

MARKET DEPENDENCY AND HOUSEHOLD FOOD CONSUMPTION IN EAST JAVA, INDONESIA

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ABSTRAK

Tujuan utama penelitian ini adalah untuk melihat perbedaan diantara konsumen di daerah pedesaan dan perkotaan dalam mengkonsumsi bahan makanan utama, dan terutama menelusuri seberapa jauh konsumsi di masing-masing lokasi (desa dan kota) tergantung pada uang tunai dan pasar (*cash or market dependency*) untuk pemenuhan konsumsi bahan makanan tersebut. Data dianalisis dari SUSENAS 1993, BPS, Provinsi Jawa Timur. Hasil penelitian menunjukkan bahwa ketergantungan akan uang tunai dan pasar berhubungan erat dengan jumlah konsumsi bahan makanan yang akan dibeli. Terdapat perbedaan nyata antara konsumen di daerah pedesaan dan perkotaan, dimana konsumen di pedesaan memiliki angka ketergantungan uang tunai dan pasar yang lebih rendah daripada konsumen di perkotaan. Asumsi lama dan klasik yang menyatakan bahwa penduduk di pedesaan kebanyakan adalah petani subsisten (yang dapat memproduksi untuk dikonsumsi sendiri) sudah tidak berlaku lagi. Walaupun demikian masih didapati bahwa seringkali rumahtangga di pedesaan menjual bahan makanan berkualitas lebih baik yang diproduksinya, sehingga uang hasil penjualan tersebut dapat digunakan untuk membeli kualitas yang lebih rendah, yang berarti memaksimalkan konsumsi dari segi kuantitas. Hasil penelitian ini menyiratkan pentingnya pengambil keputusan menyadari perbedaan antara penduduk desa dan kota tersebut. Studi semacam ini apabila ditunjang oleh studi perilaku *marketed* dan *marketable surplus* dapat membantu pembuat kebijaksanaan di bidang pengadaan dan distribusi pangan. Studi ini juga membantu memperjelas adanya perilaku ketergantungan pada uang tunai dan pasar yang berbeda pada rumahtangga di daerah desa dan perkotaan.

Kata kunci: *konsumsi makanan, pasar, pemakai kota dan desa.*

ABSTRACT

The general purpose of this study was to examine the differences between rural and urban consumers in how they acquire the food they consume and, in particular, to determine how much consumers in each location depend on cash for procuring the food they consume. The quantity of food purchased was modeled as a function of cash dependency, household income, household size, and prices. Data were taken from the 1993 *Survei Sosial Ekonomi Nasional* (SUSENAS) in East Java, conducted by the *Biro Pusat Statistik* – BPS (Central Bureau of Statistics), Indonesia. The results of this study indicate that the cash dependency for all food categories examined was significantly related to the quantities purchased of the foods (cereals, tubers, vegetables, fruits). Significant differences in cash dependency were also found between rural and urban consumers, with rural consumers having lower food cash dependency ratios than urban

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consumers. Perhaps the most surprising discovery was that the vast majority of rural consumers also depend on cash for acquiring food. The old assumption that mostly people in the rural areas in Indonesia are subsistence farmers (consume what they own produce) is no longer hold. The data from the survey shows that there are less and less subsistence farming exists in the area (East Java). The maintenance of subsistence farming may, indeed, be of strategic importance for the satisfaction of basic needs and the survival of rural households. When production from own sources is inadequate to meet the consumption needs, the households concerned may sell superior food (i.e., superior cereals or superior varieties) they produce, so as to maximize their purchasing power with which they can purchase inferior cereals and meet their own needs – thus maximizing their consumption at least in quantity. This study stresses the importance of using household consumption data in the making of public policy (food policy). They are important in that the implementation of policy will affect large number of people. It even will affect rural and urban consumers differently. This study combined with a study of behavior of marketed and marketable surplus can be significant help in designing a system of procurement and public distribution. This study also can help in understanding the behavior of purchase of food by farmers in different areas.

Key words: *food consumption, market dependency, urban and rural consumers.*

INTRODUCTION

During the last three decades (1965-2000), Indonesia has followed a well-recognized trend among developing nations: a 4 fold increase in real per capita income, a decline in agricultural production as share of GDP, a decline in population growth rates, a decrease in infant mortality rates from 145 to 51 deaths/1000 live births, an increase in primary school enrollment from 41 percent in 1965 to 93 percent in 1995, an increase in life expectancy from 46 years to 64 years, and an increase in homes with electricity from 6 percent to over 50 percent (Drake, C, 1998). The agricultural sector, however, is still vital for several reasons. Agriculture is still a major sector in the Indonesian economy. It accounted for 20.6 percent of gross domestic product (GDP) and 55 percent of the labor force in 1990. The majority of people (69%) lives and work in rural areas and most of their income is from agricultural activities.

