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Rice Price Adjustment and its Impact to the Poor

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Abstract

This paper attempts to analyze the impact of rice price policy changes on the poor. It is shown that contrary to widespread opinion, an increase in the price of rice, particularly through protection policies, will negatively impact the poor. In other words, protective rice price policies are anti-poor. Each 10% increase in the price of rice will lead to a 1% increase in the poor population, in other words more than two million Indonesians will fall below the poverty line as a direct effect of a 10% increase in the price of rice. Rice price increases also contain undesired distribution dimensions: income transfer from populations outside Java to populations in Java, transfer from urban to rural populations, and income transfers from populations in poor provinces to populations in rich provinces, or from the poor to the rich.

Keywords: *Poverty-Economic development*
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1. INTRODUCTION[1]

The significant influence of rice in poverty reduction during 1970s to the early 1980s is undebatable. Using windfall profits from oil and gas price hikes, the Indonesian government made huge investments in rural and agricultural development. The agricultural sector was consistently prioritized in budget allocation. Infrastructure expenditure (in particular on irrigation and the building of rural elementary schools by Presidential Decree) received significantly greater budget allocation than that for urban areas.[2]

Rice production increased significantly from 1970 to 1985 resulting in Indonesia's move from its status as the largest importer of rice worldwide to an exporter of rice. This increase in production was rooted in the expansion of cultivation areas and improvements in productivity.[3]

But the story from 1970-1975 had changed by 1990-1995, as the successes in poverty reduction led to a change in the structure of household demands, especially for lower-income groups. The demands of poor and near poor households rose from inferior goods, such as cassava, to rice. As a result, per capita demand for rice, particularly by poor households, has continuously increased to the present. On the supply side, rice field productivity in Java is nearing saturation levels. Further, cultivation areas are permanently shrinking as a result of land use competition with industrial and housing developments. Increases in production have not been able to keep up with per capita increases in the demand for rice, causing Indonesia to once again become a net importer of rice.

Fundamental changes have occurred in the international market as well. On the demand side, a decrease in per capita consumption in several countries like Thailand and Malaysia has occurred simultaneously with an increase in per capita demand for other foods which has pushed diversification of consumption patterns from carbohydrates to animal and vegetable proteins. On the supply side, liberalization of formerly communist countries like Vietnam, Cambodia and Laos has significantly increased rice available in the world market. The combination of these supply and demand side changes has increased the volume of rice traded globally. At the end of the 1980s the volume of rice traded was only 18 million tons/year. This has since increased to 25-

[1] The author wishes to thank Vivi Alatas and Steve Mink of the World Bank for their assistance as well as Usman and Bintoro for their help in calculating SUSENAS data. The author would further like to thank DAI-USAID- Bappenas, *Badan Ketahanan Pangan Deptan* and LPEM-FEUI for their financial contributions to this research.

[2] See Timmer [2004].

[3] Lipton categorizes Indonesia as an exception among developing nations.

30 million tons, leading to more stabile world rice prices that far lower than before the 1990s.

These changes support demands for changes in rice public policy. Many of the justifications for price stabilization policies are not valid, have large fiscal costs and negatively impact impoverished households. The last is connected to two issues: the position of poor households and farmers as net consumers and the importance of rice in the consumption bundle of poor households.

The political-economic viewpoint of the relationship between the price of rice and poverty is divided. On the one hand, rice price pro-liberalization groups believe that liberalization will benefit the poor as they argue that a decrease in the price of rice in accord with world market trends will lighten the financial burden of poor households as net consumers. Increases in the price of rice will upset the minimum nutritional requirements for the poor as rice dominates the diet of the poor. The BPS poverty line bundle and alternative poverty lines like those from the World Bank and LPEM show that 60-65 percent of food expenditure by the poor is spent on rice. It is also interesting to note that the ways the poor handled their decrease in purchase power during the economic crisis were dominated both by efforts to decrease food quantity and food composition from more expensive to cheaper calorie sources. If permanent, these changes will negatively affect the nutritional balance of the poor, especially of babies and children. The other group believes that rural labor market mechanisms will strengthen the purchase power of poor households even though they are net consumers. Further, this group argues that rice is a dynamist in the rural economy.

This research will analyze the impact of rice price policy changes on the poor. This assessment is very important as there are two groups with differing opinions on how rice price changes impact the poor. On the one side, there is a strong belief that increasing the price of rice will accelerate poverty reduction. On the other, price liberalization groups argue that the majority of the rural poor including those that depend on the agricultural food sub-sector for income are net consumers and thus any increase in the price of rice will increase the total number of the poor.

To see how the price of rice influences the poor it is very important to first understand Indonesia's poverty profile, focusing on the agricultural food sub-sector. The next section will examine the state of poor and non-poor households as net consumers or producers as seen from various dimensions. The final section will examine the impact of increases in the price of rice on these groups and on poverty levels.

2. INDONESIAN POVERTY PROFILES AND ITS DETERMINANTS

The majority of the poor depend on the agricultural sector. The Susenas 2002 shows that the agricultural sector contributes 55.26% to the total poverty incidence in Indonesia. This occurs both in rural and urban areas, both of which have high levels of poverty incidence. In urban areas, although only 19% of poverty originates in the agricultural sector, this poverty incidence is the highest. Meanwhile, in rural areas – which contributes three-fourths of the poverty in Indonesia – the agricultural sector not only contributes 67% of the poverty incidence, but also ranks as the highest level of poverty in all existing poverty measurements. Moreover other poverty measurements like the poverty gap – which illustrates the difference between average income for the poor with the poverty line – and poverty intensity – which is shown by the squared poverty gap index – which are also high for the agricultural sector. **Table 3** (appendix) shows that the agricultural sector poverty gap is two times higher than that for the non-agricultural sector; poverty intensity is 2.21 times higher than in the non-agricultural sector; and 1.79 times higher if the headcount index is used to measure poverty levels.

The figures above have broad policy implications. ***First,*** although rural poverty levels have decreased significantly, rural and agricultural sector poverty still require government attention and priority. ***Second,*** budget allocation to handle poverty must continue to be prioritized keeping in mind the sheer size of poverty levels in rural and agricultural areas. ***Third,*** anti-poverty programs in the agricultural sector should be designed more carefully keeping in mind the heterogeneity of the factors that cause poverty and given the size of poverty intensity.

There must be special attention on thee diversity of the agricultural sector, which covers food, forestry and fisheries. **Table 3** (appendix) depicts disaggregation of the poverty incidence in the agricultural sector, showing that conditions in the food sub-sector are not the worst of all agricultural sub-sectors. Poverty incidence in the food sub-sector is 36%, while sub-sectors like forestry and livestock have higher poverty levels at 40 and 44% respectively.

But, it is interesting to note that if the poverty gap index or squared poverty gap index is used the food sub-sector ranks higher. This has two important implications. First, the average income of the poor who work in the food sub-sector is much further below the poverty line compared to the per capita income of the poor in other agricultural sub-sectors, assuming relatively similar levels of savings. This implies that a large transfer is needed to handle poverty in the food sub-sector.

Table 4 (appendix) shows that income distribution among the poor in the food sub-sector is worse than in other sub-sectors. This implies that

both pro-growth and pro-equity policies are needed for combating poverty in that sub- sector.

Tables 4 and 5 (in appendix) give the decomposition of the poverty index based on head of household status and type of work. It can be seen that 57% of the poor in the food sub-sector are heads of households who are helped with temporary work followed by farm labors at 24%. That table also reveals that 99% of the poor in the food sub-sector are farmers or farm labor. In addition it also shows that 35% of farmers who are helped by temporary work are classified as poor and 47% of farm labor cannot fulfill their minimum basic needs. For the first group, income gap or the difference between average expenditure and the poverty line was Rp. 16,048.8 per capita per month. There are approximately 10.2 million farmers helped by temporary work (including their dependents) classified as poor, and thus transfers of Rp. 1.96 trillion are needed per year to raise this group out of poverty. Meanwhile, the expenditure of these poor farm laborers is approximately 20% below the poverty line or about Rp. 15,326 per capita/month below the rural poverty line. If there are 4.3 million poor farm laborers, then a transfer is needed of Rp. 720 billion or 12% of total costs to eliminate poverty in rural areas in Indonesia in 1999.

The decomposition index also gives a strong argument for the government to continue to target the food sub-sector in anti-poverty policies. But should this be accomplished through output, input or interest subsidies? The answer depends on a few considerations. First, assets owned composition, and second, the status of poor families in the food sub-sector as net consumers or net producers. The second issue will be explained below.

The composition of asset holding plays important role to justify any government intervention. Given the fact that most of the poor are the landless or farm labor, any Rupiah government transfer will only benefit the land owner who are the non poor. This may not only ineffective but also deteriorate income distribution which will reduce the power of growth for poverty reduction.

