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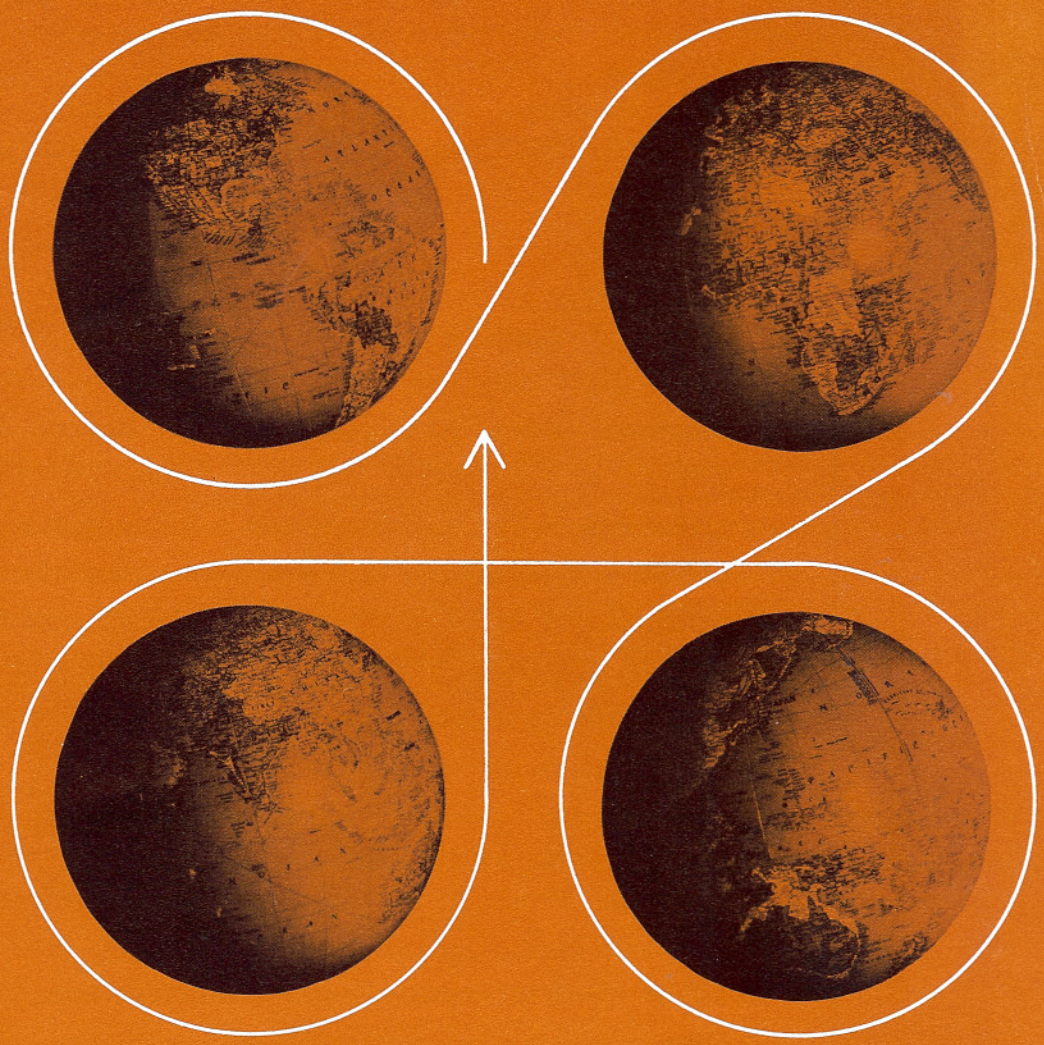

THE PHILIPPINE RICE PROGRAM - LESSONS FOR AGRICULTURAL DEVELOPMENT

Randolph Barker

DEPARTMENT OF AGRICULTURAL ECONOMICS

New York State College of Agriculture and Life Sciences
A Statutory College of the State University
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THE PHILIPPINE RICE PROGRAM - LESSONS FOR AGRICULTURAL DEVELOPMENT

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This is a short essay on one aspect of Philippine agricultural development, the rice program. It documents the success of the Philippine program in rice production emphasizing the coordinated approach followed by agencies of the Philippine government working hand in hand with with foreign donors. The Philippine experience in rice is not unique. A major issue now facing many Asian countries is how to extend the success in rice to other segments of agriculture.

The Masagana 99[1] program, launched in 1973 following the disastrous 1972 crop season, is frequently regarded as the key factor in the successful rice program. However, the basic foundation of the rice self-sufficiency program was established in 1966-70 under the Rice and Corn Production Coordinating Council (RCPCC). Following a slackening of government support in the early 1970s, the Masagana 99 program to a large extent reestablished and reaffirmed the priorities set forth by the RCPCC. However, during the Masagana 99 period greater emphasis was given to irrigation development and Agrarian reform, and this did much to sustain the growth in rice production. Between 1961-65 and 1977-81 rice production grew at over 4 percent per annum. By the late 1970s the Philippines was experiencing a new problem of finding markets for rice exports, and was beginning to turn more attention to crops other than rice.

