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THE POLITICAL ECONOMY OF RICE IN ASIA: INDONESIA†

Indonesia needs no introduction to commodity economists interested in the world rice market, or to development economists interested in structural change and the role of agriculture in economic development. In half a century, Indonesia has been transformed from a leading exporter of rice to the world's largest importer of both commercial and concessional rice. And through the writings of Boeke, Indonesia has served as the model for the elucidation of dualism, a concept that permeates nearly all aspects of development economics. It is appropriate to lead this sequence of articles on rice policy in Asia with the Indonesian essay.

The development of the discussion is straightforward. Following a review of the agronomic and economic setting of Indonesian rice culture is a discussion of the history of rice policy, a history dating back to the seventeenth century. With the discussion of modern rice policy comes an attempt to make explicit the interaction of objectives, policies, and constraints. The goal is to understand what drives the system, what the overriding objectives are, and which constraints most closely condition the policy choices. The essay closes with an evaluation of modern Indonesian rice policy and a prognosis that tentatively rejects the historical determinism that constantly lurks in the background of any discussion of rice policy in Indonesia.

THE TECHNICAL AND ECONOMIC SETTING

Economic Geography

A handful of mere statistics of the most routine, humdrum sort can sketch a picture of the basic characteristics of the Indonesian archipelago as a human habitat with more immediacy than pages of vivid prose about steaming volcanoes, serpentine river basins, and still, dark jungles. The

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> land area of the country amounts to about one and one-half million square kilometers, or about that of Alaska. Of this only about one hundred and thirty-two thousand square kilometers are in Java, the rest making up what are usually called 'the Outer Islands'—Sumatra, Borneo (Kalimantan), Celebes (Sulawesi), the Moluccas, and the Lesser Sundas (Nusa Tenggara). But the country's total population (1961) is around ninety-seven million, while Java's population alone is about sixty-three million. That is to say, about 9 percent of the land area supports nearly two-thirds of the population; or, reciprocally, more than 90 percent of the land area supports approximately one-third of the population. Put in density terms, Indonesia as a whole has about 60 persons per square kilometer; Java has 480, and the more crowded areas of the central and east central parts of the island more than a thousand. On the other hand, the whole of Indonesia minus Java (i.e., the Outer Islands) has a density of around twenty-four per square kilometer. To summarize: all over, 60; the Outer Islands, 24; Java, 480: if ever there was a tail which wagged a dog, Java is the tail, Indonesia the dog.[1]

Indonesia's agriculture is dominated by the country's equatorial location. The westward monsoon from December to January carries the rains for the large wet season rice crop on Java; the eastward monsoon from June to August is dry. Only irrigated land can be double- or triple-cropped with rice, although the dry season usually is wet enough to grow secondary crops such as soybeans, maize, cassava, or peanuts.

Production

Rice culture is millennia-old in Indonesia; there are wet paddy fields (*sawah*) that have undoubtedly been planted twice a year to rice for centuries without ever receiving artificial fertilizer. The enriching nature of volcanic ash, the runoff from volcanic slopes, and the unique eco-system of paddy-cultivated rice have permitted stable yields (although low by temperate Asian standards) without modern technology. Fertilizer use on rice has historically been very low. Still, many Javanese farmers became familiar with artificial fertilizer when forced to grow sugar for the Dutch mills in the late nineteenth and early twentieth centuries. It was not until the late 1960s, however, under the influence of government programs to make fertilizer more readily available at profitable prices, that farmers began to use significant quantities of fertilizer on rice.[2]

The raw population densities for Indonesia have already given some hint of the major technical constraints on the typical rice cultivator: the extremely small size holdings. Although very wide variations in both land tenure and land quality make "average land ownership" a dubious concept at the micro level, the pressing fact is that over two-thirds of the farm population have less than half a

[1] Geertz (7, pp. 12–13). Naturally, the population density figures are even more striking with current population: Java has nearly 600 people per square kilometer while the Outer Islands have only 34. Including West Irian (excluded in Geertz's calculations) in the Outer Islands reduces the population density to 24. For further discussion of the ecological setting of Indonesian rice culture on both Java and the Outer Islands, the book by Geertz (7) is unsurpassed.

[2] Estimates of fertilizer use have been constructed by the National Fertilizer Study Team (*18*). Kolff (*11*) presents a discussion of fertilizer distribution.

TABLE 1.—MIRI: LAND OWNERSHIP OF SAWAH*
(*hectares*)

Area owned[a]	Number of owners	Percent of all owners	Percent of all land owned
None	60[b]	37	0
Under 0.2	77	47	33
0.201 to 0.8	24	14	40
0.801 and over	3	2	27
Total	164	100	100

* Village records, reported in Penny and Singarimbun, "A Case Study of Rural Poverty," *Bul. of Indonesian Econ. Studies*, VIII, 1, March 1972.

[a] Includes land distributed to village officials in lieu of salary or pensions.

[b] Of these 60 families without sawah, 24 own some house compound or dry land, while 36 own no land at all.

hectare to cultivate, and probably less than a third. Several recently published village surveys provide some depressing details.[3]

Miri, a hamlet in the *kelurahan* (sub-country) of Srihardjo, lies in the poverty-stricken region south of Yogyakarta. It has a population of 164 families with 964 people, nearly all of them farmers. The total arable land controlled by these families is 29.5 hectares, or less than 0.2 hectares per family. And even these postage stamp-sized holdings are not held evenly, as Table 1 shows.

In *kabupaten* (district) Klaten in Central Java, average land ownership has not deteriorated to quite the levels of Miri in Yogyakarta Special region. Table 2 summarizes some basic data for the three sample villages of Nganjat, Kahuman, and Pluneng in Klaten.

Although average sawah ownership is larger in Klaten than in Srihardjo, the proportion with rice fields is much worse: in Nganjat and Kahuman 44 percent own sawah; in Pluneng, only 27 percent. This high degree of landlessness among the rural population is a function of past population growth, and the future obviously holds no immediate hope for improvement.

Neither Srihardjo nor Klaten should be taken as indicative of average Indonesian rural conditions. West Java and much of Central and East Java have somewhat more favorable man-land ratios. Still, unless there is a drastic change in present trends, Srihardjo and Klaten beckon menacingly as Java's future. They should and do cause sleepless nights for those concerned about Indonesia's rural development.

Within the constraints of farm size, input availability, and capital resources, the Indonesian peasant is a remarkably able agriculturalist.[4] The available econometric evidence, while not strong, indicates a market awareness, sense of economic calculation, and willingness to innovate (subject to fairly obvious constraints). The only aggregate production response study is that done by Mubyarto

[3] See Penny and Singarimbun (*17*) and Utami and Ihalauw (*33*) for case studies and Utrecht (*34*) for summary evidence and discussion of the 1960 land reform bill.

[4] Hawes (*9*, p. 2) observes that the Indonesian rice farmer is one of the most skilled in Asia.

TABLE 2.—BASIC LAND OWNERSHIP DATA FOR THREE VILLAGES IN KLATEN, CENTRAL JAVA*

Item	Village		
	Nganjat	Kahuman	Pluneng
Total population	1,466	3,262	2,274
Sawah areas (*hectares*)	64.38	167.04	99.25
Total area (*hectares*)	74.89	195.06	123.93
Number owning land			
Rice fields and house plots	129	231	150
Rice fields only	7	54	10
House plot only	51	145	218
House only	49	218	115
Number landless	74	4[a]	105
Average size of sawah holding (*hectares*)			
Owned by all land-owning farmers	0.37	0.59	0.62
Owned by sample farmers	0.42	0.52	0.75
Operated by sample farmers	0.46	0.60	0.51
Average yield per holding (*tons*)[b]	2.72	3.92	3.31

* Constructed from Utami and Ihalauw, "Some Consequences of Small Farm Size," *Bul. of Indonesian Econ. Studies*, IX, 2, July 1973.

[a] Includes *tani pituwas* who cultivate land which is not inheritable.

[b] Yield measured in tons of wet stalk paddy.

and reported in Mubyarto and Fletcher (*15*). The elasticity of planted rice acreage with respect to relative rice prices was small but significantly positive, approximately 0.3. Output elasticity was estimated at 0.4, implying a yield elasticity of approximately 0.1. The yield response could be due to a fertilizer response or more intensive cultivation techniques (such as planting, weeding, and harvesting) although the scope for the latter is quite small at the present time.

Mangahas, writing for the Bimas Evaluation Survey (*20*), analyzed a sample of farmers' responses to the question of what urea use would be at various fertilizer prices. His analysis of this survey data indicated an elasticity of demand for fertilizer with respect to fertilizer price of at least −3.0 for Java and −1.5 for Sumatra. Further analysis of experimental response functions indicated fairly similar results although the price elasticities rose strongly from high yielding varieties (−0.5 to −1.0) to national improved varieties (−2.0) to local varieties (−4.0). These results are not surprising in view of the initial fertilization levels for these three varieties and the nature of elasticity calculations under linear demand functions.

It is also possible to estimate an aggregate fertilizer response function. Foodcrop fertilizer use rose from nearly zero in 1959 to almost 200,000 tons in 1970, but since considerable rice was produced without artificial fertilizer, the land must contain some latent fertility. Although a soil expert could probably determine the extent of this fertility with suitable soil samples, the information is not available for estimation purposes. Accordingly, an assumed constant level of latent soil fertility was added to the nitrogen fertilizer applications for each year, and a standard Cobb-Douglas response function was estimated with fertilizer application and area harvested as independent variables. The most satisfactory equation resulted when the level of assumed latent fertility was 100, somewhat

higher than the average application level of artificial fertilizer for the period, with the results as follows:

$$\begin{array}{lll} \text{LOGSPROD} = & -.734 + 1.272\,\text{LOGSAREA} + 0.109\,\text{LOGNFERT} & \\ & (-7.8)\ (19.7) \qquad\qquad (7.0) & R^2 = 0.990 \end{array}$$

where LOGSPROD = log of sawah (wet land) production in millions of metric tons annually from 1959 to 1970,

LOGSAREA = log of harvested sawah area in millions of hectares, and

LOGNFERT = log of nitrogen fertilizer applications (in thousands of nutrient tons plus 100).

By sheer coincidence the fertilizer coefficient of 0.109 is precisely the same as that estimated for a six country cross-section sample of tropical Asian rice-growing countries for the years 1962 to 1970.[5] Assuming that farmers react appropriately to changes in the ratio of rice price to fertilizer price, this result implies an elasticity of output with respect to changes of fertilizer prices of about 0.122. This elasticity is consistent with the yield response coefficient of about 0.1 from Mubyarto's analysis because area is held constant here.