However this argument was rejected by pro-intervention groups. Their argument is based on the fact that the food sub-sector (rice) dominates the rural economy and thus has a large multiplier effect on other rural sectors. Input-Output Table analysis verifies this argument using forward and backward linkages. But this analysis is incomplete keeping in mind asset distribution, particularly land, which is not reflected in the Input-Output Table. Table 6 (appendix) shows the decomposition of the poverty index with asset distribution (agricultural land). From this table it can be seen that approximately 84% of the poor in the food sub-sector are farm labor or farmers who own less than one

hectare of land, consistent with the findings in Tables 4 and 5 (appendix). This again support argument above that price policy, whether tied to output price subsidies, input or loan interest rates will only benefit farmers with more than one hectare of land and, that these farmers account for only 3% of the poor in the food sub-sector.

The first and second arguments still justify government intervention through price policy if the following conditions are fulfilled. First, as discussed above farmers account for 13.19% of total poor whose head of the family depends on the food sub-sector. This will be explained in the next section using net benefit ratio criteria. The second is tied to rural labor market dynamics. Will a price increase push the demand for labor and is there a strong positive correlation between food price increases and farm labor wages? If there is a strong relationship, demand elasticity and a given labor supply will push an increase in farm labor income. But this is outside the focus of this research.

POVERTY DETERMINANTS IN RURAL AREAS

The next question that must be answered is what are the poverty determinants in this sector? Mason (1996), Ikhsan (1998) and LPEM (2003) point to several rural poverty determinants. *First*, insufficient human capital endowment complicates the labor transformation process between sectors. There is a visible difference between net or gross enrolment ratio in urban and rural areas, especially at the primary school level and above. This finding implies that programs to expand access to education and improve the quality of education decrease rural poverty. Past experience shows that the *Inpres* program and *Paket Kejar* Program have helped increase agricultural productivity, particularly of rice, through the green revolution. These improvements in education assisted the seed technology transformation process, different from what occurred in India (Ikhsan, 1998)

Second, in conjunction to demographic characteristics, household factors also influence poverty status in rural areas. In general, rural families are larger than their urban counterparts. At the same time, a quantitative analysis using logit models shows household size has a positive and statistically significant relationship to rural household poverty status. The policy implication of this finding is that family planning efforts and policies must be continued to further reduce household size in rural sector.

The third determinant of rural poverty is infrastructure quantity and quality. Infrastructure quantity and quality play several roles in handling poverty in agricultural areas. Specifically: (i) improving infrastructure quantity and quality will reduce the transportation margin

(connected to a number of studies which show that high transportation costs increase prices paid by consumers); and thus decreasing the transportation margin will have added benefits for farmers; (ii) improving the total stock and quality of infrastructure will also give farmers a stronger bargaining position in handling market imperfections both in the financial sector and in marketing. A Logit analysis shows that all infrastructure variables, from electricity supply and access to road quality, greatly determine whether or not households are poor in rural areas. This finding is also supported by a study by LPEM (2004) which showed that households without access to electricity – which are generally poor - pay 4-5 times more than non-poor households. This implies that infrastructure improvements – including the expansion of electricity networks – will reduce the effective energy costs paid by poor families. This effect will be enhanced by production side impact because it will reduce of cost of doing business in rural area and opening business opportunities as well.

Fourth, asset ownership also influences whether a family is classified as poor or non-poor. Asset ownership not only influences the availability of production factors but also influences poor family access to financial resources. Although theoretically, Bank Rakyat Indonesia does not require physical collateral to guarantee loans, but in the reality land ownership eases access to general rural credit (KUPEDES). Furthermore, asset ownership allows farmers to take risks in using new technologies and thus improves the chance of increasing production and income. This is supported in Table 5 which shows the strong correlation between land ownership and poverty levels.

The fifth factor which determines poverty status is linked to government policy. Government policy which has been overly biased toward rice for the last 30 years has distorted the prices of other farm commodities which actually have greater comparative advantage and added value. The reduction of government intervention through the *Pangan* Law in 1992 which gave farmers the freedom to choose their own crops was the first positive step to cut distortion in the agricultural sector. Still, the high levels of government intervention in this sector in the form of regulations mean that farmers must acquiesce to pay economic rent to traders.

Tables 7-9 (appendix) provide important lessons regarding how government intervention should be used to increase farmer income and simultaneously improve income distribution. Government intervention is meant to guarantee the functioning of market mechanisms. Low prices received by farmers are caused by three things: ***first,*** imperfect information; ***second,*** high transportation costs; and ***third,*** market imperfections due to both the first and second reasons above as well as

government intervention. Imperfect information causes two classic detriments for farmers: limited bargaining power and limited access to financial institutions (Stiglitz, 1996). Monopsony emerges as a result, which harms farmers and in the end causes the end price received by farmers to be lower than it should be. Copra, cloves and dried cassava (Lampung) are examples of this. High transportation costs resulting from bad infrastructure quality have been proved in many cases. The chocolate case in South Sulawesi is a good example. The price received by farmers increased with infrastructure improvements. Prices received by farmers who have better access to Ujung Pandang are higher than those in areas with worse roads. Examples of how government intervention reduces farmer income are not limited to the clove and rattan cases, but also occurred in many other provinces. For example, in East Nusa Tenggara (NTT), the province with the highest level of poverty in Indonesia, regulations forced by both 2 local governments (*Pemda*) caused prices received by farmers to be very low and also caused a transfer of wealth from poor farmers to the alliance between government officials and traders (World Bank, 1996 and 1997). Law No. 18/1997 actually reduced the authority of local governments (*Pemda*) to impose taxes or retributions which harm the populace and benefited the poor as seen in an increase in the margin received by farmers (see **Table 7**). Yet the amendment to Law No 18/1997, Law No 34/2002, gave very broad freedom to local governments to implement various new taxes or retributions, particularly tied to institutional limitations in the central government.

3. CHANGES IN THE PRICE OF RICE AND WELFARE LEVELS OF THE POOR

To see the influence of rice price policies on the poor, it is necessary to understand the characteristics of each population group as net consumers or producers (Mellor, 1978). Net seller households will benefit from an increase in rice price, while net consumer or net buyer households, like most urban households, farm labor and non-farm households, will be harmed as a result of an increase in the rice price. It is important to note that the argument above only reflects the direct impact of changes in rice prices and that rural households are still influenced by indirect impacts like changes in the labor market and changes in non-farm demands (goods and services). If production elasticity and demand for labor are large enough, the impact of increases in the price of rice on farm labor or households outside the rice sector can compensate for direct impacts through increases in the demand for labor and wages as well as in the demand for non-farm goods and services. Rough empirical data indicates that the final impact tends to be smaller as symbolized by low supply

elasticity in rice price. This reality is supported by three other important facts: (i) real wage (farm labor wages are deflated with rice price): decreases indicate the inelastic relationship between the price of rice and farm wages; (ii) the smaller role of rice in rural and urban household consumption patterns, and; (iii) the decrease in farmer dependence on income from rice. This argument implies that household identification based on classification as net buyers or net sellers is sufficient to see the impact of an increase in the price of rice on each household group.

Practically, this identification can be conducted using the methodology developed by Deaton (1989, 1997) by calculating the net benefit ratio (NBR) which is defined as the value of net sales of one commodity relative to income. NBR can be interpreted as "before response" or elasticity impact of real income due to price changes. NBR depicts impact in the very short run as it assumes no changes in producer or consumer behavior.

Tables 9-15 and Figures 1-3 (appendix)show the results of calculating the net benefit ratios for rural and urban areas in Indonesia. It is not surprise that the majority of urban households are net consumers, with only 5% of these households classified as net producers. In rural areas, almost 45% of households are net producers of rice. Interestingly, as shown in Table 13 (appendix), even among net producers of rice only one third of their income is coming from rice income.[4] It means that any price adjustment will not affect the welfare of rice farmer. Furthermore, it also implies that a broad-based approach which may more than proportionately benefit the non farm business will have greater impact to rural development (and particularly the rural poor welfare).

Figures 1 and 2 (appendix) provide rough sketches of the short-term impacts of increases in rice prices categorized by winners and losers. Because the NBR reflects benefit as a percentage of total household consumption, a flat line for all households proportionally benefits so long as price changes are not regressive or unprogressive. A positive slope proportionally benefits the better-off; likewise a negative slope benefits the poor.

Figures 1 and 2 (appendix) show a positive slope, thus an increase in rice tariffs will benefit rich rural farmers and harm the urban poor. In Figure 2 it can be seen that the NBR is negative for all income groups as a consequence of the fact that 96% of urban residents are net consumers. A positive slope is also a reflection of Engel's Law which shows that the percentage of expenditure on rice will decrease with an increase in expenditure or income.

[4] This finding is also supported by other studies for example Gilligan. Et.al (2000).

The total impact on all population groups very much depends on the negative compensation effect experienced by net consumers and the advantage obtained by net producers. With only 29% of households in Indonesia categorized as net producers, for every one net producer there are three net consumer households. Thus, the message implicit in Figure 3 (appendix) is that the imposition of tariffs which increase rice price will more greatly harm than benefit poor households.