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1. "Masagana" means "bountiful" in the local language. The number 99 signified the nominal target of 100 cavans (2.3 tons) per hectare.

Table 1. Rice importation as percent of production.

Year	Production (1000 mt of milled rice)	Imports (1000 mt of milled rice)	Imports as percent of Production (Percent)
1956	2,125	42	2.0
1957	2,172	7	0.3
1958	2,079	231	11.1
1959	2,392	7	0.3
1960	2,427	nil	nil
1961	2,405	186	7.7
1962	2,538	0	0
1963	2,579	256	9.9
1964	2,498	230	9.2
1965	2,596	569	21.9
1966	2,647	108	4.1
1967	2,661	239	9.0
1968	2,964	(40)	0
1969	2,889	nil	nil
1970	3,402	nil	nil
1971	3,472	369	10.6
1972	3,315	440	13.3
1973	2,870	308	10.7
1974	3,636	169	4.6
1975	3,679	145	5.4
1976	4,004	55	1.4
1977	4,196	16	0.4
1978	4,482	(13)	0
1979	4,678	(38)	0
1980	5,093	(236)	0

Sources: Production - Bureau of Agricultural Economics, DNAR;
Importation - National Grains Authority.

a Crop year 1956 includes crops harvested July 1, 1955 to June 30, 1956 etc.

What were the lessons learned from the success of the rice program?

The New Rice Program: 1966-70.

Rice is the staple of most Filipinos. Providing an adequate supply of rice without heavy reliance on foreign imports has been seen as both a political and social necessity. Throughout most of this century the Philippines has experienced periodic "rice crises". A shortfall in domestic production has been accompanied by a sharp rise in prices necessitating imports to meet demand. However, until the 1960s the level of import rarely exceeded 5 percent of total production (Galay and Goodstein, 1978). Perhaps this is why these crises were never taken seriously except in election years, when supplying cheap rice through whatever means was seen by the incumbent party as a way to secure votes. (Apiraksinkul and Barker, 1976) (Parenthetically, the political gain through this procedure seems questionable since no president until Marcos won reelection.)

The situation changed dramatically in the 1960s, however, as Philippine agricultural economy underwent a major transformation from land to labor surplus (Barker and Crisostimo, 1979). The period after World War II had witnessed a rapid migration to Mindinao and the opening up of new lands to agricultural cultivation in other islands with still untapped resource potential. Numerous government resettlement schemes encouraged this migration to new areas. But within a decade most of the good farmland, particularly the land suitable for rice production, had been settled. The closing of the land frontier was marked by a slowing down of the growth in rice production, and rice imports began to regularly approach or exceed 10 percent of annual production (Table 1). The rice supply problem seemed to be

Table 2. Growth in Philippine Rice Production, and Yield and Adoption of Modern Rice Varieties - 1965/66 to 1979/80.

Crop Year	Production (1000 mt of palay)	Yield/ha (kg)	Modern Varieties (percent)
1965/66	4,072	1,310	0
1966/67	4,094	1,322	2.7
1967/68	4,561	1,381	21.2
1968/69	4,445	1,334	40.6
1969/70	5,233	1,681	43.5
1970/71	5,343	1,716	50.3
1971/72	5,100	1,571	56.3
1972/73	4,415	1,419	54.0
1973/74	5,594	1,628	63.3
1974/75	5,660	1,599	61.5
1975/76	6,160	1,721	64.5
1976/77	6,456	1,820	68.1
1977/78	6,895	1,965	70.0
1978/79	7,198	2,075	72.4
1979/80	7,835	2,237	74.5

Source: Bureau of Agricultural Economics

expanding beyond a level that could be handled with periodic political imports. This was the situation which faced the new Marcos administration elected to power in November 1965.

The strategy of the new government required a coordination of effort to increase rice production, not by the traditional means of expanding the rice area, but by increasing rice yield per hectare. Rice yields in the Philippines were among the lowest in Asia, stagnating at less than 1.5 tons per hectare.

The Rice and Corn Production Coordinating Council (RCPCC) was given the overall responsibility of solving the rice problem. A number of foreign donors and international organizations also participated in the effort. The key elements which led to the success of their program are discussed in the sections which follow.

Technology

High yielding, fertilizer responsive varieties released by the International Rice Research Institute (IRRI) in 1966, coupled with improved varieties from the Bureau of Plant Industry (BPI) and the University of the Philippines College of Agriculture (UPCA) provided the technical breakthrough. Farmers in the irrigated areas of the Philippines quickly realized the advantage of the modern varieties (Mangahas and Libero, 1973 and Herdt and Capule, 1983). During the latter part of the 1960s rice yields and rice production grew at an unprecedented rate of 5.5 percent (Table 2). The RCPCC developed a program for rapid dissemination of the new varieties by organizing private seed producers. By 1970 more than half of the paddy land

in the country was planted to the modern varieties, a truly remarkable accomplishment which destroyed once and for all the myth that Philippine farmers were backward and unresponsive to new ideas.