Despite all the above aggregate evidence of farmers' responsiveness, it is important not to misjudge the seriousness of the constraints that stand in the way of increasing rice production. Many farmers remain heavily oriented toward subsistence needs, and these are becoming much more pressing as families grow and divide the landholdings. Many traditional farmers refuse to use high yielding varieties, fertilizers, or pesticides. Several of the early high yielding varieties developed at IRRI were unsatisfactory in Indonesia. Disease problems, consumer rejection, insects, and the cost of the associated input package discouraged farmers from further use of new varieties. Much research remains to be done before locally adapted fertilizer-responsive varieties are widely available and used.

Nor should the difficulties in getting fertilizer to the farmers be minimized, even if they should want it. Fertilizer marketing channels have not had the same long time span to develop that rice marketing channels have. The fertilizer that has been marketed has usually been under government monopoly. Private traders have had little incentive to build up a vigorous network of retail fertilizer outlets although PUSRI, the Palembang-based urea manufacturer, has made important progress in this area since 1971.

All of these difficulties stand in the way of increasing rice production. Still, at the margin, the summary view ought to be one of price-responsive farmers. The degree of responsiveness is known only roughly, but the direction is not in doubt. Policy makers in Jakarta are faced with a peasantry that considers many issues in its agricultural decision making. The problem of agricultural policy formulation in Indonesia is to work from the standpoint of "economics *and* . . ." (*16*, p. 167). But the point is that economics is important to the farmer. He will not use fertilizer, pesticides, or high yielding varieties unless they are sufficiently profitable to offset the risk and uncertainty he faces. A government concerned about modernizing agriculture can work at either or both ends of

[5] See Timmer and Falcon (*32*). The tropical countries in the sample were Indonesia, Ceylon, Thailand, Burma, Malaysia, and the Philippines.

the lever—to reduce risk or to increase profitability. Other methods may seem more appealing from Jakarta, but they are bound to bump headlong into the realities of farmer behavior.

Marketing

Rice marketing, especially the processing sector, is relatively better understood than the rice farmer. Nevertheless, it is remarkable just how little is known about some of the basic marketing issues—the size of the marketed surplus, for example, or the extent of losses during drying, storage, and processing—and even more remarkable how little has been learned about these issues since the research for Mears's book was completed over a decade and a half ago.[6]

Estimates of the net marketed surplus are generally in the range of 25–35 percent, but these are somewhat misleading since the remaining 65–75 percent does not all stay on the farm for subsistence consumption. Instead, there is a significant pattern of selling rice at harvest time, both by harvesters and farmers, who repurchase rice later in the year for home consumption. A handful of spot surveys has indicated recently that most families with less than 0.2–0.3 hectares of rice land (perhaps half the rural farm population) earn the majority of their incomes from nonfarm sources, primarily petty trading and day-labor. Their rice crop serves mainly as a seasonal source of cash and an all too brief improvement in their diet. But the majority of their food, even rice, must be purchased. It is hard to know whether to treat this large segment of the population as producers or consumers; i.e., do they benefit or suffer from higher rice prices?

Rice marketing in Indonesia, especially on Java, is exceedingly labor intensive. From the time of the harvest, which is traditionally open to all who wish to participate and which is done stalk by stalk with the *ani-ani* (small finger knife), to the retailing from innumerable small stalls in the local markets, rice marketing provides employment for literally millions of people in Indonesia.[7]

The shared harvest, with the harvesters claiming anywhere from one-twentieth to one-fifth of the crop, has been the traditional Indonesian job of last resort in the countryside, with some urban to rural back migration during peak periods.[8] But under the impact of increasing landlessness and the high yielding varieties, the traditional harvesting methods seem to be breaking down.

> Large numbers of people, most of them landless laborers, are traveling further and further afield to find harvesting work. With so many people trying to share in the harvest, the amount of work each harvester gets has been becoming smaller, so they try to get larger shares than custom dictates. In one village, farmers were asked if they ever refused to allow the itinerant harvesters to participate. The farmers felt they had no choice. One farmer said that if the landowners tried to exclude the itinerant laborers from participation in the harvest "there would be war." . . .
>
> In order to improve their shares, farmers have to limit the numbers of harvesters. The responses to this problem appear to be somewhat different

[6] The basic book was completed in 1957 and a supplement was added to cover events to mid-1968. The entire volume was copyrighted in 1959 and printed in Indonesia in 1961 (*13*).

[7] Some very rough quantitative estimates, primarily for the processing sector alone, are provided in Timmer (*28*).

[8] One-sixth or one-seventh shares were traditional before the high yielding varieties.

for the smaller, poorer farmers than for the larger farmers. The small farmers appear to be more bound to traditional systems of harvesting and to be somewhat more at the mercy of the swarms of harvesters (*6*, pp. 37–38).

Both Collier and Soentoro (*6*) and Utami and Ihalauw (*34*) report that larger farmers are selling their harvests to outside agents who then use their own crews for the harvest. The result is larger returns to both the farmer and the few workers with close relationships with the harvest agent. But the hordes of itinerant harvesters increasingly excluded from the fields are being squeezed out of what little income they had, and the consequences will be serious disorders in the countryside unless alternative income sources, such as the kabupaten rural works program are found.[9]

Rice harvested stalk by stalk with the ani-ani is tied into bundles and dried and stored in this form. Apart from the sheer beauty of the stalk paddy system, it complements the labor-intensive nature of rice marketing. For instance, most rice is carried from field to house and from house to mill on shoulder poles; handling bags of *gabah* (rough rice threshed from the stalk) is a much more awkward process than simply draping the stalk paddy over the pole, and the bags are expensive. This technique obviously places a high premium on rice varieties that do not shatter easily. The easy-shattering high yielding varieties have frequently occasioned a shift to sickle harvesting and in-field threshing, with correspondingly lower labor requirements.

Rice is sun-dried before storage and milling. The several hundred mechanical driers in the countryside are largely unused. Not more than one or two are operated, mostly because of high operating costs and inexperienced operators. Some observers feel the social payoff to properly designed, installed, and operated mechanical driers would be very high (*36*). But the difficulties and costs of mounting a significant program are also great, and further development of sun-drying techniques may offer a better payoff.[10]

Rice milling has been more thoroughly analyzed than any other part of rice marketing. Rice milling on Java has virtually been transformed in just the past few years. The proportion of rice which is hand-pounded almost certainly declined from perhaps three-quarters of the crop to less than a quarter, possibly significantly less. Mechanical milling has rapidly expanded to drive out hand-pounding, but the new mills do not much resemble the traditional large scale mills put up by the Dutch and Chinese in the 1930s or the small "huller mills" that were widespread in the countryside. Instead, most of the new facilities are modern, technically sophisticated rubber roll huskers with pneumatic (or Engleberg) polishers. These facilities are well suited to Indonesia's factor endowment. In some ways they are the happy result of a government "non-policy" at the micro-level coupled with appropriate macro-level policies with respect to rice prices, wage rates, and interest rates.[11]

Very little is known about private storage facilities for rice. No doubt the

[9] See De Wit (*37*) for a description of this program.

[10] Some further discussion of the drying issue is contained in Timmer (*28*).

[11] For discussion of the whole choice of technique issue in rice milling, employment effects, evidence from the countryside, etc., see (*28*, *30*, *31*).

vast majority of the crop is stored in farmhouses and small village godowns. Most larger rice mills have some warehouse area for milled rice, but stalk paddy is usually stacked outside on concrete or brick aprons. If stacked properly and suitably dry, losses from rainfall, birds, and spoilage are small. Large rice merchants in urban areas have their own warehouses in which the majority of milled rice in private hands is stored. In 1972 the government food logistics agency (BULOG) had storage capacity, mostly rented, for about a million tons of milled rice. Since the rice shortage in 1973, BULOG has invested in substantial additions to its storage capacity.

The structure of rice marketing—the channels and hands through which the rice physically moves—varies considerably from province to province in Indonesia. Mears observes that two basic channels should be distinguished in virtually all areas: the private marketing path and the government marketing path.[12] A good deal more will be said about the government marketing effort below, as it has been one of the major policy implements of all Indonesian governments. But the government does not reach all the way down to the farmer in its marketing channels to get rice from the farm level to mills and beyond.

The market connection between mills and farmers may be as direct as the farmer carrying supplies to the mill himself, or it may be as indirect as to move the rice through several agents and sub-agents. A critical question for Indonesian rice policy for several years has been the size of the margin between the farm gate and the mill where BULOG operates its price support scheme. The margin between the mill and urban retail markets is also important because the level of rice prices, both harvest and preharvest, is judged from urban market prices. Research recently published by Atje reports that both margins are smaller than had previously been supposed. The average margin between the village and kabupaten town was about 11 percent, compared with expectations of about 30 percent, but the results are very tentative, based as they are on one region for one year.[13] Further such research is needed by policy makers in Jakarta to provide a proper factual foundation for policy discussions and decisions.

No discussion of rice marketing would be complete without some mention of the *cukongs*, the large-scale, ethnic Chinese rice merchants who are frequently thought by government and citizenry to exploit Indonesia's frequent rice shortages to their own advantage. They are the ubiquitous middlemen when rice prices start rising. No published source documents their behavior, influence, or even existence (apart from some rabid newspaper accounts), and no analysis of seasonal price margins has shown evidence of monopolistic price formation.[14] And yet it would be foolish to ignore their impact, both on the real world and on the state of mind of the government and populace. Research that sorted out these two impacts in a documented fashion would add immeasurably to our understanding of how Indonesian rice marketing functions.

[12] See Mears (*13*), especially Chapter V, and Appendix XIV for unusual marketing patterns in various provinces. Volume IV of the Bimas Evaluation survey (*20*) also contains an interesting analysis of survey data on rice marketing in Java and South Sulawesi.

[13] See Atje Partadiredja (*2*). The sample was taken in Central Java.

[14] The only such analysis conducted recently is by Goldman (*8*). Earlier analyses are reported by Mears (*13*).

Consumption

The structure of food consumption, like marketing in Indonesia, is somewhat better understood than production. On a national average basis more than three-fifths of carbohydrate calories (a large proportion of total calories) come from rice, about one-fifth from cassava, and somewhat less than that from maize. Sweet potatoes are an important source of vitamin A, and soybeans and peanuts provide needed protein, but they are consumed in small amounts.

Rice is the most important consumption good in the economy. It is the strongly preferred staple of nearly the entire population, even of those who are constrained by poverty to eat mostly cassava or maize. (The sago eaters in the Eastern Islands are an exception.) Nearly a third (31 percent) of the total cost of living index for Jakarta is accounted for by rice alone, although the new index based on 1969–70 consumption patterns will reduce this share to about a quarter. Rice is also the primary wage good of the economy. Many workers are paid directly in rice. To protect civil servants' salaries during inflation, the government distributes rice rations. Clearly, rice plays an entirely unique role for Indonesian consumers, especially urban consumers.

