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STATIC AND DYNAMIC POVERTY INDICATORS: AN INDONESIAN EXAMPLE

by

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PREFACE

The Indonesian Ministry of Health and Cornell University have, since 1979, been involved in a research project on nutritional surveillance methods for food-crisis-prone areas. As a result of our collaboration, we have learned several lessons about the etiology of poverty and malnutrition in monsoon Asia. One of the most important lessons is that poverty, a multi-dimensional state of deprivation, is not a continuous, dismal state of affairs but is a condition that can change radically in a short period of time. Conditions can be highly responsive to short-term seasonal and cyclic phenomena - in particular, to environmental changes that occur with great regularity in monsoon Asia.

As applied researchers helping to design warning and intervention systems to alleviate the worst excesses of seasonal impoverishment, we were faced with the task of identifying what it is that qualified as an intolerable state of impoverishment. Quickly this became a question of when rather than what. Many indicators of deprivation are 'static', such as signs of malnutrition, underemployment, forced migration and so on. However, because the depth and extent of impoverishment can change rapidly in a short period of time, timing was of more concern.

In investigating measures of impoverishment suitable for triggering timely intervention, we found that several of the single-period, static indicators of impoverishment would not be useful for this purpose. Instead, a more dynamic set of measurement devices would have to be used.

In this paper, we describe several of the static poverty measurements that are used, by Indonesians, to assess welfare conditions in their country. Using data from a project area, we try to apply these indicators and find, not surprisingly, that they do not perform adequately, even as static indicators. In the second part of the study, we present a preliminary analysis of poverty conditions in Central Lombok, a test-site for nutritional surveillance research efforts, using two dynamic poverty measures that were constructed to aid our understanding of welfare conditions on this famine-prone island. We tentatively conclude incorporating measures of change in welfare levels over time to be a useful process, both for planning relief measures and for obtaining an understanding of the nature of impoverishment as a dynamic process.

INTRODUCTION

In the past decade, the Indonesian economy has witnessed a period of high economic growth and expansion. Certain of these factors have acted to increase average welfare levels and reduce their variability. Others may be increasing their vulnerability to serious variation in welfare levels in the future. Thus, on the one hand extension and improvement of transport and communication networks, the increases in food production and the development of a set of efficient social services has acted to improve welfare levels. On the other hand, the widening distribution of income, the disappearance of certain forms of reciprocity institutions, the tendency towards rice monocropping with a sharply reduced seed pool, the deforestation of large parts of the Outer Islands, the reliance of the nation on the international petroleum economy for a considerable share of its budget, and the increased dependence of the rural population on the Central Government for the provision of production inputs and the marketing of foodstuffs are characteristics of advancing economic complexity and of potential social vulnerability. (1)

The tendency is for commonly used Indonesian poverty measures to neglect the instability component of impoverishment and, by doing so, to misrepresent the poverty situation, the means by which it can be overcome and the dynamic systems of social organization that must adapt to this instability. This tendency risks overlooking possible sharp deteriorations of welfare in the future. We suggest that more attention should be therefore devoted to instability.

Poverty is measured for a variety of reasons. At the national level, planners are concerned with the economic progress of the state. Generally they wish to monitor the proportion of the population falling below some socially derived minimum standards using poverty indicators such as per capita income or per capita calorie intakes. Other officials try to measure poverty in an effort to better focus and target projects and interventions either to specific population subgroups or to specific regions within the nation; poverty indicators are then used in an effort to evaluate the effectiveness of these same projects and policies. Still others, notably applied researchers, attempt to operationalize definitions of poverty in order to clarify and characterize underlying causes of impoverishment at the local, regional, and national levels. Such operational indicators are often based on factors such as ownership of productive assets or

access to vital services.

The aim of this paper is to highlight the importance of including temporal dimensions in the collection of poverty indicators. By temporal dimensions, we mean those aspects of impoverishment that are not captured in single-period estimations. More specifically, the temporal dimension of impoverishment should concentrate on those factors which reduce the ability of the poor to maintain stable welfare levels over time. Thus, the temporal dimension of poverty could be expressed by apparent changes in welfare levels. We refer to these as dynamic poverty indicators.

The prime difference between static and dynamic poverty indicators is not in the type of measure, but in the collection and analysis of the data on which the indicator is based - for example, food consumption at one point in time as opposed to variability over time. For some purposes, single-period estimations are adequate, yet for other purposes the exclusion of the temporal dimension leads to a serious loss in the quality of the information and, more importantly, in the understanding of the particular situation. For example, post harvest food consumption estimators give little or no information on pre-harvest hunger. Data collection is generally conducted far more frequently than tabulation, which itself is conducted more often than analysis. In many cases there is an ample supply of data for reasonably sensitive dynamic measurements.

There are a variety of measures that are used as indicators of deprivation. While national levels and styles of development differ widely, there is a considerable similarity in the kinds of indicators most commonly used. Although many poverty indicators are collected at a low cost and with adequate frequency for most uses - many of them in fact acting as "free riders" on existing bureaucratic reporting regimes - there is a pronounced tendency to utilize these indicators on a more long-term interpretive frame than to employ them in quick-response policy and program formulation. Much of the more detailed, low level of aggregation information is only collected on a sporadic basis from higher cost household surveys.

Much of the theoretical and applied work on poverty measurement to date appears to be rooted in a static conceptualization of poverty, in which only the absolute level of poverty is deemed important.(2) Poverty is virtually always measured at a single point in time. Although we purport to measure and characterize a phenomenom which exerts daily and variable effects on the lives

of the poor, we make do with only a "snap-shot" of destitution. For some uses this "statistical still-life" may be adequate but there are critical drawbacks to poverty measurement based on single-period cross sectional data.

One of the major weaknesses of single-period poverty measurement is the loss of important information. This is especially true when seasonality is ignored. In many parts of Indonesia, poor agriculturally subsistent households will experience increases in both dietary intake and income at harvest time. During this period of bounty many households may actually be above one or more of the normally used poverty cut-offs. Several months later, during the peak of the pre-harvest stress period, these same households often find themselves in an entirely different situation: food stocks are being drawn down, energy demand for agricultural labor is rising, and dietary intakes continue to fall. If measured at this time a far greater number will be considered impoverished. However, given the methods presently used in poverty measurement, planners and researchers are unable to answer the following:

1. Is there a change in prevalence of impoverishment between the harvest and stress periods and if so what is the magnitude of the change?
2. Who and where are the groups experiencing the most severe increases in impoverishment?
3. What are the functional characteristics of the groups experiencing the greatest impoverishment?
4. What benefits will the impoverished groups obtain from stabilization programs?
5. What interventions will be the most effective in (a) short-term prevention of the effects of variability and in (b) preventing this vulnerability itself?

VARABILITY AND INSTABILITY

Agrarian societies normally experience variability in, for example, food intakes, both in quantity and quality depending on the nature of the local agricultural cycle. Moreoever, the effects of this variability differ depending on the season: for instance, households require more food for laborers to meet increased energy demands. Thus, intakes should increase; after harvest when energy demands are low, these same laborers will not need to eat as much. Thus,

food requirements are variable and, if the timing of intakes is in-phase with differential energy needs, then the variability presents less of a problem. However, variability in food consumption in agrarian societies can have serious effects on physical well-being, or possibly productivity, if the timing between energy demand and intake is out of phase; for example, if intakes are falling during the peak of the harvest which is also a period of concentrated, high-expenditure physical activity. This tendency to be out-of-phase relative to a physiologically derived need, can be defined as unacceptable variability, or instability.(3)

The concept of instability as "unacceptable variability" does not however help in deciding how much variability is tolerable or intolerable. Instead of selecting a cutoff value for tolerable variability from an examination of stability/instability conditions alone, the decision is complicated by the need to weigh the costs of instability against the costs attached to various programs and policies that are designed to mitigate against variability. This sort of calculation is easy to discuss in general terms but is far more difficult to estimate in practice. Still, there are several advantages to incorporating a dynamic element into the measurement of poverty and these advantages relate to the uses to which one will put the data. For example, planners would have to decide which developments do, or have the potential to, dampen or exacerbate future variability in welfare levels.

Variability/instability indicators could enhance the design, targetting, and evaluation of programs, projects, and interventions directed at both increasing welfare levels and limiting instability in these levels. For example, crop insurance schemes, improved storage facilities, and off-season employment strategies may appear to have only an incidental and indirect impact on poverty eradication when viewed in a static, average-level-of-poverty framework. However, these sort of activities are primarily directed towards stabilizing the welfare levels of a poor population and can be thought of as facilitating already established household buffering mechanisms. This could serve as an important prerequisite to more rational on-farm planning and allocation of household resources. Similarly, in areas that suffer from recurrent periods of acute hardship, improved information systems and relief planning operations based on variability indicators, could produce a welfare payoff that is not apparent from the evaluation of annual, average poverty measurements.(4)

Research into the causal mechanisms of poverty may also benefit from explicit inclusion of variability/instability indicators. Often, what are perceived as "causes" of poverty at one time period may in fact no longer be valid causes or may no longer be "sole causes". Often structural or secular change has occurred which accounts for this time-specific causality. For example, in agrarian societies before the "green revolution", size of landholding was in most cases the primary cause and indicator of rural inequality. Today, in areas dependent on high-yielding variety inputs, access to these inputs may, in fact account for more variation in impoverishment than size of landholding itself.