Increasing income and the maintenance of low relative prices has led to a significant shift in the staple food consumption mix in favor of rice. This relatively low rice price policy has created a high reliance on rice as a staple, and, therefore, has forced the government to import more rice. Large imports of basic foodstuffs are undesirable both economically and politically, and this fact must enter into consideration of food policy.

For food in general, and especially for main staples or basic foodstuffs, there is a need in Indonesia to influence consumption through food policies because food policies can be designed to reduce the dependency on certain

categories of food. In order to design and to implement food policies that aim to reduce the dependency on certain categories of food, there is a need for information on how consumers acquire their food. Burk (1980) stated that it is quite possible that more than half of the food consumed in some developing countries does not enter commercial channels. Nyberg (1980) stated that imports of food products are typically for urban consumers. Some researchers do believe that a first step toward understanding the interaction of various food in consumers' diets is the estimation of own and cross price elasticity's for each item of food; and then the estimation of its' income elasticity's. However, price elasticity's apply only to food that goes through market channels. The first step needed to understand consumers' food consumption is to get the information on their food acquisition, because not all food those consumers' consume is provided through purchase in the market. Therefore, to understand and to design policies that can influence food consumption, information on consumers' food acquisition (both in urban and rural areas) is needed.

A major share of disposable income in Indonesia is spent on food. Sutomo (1989) found that in Indonesia about 59 percent of household income in 1975 and 53 percent in 1980 was spent on food consumption. Chernichovsky and Meesok (1984) in their study of the Pattern of Food Consumption and Nutrition in Indonesia, found that on average 68 percent of household's total expenditures was spent on food. For the total population, rice accounts for one-third of total food expenditures, other staples for 7 percent; fish, meat and poultry 9 percent, eggs and dairy products 2 percent; vegetables, legumes, and fruits 13 percent; and other items which include oil, butter, sugar, bread and drinks account for remaining 35 percent.

One of the major issues of food consumption in Indonesia for the past decade is the high reliance on rice as the main staple food. Rice represented 72 percent of total staple consumption in 1990, compared with 68 percent during the 1970-75 period. As income and population increases, the reliance or the dependency on rice increases as well.

There are three main objectives of Indonesian government regarding food policy: (1) Food security, (2) Income distribution (rural-urban equity), and (3) Income growth. These three objectives are closely related. They could be in conflict or in harmony with one another. An example of their being in conflict with each other is when a large food security rice stock ties up government funds that could be invested elsewhere and therefore reduces the growth rate of the economy as a whole. An example of the objectives being complimentary to each other is when the government decided to invest in the rural infrastructure, because this type of policy can both generate growth and improve income distribution. Rice policy has had the objective of trying to stimulate production while maintaining moderately priced rice for the consumer. Domestic prices have been maintained below world prices and subsidized imports have been necessary to fulfill the demand at the established prices (Nyberg, A., 1979).

Food policies can be designed to reduce the dependency on certain categories of food. Commonly, governments in many developing countries adopt a food policy that keeps the price of staples low and limits year-to-year price fluctuations. In Indonesia, the maintenance of low prices during past decades has led to a significant shift in the staple food consumption mix in favor of rice and relative decline in the per capita intake of less preferred alternatives, such as corn, cassava, and sweet potatoes (Tyers and Rachman, 1982).

In theoretical model, consumers are assumed to seek to maximize their own utility or satisfaction through a series of choices that are constrained by their limited income. In the model, it is suggested that economic factors such as income and price, should have a major impact on the types and amounts of food products and other goods purchased by consumers. However, food consumption totals are not the same as total food purchased. To understand food consumption, we need to have information on how consumers acquire their food.

There are differences that exist between consumers in urban and rural areas. Even though it is generally well accepted or commonly known that consumers in rural areas are less dependent on their cash incomes for food relative to those who live in urban areas, there are few studies that have attempted systematically to confirm or deny the assumption. Many of the rural consumers are involved in food production (i.e., subsistence farming) whereas urban consumers are heavily depending on their cash for food consumption. Certain food policies (e.g. food price policy) may have different effects on rural and urban consumers. Policies focused or targeted on urban consumers may affect rural consumers adversely. Therefore, in order to form an effective food policy for all consumers, there is a need to know on how much consumers depend on their cash income for food provision.

Purpose of the Study

The main objective of this study is to answer the question: "Do differences exist between rural and urban consumers in Indonesia in how they acquire food?" and to measure how much consumers in rural and urban areas depend on their cash income to acquire food.

METHOD

The classical theory of consumer demand provides the analytical framework for the study. The purpose of this theory is to explain the behavior of consumers and to investigate the determinants of consumer demand or consumption.