The income elasticity for rice has long been an important policy parameter (mainly for planning, but also for justifying imports of rice to food aid donors). There is apparent agreement that the cross-section elasticity is in the range of 0.6 to 0.7 (see *23*, *14*, *24*, and *27*). In addition, the evidence shows large differences by expenditure class: the poorest third of the population has an income (expenditure) elasticity of demand for rice near or above unity, while the upper third has an elasticity of less than 0.3. These wide differences by income class mean that projections of rice demand on the basis of per capita income growth are strongly dependent on the ultimate recipients of the higher incomes. A widely based increase in rice production has vastly different consequences than enormous increases in timber and oil extraction.[15] This is the case at least for rice demand.

In view of the wide choice of carbohydrates available to most Indonesians, it would be surprising if there were no significant degrees of substitution among them on the basis of price. No convincing estimates of own-price and cross-price elasticities have yet been published, but Table 3 reports the results of some rough calculations made on 1968–1971 price and consumption data for the six basic foodcrops. It appears that correction for significant degrees of price substitution among commodities lowers the income elasticity for rice based on time series data to about 0.3. Still, this figure may not be in complete contradiction to the cross-section results if recent gains in per capita income have been very unequally distributed as the significantly lower rice prices through 1972 alone would dictate.[16]

In short, the sketchy evidence shows high income elasticities for rice among low income groups and still moderate elasticities for rice among higher income groups. In addition, considerable shifting about, at least at the margin, among

[15] For some rough examples, see Timmer (*27*).

[16] These results are taken from an unreleased document produced in August 1972, for BAPPENAS, the Indonesian National Planning Agency. See Timmer (*29*) for details of the methodology.

TABLE 3.—INCOME, OWN- AND CROSS-PRICE ELASTICITIES FOR SIX BASIC FOODSTUFFS

Crop	Income elasticity[a]	Price elasticity on relative prices[b]	Price elasticity on non-food prices[c]	Price elasticity on deflated prices[d]	
				Own	Cross
Rice	0.28 (0.60 rural) (0.10 urban)	−0.60	+0.10	—	—
Maize	−0.56	−1.48	−0.20[f]	—	—
Cassava	−1.94	−1.38[e]	−0.11[f]	—	—
Sweet potatoes	−0.36	−0.17	−0.15[f]	—	—
Peanuts	0.23	−0.53	0.07	—	—
Soyabeans A	0.12	−0.78	0.75		
B	0.77	—	—	−1.41	+0.34

[a] Calculated assuming per capita incomes grow 4.7 percent per year in 1969, 1970, and 1971.
[b] Own price relative to a weighted index of the five other basic food prices.
[c] Jakarta price index weighted as follows: Food, 0.0; Housing, 0.5; Clothing, 1.0; Miscellaneous, 1.0.
[d] Own and cross prices deflated by the Jakarta non-food price index (see footnote *c* above).
[e] Percentage change in cost of cheap calories from cassava, defined as follows: Percentage change in price = [(cassava price change * 2.17) − (cross price change)] ÷ [2.17 * cassava price (in base year)].
[f] Thus, holding real income constant, an increase in prices of non-food items causes a decrease in consumption of maize, cassava, and sweet potatoes.

the several basic carbohydrates seems to be called forth by relative price shifts. Thus the scope for influencing both rice producers and consumers through price policy appears to be significant.[17]

ANTECEDENTS OF MODERN RICE POLICY

Legacy of the Dutch, 1650–1940

Rice policy has been a function of rice prices for the entire recorded history of the Indonesian archipelago. Sunan Amangkurat I (1645–1677) prohibited the export of rice from Java in 1655 in response to a severe drought that sent rice prices up by 300 percent (*3*). For the next two centuries rice prices were very unstable around a steeply rising trend, and in 1847 appeared the first recorded imports of rice to Java, from Saigon.

Basic Dutch policy was to minimize controls, subject to broadly satisfactory welfare levels for producers and consumers, although the latter generally fared better. In 1863, for instance, the import duty on rice was annulled following a bad harvest. Efforts were made to increase production to keep rice prices low, and when prices fell drastically in the 1880s as part of the world-wide overproduction of cereals, the Dutch response was to require that all government needs be supplied from domestic supplies. In 1911 poor crops and the approaching world war sent rice prices up again, and again exports were prohibited.

A long period of declining rice prices began in 1930 due to Asian overproduc-

[17] In addition, the price elasticity of demand for wheat flour is about −1.4 and the cross-price elasticity with respect to rice price is 1.2. See Timmer (*26*).

tion and the world economic crisis. Other food prices fell in step with rice prices, and farmers could not pay their taxes. The limit to the functioning of the free market had been met.

In March 1933, the Government decided to intervene. It put an end to the free import of rice and restricted it by a system of licenses. This meant more than merely a checking of free importation; it signified the intention to work toward a system of self-supply with regard to rice. Javanese rice which until then had been offered chiefly in local markets had to find its way to all the Outer Provinces. In the few rice-surplus areas of these provinces, such as Bali, Lombok and South Celebes, an inter-insular rice trade had to be started. It was necessary to replenish its stock and had to become familiar with the intricacies of a purchasing system covering all the scattered home supplies. Care had to be taken to insure a stable price so as not to raise the cost of living in the rice-consuming districts. In short, no failure of crops and no record harvest in a single territory of the vast archipelago could ever be allowed to become the occasion of a just reproach that the Government had neglected the obligations which it had undertaken to be responsible for a steady and regular supply of rice. . . .

Real strategy was expected of the leaders. Here a district might be temporarily closed to outside supplies and designated to supply itself; there it might be desirable to shut out foreign supplies and at the same time to organize an inter-provincial supply; in yet another place a primitive traditional barter had, as with a conjurer's wand, to be transformed into a modern export trade. Measures had to be taken on quality, packing, freight rates, time of delivery, etc. Rice mills had to shoot up from the ground. . . .

The prices at which the imported rice was sold to the public were controlled; if they appeared to be much higher than the c.i.f. value, the price level was reduced to reasonable proportions by the expedient of sending further supplies to the district concerned. Provision had to be made, too, that stocks were not left over at the end of the period of scarcity, which might be used by speculators to repress the prices of the new harvest. . . .

Another insoluble difficulty is posed by the contrary interests of producer and consumer. The price of the intensively raised Java rice will usually be higher than of that raised on the South Asiatic mainland. Is it permissible to keep the price of rice high by artificial means in times when the prices of Netherlands Indian export products are decreasing? Already it has occurred that the Government has had to support Javanese rice exports to the Outer Provinces with export premiums in order to hold down the price of rice in these provinces, while at the same time it was compelled to raise the import duties on foreign rice. . . .

The peculiar character of both the raw material and the final product of the rice hulling mills made it inadmissible to allow a free growth of these plants. Danger was seen in the withdrawal of too much rice from the producer-consumers in some areas and the increase of the share of the Java mills in the paddy crops sold in five years from 12 to 21.5 percent. Therefore, in 1940, the provisions of the regulations under the industrial ordinance were applied to rice hulling mills with a capacity of 2½ H.P. or more. In addition, the mills were organized and their sales centralized, on condition that they keep to the paddy purchase and rice selling prices fixed by govern-

ment directive. To compensate for this restriction of liberty, the Government declared its readiness to take over any unsaleable rice surplus at the official price.[18]

A specialized government agency was clearly needed to implement this revolutionary degree of interference in the functionings of the rice market. It was established in April 1939 as the *Sticting Het Voedingsmiddelenfonds,* or VMF. Its finance for imports was gained from the *Javasche Bank* with government guarantee; finance for purchase of domestic rice was arranged through private banks.

Looking back with a 30-year perspective reveals how thoroughly the Dutch actions of the 1930s laid the path for what was to follow. The physical apparatus in the form of rice mills, transportation and communication networks, and the legal and institutional apparatus in the form of the VMF and regulations carefully organizing all aspects of trade in rice were put in place. In addition, and perhaps most importantly, a philosophy was established.[19] It argued that rice was too important to be left alone and that the proper government response was direct intervention in the market place, frequently with trade barriers, price ceilings and floors, and an ultimate reliance on cheap foreign imports to maintain stability. Whether an efficient Dutch civil service adequately implemented these policies is a question without a full answer. Whether an inexperienced, underpaid, and demoralized Indonesian civil service could implement similar policies drawn from this inherited philosophy is a question with all too final an answer, as the history of the first two decades of the new Republic shows.

Efforts by the New Republic, 1945–58

After the chaos of the war years and the fight for full independence, rice policy settled into the old Dutch pattern. The VMF was renamed BAMA (*Jajasan Bahan Makanan,* or Foundation for Food) in 1950, but its activities were unchanged. In 1952 this became the JUBM (*Jajasan Urusan Bahan Makanan* or Foundation for Food Affairs), again with little changed activities.

Continuing inflation in 1950 and 1951 did bring a new policy that was a glimpse of the future: rice rations were distributed in kind to civil servants and the military (and their families) to protect their real income. No longer was the government rice agency interested solely in avoiding high rice prices during scarcity and low prices during surpluses. It now had fixed distribution commitments that had to be honored, month in and month out. A government that cannot pay its civil servants and army will fall. First claim on foreign exchange for imports and on the rupiah budget for domestic purposes went to rice.

The move to making partial salary payments in rice, while perfectly understandable and indeed laudable on welfare grounds, clearly served over time to politicize further a commodity that historically was already nearly beyond the control of normal market forces. Almost lost sight of for the next decade and a half was the fact that rice was not at all political to the rice farmer. To him it was

[18] The running quotations are from a more extended discussion of rice policy in the Netherlands Indies during the 1930s by Boeke (*4*, pp. 112–115).

[19] Some would argue that this philosophy had always been dominant in Dutch thinking. For a review (in Dutch) see De Vries (*35*).

traditional, cultural, and economic, but it was not political. These widely divergent views of the basic foodstuff were to cause periodic major upheavals in the Indonesian government.

Not that the farmer was forgotten during this time; he was the source of the great bulk of Indonesia's food supply. Perpetual shortages of foreign exchange to buy foreign rice frequently caused the government to turn hopefully to the countryside for increased output. Early attempts, for example, the *Kasimo* welfare plan announced in 1952 which aimed at self-sufficiency in rice by 1956 (*10*), followed the early Dutch colonial extension pattern of *olie vlek*, or "oil spot" method. Good farming techniques were demonstrated at critical locations in the countryside and were to spread gradually from there. The Dutch experienced satisfactory qualitative results, but the rate of progress was much too slow to keep up with expanding population. The early Indonesian plans were never adequately staffed or funded.[20] Still, rice prices were stable from 1952 to 1954, and plans were made to eliminate imports in 1955 on the basis of the promising trends. But yields on Java in 1955 were lower than in the previous years, the JUBM was caught without stocks when rice prices started to rise sharply, and the production program fell apart in the scramble to arrange emergency imports.