Incorporation of the time dimension into poverty measurement also involves the development and use of variability/instability indicators. Perhaps more emphasis should be placed on the word use rather than development. It appears that in many cases enough time periods are available for construction of dynamic poverty indicators; what is important is the choice of time periods for comparison, e.g., pre-harvest stress vs. post-harvest slack, flood months vs. dry season, pre vs. post oil price hike, year after currency devaluation, etc. Also, new and original variability statistics are probably unnecessary. Statistics such as relative first differences, maximum relative decline, and coefficient of variation of the residuals around a trend line are presently available as are others. We suggest that existing data resources can be used to incorporate the temporal dimension into the measurement of poverty.

In the following section, we will examine four of the more commonly used Indonesian poverty measures. These static measures have several advantages and disadvantages relative to the use to which they are put. In areas that suffer from pronounced variability in community welfare levels, the use and interpretation of single-period poverty measurements is difficult and may be misleading. To demonstrate this, we will apply these four measures to government data from Central Lombok which was collected as part of the Indonesian Nutritional Surveillance project.

CENTRAL LOMBOK BACKGROUND

The island of Lombok is divided into three distinct geo-climatic regions which follow the geologic continuum observed in Java and Bali. These regions are characterized by a northern mountain complex of volcanic origin, a central plain running east and west for approximately 56km with a width of about 25km, and a southern range of lower, older hills of non-volcanic origin. Three political districts or kabupatens are overlayed onto the geo-climatic regions of the island. These are the kabupatens of West, Central, and East Lombok. Central Lombok straddles the three geo-climatic regions with the bulk of its population of 576,000 living in the central plain. The population density of Central Lombok is 485 persons/km^2, which is high even by the land-scarce conditions of Indonesia's Inner Islands.

The kabupaten of Central Lombok was chosed as the area of investigation not only because it comes from one of the poorest Indonesian provinces, but because of the pronounced variability in impoverishment across its subdistricts and the extreme cyclicity of poverty within subdistricts over time. Serious food shortages, at times reaching crisis/famine proportions have been recorded in Lombok in 1938, 1946, 1953, 1957, 1966, 1969, 1972, and 1977. However, not all of the subdistricts in Central Lombok are equally vulnerable to food crisis or report signs of food problems.(5)

The three most northern of Central Lombok's subdistricts overlap the mountainous and central plain regions and have access to year-round irrigation. The remaining six southern subdistricts (kecamatans) straddle the central plain and the lower, drier southern hills. Irrigation is much less extensive in these areas such that the large majority of rice land is rain-fed and capable of producing only one crop of rice per year as compared to the 2-3 crops produced annually in the three northern kecamatans. The three northern kecamatans have no history of food crises.(6)(see Map 2)

POVERTY MINIMUMS AND THEIR APPLICATION TO CENTRAL LOMBOK

Since the bulk of the Indonesian population still depends on agriculture for their livelihood, it is not surprising that many of the poverty measures pertain to dietary minimums or agro-economic characteristics. Four of the more common poverty indicators are 1) evidence of widespread cassava consumption, 2) sub-

minimum landholding, 3) rice consumption below a certain level (Sajogjo rice equivalents expenditure mark) and 4) the recording of dietary/ clinical signs of under-nutrition. Each of these is examined below.

Poverty Measure #1: High Cassava Consumption

One of the earliest post-war references linking a high level of cassava consumption to severe deprivation is the series entitled, Nutrition Studies in Indonesia by K.V. Bailey published in eleven installments in 1961 and 1962. According to Bailey, undernutrition and malnutrition were endemic to the cassava producing areas of Java and Madura. In these areas, hunger oedema was frequently observed and, on average, calorie and protein intake values were estimated at near starvation levels.(7) The use of cassava consumption as a proxy for impoverishment was later extended by Napitupulu (1966) who declared that, "areas which use cassava as the staple food are likely to suffer from malnutrition... When a district produced more than 50 kg. of cassava per head per year, it is very likely that many of the inhabitants will suffer from malnutrition".(8) Further evidence of the links between cassava consumption and poverty came from a large scale food habits survey in which cassava was concluded to be the least preferred of the Indonesian starchy staples.9 Although there may be a strong correlation between the consumption of cassava and the nutritional status of household members, there are several limitations to the use of cassava as a poverty benchmark.

For example, research carried out on the National Socio-Economic Surveys indicates that cassava is freely substituted for rice in times of high rice prices.(10) In this case, the consumption of cassava is not a sign of poverty but a means by which to avoid further impoverishment (or at least hunger). Similarly, by pairing up the national consumption and production surveys, it appears that a sizable amount of cassava, particularly in fresh form, is eaten far away from the production site in urban areas. In certain provinces, the majority of the cassava is produced for export rather than subsistence needs. To conclude that high cassava production levels are indicators of impoverishment would be, in several regions, tantamount to equating production success and export prosperity with hardship. Finally, there is evidence that suggests that, as expected, there are many non-cassava staple areas that suffer from high rates of malnutrition.

We have applied Napitupulu's 50 kg. cassava consumption/poverty indicator to government data from Central Lombok in order to rank subdistricts from least

to most impoverished. In Table 1 are presented the annual, average per capita cassava production results for each of the kecamatans of Central Lombok during the period of 1976 to 1980. From this table, it appears that only twice did average production levels reach the fifty kilogram mark. This occurred in 1979 and in 1980 in Praya Barat. From even cursory observation, it is apparent that the production of cassava varies considerably from year to year. This variability is also present during the course of a year. (We realize the drawback of using average data at area - kecamatan - level. For the present purposes these were the only data available).

In Figure 1, per capita cassava consumption, on an annually adjusted basis, is plotted against time for the average of a group of landless and land-poor households in Praya Timur and Pringgarata. From this plot, it appears that household consumption of cassava peaked at an annual equivalent value of 28 kilograms per capita in July of 1981 and dropped off sharply the following month. In the thick of the pre-harvest stress period, cassava consumption, on an annual equivalent basis, was under ten kilograms per capita. According to the fifty kilograms of cassava standard, none of these households would be considered poor although they are, in productive asset terms, amongst the most disadvantaged of the region. Furthermore, using the annual cassava production figures, only one out of the nine kecamatans can be considered, in cassava-poverty terms, as impoverished and then, only in two out of the last five years.

From these results (see Table 1), we can conclude that cassava production shows both marked annual and month-to-month variation in production and consumption. Hence, there are serious interpretive problems with the use of an average production poverty indicator that fails to take this variability into account. Although several earlier studies equated cassava consumption and deprivation, it is altogether clear that the consumption of cassava does not mean low calorie intake but may mean protection from just that.

Poverty Measure #2: Subminimal Landholding

Another standard that is frequently used to differentiate rural households into the poor and not-poor is a measure of landholding and/or land controlled. The logic behind this indicator is that households in rural areas that do not have access to a minimal amount of productive resources will be most likely to suffer from insufficient food consumption and thus be considered impoverished. The

TABLE 1

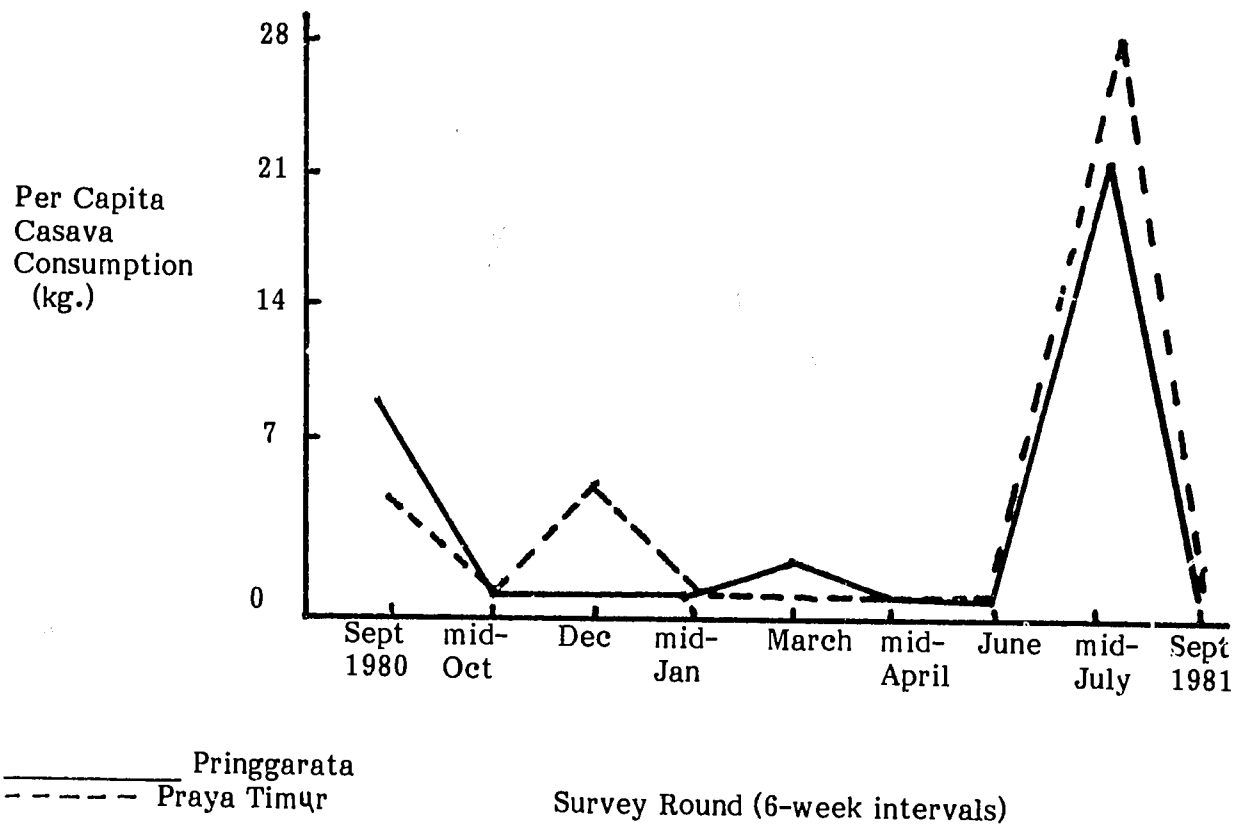
ANNUAL PER CAPITA CASSAVA PRODUCTION (KG.) DURING THE 5-YEAR PERIOD 1976-1980 IN THE NINE KECAMATANS OF CENTRAL LOMBOK*