More detailed calculations show that in only a few rural areas in West Sumatra, Central Java and NTT are there more net producer than net consumer households.[5] This is a little different from NBR calculations which show that on average there is not one single area with a positive net benefit ratio. Tables 11 and 14 (appendix) depict disaggregation based on poverty status in which it can be seen that urban and rural poor groups are net consumers and have lower net benefits than other income groups. Further, this fact shows that an increase in rice price (rice price deviation from international price) will tend to harm poor households. Part of this can be explained by the data in Figure 4 (appendix) in which it can be seen that impoverished rice producer groups tend to use their yields for self-consumption compared to other groups. Indeed, only 70% of impoverished rice producing farmers sell their rice compared to the 80% of non-poor producers who are involved in the rice market.

Furthermore, disaggregation of household position based on primary household occupation produced a dramatic finding: in the food sub-sector net consumers are more dominant than net producers. Indeed, refereing back to Table 13 (appendix) income from rice production is not very different from households whose primary income comes from occupations outside the food sub-sector (see Table 15 and Table 13 (appendix)).

The calculations above are still rough estimates as they only examine short-term impacts and do not calculate consumer and producer reactions to price changes. Further developments of the NBR calculations enable more complex calculations which include demand and supply elasticity for consumers and producers. Changes in welfare due to price changes can be expressed as:[6]

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[5] There are issues with the Susenas 1999 data, particularly household position in Nusa Tenggara Timur. This province is known for its low levels of rice production and thus it would be strange for the province to have a dominant position as a net producer of rice. The first wrong assumption is the rural household inflation factor in NTT is too large. Susenas sample data shows that consumer households are more dominant which makes sense given the characteristics of the province.

[6] See Minot and Goletti (2000)for the complete derivations of this formula. The formula above has been developed from Deaton's formula (1989).

$$\Delta w_i^1 / x_{oi} = \Delta p_{or}^P / p_{or}^P PR_{ir} - \Delta p_{or}^c / p_{or}^c CR_{ir} \quad \text{.....(1)}$$

in which Δw_i^1 = first order approximation of changes in welfare levels for household *i* as a result of changes in rice price.

x_{oi} = first income level for household *i*

p_{or}^P = first price for calculating rice production in area r

p_{or}^c = first price for calculating rice consumption in area r

PR_{ir} = household *i* rice production as a percentage of total income or expenditure.

CR_{ir} = household *i* rice consumption as a percentage of total income or expenditure.

Meanwhile, the after response income effect can be calculated using the following formula:

$$\Delta w_i^2 / x_{oi} = \Delta p_{or}^P / p_{or}^P PR_{ir} + \tfrac{1}{2} (\Delta p_{or}^P / p_{or}^P)^2 PR_{ir} \varepsilon_{rr}^s - \Delta p_{or}^c / p_{or}^c$$
$$CR_{ir} - \tfrac{1}{2} (\Delta p_{or}^P / p_{or}^P)^2 CR_{ir} \varepsilon_{rr}^d \quad \text{.....(2)}$$

in which: Δw_i^2 = the second order approximation in changes in welfare for household i due to changes in rice prices.

ε_{rr}^s = supply elasticity

ε_{rr}^d = Hicksian demand elasticity

There are some important notes for the formula above. If demand and supply elasticity equal zero, then equation (2) is identical to equation (1). If this occurs – in the case of immediate impact – the impact of a 1% increase in the price of rice on income is the net benefit ratio times 1%. This assumes price changes at the producer level will be fully transmitted as changes in consumer price. This assumption tends to be very loose keeping in mind that when paddy (*gabah*) price increases 1%, refined rice price tends to increase by more than 1% but when paddy price decreases, rice price decreases less than proportionally.

Other important assumptions in calculating short-term impacts are:

Supply elasticity or rice on price:	0.3
Price elasticity on poor household demand for rice:	- 0.975
Price elasticity on mid-income household demand for rice:	- 0.701
Price elasticity on upper-income household demand for rice:	- 0.508
Price elasticity on urban household demand for rice:	- 0.504
Price elasticity on rural household demand for rice:	- 0.707

The assumptions above were obtained from earlier studies and separate regression results using Susenas data. Another assumption is the production conversion of paddy to rice is 0.65. This assumption is actually very generous given that in practice the conversion coefficient ranges between 0.6 and 0.63.[7]

Tables 17-19 (appendix) show the results for both the immediate and short-term impacts (after response impact) as explained below. ***First,*** for the immediate impact, as expected, urban households will experience a bigger impact than rural counterparts, and Indonesian family who live outside Java will experience a greater decrease in welfare levels than the ones who reside in Java. It is also not surprise at all if families who live Java will experience a larger decrease in welfare than even urban residents in Java at 1.18% (rural areas outside Java) and 1.03% (urban areas in Java). If adjustments are made between producers and consumers, the decrease in real income is more moderate. Indeed, in rural Java, an increase in the rice price is relatively neutral.

Second, furthermore a regional disaggregation shows that off Java households are harmed at above average levels of decreases in the national welfare level, except for a few rural areas in North Sumatra, West Sumatra, Lampung, South Sulawesi, North Sulawesi, and Central Sulawesi which experience only a moderate decrease in welfare. Yet the picture above shows that almost all residents aggregately experience a decrease in real income. This picture is slightly different if the impact is adjusted for producers and consumers; in this case two provinces emerge which experience an increase in income, Central Java and East Java, but these still experience a decrease in real income.

Third, **Table 19** (appendix) shows that poor groups are disproportionately harmed as a result of increases in the price of rice regardless of location. The poor experience a decrease in welfare more than two-fold greater than the non-poor at a 1.72% decrease in real income for the poor compared to minus 0.81% for non-poor groups. This comparison is more visible if we compare decreases in real income for the poor in urban areas outside Java with decreases in real income for the non-poor in Java with a ratio 18 times higher (minus 2.29% and minus 0.13%). Adjustments for producers and consumers further contrast this picture, in which non-poor populations in rural Java enjoy an increase in income of 0.27% due to a price increase.

Fourth, the third point above shows that an increase in rice price does not only lead to a decrease in real income, but also impacts income distribution. The impact on income distribution occurs in several dimensions: from city to village dwellers – which might be desirable; and

[7] Using a higher conversion coefficient will give a more positive impact to producers.

two undesired impacts- from residents outside Java to residents of Java and from poor groups to non-poor groups. This calculation further shows that rice protection policies tend to be anti-poor even though the dynamic impact on the labor market is not yet calculated.[8]

4. THE IMPACT OF RICE PRICE INCREASES ON THE POVERTY INDEX

The final section of this paper examines the impact of price increases on the poverty index. The assumptions used are the same as in the previous section in which changes in real household income are simulated for the first poverty line. The impact on real income here is met through calculating adjustments for consumers and producers.

The results pictured in **Tables 20** and **Figure 5** (appendix) are consistent with the previous findings. Aggregately, each increase of 10% in the rice price will be translated as a 1% increase in the number of the poor or an additional 2 million poor in Indonesia. Further disaggregations give several interesting findings. First, a 10% increase in the price of rice will cause an increase in the headcount index of 1.15% in urban areas and 0.90% in rural areas. In contrast to the previous finding on real income effect where off Java household affected more than their Java's counterpart, a rice price increase will tend to increase number of poor more in Java than outside Java. This is valid for both urban and rural areas. This finding is also obvious because as explained before, poverty in Indonesia is predominantly Java phenomenon. Further disaggregation shows only 18 urban and rural areas (based on provinces) whose increase in poverty will be below the national average, while more than 34 areas will experience an increase in the headcount index above the national average. Rural areas in West Nusa Tenggara (NTB) will experience the highest increase at 2.56%, followed by urban areas in NTT, rural areas in Jambi and urban areas in Maluku (see **Figure 5**). Figure 6 is consistent with previous findings in which the impacts of price increases measured by changes in the poverty index will be more greatly felt in poor regions than in rich regions. In terms of distribution, it also means that a rice price increase implying a transfers from poor to rich regions

[8] Dynamics in the agricultural sector labor market are impeded by the reality that average land ownership is 0.25 to 0.30 hectares and thus estimated price increases are not transmitted as increases in the demand for labor and wage increases. Warr (2003) used the CGE model to calculate impacts in the labor market which point in the same direction as the conclusions of this article. Rather, the magnitude of the impact of rice price increases on poor households tend to be smaller and are not caused by adjustments to the labor market but rather as a result of more strict assumptions which tend to benefit rice producers; for example by assuming a low import and domestic rice substitution coefficient which is actually relatively high in practice.