Massive imports that arrived in 1956 were used to push rice prices down. Prices declined throughout most of that year and even dropped during the three preharvest months in 1957. But the "feeling of ease" in the rice market—that sense among urban consumers that there was adequate rice available—had been disturbed. Imports continued for the next few years on a large scale: an average of 770,000 tons per year from 1956 to 1958 compared with only 225,000 tons from 1953 to 1955. And yet rice prices more than doubled from early 1957 to late 1958 as part of the inflation created by budget deficits. The "feeling of ease," now badly shaken, was not to return for a decade.[21]

Sukarno's Guided Economy, 1958–66

Physical rice rations had gradually been phased out in favor of cash payments for civil servants during the quiet years of the early mid-fifties. Rations for the army and police were never discontinued. But the rising prices in 1957 and 1958 brought a predictable response: reinstatement of physical rations for all civil servants and their dependents. Authority given earlier to provincial governors to set the price of paddy at which the JUBM would buy supplies was extended to the ceiling price at which the JUBM could sell. This action, coupled with the increased reliance on physical distributions, fragmented Indonesia's rice markets very badly. Governors of surplus regions kept prices extremely low to serve the interests of their urban consumers and to reduce budget demands for providing rations for their civil servants and military, while governors of deficit regions, mostly in the outer islands, found ways to tap local export earnings in order to import rice. Jakarta was supplied by the central government to allocate foreign exchange for rice imports and through the residual supplies of the JUBM.

The costs of this strategy were becoming apparent before the end of the decade.

[20] See Afiff and Timmer (*1*) and Soedarsono Hadisopoetro (*22*) for further discussion of this early plan and its ultimate failure.

[21] An excellent account of the events during this time and the government's response with respect to rice policy is contained in the official BULOG history (*3*).

In a clash between using foreign exchange for fertilizer or for rice imports, rice in the short run always won over rice in the long run. As Indonesia's balance of payments deteriorated, the reality of the impact of monthly distribution requirements on Indonesia's rice policy was a mortgaging of the future for the present. It was a mortgage that became increasingly expensive in terms of current foreign exchange.[22]

Once again the government, now under the banner of Sukarno's Guided Democracy (and economy), turned to the farmer for help. An ambitious three-year program for self-sufficiency was announced in 1959 that included: (1) intensification of rice cultivation through the use of "padi centers"; (2) mechanized rice cultivation on dry lands (that needed clearing first); and (3) clearing and cultivation of tidal lands.[23]

Only the "padi center" program began in 1959. Each center was to coordinate intensification on about 1,000 hectares; by 1964, 1,500,000 hectares were to be in the program. Farmers in each area were given credits in the form of fertilizer, seeds, and cost-of-living funds, with repayment to be made in kind with dry stalk paddy, generally at a price below the prevailing price in local markets.

All of the tasks of rice intensification—education, fertilizer and pesticides, improved seeds, and a paddy collection mechanism for repayment—were brought together in the "padi center." Still, the program failed. Imports were larger in 1962 and 1963 than in 1958 or 1959—over a million tons in each of the latter years. Rice production was lower in 1961 than in 1960.

The causes of the failure were important in designing subsequent programs and are also highly relevant to understanding Indonesian rice policy in the early 1970s. First, farmers reacted very unfavorably to the strong centralization of the program in general and to the low stalk paddy collection prices in particular. Despite political appeals, the farmers felt the government was cheating them.

Second, in order to bypass existing bureaucratic bank procedures that prevented most farmers from receiving credit, the program arranged easy credit at the "padi centers." This system was very badly abused, both by the officials giving the credit and by the farmers receiving it.

Third, and especially important for understanding present problems, the program was set up on very short notice. Each "padi center" was immediately responsible for the full intensification package, and consequently most were seriously understaffed with competent technicians. In many cases these personnel were available and unutilized in several existing agencies.

The politicization of rice reached full bore under Sukarno. It was "the main food of the people whose distribution and spreading in the guided economy was not allowed to be made an object of trade or of speculation" (*3*). As the domestic economy deteriorated under the brunt of exploding government deficits, spiraling inflation, and negative investment, the rice economy crumbled as well. To pick the worst years, rice production dropped by 13.6 percent on Java from 1960 to 1964.

[22] No satisfactory time series of rice imports as a percent of the value of total imports seems to exist, no doubt due to the great unreliability of both rice import data and total import data, especially for values.

[23] The discussion of the "padi center" approach to rice intensification is adapted from Afiff and Timmer (*1*, pp. 137–138).

> If only the rather modest trends of the late 1950's—an increase of 1.5 per cent per year in production—could have been maintained on Java, output in 1966/67 would have ben 5.61 million tons instead of 4.82 million tons, or 16.4 per cent higher than what was actually realized.
>
> The production problems on Java in the early 1960's were caused jointly by declining area harvested and declining yields. Yields dropped continuously from a 1962 high of 1.23 tons of milled rice per hectare to a 1966 low of only 1.13 tons per hectare, which was no better than in 1958. Compounding the problem of lower yields, and partly causing them, was a prior decline in area harvested. This was mostly due to a deterioration, through neglect and lack of funds, in the rather sophisticated irrigation network on Java. As the extent of controlled irrigation declined, so did the area successfully double cropped. Inadequate and uncertain water supplies also led to lower yields (*1*).

The failure of the farmer to treat his rice in the political spirit desired intensified the foreign exchange demands of imported rice. From 1961 to 1963 over a million tons a year were imported, and then the foreign exchange simply ran dry.[24] Imports the following three years averaged only 290,000 tons and rice prices spiraled out of control.

Since marketing is the glue that holds an economy together, the economy in the mid-1960s was quite literally coming unglued. Typically, the highest retail rice price in provincial capitals in Indonesia would be four times the level of the lowest retail price. The entire economy, rice marketing an important and special example, was unable to perform the very basic tasks of marketing—matching the seasonal and the regional price differences to the costs of storage and transportation.

But the government's penchant for intervention made matters far worse. Rice mills could operate only for the government. Despite attempts by the central government to regain control of regional rice price and trade policy from regional administrators, authority and proper communications were lacking, and most regional administrators protected their own local interests before thinking of Jakarta. Since the national government was unlikely to be of much help in times of shortage, most regional administrators simply prohibited the export of rice from their regions, no matter how low prices fell. Rice trade was easily taxed, especially at military checkpoints, and it probably provided the bulk of finance for surplus and deficit regions alike. "Rice policy, such as it was, emphasized con-

[24] The first "Survey of Recent Developments" in Volume 1 of the *Bulletin of Indonesian Economic Studies*, June 1965, pp. 2–3, made the following observations on availability of foreign exchange. "Indonesia's trade has been declining in recent years. Exports have fallen steadily since 1959 from the annual level of about 900 million dollars which prevailed in the fifties, largely because of lower prices. Imports have contracted even more sharply since 1961, restoring the normal balance of trade surplus. However, there have been large deficits on current account in the balance of payments, owing to heavy invisible imports (especially transport costs and oil company profits). These deficits have been caused by borrowing and running down reserves. Net funds from these two sources, which averaged over 300 million dollars annually 1961–63, have now contracted owing to mounting repayment obligations and the extremely low level to which foreign exchange reserves have sunk. Though Soviet loan repayments have been rescheduled, and though new credits are still available, it appears that current exports of goods and services will have to balance imports this year for the first time since 1959. This explains the government's anxiety to stimulate exports and prune imports as much as possible" (*25*).

sumer interests and local revenue generation. It is no wonder that production suffered and prices were unstable."[25]

The Stabilization Years of the New Order, 1966–70

Rice as a tool of stabilization and stable rice prices as the intended result date back at least to Sunan Amangkurat I. But no government since Dutch colonial times has pursued the goal with quite the intensity, resources, or skill that the Suharto government brought to the task during the last third of the 1960s.

The abortive coup attempt late in 1965 seemed the climax of a nightmare, except the unreality of the previous half decade turned out to be real. The year ended with a 1,000 to one revaluation of the rupiah. By March of 1966, when leadership was transferred to the triumvirate of General Suharto, Adam Malik, and the Sultan of Yogyakarta, an evaluation showed no rice in the warehouses of the food agency (then called BPUP), no foreign exchange in the treasury, and an inflation rate of 600 percent per year. The first task was to find new supplies of rice.

> In the Months December 1965 to March 1966, there was an acute shortage of rice, particularly for government employees and members of the Armed Forces. There were sufficient stocks in the free market, but depletion of government stocks led the authorities to reverse the earlier decision to stop imports. . . .
>
> Some Indonesian experts doubt whether Indonesia needs to import rice in the sense that domestic production is insufficient if properly distributed to meet reasonable minimum requirements of the population. Even these experts, however, agree that imports of rice (of the order of $30 million) will be unavoidable because the Government is unable, organisationally and politically, to purchase from domestic sources the rice needed by the Armed Forces and for distribution in kind to government employees. To import rice for these purposes is both easier (to the cities by ship from abroad than by land transport from the villages) and cheaper (at the unrealistic official exchange rate applied to government transactions). Any attempts to do without rice imports would run into strong opposition from the politically powerful beneficiaries, the military and the bureaucracy (*25*).

The importance of obtaining rice for these groups, especially the military, is reflected by the highly uncertain political situation immediately following the coup attempt. The military had crushed the coup, but Sukarno was still in power. His sympathies, moreover, remained with the coup organizers, and so the military was left to fend for itself. To do so, a network of national logistical commands was set up (KOLOGNAS) to provision the military and civil service. It obtained some rice domestically, but the bulk of its supplies came on special arrangement from Burma and Thailand and from a surprisingly fast offer of PL 480 rice from the United States.

There was no hope for stability in 1966. The budgetary process was too disrupted, the political situation much too unsettled, and the economy too shattered

[25] Afiff and Timmer (*1*, p. 135). A great deal more could be added about the details of national rice policy during the Sukarno era, but the essence is sufficiently conveyed above. The BULOG reference volume is the best source for further information (*3*).

for hopes of anything but mere survival. And although rice prices increased more than threefold during the year, the country did survive, and by early 1967 General Suharto emerged sufficiently powerful to set the country on a course of stabilization. The military emergency over, the KOLOGNAS network was disbanded and replaced with BULOG, the presently functioning Food Logistics Agency, directly under the control of the President.

For once the stabilization strategy involved more than massive injections of imported rice. From budget deficits double and triple the total government revenue, the budget was to be balanced, quarter by quarter. From government loans with annual face values of 6 percent per year and negative real values, loans henceforth charged a real positive rate of interest commensurate with the capital scarcity in Indonesia. *Monthly* interest rates early in 1967 from the State Bank ranged from 6 to 9 percent depending on the priority of the sector involved. By mid-July it was possible to reduce them to 3 to 5 percent per month.