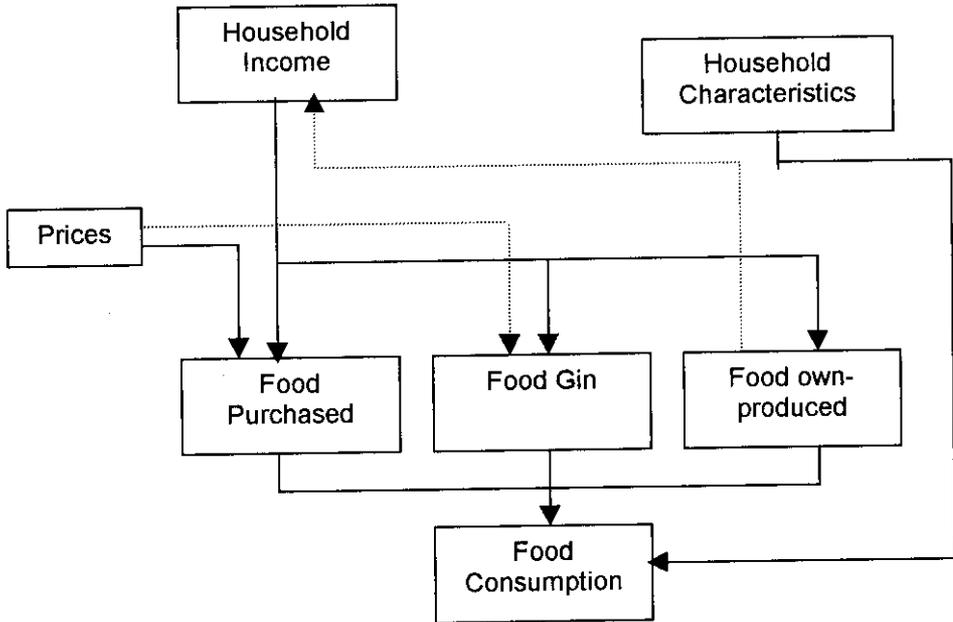


Figure 1. Food Consumption, Income, and Household Characteristics

As indicated in Figure 1, consumption of food is primarily a function of income, prices, and household characteristics. Household characteristics can directly influence household food consumption. It can also influence household food consumption indirectly through income. Food consumption is operationally defined in this study as the quantity consumed of each category of food. Four categories of food will be analyzed, namely: cereals, tuber, vegetables, and fruits.

This study measures the cash dependency of each item of food for rural and urban consumers (i.e., as a proportion of food purchased), and then estimates the influence of the independent variable cash dependency on the quantity of food purchased by rural and urban consumers.

The *Survei Sosial Ekonomi* (SUSENAS) 1993, conducted by the Central Bureau of Statistics in East Java, Indonesia, will be used as a source. Data were collected from January to April. The major objective of the survey was to get detailed information on household food consumption. East Java provides a large share of the national food production and consumption in Indonesia. The

province is also known for its diversification food crop production, and it is the largest producer for secondary (*palawija*) crops.

The empirical model is:

$$\ln C_{E_{cg}} = \alpha_1 + \gamma_{cg^1} \ln I + \gamma_{cg^2} \ln S + \gamma_{cg^3} \ln P_{cg} + \gamma_{cg^4} \ln P_o + \gamma_{cg^5} D + \gamma_{cg^6} L_n + \varepsilon$$

$$\ln C_{E_t} = \alpha_2 + \gamma_{t^1} \ln I + \gamma_{t^2} \ln S + \gamma_{t^3} \ln P_t + \gamma_{t^4} \ln P_o + \gamma_{t^5} D + \gamma_{t^6} L_n + \varepsilon$$

$$\ln C_{E_v} = \alpha_3 + \gamma_{v^1} \ln I + \gamma_{v^2} \ln S + \gamma_{v^3} \ln P_v + \gamma_{v^4} \ln P_o + \gamma_{v^5} D + \gamma_{v^6} L_n + \varepsilon$$

$$\ln C_{E_{fr}} = \alpha_4 + \gamma_{fr^1} \ln I + \gamma_{fr^2} \ln S + \gamma_{fr^3} \ln P_{fr} + \gamma_{fr^4} \ln P_o + \gamma_{fr^5} D + \gamma_{fr^6} L_n + \varepsilon$$

where: C_{E_i} is quantity purchased of the i^{th} food, where $i = cg, t, v, fr$

represent four categories of food, namely: cereals and grains, tubers, vegetables, and fruits, I is income of the household, S is the size of the household, P is the price of the i^{th} commodity (food as categorized above), P_o is the price of substitute commodities, D is the cash dependency (i.e. the quantity of the i^{th} food purchased divided by the total quantity of the i^{th} food consumed), L_n is the location type (where $n=1$ for urban, $=0$ for rural consumers), and γ_{ith} , $i^{th} = cg, \dots, fr$ (for each category of food) are the coefficients that measure the response of the quantities of food purchased to changes in household income, size, prices, cash dependency, and rural and urban location. More elaborated definition and measurement of those variables are listed in Appendix 1.