Other dimensions of rice price changes on poverty levels can be seen in **Table 19** (appendix) which depicts the relative difference between urban and rural areas when the poverty gap index or squared poverty index is used. **Figure 7** (appendix) explains the poverty dimensions linked to poverty measurements and changes in rice price. First, the impact of a rise in the rice price tends to increase (in index increase percentage) if more strict poverty measurements are used. This means that an increase in the price of rice does not only increase the total number of poor but also deepens the poverty gap and increases poverty intensity as a percentage. Meaning that the cost of handling poverty – assuming perfect targeting – will increase from Rp 9.01 trillion per year to Rp 9.64 trillion per year, an increase of Rp. 618 billion per year.[9]

Second, seen from the regional dimension, if the headcount index is used, rural Java will experience a relatively small increase in poverty levels even though most of Indonesia's poor live in rural Java. But it is important to note that if the poverty intensity index is used (squared poverty gap), poverty in rural Java increases more than in rural areas outside Java, further proving that Java's poor will be hit hardest by an increase in the price of rice.

5. CONCLUSION

The analysis in the previous section has shown that contrary to widespread opinion, an increase in the price of rice, particularly through protection policies, will negatively impact the poor. In other words, protective rice price policies are anti-poor. Each 10% increase in the price of rice will lead to a 1% increase in the poor population, in other words more than two million Indonesians will fall below the poverty line as a direct effect of a 10% increase in the price of rice.

Rice price increases also contain undesired distribution dimensions:

- Income transfer from populations outside Java to populations in Java
- Transfer from urban to rural populations
- Income transfers from populations in poor provinces to populations in rich provinces, or from the poor to the rich.

[9] Ways to calculate the cost of handling poverty include the following. First, calculate the poverty income gap by dividing the poverty gap index by the headcount index. This figure shows the gap between average income and the poverty line. Second, multiply the poverty income gap and poverty line to obtain the monetary value of the income gap. Third, multiply this by the number of poor to obtain monthly and yearly aggregate cost.

Protective rice policies will not only increase poverty but will also worsen income distribution as reflected in monotically increasing impacts on the number of the poor (seen in the headcount index), the depth of poverty (poverty gap index) and poverty intensity.

Government policies to cope with rural poverty must take into account the fundamental factors that cause poverty. ***First,*** efforts to increase farmer welfare cannot be only sector like price policy. Increases in welfare will only be possible if the transformation to non-agricultural sectors is quickened. Because of this, the investment climate, especially for activities which are labor-intensive, must be improved. If this occurs, then the labor transformation process can be speeded up.

Second, transformation in the farming sector also must be actively pursued, in particular to direct labor from declining sectors like sugar cane and rice to sectors which have high added value like horticulture. For this, in addition to the investment climate issues, more intensive government intervention is needed to improve physical, technological and market infrastructures. A necessary condition is the elimination of price distortion especially in rice which impedes transformation in the farming sector.

Third, land reform in the form of more innovative and participative transmigration programs must be resumed. Land reform in the form of certification will help modernization and increase added value in the farming sector as it will allow farmers to obtain broader access to financial and capital markets.

Fourth, institutional innovation, for example land exchange which facilitates land consolidation, can be conducted. This is important as many farming activities are sensitive to economies of scale in which land consolidation allows farmers to act as capitalists while production management is transferred to professionals. Developing cooperatives can thus actually create capital.

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APPENDIX

Figure 1
Distribution of Net benefit ratio for Rural Households: (Y axis: Net Benefit Ratio, X axis percentile of expenditure for all Indonesia)

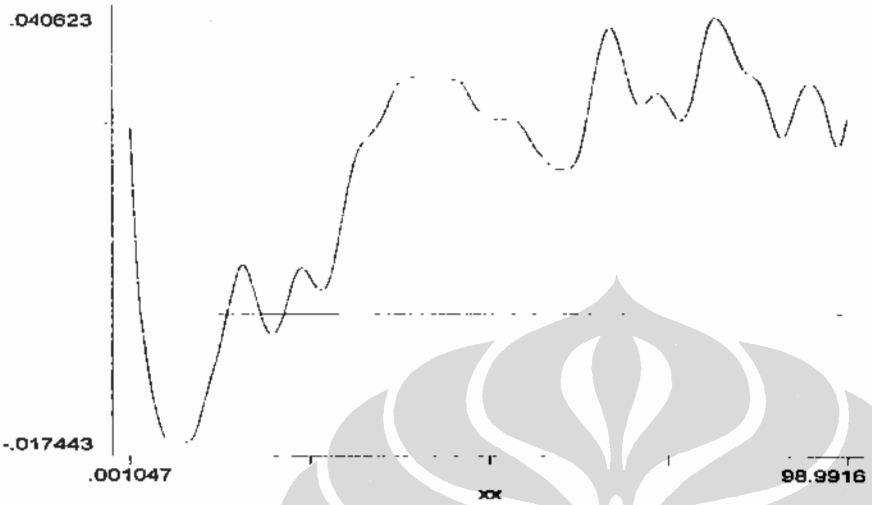

Figure 2
Distribution of Net Benefit Ratio for Urban Households: (Y axis: Net Benefit Ratio, X axis percentile of expenditure for all Indonesia)

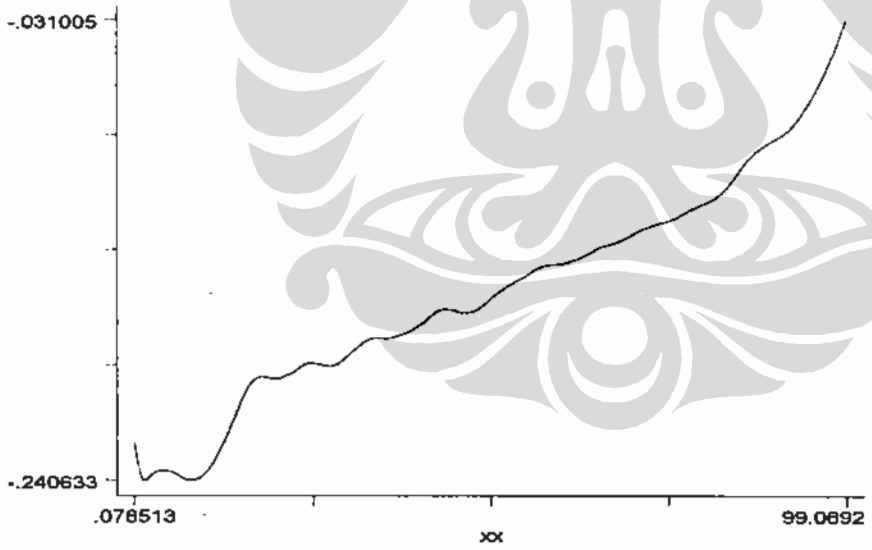

Figure 3
Distribution of Net Benefit Ratio for All Households: (Y axis: Net Benefit Ratio, X axis percentile of expenditure)

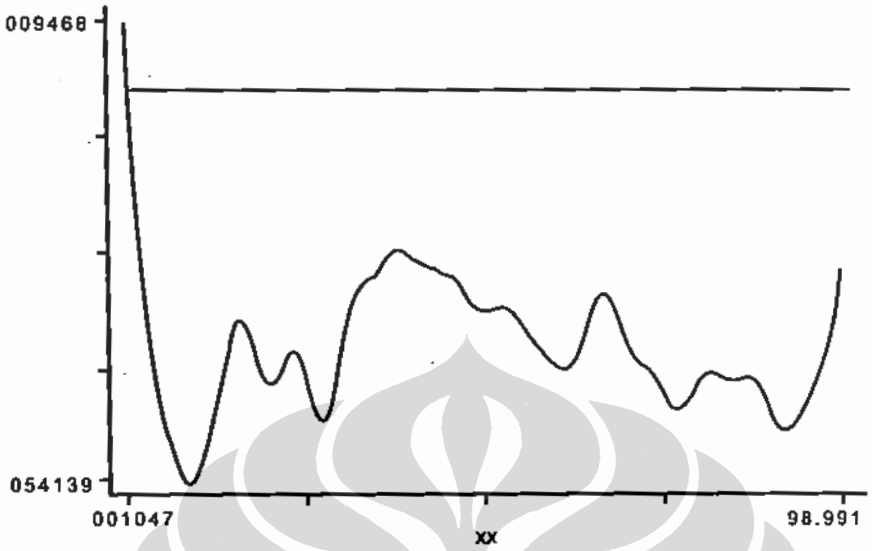

Figure 4
Seller to Producer Ratio

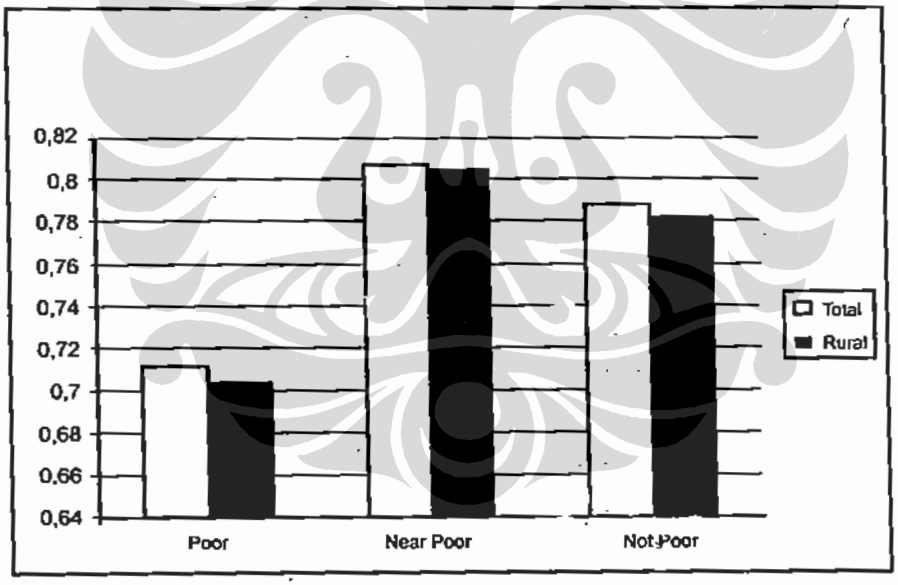

Table 1
Rice Price Variability in the World Market

	1980-85	1990-95	Overall
US (New Orleans)	18.25	12.53	15.12
Thailand (Bangkok)	20.38	13.51	16.68
Thailand	20.12	14.08	16.67
Myanmar	25.91	11.70	20.50
India (Kakmanda)	9.79	9.93	9.65
India (Bangalore)	8.73	8.95	8.63

