53 **	0.0247	3.38 **
Initial poverty severity	-0.1841	-4.32 **	-0.1732	-4.09 **
Constant	0.0025	0.47	0.0131	1.94 *
Number of observations	125		125	
F-test	8.63 **		6.6 **	
R-squared	0.1762		0.2170	

Notes: ** = significant at 1 percent level

* = significant at 5 percent level

D. Agriculture Contribution to Poverty Reduction

The results of the estimations have shown that agricultural growth is the strongest factor in reducing poverty in Indonesia. But how much is actually the contribution of the agricultural sector to poverty reduction? To answer this question, Table 7 calculates the contribution of agricultural growth to poverty reduction in Indonesia using the estimated coefficients and other empirical data. The calculation is exercised for the period of 1984-1996 only as this is the high growth period where the poverty reduction has occurred, while the 1996-1999 period is a crisis period where poverty increased.

Table 7. The Contribution of Agricultural Growth to Poverty Reduction, 1984-1996

	Urban	Rural	Total
Poverty Headcount:			
- Observed change in poverty (% point)	-22.14	-41.82	-39.24
- Impact of agricultural growth (% point)	-12.16	-31.12	-25.74
- Contribution of agricultural growth (%)	54.94	74.40	65.58
Poverty Gap:			
- Observed change in poverty (% point)	-7.87	-19.38	-17.08
- Impact of agricultural growth (% point)	-2.84	-11.07	-8.73
- Contribution of agricultural growth (%)	36.05	57.15	51.13
Poverty Severity:			
- Observed change in poverty (% point)	-	-9.98	-
- Impact of agricultural growth (% point)	-	-4.91	-
- Contribution of agricultural growth (%)	-	49.22	-

In Table 7, the “Observed change in poverty” shows the actual reduction in poverty between 1984 and 1996 in terms of percentage point change. The numbers are obtained from Figures 3 to 5 for the respective measure of poverty. The “Impact of agricultural growth” is calculated by multiplying the estimated coefficients in Tables 4 to 6 with the share of agricultural GDP from the total GDP and the growth of agricultural GDP. To take into account varying share and growth of agricultural GDP from period to period, the calculation is done sequentially for each three-year period. The numbers shown in the table are the cumulative results for the whole period between 1984 and 1996. To obtain consistent estimates of poverty change across regions, the calculations are done separately for urban and rural poverty, while the change in total poverty is obtained as the population weighted average of the changes in urban and rural poverty. Finally, the “Contribution of agricultural growth” is the ratio of the latter to earlier row, which shows the contribution of agricultural GDP growth to poverty reduction.

The results show that indeed agricultural growth has been the most important factor contributing to rapid poverty reduction experienced by Indonesia during the high growth pre-crisis period. In terms of poverty headcount, agricultural growth accounts for 66 percent of total poverty reduction, 55 percent of urban poverty reduction, and 74 percent of rural poverty reduction. In terms of poverty gap, agricultural growth accounts for 51, 36, and 57 percent respectively of total, urban, and rural poverty gap reduction. Meanwhile, for poverty severity only the reduction in rural areas is calculated as only for these areas the coefficient is statistically significant. It appears that 49 percent of reduction in poverty severity in rural areas is due to agricultural growth.

VI. Poverty Reduction Programs: A Brief Overview

The previous chapter shows that economic growth, in particular agricultural growth, is the major factor behind poverty reduction experienced by Indonesia during the pre-crisis high growth era. The analysis, however, also indicates that economic growth does not explain all of the observed reduction in poverty. One factor that may have had significant contributions to the poverty reduction is direct efforts by the government at various levels to reduce poverty through poverty reduction or anti-poverty programs. This chapter briefly describes such programs, including the recently established social safety net programs as a response to the recent economic crisis.

A. General Approach of Development

Despite a number of idiosyncratic flaws and important weaknesses,²³ during the pre-crisis high growth period Indonesia made substantial improvements in social development and poverty reduction. As has been discussed in the previous chapters, the number of poor people dropped sharply during the period. In the education sector, between 1973 and 1983 gross enrollment rate for primary school increased from 82 to 109 percent and for junior secondary enrollment school increased from 24 to 52 percent. In the health sector, infant and child mortality rates fell, nutrition status improved, and average family size declined.