RESULTS AND DISCUSSION

On average consumers in rural consume more cereals, tubers, vegetables, and fruits than those in urban areas. Household size in rural was almost one-third higher than urban areas (Table 1). Average household income in urban was 24 percent higher than rural areas. Rural households' dependency ratio for cereals and grains, tubers, vegetables, and fruits had more variations compared to urban areas, which indicated that more households in rural were less depend on cash for their food provision.

Table 1. Average Variables Description

	Urban	Rural
Average quantity consumed ^a		
cereals and grains	1.86	2.08
tubers	0.26	0.44
vegetables	1.80	2.80
fruits	2.60	2.80
Household size	4.1	5.4
Income ^b	160 177	128 199
DR ^c		
cereals and grains	.98	.88
tubers	.95	.91
vegetables	.92	.72
fruits	.95	.76

^a average quantity per capita per week (in kg)

^b in Rupiah

^c calculated as the ratio of the quantity of a given category of food purchased to the quantity consumed of that food category.

The cash dependency coefficients were found positive for all categories of food. The explanation is that food is considered as a necessity for both people lives in urban and rural areas. It is a basic need for human, therefore its provision can be through either market or non-market sources.

Although both cash dependency coefficients were significantly associated with the quantity of cereals purchased, the coefficient for urban consumers was lower than for rural consumers (Table 2). The same result is also shown in the coefficient of household income of rural and urban consumers.

The coefficient for household income was positive and significant for both urban and rural consumers. This means that consumers will increase their cereals consumption as their incomes rise. However, rural consumers have a higher income elasticity than urban consumers, which means they are more likely to purchase cereals if their incomes change. Jensen and Manrique (1996) study in Indonesia clearly showed that households in different income groups were affected differently by commodity prices increases. The low income groups were the most affected and the high income groups were the least affected by an increase in the price of rice (main cereals). Relate to their study, if we assume that rural consumers generally have lower income than urban consumers, then the rural consumers were the most affected by an increase in

the price of rice/cereals. This explains why rural consumers have a higher price and income elasticity's compare to urban consumers. Jensen and Manrique (1996) found that rice was price elastic for most sub samples of low income households. It also can be explained due to the fact that urban consumption of cereals are already at the point where the utility they derives from each additional unit of consumption diminishes, whereas for rural consumers are still below that point. However, this is still difficult to digest by looking at the average quantity per capita per week consumption of cereals for rural consumers was 2.08 kilograms and for urban consumers was only 1.86 kilograms.

Table 2. Coefficients in Multiple Regressions: Cereals

Independent variables	Coefficients	
	Rural	Urban
Intercept	3.576	1.773
Dependency ratio	2.457	2.290
Household income	0.103	0.024
Household size	0.822	0.814
Cereal price	-1.024	-0.798
Substitute price	0.048	0.073
R-Squared	0.413	0.600
F	38.117	22.802

Note : significant at p<.01
 significant at p<.05
 significant at p<.10

The coefficient for cash dependency was found to be positive and significantly related to the quantity of tuber purchased. For urban consumers, tubers are less preferred than cereals. Rice occupies a position as a most favored good in the staple food budget of the Indonesian households. In response to rice price changes, consumers alter their consumption of less preferred commodities and non staple commodities to release resources for rice. Increases in rice prices are likely to shift consumption of rural consumers toward tubers. This result is contradict to what Tabor (1988) implied that rice consumption is relatively immune to price fluctuations in other staple foodstuffs (cassava, corn, peanuts, mungbeans, and soybeans).

Table 3. Coefficients in Multiple Regressions: Tubers

Independent variables	Coefficients	
	Rural	Urban
Intercept	6.840	2.732
Dependency ratio	0.192	0.244
Household income	0.144	0.224
Household size	0.542	0.346
Tuber price	-0.991	-0.733
Substitute price	0.408	0.178
R-Squared	0.420	0.379
F	39.163	9.267

Note: significant at $p < .01$
 significant at $p < .05$
 significant at $p < .10$

For vegetables, the cash dependency coefficient was found to be significant and positively related to the quantity purchased. The coefficient was found to be higher for urban compared to rural consumers, which means that for urban consumers, cash dependency has a stronger relationship to the quantity of vegetables purchased. The explanation is that more people in urban areas depend on the market for vegetables (Table 4). However, BPS (1994) revealed that average daily per capita of protein came from vegetables for rural was higher than urban consumers. This is a common fact in Indonesia in that people in rural areas are generally eating more vegetables than people in urban areas.