KECAMATAN	1976	1977	1978	1979	1980
Praya	1.4	1.9	6.7	0.9	10.3
Praya Barat	9.9	13.9	37.4	61.5	126.6
Jonggat	0.7	0.0	0.0	0.0	1.8
Pringgarata	40.0	33.0	32.5	10.4	15.9
Batukliang	32.9	26.0	26.5	15.6	31.6
Kopang	25.9	24.3	20.7	23.8	22.0
Janapria	41.8	1.4	1.2	14.4	8.6
Praya Timur	1.8	20.2	11.4	20.5	31.2
Pujut	24.3	11.4	18.1	22.1	46.2

* Source: Central Lombok Agriculture Department, 1981

Annual cassava production figures were divided by mid-year population estimates for each kecamatan.

Figure 1: Consumption of Cassava on a per capita annual-equivalent basis observed in two kecamatans of Central Lombok*



*Time axis represents the first 9 rounds of a longitudinal household survey. Daily per capita cassava intakes were computed from a three-day staple food recall administered to sample households at each survey round. Gram amounts of cassava were converted to annual kg. equivalents by multiplying by 360 and dividing by 1000. The values graphed thus represent the amount of cassava that would have been consumed in one year by a household member if that round's rate of daily consumption was maintained throughout the year.

The peak in consumption observed in mid-July occurred during the generally more prosperous period following the April-May rice harvest. In 1981 the month of July coincided with the Moslem holy month of Ramadan, a period when fasting occurs during the day, but compensatory consumption including that of cassava-based pastries, takes place at night.

minimum landholding that can provide for the needs of a family of five, on Java, is estimated to be 0.2 hectares of land.(11) This implies that those who are landless or who control less than this amount of land can be considered poor. While this measure has been used quite often, there are several problems that arise from its use as a general poverty yardstick. For example, a family may live poorly off of 1.0 hectare of upland tegal (dryland) but may live adequately well off 0.2 hectare of three-rice-crop-a-year, irrigated sawah (wetland/lowland).

A poverty indicator based on assets owned/controlled may be appropriate for certain static agrarian environments. Where yields have increased rapidly, a static productive asset indicator loses its ability to link assets and product. Similarly, in an environment in which patterns of land usage depend on a variety of tenancy, ownership, kinship and exchange relations, it is difficult to differentiate between returns to factors owned as opposed to returns to factors controlled and, for that matter, between factor returns and a household's social security position within a particular community.(12) Although this is most obvious, the use of a single productive assets indicator as a poverty measure overlooks the range and importance of secondary assets and occupations. Recent studies in various parts of the Indonesian archipelago suggest that there are several non-agricultural activities, such as trade, craft production, factory work, circular migration and peri-urban settlement which allow asset-poor households to supplement their meager incomes.(13) This does not mean that the rural landless are not, on average, poor, but it does indicate that the range of income supplementation possibilities are becoming too diverse to declare this group as uniformly poor. Finally, the use of a quantitative rural asset indicator presumes a fairly homogeneous return to all types of agricultural land. In areas where landholdings are generally small, qualitative differences in the soil profile and differential access to complementary inputs and services may be the most important determinants of final output.

While there are many limitations to the use of the landholding poverty indicator, what it does do is act as a reminder to Indonesian officials that control of productive assets and impoverishment are causally connected. By encouraging a deeper reflection on the structural roots of deprivation, use of the landholding indicator serves a useful purpose. In the Indonesian case, the collection of accurate landholding data is complicated by the lack of cadastral surveys, the

complex patterns of land tenure and the tendency to own non-contiguous plots. Although this indicator is collected rather infrequently, as a component of micro-level studies or as the result of periodic census, it serves the "causal connection" purpose relatively well. Using the results of the 1980 Census, we can determine the number of households in each Kecamatan of Central Lombok that control less than .2 Ha. of land. As a percent of total households in each Kecamatan, this is as follows:

Kecamatan	Proportion Poor in Land Terms	Rank (9-"poorest")
Praya	.57	3
Praya Barat	.67	7
Praya Timur	.61	5
Kopang	.58	4
Janapria	.69	8
Batukliang	.55	2
Pringgarata	.77	9
Jonggat	.67	6
Pujut	.49	1

Two conclusions are obvious from these findings. First, that fifty to seventy percent of the households in Central Lombok do not have access to a minimal amount of land. Second, according to this land criteria, there are a higher percentage of land-poor households in the fertile northern Kecamatans of Jonggat and Pringgarata than in Pujut or Batukliang. These results must be qualified somewhat.

The use of land, or any fixed asset welfare standard depends on the ability to equate assets and returns. If we were to rank these same kecamatans on the basis of average per capita returns from agricultural production in 1980/81, we would obtain the following figures:

Kecamatan	Ranks of Average Per capita Agricultural Returns (9 = lowest)
Praya	6
Praya Barat	5
Praya Timur	9
Kopang	3
Janapria	8
Batukliang	7
Pringgarata	2
Jonggat	1
Pujut	4

(Source: Department of Agriculture, Central Lombok, 1981; see Appendix 1)

From these figures, it appears that Jonggat has the highest average agricultural returns while Praya Timur has the lowest. If we correlate the average production return ranks with the landholding ranks, the estimated Spearman rank correlation coefficient is -0.85. This implies that there is actually a strong negative relationship between landlessness in a region and average agricultural returns. (While based on aggregate data sources this does call to question the assumption that landlessness and impoverishment are synonymous.)

On the basis of these inter-kecamatan ranks, it appears that areas with higher rates of landlessness have, on average, higher returns from agricultural production. Whether this higher average return reaches the land-poor in a high landlessness region is difficult to determine. Nonetheless, this does suggest that the complexity of production and distribution relations in a region must be incorporated into any measure of poverty that relies on a fixed asset standard.

The use of landholding as a poverty standard is confounded by the differences in yields and values of crops on different quality holdings, the differential contribution of off-farm income to household returns and the distribution of access to complementary agricultural services. Our comparison of agricultural returns with the prevalence of landlessness indicates that many of

these points are more important than the average size of the landholding. Nonetheless, for peasant agriculture in the most densely populated regions of Indonesia, access to land, in and unto itself, provides a measure of asset-security that may not be fully measured by size-of-holding alone.

Poverty Measure # 3: The Sajogjo Rice-Income Poverty Line

An improvement on landholding measurement for poverty could be to estimate real income - for example, in rice equivalents as used by Sajogjo.(14) The link between an assets indicator and the welfare status of the household stems from the connection between a given landholding size and the ability to provide for an adequate (cukupan) diet. One such measure of dietary adequacy is the Sajogjo rice-equivalents poverty line. The Sajogjo rice-equivalent income minimum is 1200 kilograms of milled rice equivalents per year for a family of five. To estimate the rice equivalent value, the household income (or in most cases an estimate of total expenditures) is divided by the local market price of rice and the number of household members. In Sajogjo's research, a per capita standard of 360 kilograms of milled rice equivalent income was employed as the poverty cutoff value in urban areas to correct for the higher costs of an urban lifestyle. According to Sajogjo this welfare standard allows income comparison across historical periods and avoids the problems of inflation bias and the use of distorted foreign exchange conversion rates.(15)

This poverty-line has also drawn its share of criticism. Sajogjo's index assumes that the most rational denominator of consumption adequacy is the rice price. Recent studies, including those by Sajogjo himself, have shown that, in several areas, corn and cassava provide an important share of the food consumed by poor households.(16) Since the cost of corn and cassava, on a per calorie basis, tend to be a half to a third the cost of rice, a switch to a more weighted average price denominator would considerably reduce the estimated number of impoverished if the rice-equivalent cutoff point is kept the same. Thus, since the cost/kcal is less for corn and cassava, this method overestimates the degree of impoverishment in areas depending on corn and cassava, viz-a-viz the rice areas. In application, the Sajogjo standard depends on a reasonably accurate measure of total household expenditures, the prevailing rice price and the

number of family members. None of these values are easy to estimate with any great precision. Finally, due to problems of applying regional average household size estimates to the entire regional population, one recent application of this poverty-measuring technique has drawn considerable criticism.