These achievements were partly due to rising incomes, which made it possible for households as well as the government to spend more on education and health. However, government policies also played significant role, including the approach followed by the New Order government in its early establishment in the late 1960s which concentrated its focus almost exclusively on the agricultural sector at least until the 1970s. This policy was implemented in a massive rural development program (focussed particularly on Java), including a rice intensification campaign and widespread expansion of rural infrastructure.

In addition, the success in stimulating growth in line with poverty reduction was also attributed to substantial investment in economic and social infrastructure, which in turn supported broad-based growth. This included investment in human capital, especially basic education and public health through INPRES (Presidential Instruction) grants, including the 1974 Primary

²³ The abuse of centralized control and top-down decision making during the New Order created extraordinary profits for certain groups. The same system was also used to form marketing monopolies, to channel bank credit into privileged firms and to “reserved” sectors, to seize communal land and allocate them to “development” projects, as well as to manipulate government contracts. Lack of transparency in the government was also evident.

School INPRES whose objective was to build “a primary school in every village”.²⁴ Through this INPRES more than 60,000 primary schools were built in five years between 1973 and 1978.

B. Poverty Focused Programs

It is important to note, however, that poverty alleviation was never explicitly set as a development goal during the first five rounds of the ‘Five Year Development Plan – PELITA’ between 1969 and 1994. Only in 1994, in PELITA VI, for the first time did the government identify explicitly targets for reduction and eventual total elimination of poverty. A number of nation-wide and regional poverty eradication programs were devised to achieve the objectives.²⁵ Some of these new and more direct major anti-poverty programs were:

- 1) The Presidential Instruction on Disadvantaged Villages (INPRES IDT), the Disadvantaged Village Infrastructure Development Program (P3DT), and the IDT Nutritional Program for school children. The objective of the IDT program was to accelerate poverty reduction in less developed village across Indonesia. The programs started in 1993, and provides a grant of Rp 20 million to Rp 60 million for each village deemed to have been left behind by the development process. The funds were intended to be given to the community to undertake grass-roots poverty alleviation activities. Linked to the IDT programs were P3DT which provides infrastructure block grant funds directly to the villages. The key elements of these two programs were an increased emphasis on village-level participation. In addition, the IDT program was complemented by a food supplement program for primary school children which targeted impoverished families.
- 2) Family Welfare Development Program through TAKESRA/KUKESRA (saving and credit) program. In this program, which was managed by the National Family Planning Coordinating Body (BKKBN), the ‘poor’ families were first invited to join the TAKESRA (prosperous family saving) saving fund, with initial savings of Rp 2,000. They can then obtain credit (KUKESRA) for an amount up to 10 times the family’s TAKESRA balance. In the following stage, 10 percent of the Rp 20,000 loan was deducted, and added to the savings now totaling Rp 4,000. With these savings, the second amount of credit available is up to Rp 40,000.

²⁴ INPRES is a grant mechanism system which allowed direct grants to be made by the central government to the local government. For discussions on the Primary School INPRES, see Duflo (2000).

²⁵ Daly and Fane (2002) define ‘anti-poverty programs’ as the programs whose benefits are specifically targeted at the poor.

Following this process the credit ceiling for the program is Rp 360,000 per family.

- 3) Income Generating Project for Marginal Farmers and the Landless (P4K — *Proyek Peningkatan Pendapatan Petani Kecil*). The program is intended to increase incomes of small farmers through self-help groups, and to organize them to gain access to credit. Other micro finance programs being utilized to provide access to financial resources for the poor include BKK, BKPD, and Lumbung Pitih Nagari.
- 4) Urban Poverty Reduction Program (P2KP – *Program Pengentasan Kemiskinan Perkotaan*) and *Kecamatan* Development Program (KDP). The aims of these programs was to foster more democratic and participatory forms of local governance by strengthening sub-district (*kecamatan*) and village capacities and improving community participation in development projects. KDP provides block grants of approximately US\$ 43,000 to US\$ 125,000 per year directly to *kecamatan*s and villages for small-scale infrastructure and economic activities.

In addition to these four major programs, there are also many other small programs carried out by various line agencies and regional governments.²⁶ While not free from weaknesses, these programs in theory have been more effective than general program (like fuel subsidy) because they focus on target groups, such as poor people and households.