The food supplies side of stabilization required a double-edged attack. Large imports of food aid commodities, mostly rice and wheat flour, were arranged to keep rice prices under control directly. But the counterpart rupiah funds were channeled to the government's Development Budget, which in the first few years was to draw almost exclusively on aid financing for support. The Routine Budget was financed entirely from domestic revenue collections, especially import duties. Ultimately the surplus from the Routine Budget was also channeled to the Development Budget.

The inflation rate was reduced from 650 percent in 1966 to 120 percent in 1967. Still, the year was very nearly a disaster for the new government because rice prices were less stable than the overall price level in the economy as a whole, something of a reversal for Indonesia. Early in the year rice rations were discontinued; the rice agency simply ran out of supplies. The situation eased as the wet season harvest arrived in May and some imports also started coming in. The old trade-off between short run and long run was resolved in the historic fashion, but new sentiments were being heard.

> There was a strong case for using . . . foreign exchange to buy fertilizer rather than rice. There was indeed increasing recognition of the shortsightedness of a price policy which, by artificially keeping down the price of rice while allowing the price of imported fertilizer to rise through currency depreciation, made it uneconomic for farmers to buy fertilizer to expand rice production. But to tackle the problem by raising the price of rice was enormously difficult politically; and to reduce the price of fertilizer would require new subsidies in the teeth of the Government's resolve to abolish subsidies (25).

Still, the Ministry of Agriculture did agree to carry a subsidy on urea fertilizer or *rupiahs* (Rp)/kilogram, permitting a reduction in its price from Rp 21.5/kilogram to about Rp 18.

Despite the government's resolve to keep rice prices low and despite a fairly successful domestic purchase program that brought in over 500,000 tons of milled rice in the face of obvious administrative and financing difficulties, limited supplies in the world export market due to strong competition from China, Japan,

and the Philippines meant there was not enough rice available to meet demands. A severe food shortage gripped Indonesia when the dry season rice crop turned out to be sub-average. From the harvest low at the end of May rice prices doubled by the end of October and redoubled by mid-January 1968.

> One result of the rice crisis was an increase in the cost of living in September which ruled out any possibility of keeping the rate of price inflation for 1967 as a whole within the 65 per cent target. Since the cause was from the side of supply, not demand, this did not necessarily imply a serious impairment of inflation control, however painful the additional burden on those with low and relatively fixed incomes. Until the next harvest, the food situation seemed likely to remain a major preoccupation for the Government, not least for its political implications. The student newspaper's editorial comment that "rice is the barometer of the economic situation in Indonesia"[26] was bad economics but important politics.
>
> Provided, however, the food situation remained manageable, politically as well as socially, the September rice crisis, not unlike the August banking crisis, might in retrospect appear to have been a blessing in disguise. After the deliberate increase in public utility charges and other previously subsidised prices in February, the uneconomically low price of rice had remained as the single most important distortion of the price structure. Until September it seemed doubtful whether the Government would be willing to court political trouble by raising the price of rice closer to the cost of imported rice or to the level at which it would pay farmers to buy fertilizer to produce more rice. The September crisis forced the Government's hand (*25*, pp. 32–33).

The crisis refreshed short memories as to the key role of rice in any stabilization scheme. It accounts for 31 percent of the Jakarta cost of living and has important indirect effects on other economic sectors due to its dominant role as the wage good.

> But the psychological and political significance of the price of rice is much greater still. It was the fact that to most Indonesians the price of rice is the touchstone of price stability which made the confidence reactions to the sudden rise in the price of rice in September and again in January so devastating. If ... both the rise in the cost of living and in the exchange rate went further in December and January than the domestic monetary situation would have led one to expect, the main explanation is undoubtedly the collapse of confidence that followed the government's loss of control over the price of rice (*25*, pp. 3–4).

The hard-learned lessons of 1967 had immediate returns in 1968. The government decided to pay farmers an incentive price for their surplus rice, based on the *Rumus Tani* (farmer's formula), which says the price of milled rice and urea ought to be about the same for the farmer. Complementary to this incentive was a major effort to extend and improve the BIMAS (mass guidance) rice intensification program, which had its beginnings in an experiment at the Bogor Agricultural Institute in 1962–63. Fourth- and fifth-year students were sent to live in villages with farmers and demonstrate modern agricultural technology. The

[26] *Harian KAMI*, September 14, 1967.

yield results were very impressive, nearly five tons of dry stalk paddy per hectare higher than nonprogram yields in 1965, when about 10,000 hectares were in the program.[27] By 1966 the various universities participating had withdrawn because the government tied the BIMAS credit repayment to rice agency procurement, at low prices, a plan that doomed the earlier "padi centers." In 1966, under complete auspices of the Department of Agriculture and its extension agents, the program encompassed over one-and-a-half million hectares, with dry stalk paddy yields exceeding nonprogram yields by only 2.1 tons per hectare.

While the regular BIMAS program went forward as usual in 1968, shortages of fertilizer supplies and domestic credit led the government to try another approach as well, BIMAS *Gotong Rojong* (BGR, or "mutual self-help program"). The government contracted with several foreign companies (CIBA, Geigy, AHT, Hoescht, Mitsubishi) to provide rice areas with fertilizer and pesticides to increase yields. Seed, cash allowances to the farmers, and equipment and advice to extension workers were also to be provided. In actuality, however, the contracts were mostly for suppliers' short-term credits for fertilizer and pesticides of their own manufacture (some of which were of dubious relevance to Indonesia and some of which were disastrous, such as the pesticides that killed the fish in rice paddies). These credits, plus a substantial management fee, were to be paid within one year by the Central Bank on the basis of a fixed fee per hectare. BULOG was to collect as repayment one-sixth of the stalk paddy harvest from farmers put under the program.[28] "Relative to what had been achieved under earlier programs, and relative to the availability of most production inputs on soft-loan terms, BGR was a production and financial failure. The quantity of padi received from the farmers as repayment of the credit was substantially below expectations. The shortcomings had to be drawn from budget revenues to enable payment by the Central Bank to the contractors, and this was a serious drain on resources" (*1*, p. 140).

Since BULOG still needed substantial imports to meet its distribution requirements, the foreign exchange used for BGR was a double loss. Nevertheless, 1968 was a good year for rice price stability. An excellent harvest and the incentive price paid by BULOG permitted domestic purchases of 600,000 tons. Imports exceeded 625,000 tons. Prices in Jakarta in December 1968 were actually lower than in December 1967, and they continued to decline through the preharvest period from January to March 1969. Prices continued to fall throughout the 1969 harvest to very low levels, as BULOG was unable for administrative reasons to buy more than 200,000 tons despite a good wet-season harvest. A poor dry season, plus a shift in crops away from rice by farmers disappointed in the prices of the wet-season crop, left supplies smaller than anticipated. BULOG's failure to purchase adequate quantities domestically and reduced concessional imports, due

[27] The BIMAS program has been the subject of extensive discussion. For the history of the early program, see Rockasah and Penny (*21*); for a mid-life review, Mears and Afiff (*12*); and for a recent major analysis, the BIMAS Evaluation Survey (*20*). The following discussion draws heavily from the summary by Afiff and Timmer (*1*).

[28] "Put" is the operative word here. The farmers had no choice in participation, nor in selecting amounts or types of fertilizer or pesticides. They did control whether the fertilizer was applied (much was sold in black markets), but a good deal of pesticide application was by airplane. In some instances livestock and villages rather than sawah were sprayed.

to a good harvest and low prices, meant inadequate stocks late in 1969 to keep rice prices stable. The situation was brought quickly under control, again with emergency imports, [with seriously inadequate financial accounting], but the experience served to burn anew the just-healed scars of 1967.

MODERN INDONESIAN RICE POLICY

The Evolution of Current Policy, 1970–73

Although the First Five-Year Development Plan (Repelita) was drafted in 1968 and inaugurated April 1, 1969, it was a document of the seventies. It was formulated on a premise of stability which came to full fruition in the 1970–72 period, and it was built around self-sufficiency in rice. The plan fortunately did not spell out program details. The failure of BGR and the BULOG domestic purchase program in 1969 required major changes if self-sufficiency were to be achieved. And major changes in both areas were soon forthcoming. The poor performance of BGR especially was interpreted as a failure of the command nature of the program. When BGR was suddenly discarded in mid-1970, it was replaced by a highly incentive-oriented "perfected BIMAS" organized around village units. The program stressed getting profitable inputs, subsidized credit, and information out to the farmers and letting them decide whether and how much to participate. Fertilizer distribution was partially turned over to the private market, with a charge to sell for no higher than the ceiling price of Rp 26.6 per kilogram for both urea and triple super phosphate. The price required a subsidy to distributors of Rp 7–8 per kilogram (in 1971) which was covered from the Development Budget.

The second innovation was to implement an effective floor price for stalk paddy. With the lesson learned several times over that farmers do not like to repay debts with stalk paddy at below market prices, BULOG was instructed to prevent the price of village dry stalk paddy from falling below Rp 13.2 per kilogram. Earlier attempts to use the Rumus Tani as a guide to price failed due to great uncertainties on the part of local BULOG agents as to just what price to pay. In 1968, for example, it ranged from a low of Rp 27 per kilogram for milled rice in Lombok, to a high of Rp 46 near Jakarta. Such regional variations might have made sense in terms of the realities of local fertilizer prices, but they did little to help integrate the Indonesian rice economy.[29] With a national fertilizer price ceiling established, it was possible to establish a national floor price. Although the floor price was stated as Rp 13.2 per kilogram for stalk paddy in the village, it was implemented by having BULOG pay Rp 36 at rice mills.[30]

With such forceful actions taken in behalf of the farmer, the government felt it could likewise commit itself to a nation-wide ceiling price for rice. Medium quality rice in urban markets was not to sell for more than Rp 50 per kilogram. This permitted an expected spread of between Rp 8 to Rp 10 per kilogram between the seasonal low price and the seasonal high price. Although this margin was very

[29] See, for instance, the "Survey of Recent Developments," February 1968, p. 28, by Ponglaykim, Penny and Thalib for a discussion of regional price variations (*25*).

[30] A full discussion of the price-oriented program is found in BULOG (*3*), and an analysis is provided by Afiff and Timmer (*1*).

narrow in terms of prevailing interest rates, the private trade did seem to find it profitable to carry stocks in 1970 and 1971.

By mid-1972 the new programs looked like major success stories. Rice production was exceeding the high targets set in Repelita, BULOG was so successful it took over handling responsibilities for wheat flour and sugar, and the National Planning Agency (BAPPENAS) and Ministry of Finance were trying to find sources of revenue to take the place of food aid counterpart funds, which seemed about to disappear.