For all its shortcomings, the Sajogjo measure does provide one means of converting a fairly abstract construct, income, into a more approachable measure of resource flows. For the upper income classes, this measure serves to bring out the potential impact of redistributive policies on food consumption levels and is then an indirect form of guide to policy affairs. The Sajogjo measure also provides a convenient means by which to compare the purchasing power of various occupations groups, villages, market participants versus non-market participants and so on. Since income is already a fairly nebulous construct, the Sajogjo index does provide what is, for many poor households, a rational measure of household welfare.

For Central Lombok, income figures are not available, yet, by applying a estimated household budget share to average staple food production figures, an approximate household rice-income can be calculated. We have taken the average data from 1976-1980 for production of staple foods by kecamatan (equivalent to the basic kilogram data for cassava, corn, rice, sweet potatoes in Appendix 2). This has been transformed to total staple kcals/capita/year produced, allowing for extraction rates, and kcal content of edible portion. This figure was then converted back to rice equivalents, in kg/head/year produced. In this area inter-regional trade is minimal and its effect is ignored. The mean expenduture share for staple food is 0.6 derived from estimates from the SUSENAS survey. Therefore we assume that kg/caput/year rice equivalents approximates to 0.6 of income. The total income in rice equivalents is therefore estimated as the staple rice equivalents divided by 0.6. The average staple food

production is shown in column one of the table below, and the rice equivalent income in column two.

Kecamatan	Average Staple Consumption* (in annual per capita rice equivalents, aver. '76-80)	Average Income Level (in rice equivalents)
Praya	138	230
Praya Barat	183	305
Kopang	178	296
Janapria	150	250
Praya Timur	145	241
Pujut	100	167
Batukliang	135	258
Jonggat	255	425
Pringgarata	234	390

*Total staples include rice, cassava, corn and sweet potatoes expressed in terms of per capita rice equivalents. A rice equivalent total expenditure figure was derived by dividing each of the consumption per capita figures by .6 — in other words, by assuming that each family spends 60% of their total disposable income on staple food items.

From columns one and two, a ranking by income can be obtained, similar to that from agricultural returns: the differences, e.g. Pujut, are probably due to differences in the time-periods compared, and not due to differences in cropping patterns between kecamatans. From these rather rough and artificial figures, it appears that only Pujut and Praya have average rice-equivalent incomes under the benchmark minimum. Moreover, comparing the figures in column two with other knowledge of relative poverty, a benchmark of roughly 240-300 kg. rice seems reasonable. Praya Barat, the kecamatan with the highest cassava consumption levels, has the third highest imputed income levels. This again underscores the divergence among our various poverty indicators.

Poverty Measure #4: Health Department Indicators

A technique that is commonly used for sorting out the poor, the very poor, and the terribly impoverished, that is commonly used in situations of severe food stress, is the reporting of physical signs of undernutrition. The measures that are used in the emergency food stress cases are the KKM, KM, KHO and HO statistics reported by the local health service in famine-prone areas. While these categories are generally not used for large scale population differentiation, they are headline grabbers—that is, they are regarded as signs of poverty serious enough to grant relief efforts.(17)

The acronyms listed above stand for possible insufficient food intake (KKM or Kemungkinan Kurung Makan), insufficient intake (KM or Kurung Makan), almost hunger oedema (KHO or Kemungkinan Hunger Oedema) and HO for hunger oedema. The first two categories generally refer to the consumption of a non-preferred, survival-type foodstuff (e.g. leaves) while the last two categories refer to clinical signs of physiologic malnourishment.

In estimating these values, simple instructions are delivered from the People's Health Center (PUSKESMAS) to the village headman who then classifies the villagers according to the various types of undernourishment observed. The village headman then reports back to the PUSKESMAS and, at a later date, a clinic representative makes a follow-up review of the village. In general, a report that hunger oedema is cited in an adult population is regarded as a red flag for a famine. This type of flag is normally only waved with the utmost of political reluctance. Furthermore, the negotiation over the numbers declared to be in the KKM, KM and KHO categories, within the village, between the village and the PUSKESMAS and then between the PUSKESMAS and the various bureaucratic echelons results in a highly arbitrated definition of relief-deserving poverty.(18)

In Central Lombok, only the KM, KHO and HO values are reported with any regularity and, because of the high political costs attached to the reporting of hunger oedema, only the KM values are reported on a large scale. As previously mentioned, KM refers to insufficient food intake as measured by the village head based on instructions from the local Peoples Health Center. For February of each year from 1978 to 1980, the percent of the population in each kecamatan reported to be suffering from insufficient intake (KM) is as follows:

Kecamatan	1978	1979	1980	Average
	(percent of total population reported to have KM)			
Praya	.74	.04	.55	.28
Praya Barat	7.91	.18	2.02	3.37
Jonggat	0	0	0	0
Pringgarata	0	0	0	0
Batukliang	0	0	0	0
Kopang	.21	.40	0	.20
Janapria	3.95	.41	.22	1.52
Praya Timur	11.94	.03	3.74	5.24
Pujut	15.51	1.35	12.07	9.94

At most, in the aftermath of the 1977/78 food crisis, only fifteen percent of the population of one Kecamatan, Pujut, were considered poor enough to warrant inclusion in the group that was to receive supplementary food aid. For three of the Kecamatans - Jonggat, Pringgarata and Batukliang - these figures have never been reported. Whether this is a sign that there are no KM-type poor people in these areas is difficult to determine. What is clear is that this has never been measured.

ARE THE INDICATORS CONCORDANT?

As previously mentioned, it is clear that indicators do not have identical functions. This is indeed appropriate as poverty, in concept and experience, is not a homogeneous entity. People are identified as "poor" in all countries of the world. No doubt, those classified as poor in one nation would be considered truly wealthy in another. In large, culturally diverse countries, such as Indonesia, with geographically skewed distributions of resources, this same differential perception of poverty may well occur intra-nationally. At such diffuse levels of inference it is clearly unfair to ask that different indicators reach the same conclusion.

Our sample, however, is quite narrowly focused, both culturally and geographically, and although some may make the case that it is never fair to demand agreement among different indicators, we submit that more should be expected when indicators are applied to a single district of a half-million in population.

A simple and fairly undemanding test is the comparison of "least-poor" to "most-poor" rankings, produced for each indicator separately. Taken individually, the poverty measures used to rank the subdistricts do not reflect the North-South axis of resource wealth known to exist in Central Lombok. The application of "popular" poverty indicators to data normally produced in the course of the bureaucratic year yields results which are neither easy to interpret nor consistent across measures.

In instances where poverty indicators conflict, and analytical resources cannot be mobilized to sort out the inconsistency, it is evident that one should be chosen on pragmatic as well as theoretical grounds. In our example, the rice-income measure provided a reasonable ranking of kecamatans and does serve as a useful measure of real income in an economy where purchasing power and the ability to obtain an adequate diet are so tightly linked.

However, if all the indicators are taken together and summated rankings are produced, a moderate degree of concordance is achieved. This is shown in Table 2 where subdistricts are ranked along each of the poverty indicators. If the rank-scores are summed across the five indicators, an aggregate score is produced for each subdistrict which in turn can be ranked. Based on these scores subdistricts are ranked from least-poor to most poor as follows:

Kecamatan	**Rank** (from aggregate score of Table 2)
Jonggat	1
Kopang	2
Pringgarata	3
Batukliang	4
Praya	5
Janapria	6
Praya Barat	7.5
Pujut	7.5
Praya Timur	9

TABLE 2

INDIVIDUAL AND SUMMATED KECAMATAN RANKINGS OBTAINED FROM FIVE POVERTY INDICATORS (9 = 'poorest')

Kecamatan	Proportion Land-Poor	Per Capita Ag. Returns	Cassava Prod.	Sajogjo Std.	% KM	Aggregate Score
Praya	3	6	3	8	6	26
Praya Barat	7	5	9	3	7	31
Praya Timur	5	9	6	7	8	35
Kopang	4	3	5	4	2.5	18.5
Janapria	8	8	2	6	5	29
Batukliang	2	7	7	5	2.5	23.5
Pringgarata	9	2	4	2	2.5	19.5
Jonggat	6	1	1	1	2.5	11.5
Pujut	1	4	8	9	9	31

The hypothesis that there is no agreement among the different indicator rankings can be tested using Kendall's Coefficient of Concordance - W.* This non-parametric test was carried out on the above table. The value for W obtained was 0.3024 which is significant at between the 0.07 and 0.107 level. Thus, we must reject the null hypothesis that there is no agreement among the indicators.

*from: Daniel, Wayne W., **Applied Nonparametric Statistics,** Houghton Mifflin Co., Boston, 1978, p. 326.