C. Crisis Response Social Safety Net Programs

As mentioned earlier, beginning in mid 1997, Indonesia suffered a sharp, deep set of currency, financial, economic, natural, and political crises. While the initial responses to the social consequences of the crises were tepid and localized, by July 1998 civil disturbances and the fall of then President Soeharto convinced the new government to quickly deploy large-scale social safety nets (SSN) program. This includes: (i) Cheap Rice Program (OPK), (ii) Employment Creation Programs, (iii) Education SSN Programs, (iv) Health SSN Programs, and (v) Community Empowerment Program (PDMDKE).²⁷

²⁶ In a case study to identify poverty programs in Central Java, the authors found a surprisingly large number of programs aimed at overcoming poverty. More than 30 anti-poverty programs were discovered during the field work in Central Java in 1997. The large number of programs shows, on the one hand, the size of the government effort to overcome poverty. On the other, it raises questions about how the government agencies can integrate and coordinate such a large number of activities in the field.

²⁷ Daly and Fane (2002) also include the government programs to compensate the poor from reduced subsidies for domestic fuel prices starting in 2000 as anti-poverty programs.

These programs were intended to help protect the traditionally poor as well as the newly poor due to the crisis through four strategies: (i) ensuring the availability of food at affordable prices for the poor, (ii) supplementing purchasing power among poor households through employment creation, (iii) preserving access of the poor to critical social services, particularly health and education, and (iv) sustaining local economic activity through regional block grant programs and extension of small scale credits.²⁸

The programs launched were designed by the central government and were intended to encompass the following characteristics: quick disbursement, direct financing to beneficiaries, transparency, accountability, and participatory.²⁹ In the fiscal year (FY) 1998/99, a total budget of Rp 9.4 trillion was allocated to fund the SSN programs, while it was only Rp 3.2 trillion allocated for FY 2000. This reduction was due to the mild improvement of the economy and also because of the shorter FY 2000 (only 9 instead of 12 months due to the change in fiscal year period). A brief description of each major program is discussed below.³⁰

Cheap Rice Program (OPK). This program is the main component of the government effort to maintain food security. It is particularly aimed at helping the poor and the 'newly' poor because of the crisis obtaining food, hindered by both falling real income and food price escalation. This program is popularly called the "OPK" program, an acronym of *Operasi Pasar Khusus*, which literally means 'special market operation', but it is more commonly known as the Cheap Rice Program.³¹

Under this program, each eligible household can purchase 10 kilograms of rice per month at a highly subsidized price of Rp. 1,000/kg.³² For comparison, the average market price for medium quality rice in the second half of 1998 was around Rp. 3,000/kg.³³ Originally, only households under the lowest category of the official classification were eligible to participate in

²⁸ Sumarto, Suryahadi, and Widyanti (2002).

²⁹ At least as shown by some anecdotal evidence, these intended characteristics were not always achieved. See for example Tim Dampak Krisis SMERU (2000).

³⁰ There were some changes in JPS programs across fiscal years.

³¹ The program was introduced in July 1998 in Jakarta area and then expanded to all over the country.

³² The benefit was later increased to 20 kilograms and then changed again to between 10 and 20 kilograms.

³³ See 'Recent Volatility in the Rice Market: Results of a SMERU Rapid Appraisal in Central and East Java', *SMERU Newsletter*, No. 01, November 1998.

the program.³⁴ But coverage was expanded to include the second lowest category during the course of the year.

Since this program endeavors to ensure that the poor can afford to buy rice, which is the staple food of most Indonesians, it is probably the most critical component of the JPS programs. One impact of the crisis was a sharp increase in prices, particularly for those foods, which made basic necessities practically out to reach of the poor, at least in the very short run before their nominal incomes could expand to keep pace. The provisions of cheap rice for the poor, therefore, were deemed essential in avoiding widespread hunger, which might exacerbate the already chaotic political and economic situation of the country at that time.³⁵

Employment Creation. This program is popularly known as *padat karya* (which means, as an adjective, 'labor intensive') program. This actually is not a single program but a large set of activities under the category of employment creation. These programs were created as a response to the threat of burgeoning unemployment due to economic contraction, which forced many firms to either lay off workers or shutdown completely. In accordance with the urban nature of the crisis, the initial geographical targets for the first round of *padat karya* 'crash programs' in the 1997/98 fiscal year were directed to urban areas and some rural areas which experienced harvest failures.³⁶