Source: Jha and Srinivasan (2004)

Table 2
Characteristics of the Poor

	Poor		Not Poor		All	
	Urban	Rural	Urban	Rural	Urban	Rural
Education						
- Household Head Years of School Attainment	5,093	4,368	8,875	5,759	8,640	5,501
- Adult Years of School Attainment	5,806	4,732	9,218	6,230	8,948	5,868
Labor						
Labor class of adult (>18 years old)						
- Inactive (%)	35.85	27.76	35.59	29.22	35.61	28.87
- Self employed (%)	24.06	33.49	20.86	34.11	21.12	33.96
- Wage worker (%)	33.39	17.95	35.80	21.04	35.61	20.29
- Unpaid family worker (%)	6.04	20.48	4.18	14.80	4.33	16.17
Labor force participation for adult (19-59 years old)						
- Male (%)	94.54	95.78	91.00	95.28	91.28	95.40
- Female (%)	50.65	60.29	50.03	55.32	50.08	56.53
Child labor (11-14 years old)						
- Male (%)	3.26	10.55	1.92	7.36	2.08	8.35
- Female (%)	2.95	5.62	2.25	4.80	2.33	5.05
Job Sector of Household Head.						
- Agriculture (%)	31.11	69.09	9.92	54.85	11.24	57.53
- Forestry (%)	0.23	1.34	0.16	1.20	0.16	1.23
- Fishery (%)	1.48	2.23	1.54	2.90	1.54	2.77
- Mining (%)	1.25	0.49	0.90	0.86	0.92	0.79

- Industry (%)	12.17	4.98	13.57	6.51	13.49	6.22
- Bectricity (%)	0.10	0.02	0.51	0.09	0.49	0.08
- Construction (%)	9.87	3.83	6.69	4.53	6.88	4.36
- Trade (%)	14.06	5.00	22.21	9.52	21.70	8.66
- Transportation (%)	8.94	2.73	9.54	4.53	9.50	4.19
- Finance (%)	0.69	0.08	2.52	0.35	2.40	0.30
- Service (%)	8.14	2.40	17.27	6.88	16.70	6.03
- Others (%)	0.04	0.06	0.07	0.02	0.07	0.03
Others:						
Female Headed Household (%)	13.29	11.04	13.03	12.11	13.05	11.91
Household Size	5.05	4.78	3.98	3.69	4.04	3.90
HHs have land (%)	26.89	71.52	18.47	68.54	19.00	69.10
Active in local level meetings (%)	64.16	68.84	74.87	74.73	74.20	73.82

Source: SUSENAS 2002.

Table 3
Povery Index Decomposition by Occupation, 1999

Location	Occupation Grouping	Contribution to Total					
		Head Count	Poverty Gap	Squared Pov Gap	Head Count	Poverty Gap	Squared PovGap
Urban	Non-Agricultural	14.39	2.59	0.74	20.16	19.09	18.68
	Agricultural	34.64	7.27	2.22	4.74	5.24	5.46
	Food	44.28	9.80	3.07	73.62	77.57	79.66
	Other Agriculture	16.78	2.61	0.60	8.67	6.42	4.88
	Livestock	32.73	8.33	2.86	4.34	5.26	5.93
	Agriculture and Livestock Services	19.20	2.88	0.56	0.63	0.45	0.29
	Forestry and Timber	25.17	6.85	2.66	1.35	1.75	2.23
	Salt Water Fisheries	28.72	3.99	0.88	2.23	1.48	1.07
	Salt Water Fisheries	22.02	3.64	0.94	7.40	5.83	4.97
	Fresh Water Fisheries	23.56	3.49	0.83	1.76	1.24	0.97
	TOTAL	16.20	3.01	0.87	24.90	24.33	24.14
Rural	Non-Agricultural	22.03	3.98	1.09	24.58	23.38	21.80
	Agricultural	31.58	6.22	1.88	50.51	52.28	54.07
	Food	36.07	7.19	2.19	76.95	77.93	78.31
	Other Agriculture	17.36	2.73	0.69	12.40	9.91	8.29
	Livestock	43.78	9.77	3.18	5.05	5.73	6.16
	Agriculture and Livestock Services	13.99	3.19	1.18	0.11	0.13	0.16
	Forestry and Timber	39.94	10.60	3.98	2.52	3.41	4.23
	Seafood Breeding	12.08	3.33	1.38	0.09	0.12	0.17
	Salt Water Fisheries	24.64	4.60	1.24	2.11	2.00	1.78
	Fresh Water Fisheries	19.61	3.85	1.37	0.77	0.77	0.90
	TOTAL	27.65	5.30	1.55	75.10	75.67	75.86
TOTAL	Non-Agricultural	17.78	3.21	0.89	44.74	42.48	40.48
	Agricultural	31.82	6.30	1.91	55.26	57.52	59.52
	TOTAL	23.51	4.47	1.31	100	100	100

Source: Susenas 1999

Tabel 3.3.3:
Crosstabulation Results for Government Respondents

Crosstab Between Variables		Crosstab Results
Qualitative Inflation	Infrastructures	Significant
	Local Government Regulations	Insignificant
	Efforts in Controlling Inflation	Significant*
	Transportation Costs	Insignificant
	Safety	-
	Trades	Significant*
	Input Availability	Insignificant
Quantitative Inflation	Infrastructures	Significant
	Local Government Regulations	Insignificant
	Efforts in Controlling Inflation	Insignificant
	Transportation Costs	Insignificant
	Safety	-
	Trades	Insignificant
	Input Availability	Significant

* Significant at alpha=20%

For all respondents, the significant variables affecting inflation were infrastructure, safety, and trade policies. Besides infrastructure, safety, and trade condition, the significant variables affecting nominal inflation rates were local governments' efforts in controlling inflation and the availability of inputs.

For firm respondents, significant variables affecting inflation were infrastructure condition, local government regulations, and safety condition. For government respondents, significant factors affecting inflation were the infrastructure condition, efforts in controlling inflation, and trade condition. For them, local government regulations were not considered affecting inflation. On the other side, for firm respondents, local government regulations did affect inflation.

3.3. Logistic Analysis

Logistic regression allows a regression with a binary dependent variable—that is a variable that has values of 1 and 0. Value 1 is usually assigned for a success event and unsuccess event otherwise. In this paper, inflation (INFLA) is the dependent variable with 1 represents high inflation and 0 for others (low and medium inflation). The following are scores for every city observed.