This ranking, which conforms roughly to what is understood to be the agro-economic potential of the different subdistricts should be compared with the geographic ordering depicted in Map 2. The northern kecamatans of Pringgarata, Batukliang, and Jonggat can support three rice crops a year due to abundant water supplies while the southern dry kecamatans, Pujut, Praya Timur, Janapria, Praya, and Praya Barat are generally able to obtain no more than one rice and one secondary crop each year. It is in the south that food crises strike most severely and with alarming regularity.

While the above concordance underscores the advantages to the use of poverty indicators in combination, it also points to the limitations on the explanatory information that can be gleaned from the use of these static poverty indicators. To aid in the explanation of the impoverishment process in Central Lombok and impart to the subdistrict rankings a more functional character, we have examined a sub-sample of data collected from a longitudinal survey of poor agrarian households in Central Lombok. This survey was carried out between September 1980 and September 1981 in nine 6-week spaced rounds. Data was collected from the same twenty household clusters in all 85 villages of the nine subdistricts in Central Lombok, at each round. For purposes of illustration we will use results from a northern fully irrigated subdistrict (Pringgarata; ranked third wealthiest) and a southern, rain fed subdistrict (Praya Timur; ranked poorest).

POVERTY AS SEASONAL INSTABILITY

In figures 2 and 3 we present the graphs of average per capita staple kcal consumption for the two subdistricts. The food consumption, survey did not attempt to estimate total kcals, therefore staple kcals are used here. In Table 3 we have presented a cross tabulation of average kcal consumption, average variation in kcal consumption and, peak single period drops in consumption for these same households. As can be seen in this table, landless inhabitants of Pringgarata, are, in staple calorie consumption terms, better off on average, and in comparable variability terms, than the landless and small holders of Praya Timur. It is interesting to note that the variation in staple calorie consumption, on average is not very great. However, averages — especially when used as a parameter to describe variability — can be misleading. From an examination of

FIGURE 2: PRINGGARATA STAPLE KCAL LEVELS

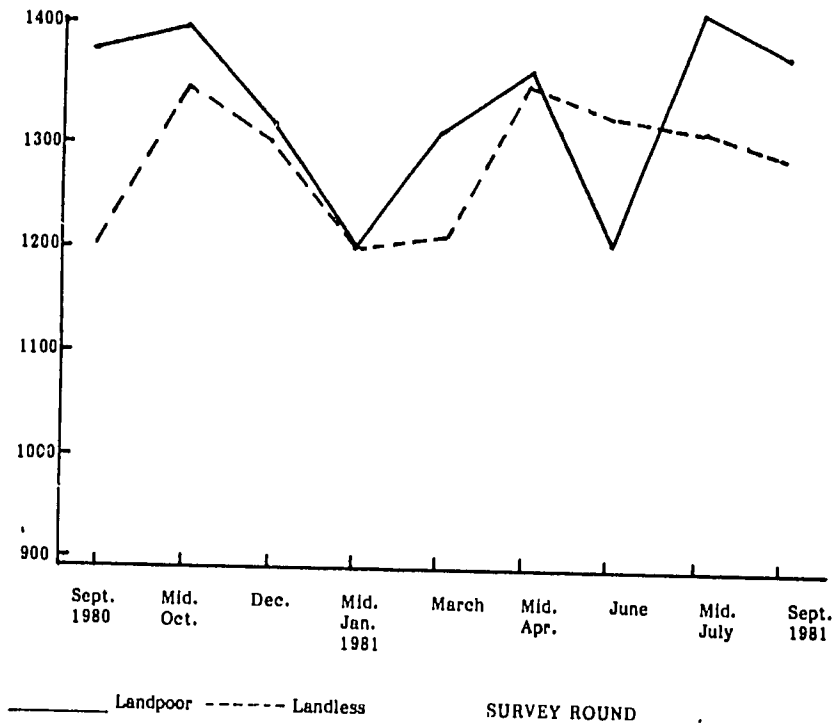


FIGURE 3: PRAYA TIMUR STAPLE KCAL LEVELS

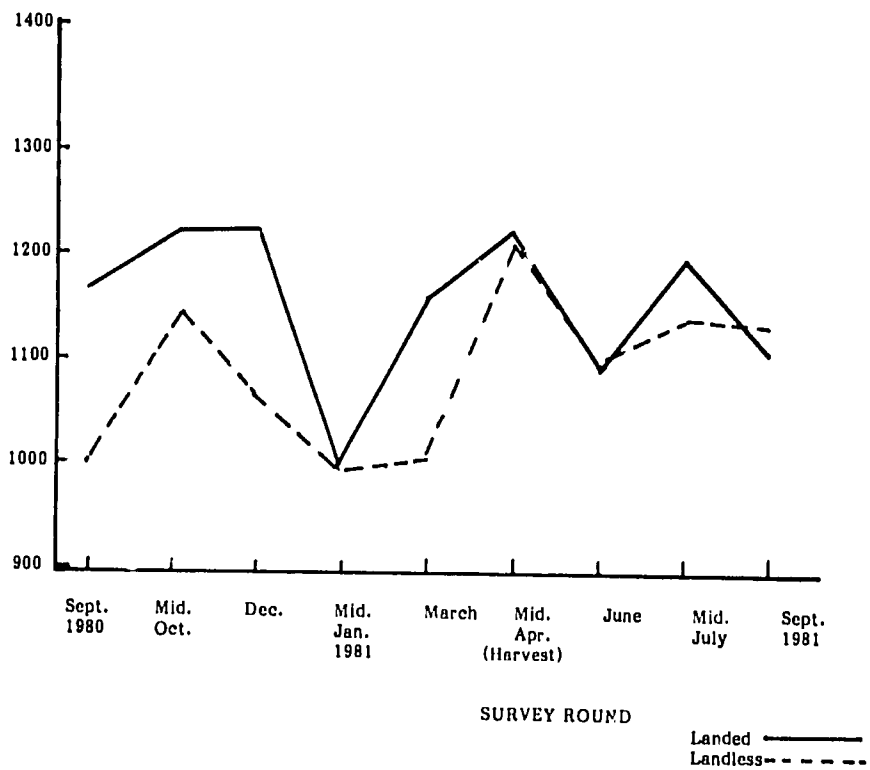


TABLE 3

Summary of trend, variability, and instability statistics for per capita kcal consumption of staples (rice, corn, sweet potato, cassava) between September 1980 and September 1981 in two kecamatans of Central Lombok*

GROUP	MEAN	TREND	RESIDUAL CV	MAX. % DECLINE	N
Pringgarata/Landpoor	1296 kcal/day	-6.7 (t= -0.68) (R2= 0.06)	5.2%	-10.4% (mid-April - June)	40-54
Pringgarata/Landless	1250 kcal/day	-0.8 (t= -0.11) (R2= 0.0002)	4.2%	- 6.6% (Dec. - mid-Jan.)	52-61
Praya Timur/Landpoor	1143 kcal/day	-6.7 (t= -0.55) (R2= 0.04)	7.2%	-20.3% (Dec. - mid-Jan.)	51.52
Praya Timur/Landless	1078 kcal/day	+14.2 (t= 1.44) (R2= 0.22)	6.2%	-10.8% (mid-April - June)	45-46

* The period between September 1980 and September 1981 included 9 rounds of the longitudinal household survey. In Pringgarata the household sample size was 120 and in Praya Timur 100. Among those that owned land (landpoor) in Pringgarata the average landholding was 0.2 hectares of rice land and in Praya Timur 0.4 hectares.
Per capita kcal consumption was computed from a three-day dietary recall limited to the four major staple foods. Trend was estimated by regressing per capita kcal on time. As a measure of variability the coefficient of variation (CV) of the residuals about the trend line was computed. The maximum percent decline between any two time periods was computed as a measure of instability.

another variability parameter, the percentage change in staple calorie consumption between two consecutive months, it appears that consumption variation can be quite important.

For instance, amongst a group of small landholders in Praya Timur, there was a twenty percent fall, on average, of consumption of staple calories from early December of 1980 to mid-January of 1981. For this group this represents a decline of nearly 250 staple kcal during the peak of transplanting and weeding the rice crop. For the landless in Praya Timur, the maximum percent decline in staple calorie consumption was nearly eleven percent from mid-April to June of 1981. This occurred in the period immediately after the rice harvest and is indicative of the inability of the landless to save very much rice during the dry season.

The same variability/instability measures applied to staple calorie consumption can be applied to household rice stocks. Values for rice stock levels were collected using a 5-point ordinal scale recall. Respondents were asked to indicate whether they had, at the time of interview, no stock (0), enough stock for one day only (1), enough stock for 2-6 days (2), enough stock for 1-6 weeks (3), or enough stock for more than 6 weeks (4). In Figures 4 and 5 we present the graph of average rice stock levels for Pringgarata and Praya Timur respectively. In Table 5 we have calculated mean stock levels, detrended C.V.'s, and maximum percent declines for landless and land-poor households in Pringgarata and Praya Timur.

We observe that in relative variability terms, stock levels show a tendency towards dramatic oscillation in the course of a year. The residual C.V. was twice the magnitude in Praya Timur, but was nearly the same across landholding groups in both subdistricts. This implies that in contrast to calorie consumption levels, household stocks are more sensitive to cyclic stress factors than consumption levels but, as a welfare indicator, are less able to distinguish between particular asset groups.