Table 4. Coefficients in Multiple Regressions: Vegetables

Independent variables	Coefficients	
	Rural	Urban
Intercept	1.696	0.833
Dependency ratio	1.009	1.120
Household income	0.311	0.352
Household size	0.352	0.328
Vegetables price	-0.726	-0.916
Substitute price	0.095	0.295
R-Squared	0.358	0.435
F	117.924	34.497

Note: significant at $p < .01$
 significant at $p < .05$
 significant at $p < .10$

The same pattern of coefficients was found for fruits (Table 5). For fruits, the cash dependency coefficient was found to be significant and positively related to the quantity purchased. It was also found that the coefficient for urban was higher than rural consumers.

Table 5. Coefficients in Multiple Regressions: Fruits

Independent variables	Coefficients	
	Rural	Urban
Intercept	1.124	3.187
Dependency ratio	0.427	1.262
Household income	0.522	0.633
Household size	0.190	0.116
Fruits price	-0.623	-0.493
R-Squared	0.257	0.435
F	34.539	16.884

Note: significant at $p < .01$
 significant at $p < .05$
 significant at $p < .10$

The results of the chi-squared test are provided in Table 6. Hypothesis that there is significant difference between rural and urban consumers in the proportion of food purchased to the quantity consumed was supported. Significant differences were found for cereals, tubers, vegetables, and fruits, were found between rural and urban consumers.

Table 6. Significance Differences of Cash Dependency Ratio of Each Category of Food Between Urban and Rural Consumers

Category of food	Chi-Square value
Cereals	21.008
Tubers	5.006
Vegetables	155.424
Fruits	18.748

POLICY IMPLICATIONS

Price elasticity's for most categories of food were found to be lower if cash dependency was included in the model for rural consumers. In Table 7, the

summary of elasticity's for cereals, vegetables, and fruits with and without cash dependency is presented. Those three categories were chosen because they have the highest variations in cash dependencies, especially in rural areas. For cereals, the price elasticity for rural consumers was -0.673 with cash dependency included. Without cash dependency, however, the price elasticity was -0.690. The elasticity is lower when cash dependency was included because this measure took into account the quantity of cereals that consumers produce at home. The implication is that if the policy makers plan to set pricing policies for cereals, they have to take into account cash dependency. Policy makers can predict the results of their policies more accurately if they take cash dependency into account. This will give more accurate results because rural consumers depend less on their cash for cereal provision.

The price elasticity of vegetables, for rural consumers, was -0.706 with cash dependency. Without cash dependency, the price elasticity was -0.795. The lower price elasticity indicates that consumers in rural areas are less responsive to changes in prices. The lower price elasticity for vegetables seemed reasonable, because many rural consumers are involved in subsistence farming for vegetables provision.

Most demand had income elasticity's less than unity. Income elasticity's for cereals for rural consumers were found to be lower than for urban consumers.

In general, the estimated price and income elasticity's for all consumers looked quite reasonable. The results have important consequences for food policy formulation, especially when income differences lead to markedly different food consumption patterns. Income group specific demand parameters can be used to make more accurate evaluations of the effects of alternative price policies on the well being of the different consumer groups.

The same pattern of price elasticity was found for fruits. Price elasticity of fruits for rural consumers was -1.214 with cash dependency included, and was -1.290 without cash dependency. The lower price elasticity indicates that the responsiveness to changes in price will be more accurate if cash dependency were included. Many of rural consumers depend less on their cash for fruit provision.

Policy makers could take into account cash dependency when they have to regulate the price of certain categories of food. Because urban consumers generally have higher cash dependency compared to rural consumers, they depend more on their cash incomes for food provision. So, if for example, policy makers set the ceiling price of cereals higher, poor urban consumers would be more vulnerable than rural consumers. This, in turn would have a negative impact on the urban poor. Tambunan (1998) supported this finding in his analyses in the ASEAN Economic Bulletin:

Table 7. Price and Income Elasticity's With and Without Cash Dependency (DR)

Category of food	DR ^a	Price ^b elasticity's	Income elasticity's
Cereals			
Rural:	0.88		
With DR		-0.673	0.427
Without DR		-0.690	0.434
Urban:	0.98		
With DR		-0.863	0.261
Without DR		-0.699	0.365
Vegetables			
Rural:	0.72		
With DR		-0.706	0.549
Without DR		-0.795	0.576
Urban:	0.92		
With DR		-0.874	0.445
Without DR		-0.886	0.509
Fruits			
Rural:	0.76		
With DR		-1.214	0.649
Without DR		-1.290	0.860
Urban:	0.95		
With DR		-1.112	0.558
Without DR		-1.123	0.564

^a The average cash dependency

^b Prices of other commodities (substitute price) were not included

Farmers' income has not increased substantially, mostly because the rise self-sufficiency program through the fixed price mechanism of both input and output markets by the Bureau of Logistic (BULOG) has extracted and transferred the potential and realized benefits (gains) from farmers (producers) to consumers. (p.52).