Table 6.
Poverty Index Decomposition by Occupation and Land Size, 1999

Location	Land Size (hectares)	NON FARM				FARM			
		Total Poor	Head Count	Poverty Gap	Squared Pov. Gap	Total Poor	Head Count	Poverty Gap	Squared Pov. Gap
Urban	1. 0	99.16	14.75	2.66	0.76	89.30	50.46	11.28	3.57
	2. 0<size<=1	0.63	10.01	1.44	0.33	8.75	23.39	4.44	1.24
	3. 1<size<=2.5	0.15	12.03	2.80	0.77	0.47	9.20	2.92	0.95
	4. 2.5<size<=5	0.06	5.03	1.34	0.47	1.47	24.50	5.70	1.49
	5. size > 5	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Total	100.00	14.68	2.64	0.75	100.00	44.28	9.80	3.07
Rural	1. 0	92.58	22.94	4.28	1.21	83.97	40.92	8.40	2.60
	2. 0<size<=1	5.38	13.66	1.95	0.49	13.20	22.91	3.90	1.05
	3. 1<size<=2.5	1.13	17.83	3.64	0.93	2.31	21.76	3.61	0.87
	4. 2.5<size<=5	0.14	8.28	0.84	0.11	0.36	12.33	1.99	0.53
	5. size > 5	0.77	65.63	3.97	0.24	0.16	18.63	1.85	0.22
	Total	100.00	22.12	4.05	1.14	100.00	36.07	7.19	2.19

Source: see Table 3

Table 7
Indonesia: The Impact of Tax Reduction and Deregulation on Farmers; Farm Gate Prices as Percentage of Wholesale Price in Consuming Area

Commodity	Propince, Regency	Proportion of Final Wholesale Trade or Processing Factory Price Received by Farmers		
		Before Deregulation (approx. June 1997)	After Deregulation (date of interview, early 1999)	Change
Fresh tea leaves	West Java, Sukaburni	77%	84%	7%
Cocoa beans	South Sulawesi, Polmas	88%	97%	9%
	South Sulawesi, Bone	84%	81%	-
Coffee (arabica)	South Sulawesi, Polmas	91%	94%	3%

Coffee (robusta)	Central Java, Temanggung	95%	98%	3%
Copra	North Sulawesi, Minahasa	65%	82%	17%
Coconuts (for oil)	North Sulawesi, Minahasa	63%	83%	20%
Cloves	North Sulawesi, Minahasa	83%	97%	14%
Shredded Tobacco	Central Java, Temanggung	63%	94%	31%
Onions	West Nusatenggara, Bima			
	Destination Banjarmasin	57%	75%	18%
Candlenuts	West Nusatenggara, Bima			
	Destination Mataram	71%	80%	9%
	Destination Banjarmasin	58%	74%	16%
Fresh fish	Yogyakarta Gunungkidul	86%	80%	- 6%
	North Sulawesi, Gorontalo	60%	80%	20%
Shrimp	South Sulawesi, Bone	85%	88%	3%
Milk	West Java, Sukabumi	50%	60%	10%
Cattle	South Sulawesi, Bone	81%	88%	7%
	North Sulawesi, Gorontalo	60%	83%	23%
	East Nusatenggara (1995)	69%	n.a	n.a
	West Nusatenggara, Bima	73%	80%	7%
	West Nusatenggara East Lombok	86%	89%	3%

Table 8
Comparison of Marketing Systems for Several Commodities in the Regulatory Era in Indonesia

Commodity	Sales Options for Farmers	Information Available to Farmers	Government Intervention	Gross (Marketing Margin)
Chocolate (South Sulawesi) (market mechanisms)	Farmers can choose quantity to sell and sell to different middlemen.	Market information available. Local prices broadcast on RRI. International prices available through BBC-Indonesia and Askindo.	Retribution to several regencies plus 10% tariff and 10% PPN.	11%; 50% in Southeast Sulawesi in 1980 before the boom
Robusta Coffee (South Sulawesi) (market mechanisms)	Farmers can choose quantity to sell and sell to different middlemen. At certain times, sales only take place through export quotas.	Market information available. Local prices broadcast on RRI. International prices available through BBC-Indonesia and AEKI.	Export is forbidden for low-grade coffee10% PPN	8%; 30-40% to valid export quotas
Dried cassava (Lampung) (Monopsony/oligopsony and high transportation costs)	In several areas, few buyers (in certain cases only one). Price determined by buyer.	Very little information available. Price deduction process by quality is not transparent.	Export quotas for European markets	82% (reflecting price deductions, drying costs and transportation costs)
Sugar (government intervention)	Farmers can only sell to factories at prices determined by the government.	Prices determined by government and adjusted annually.	Very high govt intervention from production to marketing Farmers in TRI areas are forbidden from planting other crops	53% (including 38% of farmer output taken by the factory as a processing fee)
Copra (North Sulawesi) (downpayment)	Most copra is sold by traders who prepare downpayments before harvests. The rest is sold in a free market.	Very limited price information	Retributions	27% (reflecting drying and implicit interest costs)
Cloves (Indonesia) (Monopsony and Monopoly)	Famers must sell to KUD which then sells to BPPC. BPPC sells to cigarette factories at prices set by BPPC after calculating interest and storage costs.	KUD level prices determined by government. But in reality, price is below government price. BPPC sells to cigarette factories using a non-transparent cost structure.	Fees to KUD, Pemda BPPC, Puskud	77.6-85%

Source: Compiled from a number of sources.

Table 9
Comparison of Prices Received by Farmers and Export Prices

Commodity	Province	Year	Farmers Take (%)	Degree of Market Imperfection/ Government Intervention
Chocolate Beans	South Sulawesi	1995	89	Very Low
Robusta Coffee Beans	South Sulawesi	1995	92	Low-Medium
Cashew Nuts	South Sulawesi	1995	78	Very Low
Arabica Coffee Beans	South Sulawesi	1995	77	Low-Medium
Dried Cassava	Lampung	1988	18	High
Dried Cassava	East Java	1988	53	Medium
Sugar	Indonesia	1993	47	Very High
Copra	Central Sulawesi	1995	73	Medium

Source: Compiled from Akiyama and Nishio (1995).

Table 10
Net Consumers and Net Producers of Rice in Urban and Rural, 1999

Areas		Number of households			Total	Percentage to Total		
		Zero Position	Net Producer	Net Consumer		Zero Position	Net Producer	Net Consumer
Urban	Java	0	794056	12837677	13631733	0.0	5.8	94.2
	Off Java	0	258116	5651755	5909871	0.0	4.4	95.6
Rural	Java	3338	7686118	9117435	16806891	0.0	45.7	54.2
	Off Java	717	6020490	8611367	14632574	0.0	41.1	58.9
Total		4055	14758780	36218234	50981069	0.0	28.9	71.0

See: Table 3

Table 11
Provincial Decomposition of Net Consumers and Net Producers of Rice, 1999

Areas		Number of households			Total	Percentage to Total		
		Zero Position	Net Producer	Net Consumer		Zero Position	Net Producer	Net Consumer
Aceh	Urban	0	6109	182912	189021	0.0	3.2	96.8
	Rural	0	347144	356288	703432	0.0	49.4	50.6
N. Sumatra	Urban	0	54967	1077881	1132848	0.0	4.9	95.1
	Rural	0	706833	784055	1490888	0.0	47.4	52.6
W. Sumatra	Urban	0	20682	292681	313363	0.0	6.6	93.4
	Rural	0	427617	358486	786103	0.0	54.4	45.6
Riau	Urban	0	4880	359089	363969	0.0	1.3	98.7
	Rural	717	70276	549971	620964	1.0	11.3	88.6
Jambi	Urban	0	1972	191374	193346	0.0	1.0	99.0
	Rural	0	83679	334721	418400	0.0	20.0	80.0
S. Sumatra	Urban	0	5424	541609	547033	0.0	1.0	99.0
	Rural	0	434893	779350	1214243	0.0	35.8	64.2
Bengkulu	Urban	0	4381	122654	127035	0.0	3.4	96.6
	Rural	0	80137	175701	255838	0.0	31.3	68.7
Lampung	Urban	0	16045	249662	265707	0.0	6.0	94.0
	Rural	0	667577	703006	1370583	0.0	48.7	51.3
Jakarta	Urban	0	0	2171689	2171689	0.0	0.0	100.0
W. Java	Urban	0	202963	4862435	5065398	0.0	4.0	96.0
	Rural	2274	2298528	3340966	5641768	0.1	40.7	59.2
C. Java	Urban	0	238438	2428682	2667120	0.0	8.9	91.1
	Rural	1064	2458470	2407361	4866895	0.0	50.5	49.5
DI Yogya	Urban	0	97208	383331	480539	0.0	20.2	79.8
	Rural	0	140942	136002	276944	0.0	50.9	49.1
E. Java	Urban	0	255447	2991540	3246987	0.0	7.9	92.1
	Rural	0	2788178	3233106	6021284	0.0	46.3	53.7
Bali	Urban	0	27988	295184	323172	0.0	8.7	91.3
	Rural	0	149427	282436	431863	0.0	34.6	65.4
W. Nusatenggara	Urban	0	18882	160880	179762	0.0	10.5	89.5
	Rural	0	300872	470763	771635	0.0	39.0	61.0
E. Nusatenggara	Urban	0	21164	154572	175736	0.0	12.0	88.0
	Rural	0	979749	650880	1630629	0.0	60.1	39.9
W.Kalimantan	Urban	0	2402	194852	197254	0.0	1.2	98.8
	Rural	0	331179	343466	674645	0.0	49.1	50.9
C.Kalimantan	Urban	0	480	115039	115519	0.0	0.4	99.6
	Rural	0	101369	230625	331994	0.0	30.5	69.5
S. Kalimantan	Urban	0	5353	229231	234584	0.0	2.3	97.7
	Rural	0	206402	345689	552091	0.0	37.4	62.6