The largest single-period decline in stock levels was 64 percent, between mid-October and December, for the land-poor in Praya Timur. This occurred in the midst of the planting season, indicative of the inability of the small farmer in a rain fed, one-crop-per-year subdistrict, to maintain stable household supplies until the next harvest.

The landless in Praya Timur more than halved their stock levels a full

FIGURE 4: PRINGGARATA RICE-STOCK LEVELS

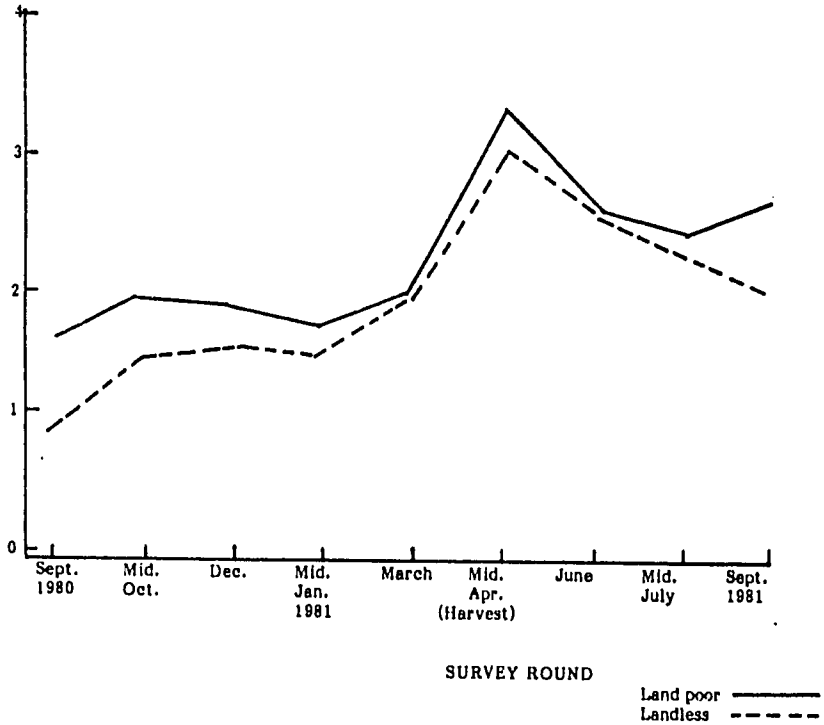


FIGURE 5: PRAYA TIMUR RICE-STOCK LEVELS

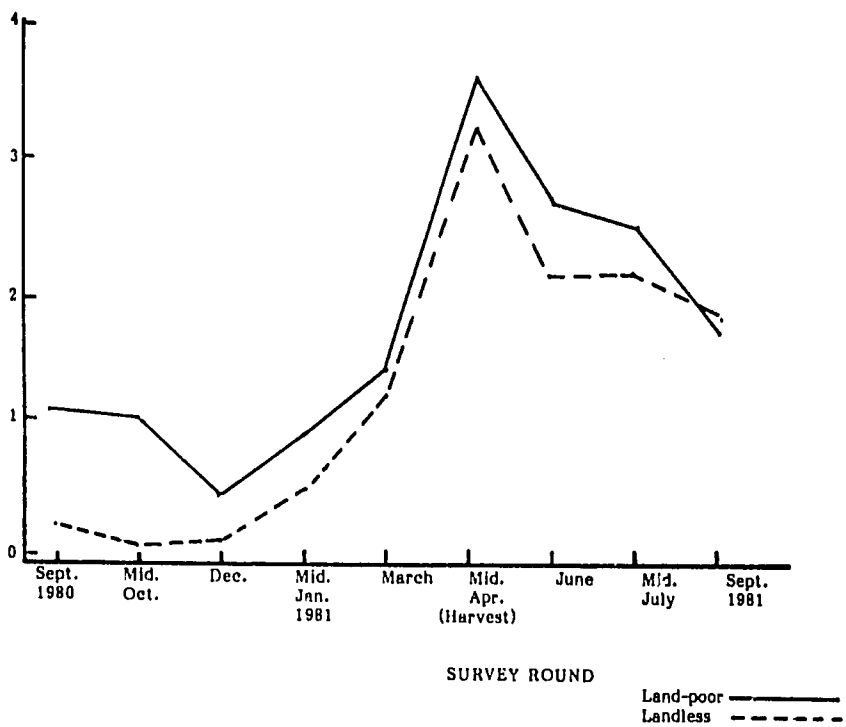


TABLE 4

Summary of trend, variability, and instability statistics for household rice stocks* between September 1980 and September 1981 in two kecamatans of Central Lombok

GROUP	MEAN	TREND		RESIDUAL CV	MAX. % DECLINE	N
Pringgarata/Landpoor	2.1	0.14	(t= 2.29) (R2= 0.43)	22.8%	-17.7% (mid-April - June)	40-54
Pringgarata/Landless	1.7	0.18	(t= 2.62) (R2= 0.50)	26.4%	-22.9% (mid-April - June)	52-61
Praya Timur/Landpoor	1.5	0.20	(t= 1.70) (R2= 0.29)	51.5%	-64.0% (mid-Oct. - Dec.)	51-52
Praya Timur/Landless	1.2	0.26	(t= 2.76) (R2= 0.52)	56.6%	-56.0% (Sept. - mid-Oct.)	45-46

* Stock Scores:

0 = no stock
1 = enough for one day only
2 = enough for 2-6 days only
3 = enough for 1-6 weeks only
4 = enough for more than 6 weeks

month before the land-poor households. This may reflect the heightened buffering potential conferred on the small holders in terms of household savings ability.

From the above examples, drawn from one of the best production years in the history of Central Lombok, the use of variability/instability indicators has added a dynamic component to the static cross sectional rankings produced by pooling the "popular" poverty indicators. The wealthier kecamatan has, not only higher levels of kcal consumption and rice stocks, but lower variability about these levels and greater year-round consumption and stock stability than the subdistrict ranked as poorest. Within each subdistrict we see that both variability and especially instability are greatest in the small landholder class for both kcal consumption and rice stock, albeit the small-holders are operating at higher average levels than the landless in their respective subdistricts. Perhaps the most striking finding is the lack of relationship between landowned and poverty when contrasting the landless of Pringgarata and the small landholders of Praya Timur. The landless of the wealthier subdistrict have higher, less variable, and more stable levels of kcal consumption and rice stocks, than those owning land only 25 km. apart. This is most dramatically shown when contrasting the maximum percent declines in staple kcal consumption for Pringgarata landless and Praya Timur land-poor. Although for both groups the maximum declines took place during the energy demanding December - January land preparation/planting season, the percent decline in energy consumption for small landholders was three times greater than that experienced by the "wealthy" landless of Pringgarata.

Hence, it is interesting to note that for energy-consumption poverty, the periods December-January and April-June seem to be the most sensitive to instability in these two subdistricts of Central Lombok. Also, the periods September-December and April-June appear to manifest the greatest instability in household rice stocks. From our knowledge of the agricultural calendar for these two areas we know that the above instability sensitive periods correspond to the land preparation/planting and harvest seasons. Although we utilized nine survey rounds for this analysis, use of prior knowledge about study-area cyclicity/seasonality could have focused the survey down to four rounds (two

rounds within the stress season and two rounds during harvest for computation of the relative decline statistics) or, perhaps even two rounds involving the computation of only a harvest-to-stress decline/instability indicator.