Azis (1998) study also supported the above findings. His study reveals that the relative position of the urban sectors deteriorates more that that in the rural areas. This implies that, if the crisis lingers, in the short-run, Indonesia has to face a massive increase in urban poverty, a fertile ground for internal conflicts and social discontent. (p.8).

Presently, Indonesia and several others South East Asia countries experience serious economic crisis. In Indonesia, the economic crisis transmits its effects in various ways. Aziz (1998) stated that the immediate repercussions directly manifested in peoples' life are: a sharp increase in prices and a considerable drop in their income, due to increased unemployment or real wage cuts. The two fuses into one deteriorate households' or consumers' purchasing power. (p.140).

If real consumption dropped as much as the rate of these prices increases, the impact on consumers both in urban and rural areas would be severe. In conclusion, policy makers and development agencies need to be careful when identifying price elasticity's of certain categories of food. Certain categories of food are produced within the household (household production), and many nonmarket resources are available to rural households.

SUMMARY AND CONCLUSION

The hypothesis that the quantity purchased of each category of food was associated with the ratio of the total quantity of food purchased to the total quantity consumed, was supported by the results of the empirical analyses in this study. The results of the F-test indicate that cash dependency was associated with the quantity purchased for all categories of food, namely cereals, tubers, vegetables, and fruits. This indicates the importance of subsistence farming in rural and certain parts of urban areas. The maintenance of subsistence farming may, indeed, be of strategic importance for the satisfaction of basic needs and the survival of rural households. When production from own sources is inadequate to meet the consumption needs, the households concerned may sell superior food (i.e., superior cereals or superior varieties) they produce, so as to maximize their purchasing power with which they can purchase inferior cereals and meet their other needs – thus maximizing their consumption at least in quantity.

Significant differences in cash dependency were also found between rural and urban consumers. Many of the rural consumers are more independent on cash for food provision, especially for staples, vegetables and fruits. Urban consumers may also suffer from lack of staple food diversity (i.e., they depend on cereals for staples, whereas rural consumers are able to consume a more diversified diet). This implies that if the prices of cereals increase, urban consumers will be more vulnerable. However, looking at the dependency ratio for cereals, it is found surprisingly high even for rural consumers. Rural farmers may sell out of distress and repurchase later. For such farmers, marketable surplus may very well be negative, as they have to make net purchase to meet their consumption needs. This study highlights the differences and importance of

two groups in food price policy, urban and rural consumers. In Indonesia, urban interest groups have been highly influential. Despite rhetoric to the contrary, food-pricing policy often benefits urban consumers and industry rather than farmers and agriculture. Urban consumers benefit not only from direct measures keeping food retail low, but also from industrial policies, which can indirectly alter food price policy.

The results indicate it would be useful for the Indonesian government to use information on cash dependency to form price policy. For example, current government policy to regulate and maintain low prices of staples and vegetables will only benefit urban consumers, because rural consumers produce or grow some of it for their own consumption. However, education policy (i.e., nutrition information) through extension workers may benefit rural consumers more than urban consumers. If home food production is to be a viable alternative, consumers (especially in rural areas) can benefit from increased information about providing their food without purchase, exchange of both knowledge and food with others in the community, and government programs to encourage such activity.

Further study can be done exploring differences in nutrient intake between rural and urban consumers. These results would help government policy makers in forming food policy.

When the significance of household income was examined, it was found that rural consumers had relatively lower coefficients compared to urban for all categories of food, except for cereals. This implies that if the government were to introduce income-generating policies, (i.e., minimum wage level), rural consumers would have a slower response compared to urban consumers. However, the fact that household income coefficient was positive for both rural and urban consumers, implies that the quantity of food purchased will increase for both if income increases.

This study combined with a study of the behavior of marketed and marketable surplus can be of significant help in designing a system of procurement and public distribution. This study also helps in understanding the behavior of purchases of food by farmers. This would enable those in charge of public distribution system to have an idea of the dependence of farmers and consumers in different areas on the marketing system to meet their food consumption needs.

REFERENCES

- Agarwal, M. K., and Ratchford, B. T. (1980). Estimating Demand Functions for Product Characteristics: The Case of Automobiles, *The Journal of Consumer Research: An interdisciplinary Quarterly*, 7, 249-262.