E. Kalimantan	Urban	0	6134	320878	327012	0.0	1.9	98.1
	Rural	0	81982	221088	303070	0.0	27.1	72.9
N. Sulawesi	Urban	0	8918	199208	208126	0.0	4.3	95.7
	Rural	0	181713	307976	489689	0.0	37.1	62.9
C. Sulawesi	Urban	0	1084	128291	129375	0.0	0.8	99.2
	Rural	0	108470	262539	371009	0.0	29.2	70.8
S. Sulawesi	Urban	0	49329	474580	523909	0.0	9.4	90.6
	Rural	0	598850	661377	1260227	0.0	47.5	52.5
SE. Sulawesi	Urban	0	783	95168	95951	0.0	0.8	99.2
	Rural	0	87558	183278	270836	0.0	32.3	67.7
Maluku	Urban	0	550	134133	134683	0.0	0.4	99.6
	Rural	0	36725	311107	347832	0.0	10.6	89.4
Papua	Urban	0	589	131877	132466	0.0	0.4	99.6
	Rural	0	38038	298565	336603	0.0	11.3	88.7

Source: See Table 2

Table 12
Decomposition of Net Consumers and Net Producers of Rice According Household Poverty Status, 1999

Areas or Poverty Status			Number of Households			Total	Percentage to Total		
			Zero Position	Net Producer	Net Consumer		Zero Position	Net Producer	Net Consumer
Urban	Java	Poor	0	285738	2719550	3005288	0.0	9.5	90.5
		Near Poor	0	172110	2053900	2226010	0.0	7.7	92.3
		Not Poor	0	336208	8064227	8400435	0.0	4.0	96.0
	Off Java	Poor	0	62849	587875	650724	0.0	9.7	90.3
		Near Poor	0	36389	768907	805296	0.0	4.5	95.5
		Not Poor	0	158878	4294973	4453851	0.0	3.6	96.4
Rural	Java	Poor	0	2742936	3232745	5975681	0.0	45.9	54.1
		Near Poor	1137	1982919	2107944	4092000	0.0	48.5	51.5
		Not Poor	2201	2960263	3776746	6739210	0.0	43.9	56.0
	Off Java	Poor	0	1512031	1644286	3156317	0.0	47.9	52.1
		Near Poor	0	1135091	1327372	2462463	0.0	46.1	53.9
		Not Poor	717	3373368	5639709	9013794	0.0	37.4	62.6
Urban	Indo-nesia	Poor	0	348587	3307425	3656012	0.0	9.5	90.5
		Near Poor	0	208499	2822807	3031306	0.0	6.9	93.1
		Not Poor	0	495086	1235920 0	12854286	0.0	3.9	96.1
Rural	Indo-nesia	Poor	0	4254967	4877031	9131998	0.0	46.6	53.4
		Near Poor	1137	3118010	3435316	6554463	0.0	47.6	52.4
		Not Poor	2918	6333631	9416455	15753004	0.0	40.2	59.8
U + R	Indo-nesia	Poor	0	4603554	8184456	12788010	0.0	36.0	64.0
		Near Poor	1137	3326509	6258123	9585769	0.0	34.7	65.3
		Not Poor	2918	6828717	21775655	28607290	0.0	23.9	76.1

Source: See Table 3.

Table 13
Source of Income of Rice Net Producer by Quantile and Decile

	Source of Income (Rp/hh/month)				Percentage to Total		
	Farm		Off Farm	Total	Farm		Off Farm
	Rice	Other			Rice	Other	
kuantil							
1	83029	133411	31796	248236	33.45	53.74	12.81
2	98466	145171	50037	293674	33.53	49.43	17.04
3	109127	156928	64678	330733	33.00	47.45	19.56
4	124056	178769	86220	389045	31.89	45.95	22.16
5	157142	220701	169265	547108	28.72	40.34	30.94
desil							
1	76144	130988	26306	233438	32.62	56.11	11.27
2	89915	135834	37287	263036	34.18	51.64	14.18
3	94736	140296	44700	279732	33.87	50.15	15.98
4	102195	150045	55372	307612	33.22	48.78	18.00
5	106367	154637	59008	320012	33.24	48.32	18.44
6	111888	159220	70350	341458	32.77	46.63	20.60
7	117870	170877	81447	370194	31.84	46.16	22.00
8	130247	186667	90996	407910	31.93	45.76	22.31
9	138846	200290	111537	450673	30.81	44.44	24.75
10	175418	241091	226933	643442	27.26	37.47	35.27
Total	**114367**	**166999**	**80404**	**361770**	**31.61**	**46.16**	**22.23**

Source: Author's Calculation

Table 14
Net Benefit Ratio and Rice Price Adjustment in Java and Off Java

Region		Household Monthly Mean Expenditure (Rupiah)	Household Monthly Mean Rice Expenditure (Rupiah)	Household Monthly Mean Rice Income (Rupiah)	Percentage Rice Expense to Total Expenditure	Percentage Rice Income to Total Expenditure	Net Benefit Ratio (percent)
Urban	Java	745226	87334	10207	11.72	1.37	-10.35
	Off Java	765349	104439	7988	13.65	1.04	-12.60
Rural	Java	403901	86067	64248	21.31	15.91	-5.40
	Off Java	487832	114465	56845	23.46	11.65	-11.81

Source: Author's Calculation

Table 15
Regional Disaggregation of Net Benefit Ratio, 1999

Region		Household Monthly Mean Expenditure (Rupiah)	Household Monthly Mean Rice Expenditure (Rupiah)	Household Monthly Mean Rice Income (Rupiah)	Percentage Rice Expen to Total Expenditure	Percentage Rice Income to Total Expenditure	Net Benefit Ratio (percen)
Aceh	Urban	745111	105007	6096	14.09	0.82	-13.27
	Rural	499642	118923	60935	23.80	12.20	-11.61
N. Sumatra	Urban	763672	113201	12874	14.82	1.69	-13.14
	Rural	520236	133717	91708	25.70	17.63	-8.08
W. Sumatra	Urban	788067	96412	10314	12.23	1.31	-10.93
	Rural	645656	119518	79003	18.51	12.24	-6.28
Riau	Urban	841631	102319	1064	12.16	0.13	-12.03
	Rural	612154	117705	14731	19.23	2.41	-16.82
Jambi	Urban	672427	95825	510	14.25	0.08	-14.17
	Rural	463077	113878	18532	24.59	4.00	-20.59
S. Sumatra	Urban	702281	98983	1432	14.09	0.20	-13.89
	Rural	503855	116366	57796	23.10	11.47	-11.62
Bengkulu	Urban	728861	92474	3925	12.69	0.54	-12.15
	Rural	500883	114518	31470	22.86	6.28	-16.58
Lampung	Urban	734763	101523	10983	13.82	1.49	-12.32
	Rural	449963	105525	66704	23.45	14.82	-8.63
Jakarta	Urban	1283657	88393	0	6.89	0.00	-6.89
W. Java	Urban	696621	98086	7068	14.08	1.01	-13.07
	Rural	440289	105085	64752	23.87	14.71	-9.16
C. Java	Urban	590712	79854	17765	13.52	3.01	-10.51
	Rural	397639	77918	63577	19.60	15.99	-3.61
DI Yogya	Urban	614082	66999	18501	10.91	3.01	-7.90
	Rural	424640	65981	35615	15.54	8.39	-7.15
E. Java	Urban	607259	79007	14495	13.01	2.39	-10.62
	Rural	373914	75759	65635	20.26	17.55	-2.71
Bali	Urban	831055	108827	17268	13.10	2.08	-11.02
	Rural	607747	122743	45326	20.20	7.46	-12.74
W. Nusatenggara	Urban	594727	102968	13372	17.31	2.25	-15.07
	Rural	401046	115167	49358	28.72	12.31	-16.41
E. Nusatenggara	Urban	685705	141415	18780	20.62	2.74	-17.88
	Rural	352902	111254	43156	31.53	12.23	-19.30
W.Kalimantan	Urban	975175	110678	1174	11.35	0.12	-11.23
	Rural	498404	150257	57181	30.15	11.47	-18.67
C. Kalimantan	Urban	892609	119554	247	13.39	0.03	-13.37
	Rural	559413	143306	48366	25.62	8.65	-16.97
S. Kalimantan	Urban	737925	95972	2064	13.01	0.28	-12.73
	Rural	461003	105711	39812	22.93	8.64	-14.29

Continue...