Following these 'crash programs', in the 1998/99 fiscal year there was a proliferation of "padat karya" programs, where 16 different programs fell into the 'employment creation' category.³⁷ These programs can be classified into four types. First, some programs were a redesigning of on-going investment and infrastructure projects into more labor intensive type projects and modes of contracts. Second, other programs gave block grants to local communities (such as the *Kecamatan* Development Program, Village Infrastructure Project, and PDM-DKE Program). These funds were directed to poorer areas, and had 'menus' for the utilization of the funds that included the possibility of public works with a labor creating effect. A third set were special

³⁴ The official classification was created by the national family planning organization (BKKBN).

³⁵ Since the amount of rice was substantially below total consumption, in practice the program served as equivalent to an income transfer. However, since the price was fixed in nominal terms, the magnitude of the income transfer was scaled to the needs for food. In this sense the program can be seen as a combination of income transfer and food security.

³⁶ These 'crash programs' were launched in December 1997 and lasted until the end of the fiscal year in March 1998.

³⁷ In the fiscal year 1999/2000, however, *padat karya* programs were cut back to only two programs: the 'Public Work Sector *Padat Karya* Program' and the 'Special Initiative for Unemployed Women Program'.

labor intensive works carried out by sectoral ministries (e.g. forestry, rural-urban, and retraining of laid off workers carried out by the Manpower Ministry). In addition, there was a fourth type of program, which were 'food for work' programs, typically launched by international donors and NGOs in drought stricken areas.

Scholarships and Block Grants to Schools. At the earlier stage of the crisis there was a worry that the crisis may force parents to withdraw their children from schools as a way to cope with falling incomes and rising costs, hence triggering a large increase in school drop out rates. This rightly alarmed the government, which then led it to establish an education funding support program. The program was started in the academic year 1998/99 and there is a plan to end the program in the year 2003.

This program has two components, one is scholarships for students from poor families to enable them to stay in schools, and the other is block grants to schools to help them continue operating. The scholarships provide cash of Rp. 10,000, Rp. 20,000 and Rp. 25,000 per month for primary, lower secondary, and upper secondary school students respectively. These amounts generally cover the cost of school fees and can be used for that purpose or to cover other expenses.

This program was intended to reach at most 6 percent of primary school students, 17 percent of lower secondary school students, and 10 percent of upper secondary school students nationwide, including students from religious schools. Since the program was targeted, it is expected that the coverage will be higher in some districts and lower in others. Meanwhile, the 60 percent poorest schools in each district were targeted to receive the block grants.

Health. There was concern early in the crisis that falling real income and increasing costs of medical services due to the crisis might force poor and new poor households abandon modern medical services, even when they needed. This would make the general society's health conditions deteriorate, reversing improvements made during the past decades.

In anticipation of this, the government established JPS programs in the health sector, known as JPS-BK (JPS *Bidang Kesehatan* or 'Health Sector JPS') programs. Through these programs it was hoped that the poor would not be forced to stop using modern medical services. Various activity programs which were specifically established to achieve this health objective have provided subsidies for medicines and imported medical equipment, operational support funds for community health centers, free medical and family planning services, and supplementary food for pregnant women and children under three years old.

Based on continuous qualitative and quantitative monitoring by the SMERU Research Institute and other groups, Sumarto and Pritchett (2001) identified five lessons from Indonesia's experience in the design of such safety nets

during times of crisis. These are: (i) Institutional commitment, clear objectives, and simple design are key to the success of programs; (ii) Even with a simple design, local flexibility is needed; (iii) No safety net using static administrative targeting will catch those households suffering sudden shocks; (iv) Some ideas that work well as poverty or development programs fail as crisis safety nets – especially micro credit projects; and (v) Monitoring expenditure a crisis creates is important, because the worst safety nets may be the biggest spenders.

D. The Institutional Set up of Poverty Programs

While safety net programs were scrutinized to ensure good design and effective targeting, the Indonesian government spent three times as much on bailing out the financial sector and five times as much on a general subsidy for energy that neither benefited the poor nor the hardest hit households. The question of whether to spend more on safety net programs depends, in part at least, on the alternatives. While governments and donors often jealously guard the (often) minimal funds budgeted for safety nets, the much greater sums that are usually available in the general budget's fiscal trough are less well protected and often consumed by powerful financial and elite interests.