- Alderman, H. C., and Timmer, C. P. (1978). Food Policy and Food Demand in Indonesia, *Bulletin of Indonesian Economic Studies*, 13, 83-93.
- Arifin, M., Suryana, A., Darmawan, D., and Rachman, H. (1989). *Konsumsi dan Karakteristik Rumahtangga Kurang Energi dan Protein di Nusa Tenggara*. CAER Forum Report, Bogor, Indonesia, 1-8.
- Azis, I. J. (1998a). Southeast Asian Crisis: The Bubble Finally Burst, *The Economic Outlook for 1998*, RSQE-University of Michigan, 275-305
- _____ (1998b). Transition from Financial Crisis to Social Crisis, in *Social Implication of the Asian Financial Crisis*, EDAP-UNDP, 139-166.
- _____ (1998c). Causes and Consequences of the Asian Crisis. Paper Presented at the International Development Lecture at the University of Illinois, Urbana-Champaign, November 23, 1998.
- Banta, S. M. (1989). Consumer Expenditures in Different-size Cities. *Monthly Labor Review*, December 1989, 44-47.
- Biro Pusat Statistik (1969-1995). *Statistical Year Book of Indonesia*. Biro Pusat Statistik, Jakarta, Indonesia.
- _____ (1994a). *Konsumsi Kalori dan Protein Penduduk Indonesia dan Provinsi*. Buku 2. (Consumption of Calorie and Protein of Indonesia and Provinces 1993). Biro Pusat Statistik, Jakarta, Indonesia.
- _____ (1994b). *Pengeluaran Untuk Konsumsi Penduduk Indonesia per Provinsi* Buku 3. (Expenditure for consumption of Indonesia by Province 1993). Biro Pusat Statistik, Jakarta, Indonesia.
- _____ (1990-1993). *Survei Sosial Ekonomi Nasional (SUSENAS)*. Biro Pusat Statistik, Jakarta, Indonesia.
- CASER Team. (1990). *Demand For Food Varieties*. The Center for Agro Economic Research, Bogor, Indonesia.
- Capps, Jr., O., and J. M. Love. (1983). Determinants of Household Expenditure on Fresh Vegetables, *Southern Journal of Agricultural Economics*, 127-132. Consumer expenditure in 1989. *BLS News*, Nov.30, 1990.
- Deaton, A. (1990). Price Elasticities from Survey Data. Extension and Indonesian Results. *Journal of Econometrics*, 44, 281-309.
- Dixon, J. A. (1979). Diversity in the Diet and Staple Food Consumption Patterns in Indonesia. *Journal of The Malaysian Economic Association*, XVI, 137-152.
- Evers, S., and McIntosh, A. (1977). Social Indicators of Human Nutrition: Measures of Nutritional Status. *Social Indicators Research*, 4, 185-205.

- FAO. (1978). Energy and Protein Requirements: Report of a Joint FAO/WHO Expert Committee, FAO, Rome, 1978.
- FAO. (1980) Carbohydrates in Human Nutrition: Report of a Joint FAO/WHO Expert Committee, FAO, Rome, 1980.
- Geistfield, L. V. (1977). "Consumer Decision Making: The Technical Efficiency Approach," *The Journal of Consumer Research: An Interdisciplinary Quarterly*, 4, 48-56.
- Gilboy, E. W. (1968). *A Primer on the Economics of Consumption*. New York: Random House.
- IFPRI-CASER Team (1987). *Price and Investment Policies in the Indonesian Food Crops Sector*. IFPRI, Washington, D. C. and Bogor, Indonesia. ADB Report, Phase II.
- Jansen, H. G. P. (1992). Dairy Consumption in Northern Nigeria. Implication for Development Policies. *Food Policy*, June 1992, 214-226.
- Jensen, H. H, and Manrique, J. (1996). Disaggregated Welfare Effects of Agricultural Price Policies in Urban Indonesia. CARD Working Paper 96-WP 173. Center for Agricultural and Rural Development, Iowa State University, Ames, Iowa.
- Jensen, H. H, and Manrique, J. (1996). Demand for Food Commodities by Income Groups in Indonesia. CARD Working Paper 96-WP 166. Center for Agricultural and Rural Development, Iowa State University, Ames, Iowa.
- Johnson, S. R., et al. (1996). Analysis and Formulation of Food Crop Policy in Indonesia. CARD Staff Report 90-SR 48. Center for Agricultural and Rural Development, Iowa State University, Ames, Iowa.
- Korb, P., and Harp, H. (1986). US Consumer Spend World Smallest Share on Food. *National Food Review*, 32, 28-29.
- Korb, P. (1987). Comparing International Food Expenditures. *National Food Review*, 38, 18-31.
- Kurland, J. (1986). Food Spending and Income. *National Food Review*, 32, 30.
- Lipton, M. (1983). Poverty, Malnutrition, and Hunger. World Bank Staff Working Paper. Washington DC.
- Lipton, M. (1975). Urban Bias and Food Policy in Poor Countries. *Food Policy*, November 1975, 41-52.
- Nyberg, A. J. (1979). Food Policy - Import Substitution or Import Dependence. *Journal of The Malaysian Economic Association*, XVI, 175-201.