Instead, the generally good weather from 1968 to 1971 ran dry. In addition, BULOG moved too fast to improve its buying standards in order to reduce storage losses, and ended up buying very little rice in 1972. In a repeat of 1969 (and 1967), the dry season was poor, BULOG stocks ran out, and imports were suddenly hard to find. The government lost control of the rice situation and reverted to emergency imports as the solution. More than a million tons of very expensive rice poured into Indonesia from mid-1972 to mid-1973. A year earlier it had seemed that no imports at all might be needed.

A new government procurement policy for 1973 emerged almost unnoticed from the 1972 rice crisis. Since 1970, when the original village units had been organized as part of the "perfected BIMAS" scheme, a number of village unit cooperatives had performed custom rice milling and even purchasing for their members. Complaints were heard during the wet-season harvest in 1972 that the new BULOG buying standards had prevented the cooperatives from selling any rice to BULOG because the milling equipment was small scale and produced 30–40 percent brokens. East Java alone, it was said, could have provided 400,000 tons of milled rice if only BULOG would have been willing to buy it.[31]

For 1973, the government declared that the village units, or *Badan Unit Usaha Desa* (BUUD), would play a major role in rice procurement by purchasing from the farmers, processing in their own facilities, and selling to BULOG. It was expected that about half of BULOG's target of 900,000 tons from domestic supplies would come from the BUUD.

> What seems actually to have happened in East Java is that in the first half of May, the first two weeks of the delayed wet-season harvest, the BUUD were instructed to pay farmers only Rp 18–19 per kg of *gabah* [rough rice]—only marginally above the then ruling support price—and to sell milled rice to BULOG at Rp 45 per kg. Since the market ex-mill price was reported to be about Rp 55 per kg, and the price at farm level therefore presumably at least Rp 22 per kg, there was widespread reluctance by farmers to sell to the BUUD. The provincial government, apparently anxious to prove to Jakarta its ability to meet the BULOG procurement target for the province, thereupon gave orders that farmers must sell to the BUUD first.[32] According to press reports, soldiers were employed in some areas to enforce the order, and on 18 May a regulation was issued banning rice shipments from one province of Java to another so as to "pre-

[31] Considerably later in the year BULOG tried to take them up on this, but whatever stocks there were had already been sold elsewhere.

[32] "In places where no BUUD was in effective existence, the order was reportedly complied with by an official representing the BUUD sitting in the private rice miller's office and certifying, for a fee, that the paddy had been sold to a BUUD" (*25*).

> vent speculation by profiteers who bought up large amounts of rice at one place and sold supplies at another place where they were short...."
>
> The attempt to force farmers to sell to the BUUD below the market price is liable to have undermined the incentive of farmers either to produce more rice or to support the new scheme for rural cooperatives (25, p. 7).

The shakiness of the commitment to real incentives for farmers is not merely a function of the prominence in the government of the military with their normal and understandable preference for commands which explains some of the more obvious short-run abuses. But the fundamental and underlying problem is a failure to appreciate the desirability and even necessity of adequate incentives for farmers as part of a production program. This more fundamental problem clearly traces much further back, and it underscores the fact that a true incentive program for rice intensification has never been given a fair test in Indonesia.

Objectives, Policies, and Constraints

The interaction of objectives and constraints in the formation of Indonesian rice policy has been implicit throughout the discussion. It is time to indicate explicitly how constraints on Indonesian policy makers molded their decision processes as they sought to reach their objectives. Policy making is never static, and the major reason for presenting the historical evolution of rice policy was to set the proper dynamic context.

It should be obvious from the list in the first article that Indonesia has pursued a large number of potential objectives in its rice policy, and with sharply varying weights over time. Early Dutch objectives stressed generation of government revenue very highly, mostly from the land tax. The most visible constraint on this policy was the farmers' ability to pay. Only when tax arrears reached substantial proportions was the government willing to charge import duties (or increase them). Farmer welfare did not enter significantly as an objective in its own right until the "Ethical Policy" of the early 1900s. Consumer welfare and price stability must also be accorded substantial weight in Dutch objectives. The Dutch themselves worked in and ruled from the cities; urban populations were more articulate and concentrated than those in the countryside. The continuously visible constraint was the possibility of urban uprisings during rice shortages. It was much better to prevent such uprisings at a welfare cost to the farmer than to suppress them by force.

The Dutch policies of the 1930s seemed to reflect a broader-based set of objectives. At a time when the Great Depression was causing country after country to turn inward in search of solutions, the Dutch emphasis on self-sufficiency within the archipelago made some sense. But the command nature of the solution is still somewhat difficult to understand. Perhaps, in light of Boeke's doctrine of dualism and the economically unresponsive peasant, the Dutch felt that normal incentives would simply go unanswered—a certain binding constraint on their successful implementation. Whatever the reasoning, the result was to set a frame of mind for a whole generation of Indonesian leaders. The potential lack of immediate economic response to incentives seems to loom large in most Indonesian minds as a serious constraint on policy making. It is, unfortunately, a constraint

that appears larger the more immediate and pressing is the problem. Since Indonesia has been living in a perpetual series of short-run crises, a true test of economic responsiveness (for example, by rice farmers) has never been attempted.[38]

Early Indonesian policy makers inherited the same set of constraints faced by the Dutch and, somewhat surprisingly, most of the same objectives. Not surprisingly, the resultant policy instruments were little changed as well. However, the persistent inflation created by the Indonesian government in its early years soon presented a dilemma: how to protect civil servant and military standards of living on fixed money incomes without further feeding the inflation by large-scale pay raises. Here, maintaining the welfare of a very special class of consumers became a major objective of the government. The operative constraints this time were less involved with the functioning of the real economy and much more tied into the governmental process itself. Inflation was inevitable in the absence of the bureaucratic resources (or possibly the economic base, although this is less certain) to collect enough revenue to meet the desired budget expenditures. But the inflation weakened the bureaucracy still further by undermining its salaries. To cut into this vicious circle the government embarked on a whole new policy direction—distribution of part of the salary in kind, especially in rice.

There was no obvious intent at the start that this policy would be at the expense of farmer welfare, and no necessity that it be. But the constraints that made the policy desirable in the first place made forced government procurement at below market prices almost inevitable. How else could government expenditures be held under control than by buying the rice as cheaply as possible? Otherwise, the civil servants might just as well be paid a cost of living allowance in cash with significantly less logistical effort.

The critical objective/constraint interaction for domestic Indonesian rice policy in the late 1950s and 1960s was therefore the almost inexorable requirements of the rice ration and its interaction with the inflation that resulted from weakness in the budgetary process. But its impact went well beyond the practice of buying as cheaply as possible from farmers. The necessity to maintain adequate distribution stocks, when coupled with the omnipresent objectives of maintaining low and stable consumer prices in the cities, meant that substantial imports of rice were required. These imports were a major drain on Indonesia's foreign exchange, and it was concern for the deteriorating balance of payments rather than farmer welfare that dictated the several rice intensification schemes in the first two decades of the Republic's history. All of those schemes foundered, however, on the necessity of the government to collect cheap rice from the farmer. The need to meet fixed distributions of rice rations was ultimately driving the system.

The intensity of this driving mechanism was furthered, not lessened, as the Suharto government gradually took power. By then the budgetary process was an absolute shambles, the inflation had totally eroded the buying power of a civil servant's money wage, and the only claim the government had on its bureaucracy and on the military was the salary it paid in kind. No government could afford

[38] It is possible that the constraint was interpreted as weakness in the marketing system itself, so that economic incentives would not be felt by the various agents. The net effect is the same although upgrading a marketing system is probably easier than teaching unresponsive farmers to become economic men. As such, this view would have been even more shortsighted.

to lose this last vestige of authority and still hope to rebuild a viable civil service. Certainly the New Order placed the highest priority on it in the first few years of its existence.

But this time a long-run economic vision seemed to appear behind the short-run political necessities. While the problem of making the civil service an efficient, honest, and workable bureaucracy continued as one of the major tasks facing the government,[34] a great deal of progress had been made since the mid-sixties. By 1970 serious plans were drawn up to phase out physical rice rations gradually. Indeed, such plans were first made in 1968, only to be cut short by the mild shortage in 1969.

Even with the rations intact, the evident stability in both rice prices and the general economy made them seem less important to both recipient and distributor. The availability of large quantities of food aid rice from the United States and Japan significantly altered the foreign exchange constraint (as have soaring revenues from Indonesia's oil exports in the past several years). If the government had any new objectives with respect to raising farmer welfare, the old constraints were sufficiently relaxed to make possible a significant effort. The following statement on self-sufficiency from Repelita I should be interpreted in this light.

> Production of food will be increased at a rate that will permit within the next 5 years the elimination of rice imports. A supplementary aim is to improve the nutritional value of the consumption of the average Indonesian through increasing the production of foodstuffs which contain animal as well as plant protein, especially fish, nuts and beans. The positive effect of achieving the above objectives is that Indonesia will not have to import rice, which means that scarce foreign exchange can be used to import the capital goods and raw materials needed for the development of other sectors, especially the industrial sector. Moreover, increasing the production of food will result in raising the income of the food producers. This will improve the standard of living of the farmers who for such a long time have lived in poverty and misery (*19*, pp. 4–5).

Beginning in 1970 the rice intensification scheme was reinforced by efforts to pay farmers an incentive price for their rice. Naturally, this policy did not mean an abandonment of consumer interests, and the ceiling price policy was in fact implemented much more vigorously by BULOG than the floor price policy. No attempt was made to argue that urban consumer interests no longer counted. But just as when a situation is deteriorating, all the circles are vicious, so too when a country starts back the return path, at least some of the circles become beneficial. This was the impact of stability. Once stability was established in the minds of both the people and their leaders, new objectives suddenly became feasible that were impossible before. Stability meant that rice rations were not quite so critical to the recipients and that they were not so difficult to obtain. With the pressure off, the traditional low man on the objectives list in Indonesia, the farmer, could finally be helped. But it all depended on stability.

The new floor price policy was designed both for its production effects and for its contribution to farmer welfare. In spite of the constraints BULOG was

[34] For a good discussion of the so-called *pegawi* problem, see the "Survey of Recent Developments," November 1972, pp. 24–30, by P. McCawley (*25*).

under, especially the practice of its regional agents allowing (even pushing) the price of rice at harvest to fall as low as possible before making purchases, implementation of the floor price was successful. Certainly the farmers seemed in a much improved position relative to 1969. But defending the interests of farmers was not automatic for BULOG. Its changed buying standards and apparent unconcern about delays in opening purchase credits for the wet-season harvest in 1972 hit hard at farmer welfare.[85]

From there the story runs as if carefully rehearsed. Domestic procurement fell far short of expectations, partly because of a poor wet-season harvest. Imports had been cut back because of large stocks and good progress in the rice intensification program. Suddenly rice prices started rising, and there was no way to stop them. They reached the ceiling of Rp 50 per kilogram and then doubled that level in some cities, including Jakarta. Emergency imports became the stopgap. In an attempt to improve procurement for the 1973 wet season the BUUD (village units), presumably with greater concern for farmer welfare, were given a role. But their overnight role created by the central government had the unmistakable scent of authoritarianism, and low-price procurement at gunpoint quickly replaced incentives.