At the beginning of April 2001, during the President Abdurrahman Wahid administration, the government formed the Poverty Reduction Coordination Board (*Badan Koordinasi Penanggulangan Kemiskinan* – BKPK). Institutionally, this board existed under the coordination of the Vice President of the day, Megawati Sukarnoputri. The primary objective of the BKPK was to coordinate the poverty reduction programs more effectively and in an integrated manner. To carry out their function, the BKPK undertook four main roles: as coordinator, the catalyst, mediator, and facilitator.

In December 2001, through Presidential Decision No.124/2001, Megawati, after replacing Wahid as president, established the Poverty Reduction Committee (KPK), dissolving the BKPK. The Coordinating Minister for Peoples Welfare and Poverty Alleviation heads the committee. Articles 4 and 5 of this decree state that the function of the committee is to “take concrete measures to accelerate the reduction in the number of poor people in all regions of Indonesia. The function of the KPK is to create policy, monitor, and report on poverty alleviation to the President. The Secretariat of this committee is based in BAPPENAS (the National Development Planning Board).

Promises to develop a Poverty Reduction Strategy Paper (PRSP) were pledged in November 2001 at the Consultative Group on Indonesia (CGI) meetings of donors and the government. It is this committee (KPK) that is responsible for the production of the PRSP. So far it appears that buying for the PRSP at both the political and bureaucratic levels remains elusive.

Independently of the PRSP, the Government of Indonesia (GOI) must prepare an action plan for poverty reduction as part of its basis for accountability in 2004 for the Proopenas (National Development Program) and the 2003 and 2004 Repeta – which is the national planning mechanisms. This will be an interim strategy, and BAPPENAS is responsible for creating the policy and devising the mechanisms to operationalize it.

VII. Conclusion and Implication

Indonesia experienced a rapid poverty reduction during the pre-crisis period. This rapid reduction in poverty in Indonesia has generally been attributed to the pre-crisis high economic growth experienced by the country. However, the advent of an economic crisis since mid 1997, which has caused poverty to increase again quickly, has led to a questioning on the emphasis on industrialization as Indonesia's development strategy.

As in other developing countries, most of the poor in Indonesia are located in rural areas and have a livelihood in the agricultural sector. The finding of this study shows that, after controlling for other characteristics, a person who has a livelihood in the agricultural sector indeed has a higher probability to become poor than those who have a livelihood in non-agricultural sectors. It appears that the development strategy emphasizing industrialization was aimed at developing a high productivity industrial sector, which hopefully will pull out people from the low productivity agricultural sector and, hence, rescue them from poverty.

The findings of this study indicate that this strategy has not worked well for two related reasons. First, as the industrial sector expanded and the importance of the agricultural sector in the economy quickly diminished, as evident from its share of GDP, the movement of people out of the agricultural sector into the industrial sector has not occurred as fast. This failure of the industrial sector to absorb a larger fraction of the workforce has left the agricultural sector with sizable fraction of the workforce while its relative size in the economy was quickly diminishing.

Second, it turns out that agricultural growth is a much more potent factor in reducing poverty than industrial growth. Even in urban areas, where industrial sector has a significant impact on poverty reduction, the impact of agricultural growth on reducing poverty is still much bigger. As a result, during the pre-crisis high growth period of 1984-1996, it is estimated that agricultural growth accounts for 66 percent of total poverty reduction, 55 percent of urban poverty reduction, and 74 percent of rural poverty reduction.

These findings have important implications for policy to eliminate poverty in Indonesia. First, it is clear that direct efforts to push agricultural growth is the most effective channel to reduce poverty. Second, the strategy of industrialization should be directed at developing industries that have strong linkages with the agricultural sector, such as the agro-industries, so that industrial growth will have bigger impact on reducing poverty.

At the very least, government should create an enabling environment to encourage private sector participation in the agribusiness development. Hence, agricultural policies that harm agro-industries – including the imposition of high tariffs on imported inputs for agro-industries, export taxes on agricultural products, and restrictions of interregional trade of agricultural commodities – should be removed.

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