E. Kalimantan	Urban	829502	86469	2327	10.42	0.28	-10.14
	Rural	555201	106666	33715	19.21	6.07	-13.14
N. Sulawesi	Urban	700585	107043	5812	15.28	0.83	-14.45
	Rural	453088	100481	68748	22.18	15.17	-7.00
C. Sulawesi	Urban	745337	98887	545	13.27	0.07	-13.19
	Rural	485549	106131	79709	21.86	16.42	-5.44
S. Sulawesi	Urban	761631	101970	17458	13.39	2.29	-11.10
	Rural	5275.1	106469	71809	20.18	13.61	-6.57
SE. Sulawesi	Urban	716746	109361	1547	15.26	0.22	-15.04
	Rural	462818	113350	59107	24.49	12.77	-11.72
Maluku	Urban	740562	99454	277	13.43	0.04	-13.39
	Rural	463029	72993	37119	15.76	8.02	-7.75
Papua	Urban	877724	97671	1144	11.13	0.13	-11.00
	Rural	379522	60096	17908	15.83	4.72	-11.12

Source: Author's Calculation

Table 17
Immediate and Short Run Impact of a 10% Increase in Rice Price by Region and Areas

Region/Areas		Percentage Change in Real Income	
		Immediate Impact	Short Run Impact
Urban	Java	-1.03	-0.63
	Off Java	-1.26	-0.86
Rural	Java	-0.54	-0.04
	Off Java	-1.18	-0.68

Table 18
Immediate and Short Run Impact of a 10% Increase in Rice Price by Province and Areas

Region/Areas		Percentage Change in Real Income	
		Immediate Impact	Short Run Impact
Aceh	Urban	-1.33	-0.93
	Rural	-1.16	-0.66
N. Sumatra	Urban	-1.31	-0.91
	Rural	-0.81	-0.30
W. Sumatra	Urban	-1.09	-0.69

Continue...

	Rural	-0.63	-0.12
Riau	Urban	-1.20	-0.80
	Rural	-1.68	-1.18
Jambi	Urban	-1.42	-1.02
	Rural	-2.06	-1.56
S. Sumatra	Urban	-1.39	-0.99
	Rural	-1.16	-0.66
Bengkulu	Urban	-1.21	-0.81
	Rural	-1.66	-1.15
Lampung	Urban	-1.23	-0.83
	Rural	-0.86	-0.36
Jakarta	Urban	-0.69	-0.29
W. Java	Urban	-1.31	-0.90
	Rural	-0.92	-0.41
C. Java	Urban	-1.05	-0.65
	Rural	-0.36	0.14
DI Yogya	Urban	-0.79	-0.39
	Rural	-0.72	-0.21
E.Java	Urban	-1.06	-0.66
	Rural	-0.27	0.23
Bali	Urban	-1.10	-0.70
	Rural	-1.27	-0.77
W. Nusatenggara	Urban	-1.51	-1.10
	Rural	-1.64	-1.14
E. Nusatenggara	Urban	-1.79	-1.39
	Rural	-1.93	-1.43
W. Kalimantan	Urban	-1.12	-0.72
	Rural	-1.87	-1.36
C. Kalimantan	Urban	-1.34	-0.93
	Rural	-1.70	-1.19
S. Kalimantan	Urban	-1.27	-0.87
	Rural	-1.43	-0.93
E. Kalimantan	Urban	-1.01	-0.61
	Rural	-1.31	-0.81
N. Sulawesi	Urban	-1.44	-1.04
	Rural	-0.70	-0.20
C. Sulawesi	Urban	-1.32	-0.92
	Rural	-0.54	-0.04
S. Sulawesi	Urban	-1.11	-0.71
	Rural	-0.66	-0.15
S. E. Sulawesi	Urban	-1.50	-1.10
	Rural	-1.17	-0.67
Maluku	Urban	-1.34	-0.94
	Rural	-0.77	-0.27
Papua	Urban	-1.10	-0.70
	Rural	-1.11	-0.61

Source: See Table 2.

Table 19
Immediate and Short Run Impact of a 10% Increase in Rice Price by Household Poverty Status

Region / Areas			Percentage Change in Real Income	
			Immediate Impact	Short Run Impact
Urban	Java	Poor	-2.13	-1.49
		Near Poor	-1.65	-1.13
		Not Poor	-0.84	-0.44
	Off Java	Poor	-2.29	-1.66
		Near Poor	-2.00	-1.48
		Not Poor	-1.13	-0.73
Rural	Java	Poor	-1.37	-0.73
		Near Poor	-0.72	-0.19
		Not Poor	-0.13	0.27
	Off Java	Poor	-1.78	-1.14
		Near Poor	-1.51	-0.99
		Not Poor	-1.02	-0.62
Urban	Indonesia	Poor	-2.16	-1.52
		Near Poor	-1.75	-1.22
		Not Poor	-0.93	-0.53
Rural	Indonesia	Poor	-1.52	-0.89
		Near Poor	-1.02	-0.50
		Not Poor	-0.65	-0.25
U+R	Indonesia	Poor	-1.72	-1.09
		Near Poor	-1.29	-0.76
		Not Poor	-0.81	-0.41

Source: See Table 3

Table 20
The Impact of a 10% Increase in Rice Price to Poverty Indices, 1999

Region		Initial Condition			After Adjusment			Percentage Point Change		
		Head count Index	Pov. Gap Index	Sq. of. Pov Gap Index	Head count Index	Pov. Gap Index	Sq. of. PovGap Index	Head count Index	Pov. Gap Index	Sq. of. PovGap Index
Urban	Total	18.19	3.48	1.02	19.34	3.79	1.13	1.15	0.31	0.11
	Java	21.75	4.32	1.30	22.99	4.68	1.44	1.24	0.36	0.14
Rural	Off Java	10.64	1.69	0.43	11.58	1.89	0.49	0.94	0.20	0.06
	Total	27.86	5.34	1.54	28.76	5.65	1.67	0.90	0.31	0.13
	Java	35.54	6.81	1.92	36.46	7.18	2.08	0.92	0.37	0.16
	Off Java	19.25	3.69	1.12	20.14	3.94	1.21	0.89	0.25	0.09
Total		24.08	4.61	1.34	25.08	4.92	1.46	1.00	0.31	0.12

Source: Author's Calculation

Figure 5
Poverty Index Change Caused by A 10 % Increase in Rice Price

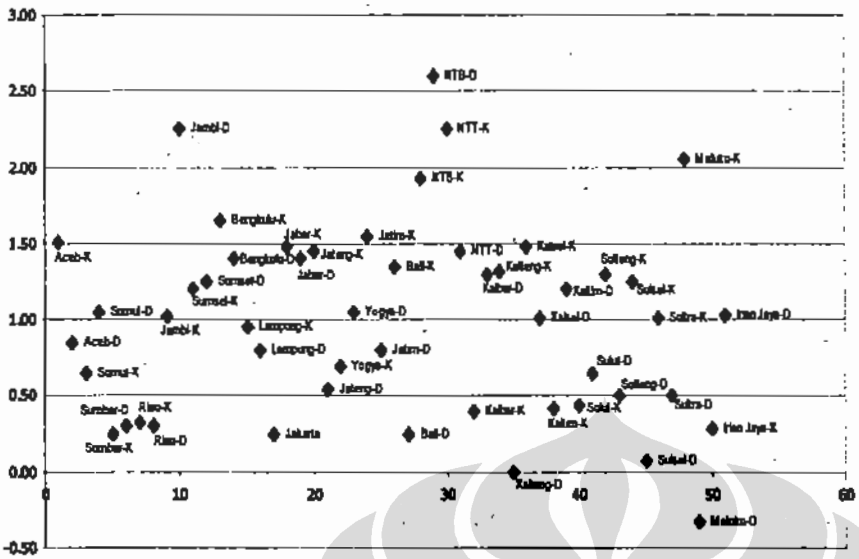

Figure 6
Change in Poverty Gap Index Caused by A 10 % Increase in Rice Price

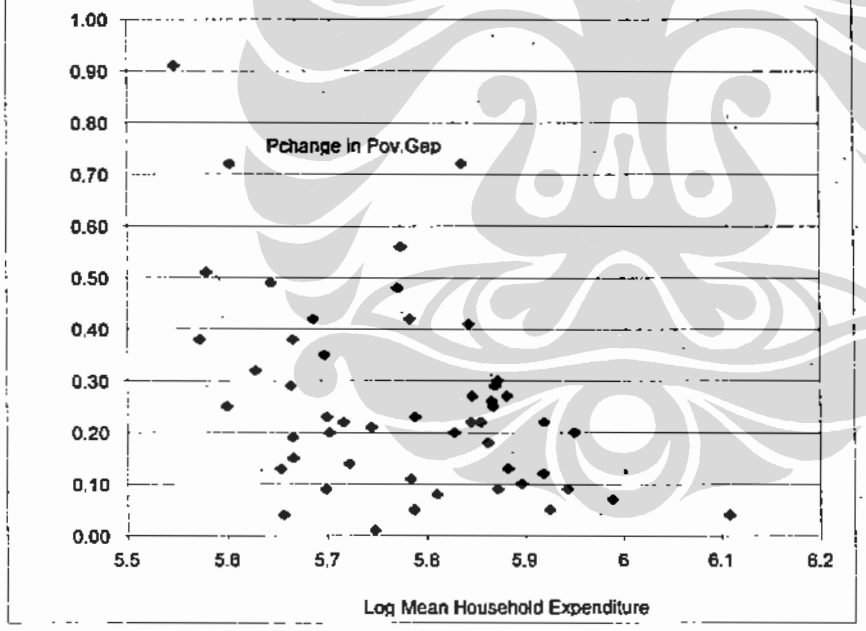

Figure 7
Poverty Index Change Caused by A 10 % Increase in Rice Price