The ultimate interactions among stability as an objective, stability as a constraint, and the question of how crucial the rice ration and urban rice prices are for the rice logistics agency are recurring themes in Indonesia's history. A broad view of whose welfare counts depends precariously on a stability that has been repeatedly snatched away. It is almost as if the gods will not permit that extra year of good weather, which would provide more time for policies to work and for events to move at a pace that can be judged and evaluated. This perspective raises, rightly or wrongly, the specter of historical determinism.

EVALUATION OF MODERN RICE POLICY

Impact on the Rice Economy

It is very easy to lose sight of the real economy when talking about policy, and it is especially easy to lose sight of trends in rice production and consumption when rice policy is so heavily oriented toward price stability. A proximate evaluation is made merely by looking at rice prices, but clearly the production and consumption interactions that determine rice prices are the important variables in the long run.[86]

Under the influences of generally good weather, much improved availability of inputs under the BIMAS program, and profitable prices for output, rice production rose dramatically between 1967 and 1971, from 9.05 million tons of milled rice to 12.77 million tons, an increase of 41 percent.[87] This expansion should be compared with the mere 3 percent increase from 1960 to 1967.

[85] The delays were in the Ministry of Finance and the Central Bank. Neither agency appreciated the critical timing involved, and BULOG did not push its case hard enough.

[86] A further reason for evaluating policy success and failure on the basis of prices is that these are promptly reported and fairly accurate. Production statistics take years to report and are of limited accuracy. Consumption is determined from production statistics, imports, and what little is known of stock changes.

[87] A small part of this increase, approximately the difference between 12.5 and 12.8 million tons, is accounted for by improved statistics.

Even more remarkable is that net supplies available for consumption increased more rapidly than production during this period, from 8.86 million tons in 1967 to 12.75 million tons in 1971, because of increased imports. The recovery in per capita consumption levels has been especially dramatic, and levels since 1969 have exceeded any previous level in Indonesia's history. Clearly, the rice policy was successful in these gross terms—increased production and increased consumption. The increased consumption especially reflected higher per capita incomes as the deteriorating economy was repaired, new investment started to flow, and stability seemed assured. The pronounced preference of the great majority of Indonesia's population for rice as the basic foodstuff, when it can afford it, was emphatically demonstrated in the 1967 to 1971 period.

The 32 percent increase in per capita consumption of rice during this period did not stem entirely from increased incomes, however. While urban rice prices were being carefully stabilized below the Rp 50 per kilogram ceiling throughout Indonesia, the prices of other commodities were still increasing. These commodities included both the directly competing foodstuffs such as maize, cassava, sweet potatoes, soybeans, and peanuts, and other nonfood items in the average consumer's budget. Especially over the four years from early 1968 to the end of 1971, rice became a significantly cheaper food, and further substitution into rice was made in the light of fairly substantial own- and cross-price elasticities.[38]

By mid-1971 it was possible to suggest that the government's new rice policy had been a major success:

> The price policy that has been part cause and part effect of this effort has emphasized stabilization around an equilibrium price level, not support above it or control below it. But the extremely wide spatial and temporal price variations that prevailed in Indonesia prior to the present policy gave scope for both price support and price control. The government, by breaking down barriers to trade, building infrastructure, encouraging the private trade, and utilizing a government agency to enforce reasonable seasonal price limits, was able to provide improved price incentives to farmers and better price protection to consumers. Farmers responded by using more inputs and producing (and consuming) more rice. Consumers reacted, through higher incomes and better relative prices, by consuming more rice. The stabilization policy has apparently had real welfare significance for a large proportion of the population (*1*).

But even in 1971 the impact of the lower real price of rice on incentives for the farmer was an issue. It was pointed out that continued subsidies on inputs, especially fertilizer, would leave the farmer's benefit/cost calculations unchanged:

> But it is total real income that the farmer is ultimately after, not a benefit/cost ratio, and here the cost reducing technology is crucial. Even lower prices can lead to higher profits if the average costs of production fall fast enough. And this is the ultimate promise of the miracle seeds. If this strategy could be successfully implemented, it would provide progressively cheaper rice as agriculture's contribution to development. Achieving this agriculture-to-other-sectors transfer seems to be a critical factor in achieving

[38] See Table 3 for estimates of magnitudes of some of these elasticities, and Timmer (*27*, *29*) for further discussion of trends in rice consumption and their causes.

self-sustaining economic progress. Whether it is too soon for Indonesia's rice sector to play this role is not yet known, but the answer is likely to emerge before the end of Repelita I (*1*).

It was too soon. Production in 1972 declined from the 1971 peak. Bad weather was obviously a major factor, and yet it does not totally explain why fertilizer applications stagnated at 1971 levels as well. The progressively lower real prices to farmers almost certainly played a role. Incentive prices work so long as they are incentives.

Efficiency of Rice Policy

Because the political economy framework has not been implemented in a quantitative fashion, the discussion of efficiency of rice policy must be impressionistic at best. A number of issues emerge from the previous discussion that bear directly on how well policies have worked and whether alternatives might have been feasible and desirable. In addition, earlier cross-country analysis of rice price policy raised interesting questions about Indonesia's strategy (*32*).

Perhaps the most basic question about the efficiency of Indonesia's rice policy deals with how hard it would have been to break what was taken to be the binding constraint—the political importance of providing physical distribution of rice rations to a large civil service and military establishment. As noted throughout the previous discussion, this issue was intimately connected with some of the hardest economic and political realities of the Indonesian situation, including the unmanageable inflation, the need for low and stable rice prices in the city, and somewhat later, the role of the military in preventing the 1965 coup, and its subsequent role in the government. To suggest that any of these realities could have been ignored is naive. But the critical factor seems to have been the unmanageable inflation. Once inflation was controlled, and it was by 1968, the new government could have moved much more vigorously to reduce physical rations, to turn significant portions of the rice economy back to the private, monetary sector. Rice prices would probably have been somewhat less stable, it is true, and BULOG's role in market injections somewhat larger. But at least in retrospect, these changes would have relieved some of the pressure on BULOG supplies in 1972 and 1973, and thus farmers would probably not have been squeezed quite as hard as they were. The private market would have paid them the going price, whereas the government tried not to.

Even in 1970, when the evidence seems to show that farmers were receiving an incentive price relative to earlier years, Indonesian farmers received among the lowest prices for their rice, relative to the price they paid for fertilizer; only prices in Burma and Thailand were lower. Assuming a response to fertilizer similar to that of other Southeast Asian countries and price-responsive farmers, it is reasonable to ask why self-sufficiency was not achieved by paying somewhat higher rice prices—prices that would still be only average for that part of the world.[89]

A different set of rather technical constraints seems to have prevented this

[89] Details of the analysis of covariance estimates of the elasticity of rice production with respect to fertilizer (and area), indirect evidence on price responsiveness, and a preliminary discussion of Indonesian self-sufficiency are contained in Timmer and Falcon (*32*).

strategy, apart from its obvious conflict with the objective of maintaining low prices for the cities and the weaker conflict with price stability (stability at somewhat higher prices is still stability). Self-sufficiency could not have been achieved in 1970 and 1971 by moving up the short-run supply curve because of the interaction of an internal and an external constraint. The external constraint was the availability of very low-priced rice in Southeast Asia. Quotations out of Singapore, Rangoon, and Bangkok ranged as low as $75 per ton, which compared with the ex-mill floor price of about $95 per ton at the prevailing exchange rate. Even though all rice imports were handled by BULOG on government account, this cheap rice served as an effective constraint on price rises within Indonesia. It has been said that God intended Indonesia for free trade. Thousands of miles of unsupervised coastline and customs officials who are frequently willing to look the other way for a price mean the smuggling potential is so great that the internal price of rice cannot be much higher, after allowing for transportation and risks, than the prevailing prices for low quality rice in nearby markets. Although this phenomenon is set forth here as an external constraint, the Japanese experience indicates that a sufficiently vigorous and honest customs service could break the constraint. In this sense, perhaps, it is an internal constraint, dependent upon the general administrative efficacy of the Indonesian civil service.

The more narrow internal constraint preventing higher prices to farmers is also administrative. BULOG, after very serious administrative difficulties in 1969 in implementing a rather vague incentive price program, was in no position in 1970 or even 1971 to defend a floor price higher than the already indicated Rp 13.2 per kilogram of village dry stalk paddy (or Rp 36 per kilogram of milled rice at the mill). Complaints were heard during these two years of prices below the floor, and although the evidence on average prices for stalk paddy showed a dramatic improvement over 1969, there clearly were specific instances in most of the surplus areas where prices were too low. BULOG had a hard enough time switching from its historic goal of a quantity target at the lowest possible prices to a price target at whatever quantities resulted. An inevitable tendency resulted for local agents to sit and wait for rice to come to them at the floor price. Much more effort was needed to implement the existing policy, an effort that was not completely forthcoming despite considerable pressure. BULOG did in fact spend considerable energies in upgrading its staff, and many observers felt it was the strongest government agency administratively. Nevertheless, the interaction of external prices and internal administrative capability ruled out higher prices as a strategy for self-sufficiency.

In the discussion of the efficiency of Indonesian rice policy, one last issue is important: the knowledge base on which such policy is formulated. In 1971 eight major areas of research were outlined as pressing. None of them has received adequate attention in the interim. The virtual vacuum of reliable quantitative data and analysis leading to a meaningful understanding of the structure of the Indonesian rice economy and especially of probable quantitative responses of producers, traders, and consumers to changes in rice policy serves as a very severe constraint on almost any policy change. But the significance is even greater than providing a rationale for the status quo. The lack of knowledge about probable responses from the private sector makes government decision makers reluctant to trust

the private sector at all. In other words, in a crunch, when change is inevitable, the government response is more likely to be of a "command-type" than an "incentive-type" because of uncertainty. It is safer to order the farmers to deliver rice than to trust the market. In the long run this response may be the greatest inefficiency of all.

The Welfare Impact of Rice Policy

If welfare could be measured simply by how much rice is consumed per capita, the judgment would be relatively straightforward. Indonesians are consuming more rice than ever before. But this simple measure, while appealing and not without some merit, misses at least two major aspects of welfare, even within the narrow context of the food input to the total welfare function. First, Indonesians consume other foods than rice, and second, not unrelated, an average consumption figure masks a tremendously wide variation in individual consumption levels.