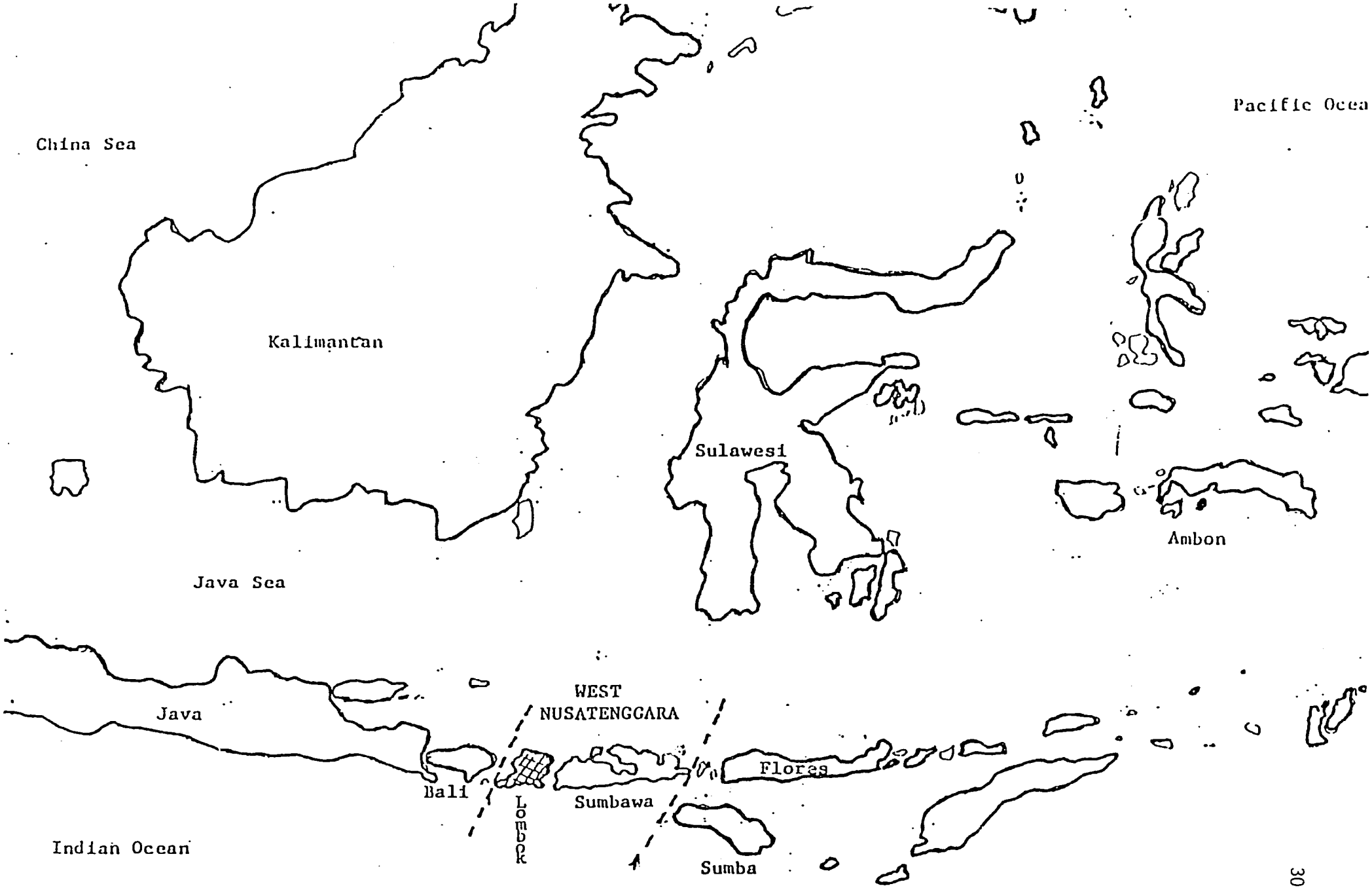
We find that welfare levels (as measured by staple calorie intake and stock holdings) are higher and more stable for the landless in Pringgarata than for the small landowners in Praya Timur. In this case, the environmental difference between the two regions appears to outweigh the difference in asset position, as far as welfare levels are concerned. This can be explained by the ability of the landless to obtain steady employment in the technically irrigated zone while the small landed are bound by the sharp-seasonality of rainfed rice production.

In addition, we find that household rice stock is a sentitive and early indicator of household food stress. As expected, households draw down their food stocks before they reduce their staple calorie intakes.

CONCLUSIONS

We began our discussion by suggesting that recent developments in the Indonesian economy have improved average welfare levels and have reduced the short-term instability in welfare levels, but at the expense of an increased risk of sudden, sharp declines in levels of living. This being the case, monitoring of indicators sensitive to rapid changes in welfare status is necessary in order to understand the dynamic nature of poverty and to design appropriate measures for its eradication. In our research, we found that the most commonly used Indonesian poverty indicators are single-period measures which do not provide entirely satisfactory, comprehensive measures of impoverishment. However, as a regional welfare discriminator, a rice-income measure, served as a reasonable indicator and appears to be a useful, timely measure of cyclicity in welfare conditions.

In an examination of dynamic poverty indicators in Central Lombok, we find that asset position alone is not enough to explain variation in welfare conditions. These indicators need to be interpreted within the area's agro-environment. From an analysis of a longitudional household survey, we find that household rice stocks are a useful, timely measure of cyclicity in welfare conditions.

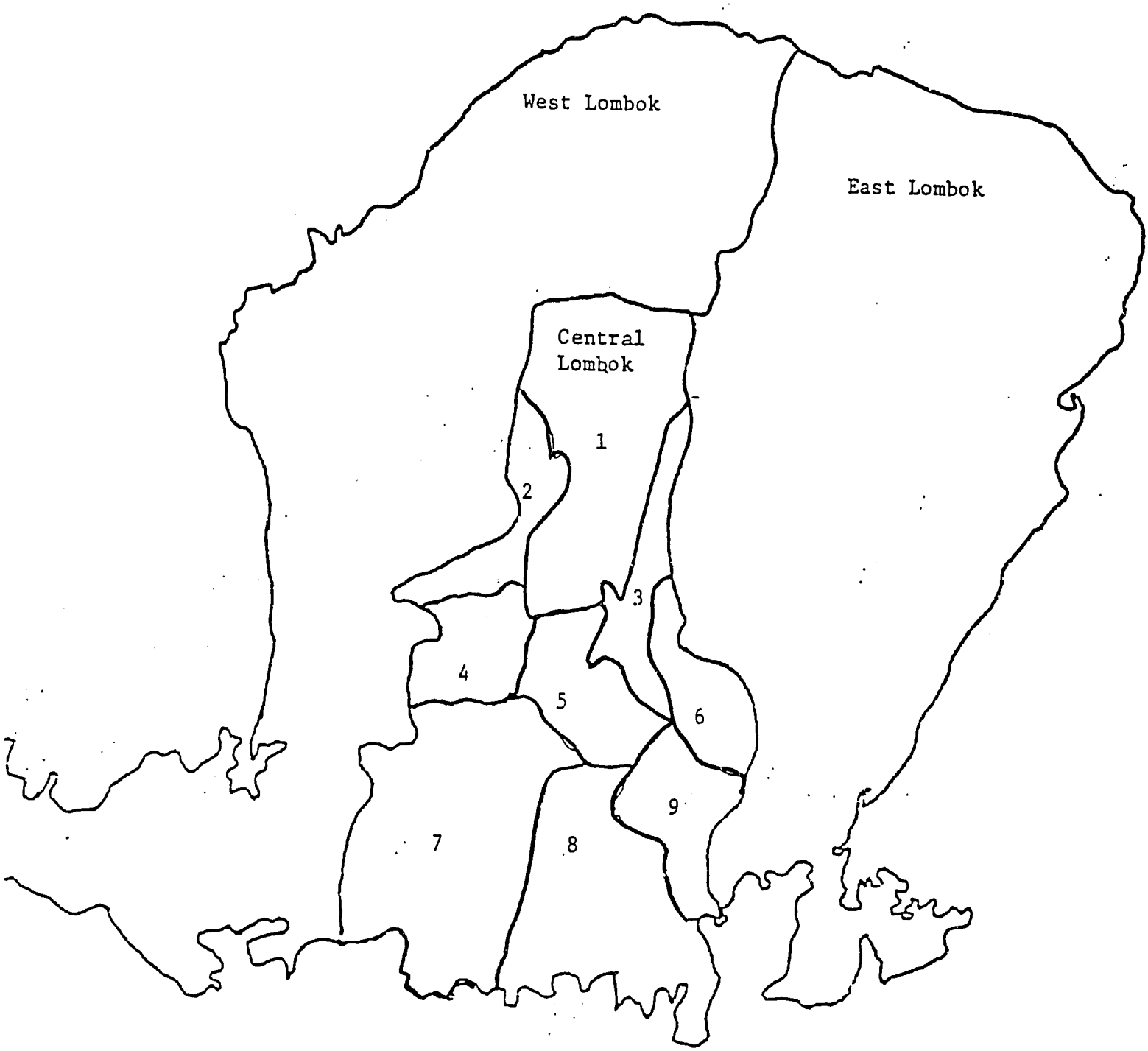


Map 1: Indonesian Archipelago

Map 2: Lombok

Kecamatan Legend:

1 = Batukliang
2 = Pringgarata
3 = Kopang
4 = Jonggat
5 = Praya
6 = Janapria
7 = Praya Barat
8 = Pujut
9 = Praya Timur



APPENDIX 1: DATA ON AGRICULTURAL RETURNS

The Central Lombok Department of Village Development (BANGDES) computes and publishes per capita income estimates at both the Kecamatan and Village levels. These income estimates are based on the prevailing market prices of the major staples. Population estimates come from the 1980 Census.

KECAMATAN	TOTAL POPULATION	INCOME PER CAPITA (Rp.)
PRAYA	105,653	Rp 66,954
PRAYA BARAT	78,655	75,854
JONGGAT	62,970	163,269
PRINGGARATA	43,201	140,845
BATUKLIANG	80,702	63,596
KOPANG	53,899	130,121
JANAPRIA	50,149	55,726
PRAYA TIMUR	38,641	54,100
PUJUT	62,415	90,856

APPENDIX 2

YEARLY PRODUCTION OF MAJOR STAPLES BY KECAMATAN IN CENTRAL LOMBOK 1976-1980.