- Penny, D., and Ginting, M. (1980). Housegardens - the Last Resort? Further Economic Arithmetic from Sriharjo. In R. G. Garnaut and P. T. McCawley (Eds.), *Indonesia: Dualism, Growth and Poverty* (pp. 487-499). Canberra: Research School of Pacific Studies/The Australian National University.
- Poduska, B. (1988). A Comparative Study of Family Budget: An International Perspective. *Journal of Home Economics*, Summer, 16-23.
- Rogers, J. M. (1988). Expenditures of Urban and Rural Consumers, 1972-73 to 1985. *Monthly Labor Review*, March 1988, 41-46.
- Senauer, B., Asp, E., and Kinsey, J. (1991). *Food Trends and The Changing Consumer*. Eagen Press, St. Paul, Minnesota.
- Smallwood, D., and Blaylock, J. (1981). Impact of Household Size and Income on Food Spending Pattern. USDA, Technical Bulletin No. 1650, Washington.
- Sudarmadji, S. (1979). Food Consumption and Production in ASEAN. *Journal of The Malaysian Economic Association*, XVI, 388-397.
- Sutomo, S. (1989). Income, Food Consumption and Estimation of Energy and Protein Intake of Households: A Study Based on the 1975 and 1980 Indonesian Social Accounting Matrices. *Bulletin of Indonesian Economic Studies*, 25, 57-72.
- Stoler, A. (1978). Garden Use and Household Economy in Rural Java. *Bulletin of Indonesian Economic Studies*, 12, 85-101.
- Tabor, R. S., Altemeir, K., Adinugroho, B., Purnomo, S., Wardoyo, P., Bagakali, N., et al. (1988). Supply and Demand for Food crops in Indonesia. Directorate of Food crops Economic and Post harvest Processing, Directorate General of Food crops, Ministry of Agriculture, Jakarta, Indonesia.
- Tabor, R.S., Altemeier, K., and Adinugroho, B. (1989). Food Crops Demand in Indonesia: A system approach. *Bulletin of Indonesian Economic Studies*, 25, 31-51.
- Tongpan, S. (1979). Thai Food Policies. *Journal of The Malaysian Economic Association*, XVI, 31-43.
- Volker, C. B., Winter, M., and Beutler, I. F. (1983). Household Production of Food: Expenditures, Norms, and Satisfaction. *Home Economic Research Journal*, 11, 3, 267-279.
- Volker, C. B., and Winter, M. (1989). Primary Household Production of Food, Food Expenditures, and Reported Adequacy of Food. *Home Economic Research Journal*, 18, 1, 32-44.

- Wagner, J., and Soberon-Ferrer, H. (1990). The Effect of Ethnicity on Selected Household Expenditures. *The Social Science Journal*, 27, 2, 181-198.
- Wells, R. J. G, and Fredericks, L. J. (1979). Food Policies in Malaysia With Particular Reference to Self-Sufficiency and Poverty Reduction Goals. *Journal of The Malaysian Economic Review*, XVI, 44-71.
- Williams, F., and Pritchard, M. (1987). Non-market Provision of Food by Low-income Households. *Journal of Consumer Studies and Home Economics*, 11, 251-265.

Appendix 1. Definition and Coding of Variables

Variables	Definition	Coding
C_{E_i}	the quantity purchased of each category	actual amount (kg/week)
$C_{E_{cg}}$	cereals and grains: local rice, high yield variety rice, import rice, and sticky rice.	
C_{E_t}	tubers: cassava, yam, potato, talas, and sago	
C_{E_v}	vegetables: cabbage, spinach, carrot, chayote, eggplant cucumber, and shallot.	
$C_{E_{fr}}$	fruits: orange, avocado, lanzon, durians, waterapple, mango, pineapple, papaya, rambutan, sapodilla, banana, and others.	
Household Income (I)	amount of household income from all sources in 12 months previous to interview	actual amount (in Rupiah)
Household Size (S)	number of members in household at time of interview	actual number
Cash Dependency (D)	the ratio of total quantity purchased of food to total quantity of food consumed	calculated amount
Prices: own price (P_i)	the value of quantity purchased divided by the quantity purchased of each category of food	calculated amount weighted to quantity (Rp/kg)
other price (P_o)	the price of other (substitute) cereals is to tubers, and vice versa, vegetables is to beans, and vice versa.	