Some recent trends in consumption of the six basic foodstuffs are summarized in Table 4. Although rice consumption increased at an annual rate of 2.8 percent over the 1968 to 1971 period, when rice policy was most effective, the other major carbohydrate sources fell behind. Maize consumption dropped by over 3 percent per year, cassava by more than 4 percent, sweet potatoes by nearly 5 percent. The protein sources fared slightly better; the decline in peanut consumption was about offset by the increase in soybean intake. The total intake of the two was little changed. The startling figures, however, are the small increase in the total rice-equivalent intake, comparable to calories, and the 3.3 percent per year decline in food intake excluding rice. How, in the face of rapidly rising per capita incomes—estimated at 5 percent per year for the period—could calorie consumption increase so little from what were already among the world's lowest levels?[40] And how could these trends be maintained, even worsened, when the comparison is with 1973?[41]

The first answer, certainly the most appealing from a welfare point of view, is that the data are simply wrong. All the effort and prestige associated with the rice intensification effort simply meant that crop reporting of the other crops suffered badly, with serious under-reporting of yields and area.

Poor statistics may be part of the answer, but the trend seems too general to brush off in this fashion. Some additional evidence suggests an alternative explanation. The critical element is what happened to rural incomes during this period. Table 5 presents data with which to form a rough judgment.

The table demonstrates that 1968 had been a good year for farmers, but 1969 caught them in a cruel squeeze. Not only did average paddy prices decline by about 30 percent, but the prices of non-food items rose by 38.3 percent, for a total adverse move in the terms of trade of more than 60 percent. The incentive price policy implemented in 1970 reversed this trend, and farmers regained about 20–25 percent or about a third of their loss from 1968. However, in 1971 an erosion again began which apparently continued in 1972, to be reversed only in 1973 and 1974. But real farm prices were clearly lower in 1971 than in 1968, and the 20 per-

[40] For a further discussion of Indonesia's calorie and protein standing see the note by Colin Clark (5, pp. 98–103).

[41] A comparison with 1972 is unfair because of the drought.

TABLE 4.—RECENT TRENDS IN PER CAPITA FOOD CONSUMPTION*[a]

Foodstuff[b]	Kilograms per capita per year						Average annual percentage increase (decrease)		
	1968	1969	1970	1971	1972	1973	1968–71	1968–72	1968–73
Rice	104.2	106.7	115.1	113.2	107.3	119.6	2.80	0.74	2.80
Maize	23.3	22.8	20.5	21.2	18.6	19.3	(3.10)	(5.48)	(3.70)
Cassava	28.1	26.7	24.7	24.6	22.6	20.2	(4.34)	(5.30)	(6.39)
Sweet potatoes	5.2	5.0	4.5	4.5	3.9	4.1	(4.71)	(6.94)	(4.64)
Peanuts	3.7	3.4	3.7	3.4	3.2	3.4	(2.78)	(3.56)	(1.68)
Soybeans	3.3	3.1	3.8	3.8	2.7	3.0	4.80	2.90	(1.89)
Total rice-equivalent weight	167.8	167.7	172.3	170.7	159.3	169.6	0.57	(1.29)	0.21
Total excluding rice	63.6	61.0	57.2	57.5	52.0	50.0	(3.31)	(4.91)	(4.70)

* Data from "Survey of Recent Developments," *Bul. of Indonesian Econ. Studies*, July 1974.

[a] In rice equivalents using the following FAO conversion factors:

Rice	1.000
Maize	0.989
Cassava	0.303
Sweet potatoes	0.269
Soybeans	0.335
Peanuts	1.517

[b] Consumption assumed to be 94 percent of production for rice, maize, peanuts, and soybeans, and 90 percent of production for cassava and sweet potatoes. Imports of rice are added to consumption.

TABLE 5.—RICE HARVEST PRICES IN THREE PROVINCES OF JAVA, 1968–1971*
(*rupiahs per kilogram*)

Year	West Java[a]	Central Java[a]	East Java[a]	Non-food price index
1968	20.14	16.84	16.67	1.000
1969	12.11	11.50	10.22	1.383
percent change	−29.9	−31.7	−38.7	38.3
1970	17.95	16.10	14.86	1.636
percent change	48.2	40.0	45.4	18.3
1971	16.82	16.37	15.38	1.731
percent change	−6.3	1.7	3.5	5.9

* BPS for harvest prices; C. P. Timmer, "A Perspective on Food Demand in Indonesia, 1968–1978," Harvard Advisory Group/BAPPENAS (Jakarta, Aug. 1972), for construction of non-food price index.

[a] Prices reported are for *Cere* No. 2 dry stalk paddy during the heavy harvest months of April to July.

cent increase in production was not enough to prevent a fairly serious decline in real incomes of rice farmers. Since rural incomes, especially on Java, are so heavily influenced by incomes from rice farming, the conclusion must be that rural incomes probably declined in the 1968–71 period despite an apparent 5 percent per year increase in per capita income for the Indonesian population as a whole.

This decline could happen only if there was a fairly dramatic shift in income distribution away from the rural sector and toward the urban (and manufacturing, mining, and oil) sector. Such a shift reconciles declining calorie consumption in the face of rising incomes. In fact, the lower half or two-thirds of the population probably had decreasing real incomes during this period, and the lower rice prices did not offset the higher non-rice prices sufficiently to maintain consumption levels of the non-rice foodstuffs.[42] The inescapable conclusion, if the statistics are approximately correct, is that a minority of basically urban consumers was considerably better off than during the mid-1960s but that a good part of the improvement was at the expense of the rural, especially farm, population. The average figures of 5 percent annual per capita growth in real income and even greater increases in rice consumption mask a very serious maldistribution of income that was getting much worse rather than better. It is too early to judge fully the impact of the events of 1973 and 1974.

PROGNOSIS

The Past as Future

The maximum that those who ignore history are doomed to relive it conveys the obvious lesson of Indonesian experience of several centuries with rice and rice policy. Historical evidence permits a hopeful view of the future. The patterns of the past will not necessarily recur if policy makers assign culpability for past crises, call mistakes mistakes, and act on the lessons of history.

[42] Retail (money) rice prices in the rural markets of Java actually rose 2.4 percent from 1968 to 1971 while a weighted index of the other five basic foodstuffs rose by 14.3 percent.

Evolution of Constraints

One of the major lessons to be learned from this perspective on Indonesia's rice policy is that all constraints have their price, at least in the long run. The problem is how to translate day-to-day concerns and ad hoc policies necessitated by very real and binding short-run constraints into a policy set that is consciously designed to break these constraints in the longer run. As long as all the old constraints remain which prompted the wrong response time after time, those responses will be forthcoming in the future. The circle is vicious, and the problem is how to break out of it. It is clearly wrong to try in the middle of a crisis, although even in a short-run crisis there are policies that will make things worse rather than better. Preventing interregional rice trade and rice procurement at gunpoint are cases in point.[43]

In retrospect it appears that a golden opportunity to make a move against the recurring constraints of fixed distribution rations and administrative incompetence was missed in the stability between early 1970 and mid-1972. BULOG should have been much more aggressive about defending the floor price and the Finance Ministry less concerned about the deficits incurred in doing so. By the 1972 harvest it would have been possible to raise the buying price by perhaps 20 percent.[44] Domestic procurement would have been much improved and the rice crisis in late 1972 and early 1973 much more manageable. An additional 300,000 tons from domestic sources might have meant the difference between completely losing control and being able to follow a rising world market price slowly and with adequate explanation to the public.

It should also have been possible to reduce and eliminate gradually rice rations for the civil service. These and equivalent ones for the military establishment have often been the driving force behind "command-type" efforts to force farmers to give up their rice at low prices. The short-run and long-run effects of such efforts are deleterious, but it will probably be necessary to remove the need before the response will go away. The stable period of 1970–72 was an excellent time to make real progress on this front, but a combination of factors prevented any action.[45] This opportunity too must await the next period of calm.

The second front where future government policy can have a significant impact on the structure of constraints it will face in the longer run involves administrative competence. Government agencies do not change overnight, and the pegawi, or civil servant, problem has been a major obstacle to rapid modernization of Indonesia's economy for the past two decades. It has become critical in the past five years, however, as the real possibilities within Indonesia's potential grasp have loomed enticingly clearer. But redundant and indeed counter-productive government employees cannot be laid off until reasonable prospects of alternative employment are available, and here the future is not promising. But this does

[43] Power, as Chairman Mao says, comes out of the barrel of a gun. But rice does not.

[44] In fact, it was lowered by perhaps 10–15 percent with the new quality standards and a shift from a price quoted f.o.b. rice mill to one c.i.f. BULOG warehouse.

[45] One of the most ironic factors, again in retrospect, was BULOG's fear of massive surpluses, unfortunately a fear partly instilled by the author. Without the monthly physical rice rations, there would be no way to dispose of aging stocks. Of course, maintaining some monthly turnover in rice stocks is important in the tropics, but the provisions for the military establishment would easily serve this purpose. In addition it might not be in the best interests of farmers or rice traders to have local military commanders responsible for their own provisioning.

not rule out progress on particular fronts, and BULOG must be prepared to implement a meaningful floor price for farmers, possibly in conjunction with the BUUD.

A third area where progress is needed and feasible is the rice intensification program. It will not go very far in the face of adverse price relationships, but incentive prices cannot meet an elastic response if the inputs are not readily available and well adapted to local conditions and if the farmers are not knowledgeable and skilled in their application. This is a large order—practically the definition of a modern agriculture. But it is a direction Indonesia must pursue vigorously. A domestic surplus of rice at incentive prices would break constraints on Indonesia's rice policies faster than anything else.

Evolution of Policy

A rural-oriented rice policy is the only way Indonesia will achieve self-sufficiency in rice. Other options are open, however. Indonesia's oil revenues are now more than sufficient to provide the massive rice imports needed to pursue a low price, urban consumer-oriented rice policy, i.e., a continuation of history. Recent scarcities in world markets have eased, and once again the pressure is off. In which direction will the government go?

Each reader is free to provide his own interpretation of how objectives and constraints will interact in the future to determine directions and policies. This writer's view, from the outside, is that inner Indonesia's only hope for the future is to opt for a rural strategy based on a renewal of Javanese village life. Industrialization can be an answer for only an elite handful relative to the tens of millions who seek jobs that will provide a better living. Agriculture and the rural village can provide these jobs if they are provided encouragement, resources, and a thriving economy in the surrounding countryside.

Most important for this strategy, of course, is a prosperous rice economy. Here the interaction of objectives, constraints, and policies comes full circle, as incentive prices help break the constraints that have thwarted development for so long. This change in direction will not be easy. Merely announcing new prices and cutting rations will not produce success. The frame of mind that generated the old policies must go, not just the policies themselves.

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