(RICE IS DRY STALK: TO CONVERT TO HUSKED RICE MULTIPLY B ' 0.52)

(KG/CAPITA/YEAR)

		Praya	P. Barat	Jonggat	Pring.	Batuk.	Kopang	Janapria	P. Timur	Pujut
1976	Rice	314.3	323.5	337.7	390.6	241.0	240.6	283.4	341.6	277.1
	Corn	0.0	0.7	13.4	0.8	0.0	7.3	2.5	0.0	0.4
	Cassava	1.4	10.0	0.7	40.0	32.9	25.9	41.8	1.8	24.3
	S. Potato	7.9	5.0	181.6	13.2	23.2	165.8	14.0	1.3	1.4
1977	Rice	238.7	219.7	330.8	348.6	246.9	236.5	271.3	247.7	106.9
	Corn	1.9	1.3	0.0	2.6	1.4	8.3	1.2	3.8	0.0
	Cassava	1.9	13.9	0.0	33.0	26.0	24.3	1.4	20.2	11.4
	S. Potato	54.4	47.9	111.5	16.3	26.2	99.6	69.0	0.2	4.2
1978	Rice	267.0	311.9	489.0	430.0	263.6	280.1	246.1	307.8	222.6
	Corn	1.2	7.3	0.0	0.8	1.8	6.8	5.7	3.2	0.5
	Cassava	6.7	37.4	0.0	32.5	26.5	20.7	1.2	11.4	18.1
	S. Potato	6.3	14.5	0.0	8.9	11.5	45.1	30.3	5.6	14.8
1979	Rice	229.3	227.6	409.3	429.0	230.2	231.3	180.6	95.7	110.0
	Corn	0.2	1.0	3.0	0.5	1.0	1.3	0.6	0.4	1.1
	Cassava	0.9	61.5	0.0	10.4	15.6	23.8	14.4	20.5	22.2
	S. Potato	1.8	9.4	54.1	3.9	60.1	51.3	99.8	64.8	4.2
1980	Rice	197.5	355.6	641.3	537.3	328.1	284.8	232.9	260.7	124.2
	Corn	0.4	17.9	10.0	0.8	0.2	2.6	3.2	5.2	2.4
	Cassava	10.3	126.7	1.9	15.9	31.6	22.1	8.7	31.2	46.3
	S. Potato	8.9	26.3	23.5	4.1	18.3	119.1	25.6	0.0	1.5

Note: Kilogram quantities were converted to kcal using the following conversions:
Husked Rice: 1 kg = 3600 kcal
Corn: 1 kg = 3600 kcal
Cassava: 1 kg = 1500 kcal
S. Potato: 1 kg = 1140 kcal

FOOTNOTES

1. For a good discussion of the various conclusions of recent poverty-oriented analysis, see Benjamin White, "Political Aspects of Poverty, Income Distribution and their Measurement: Some Examples from Rural Java" (revised mimeo version, Bogor, May 1978) 27 pp. and R.M. Sundrum and A.E. Booth, "Income Distribution in Indonesia: trends and determinants" in J. Fox, R. Garnaut, P. McCawley and J. Mackie (eds.), Indonesia: Australian Perspectives (Canberra: Australian National University, 1980) and IBRD, Income Distribution in Indonesia, 1980. Various supporting pieces are found in the Bulletin of Indonesian Economic Studies, Prisma, Ekonomi dan Keuangan Indonesia and in the Agro-Economic Survey publications.

2. In this paper we are deliberately skirting two important issues, the legitimacy of defining absolute poverty levels and the importance of relative as compared to absolute impoverishment. An interesting article that suggests that all need is relative is Peter Townsend, "Measures and Explanations of Poverty in High Income and Low Income Countries: The Problems of Operationalizing the Concepts of Development, Class and Poverty" in P. Townsend (ed.), The Concept of Poverty (London: Heinermann Press, 1970), pp. 1-46. A good survey of recent literature of poverty and inequality measurement devices, although lacking in discussion of the importance of the measurement time-frame is: Alfonso P. Castro et al., "Indicators of Rural Inequality," World Development, Vol. 9, No. 5, pp. 401-427, 1981). Also, for recent attempts within the neoclassical orthodoxy to redefine poverty measures see: A.K. Sen, "Poverty: An Ordinal Approach to Measurement," Econometrica, Vol. 44, pp. 219-232, 1979.

3. Several authors have discussed the variability issue with regards to production risk. See, for example, Sara S. Berry, "Risk and Small Farmer," Boston University (mimeo), August, 1977, and James R. Roumasset, "Risk and Uncertainty in Agricultural Development," ADC Seminar Report #15, October 1977.

4. Much of the work on the welfare benefits from stabilization schemes has been in the area on national-level buffer policies. For a summary of much of the debate on stabilization policy see: S.J. Turnovsky, "The Distribution of Welfare Gains from Price Stabilization: A Survey of Some Theoretical Issues," from Stabilizing World Commodity Markets, F. Gerald Adams and Sonia A. Klein (eds.), Lexington, MA: Lexington Books, 1978, pp. 119-148.

5. R. Daroesman, "An Economic Survey of West Nusatengara," Bulletin of Indonesian Economic Studies, Vol. XII, No. 1, March 1976, p. 44 and Alfons van der Kraan, Lombok: Conquest Colonization and Underdevelopment, 1870-1940, Singapore: Heinemann Education Books (Asia) Ltd., 1980.

6. CIDA-Crippen International Ltd., "Technical Report No. 1: General and Background Information," Lombok Island Water Resources Development, Vol. 2, Phase 1, 1975, p. 1.

7. Bailey's studies were published in eleven portions. K.V. Bailey, "Rural Nutrition Studies in Indonesia," I-XI, Journal of Tropical and Geographical Medicine, Vol. 13 and 14, 1961-1962. Bailey, however, was far from the first to make the connection between a diminution in the quality of the main staple source and the physiological status of the individual. See for example, the reference to the hardship under the Japanese occupation described by novelish Pramoedya Ananta Toer, in his short story, "Dia yang Menyerah" (The Vanguished) in Cerita dari Blora, Balai Pustaka, 1963) which is as follows: "Dan keadaan kian lama kian buruk. Bahan makanan kian susah didapat. Bahan pakaian hanja ada dalam angan-angan belaka. Dan untuk orang djudjur serta tak bermodal, uangpun susah. Beras diganti djangung. Djagung berganti gaplek. Dan achirnya gaplek berpindah ke ubidjalur—daunnya!" (The situation worsened as time went on. Food was hard to find. Clothing was only to be had in dreams. For honest people, without any capital, even money was hard to come by. Corn was substituted for rice. Dried cassava was substituted for corn. And finally, instead of dried cassava, sweet potatoe leaves!".)

8. B. Napitupulu, "Hunger in Indonesia," Bulletin of Indonesia Economic Studies, 9 February 1968, pp. 60-70. See also the interesting comments by E.H. Hipsley and David Penny that follow the article.

9. Mely G. Tan et al., Social and Cultural Aspects of Food Patterns and Food Habits in Five Rural Areas in Indonesia, National Institute of Economic and Social Research, Jakarta, 1970, 131 pp.

10. John Dixon, "Production and Consumption of Cassava in Indonesia," mimeo draft, September, 1979, a revised draft published in Bulletin of Indonesian Economic Studies, November, 1979.

11. For examples that make use of this standard see: Benjamin White: Production and Reproduction in a Javanese Village, unpublished Ph.D. dissertation, Columbia University, 1976: Richard W. Franke: The Green Revolution in a Javanese Village, unpublished Ph.D. dissertation, Harvard University, 1972; Nanu Achmad Sanusi: Rural Household Income and Expenditures in Village P, West Java, Indonesia, unpublished MS thesis, Cornell University, 1982.

12. For a good discussion of control versus tenancy questions see: Gillian Hart: Labor Allocation Strategies in Rural Javanese Households, unpublished Ph.D. dissertation, Cornell University, 1972.

13. Gillian Hart ibid.; Suharso et al.: Rural-Urban Migration in Indonesia, National Institute of Economic and Social Research, LENKNAS-LIPI, April 1976. Ida Bagoes Mantra: Mobilitas Sirkular di Indonesia, Population Studies Center, Gadjah Mada University, 1981. and Hidayat, Pengembangan Sektor Informal dalam Pengembangan Nasional: Masalah dan Prospek, Asean Seminar on the Informal Sector, Jakarta, December 1978.

14. See Sajogjo, "Golongan Miskin dan Partisipasinya dalam Pembangunan Desa", Prisma: Usaha Perbaikan Gizi Keluarga, Lembaga Penelitian Sosiologi Pedesaan. IPB, Bogor, 1974. and Masri Singarimbun, "Pola Konsumsi: Ke Arah Pemerataan?", Prisma (10 November 1978).

15. Sajogjo, "Golongan Miskin...", ibid.

16. Sajogjo et al., Proyek Studi Sektoral/Regional Penelitian Atas Tingkat Pendapatan Rumah Tangga dan Kecukupan Pangan, Lembaga Penelitian Sosiologi Pedesaan, Institut Pertanian Bogor, November 1980 (in two parts).

17. For examples of press reporting using these standards see: Kompass, 8 November 1977, "Setengah Juta Lebih Penduduknya Menderita KKM dan KM" (500,000 suffer from KKM and KM) Kompass, 23 December 1977, "Setengah Juta Penduduk Lombok diancam Lapar" (500,000 people in Lombok struck by hunger) Merdeka, 24 September 1977. These reports are interesting both for their use of KM, KHO and HO categories and also because these results pre-dated relief dissemination operations by several months.

18. Result of personal communication with officials in Lombok and at the National Nutrition Research Institute in Bogor.

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