Price Policy

Price is a two edged sword. In establishing price policy it is necessary to come to grips with the problem of lowering prices to consumers without destroying the incentive for producers. The previous administration had relied on importation as a means of holding the price line. The RCPCC followed a different strategy. In March 8, 1966 the government support ceiling price was raised and the range was from P12.50 to P18.00 (R.A. 4643). This had the affect of raising the farm level price of rice, providing a stimulus to farmers to adopt the modern inputs and new varieties, and thereby increase rice production. This support level was maintained for a period of five years. Throughout this period retail and farm rice prices fell in real terms (Table 3), a clear sign that the new program was working. Another sign of success was the total elimination of rice imports in the three year period 1968 to 1970 (Table 1). As farm prices fell, the stimulus to increase farm production was provided by incentives created by government investments in agriculture which enabled farmers to increase income. The source of these incentives is described in the subsequent section on budget allocations (see Table 5).

Inputs and Credit

Increased yields could only be achieved through increased application of modern inputs such as chemical fertilizers. Between 1961-65 and 1966-70, the

Table 3. Price of Rice in Manila and the Philippines, 1965-1970.

Year	Manila Retail - Macan 1st Class (P/ganta)		Philippines Prices Received by farmers (P/cavan)	
	Current	Deflated by CPI	Current	Deflated by CPI
1965	1.46	1.46	13.20	13.20
1966	1.79	1.70	14.92	14.24
1967	2.00	1.79	15.21	13.75
1968	1.74	1.52	14.52	12.85
1969	1.78	1.52	14.95	13.06
1970	1.91	1.43	15.66	11.91

Source: For Manila retail - Central Bank.

For Philippine prices received by farmers - Bureau of Agricultural Economics.

For Consumer Price Index (CPI) Philippines, 1965=100 - National Economic and Development Authority.

supply of fertilizer (and presumably the quantity consumed) increased by over 60 percent. Despite the opening of the new ESSO fertilizer plant in 1967, with rapidly growing demand the nation continued to rely on imports for a major portion of its supply.

Loans granted to rice farmers by formal lending institutions increased by 50 percent during this period (Table 4). The Rural Banks grew to become the backbone of the rural credit system, supplying more than 50 percent of the credit obtained by palay producers from lending institutions.

Budget Allocations: 1966-70

The shift in the government strategy for agricultural development under the RCPCC is seen most dramatically in the allocation of government budget funds. The data presented in Table 5 have been assembled with the help of the Ministry of the Budget (see Capule, 1978 and de Leon, 1983). However, it is extremely difficult to develop an accurate time series of budget expenditures in part because accounting procedures and budget categories have been periodically changed. The figures should be interpreted with caution, but do reflect the major reallocations that have occurred.

Between 1961-65 and 1966-70 the total budget for agriculture rose slightly, but there were two major shifts in budget expenditures. Expenditures for government marketing and price support programs dropped from over 30 percent to less than 10 percent of the total budget. Meanwhile, expenditures for community development largely through investment in feeder roads rose sharply. The popular 1969 campaign slogan for the Nationalist Party was "rice, roads, and reelection."

Table 4. Loans Granted for Palay Production by Formal Institutions, Philippines: 1961 to 1970.

Year	Current Prices million pesos	Constant 1965 prices million pesos
1961	136.9	170.9
1962	157.4	191.0
1963	211.1	236.9
1964	258.9	267.5
1965	236.7	236.7
Annual Average	200.2	220.6
1966	271.3	258.9
1967	393.1	355.4
1968	406.8	360.0
1969	343.3	299.8
1970	332.9	253.2
Annual Average	349.5	305.5

Source: Mears, 1974, Table 10.4 deflated by Consumer Price Index for the Philippines, 1965=100.

Table 5. Average Annual Expenditures for Agricultural Development (Constant 1972 prices in million pesos) and Percentage Distribution of Expenditures, 1961-65, 1966-70, and 1973-77.

Category	1961-65 (Pre-HYV)	1966-70 (RCPCC)	1973-77 (Masagana 99)
	----------Million Pesos----------		
Price Supports and Subsidies	85.6	34.6	60.0
Irrigation	26.8	32.8	396.1
Feeder Roads, Community Development[a]	0	70.8	115.0
Research and Extension[b]	85.6	91.8	241.6
Agrarian Reform	21.6	34.2	113.6
Environmental Management, Conservation	59.2	90.2	130.6
TOTAL	278.8	354.4	1056.8
	----------Percent----------		
Price Supports and Subsidies	30.7	9.8	5.7
Irrigation	9.6	9.2	37.5
Feeder Roads, Community Development	0	20.0	10.9
Research and Extension	30.7	25.9	22.8
Agrarian Reform	7.8	9.6	10.7
Environmental Management, Conservation	21.2	25.5	12.4
TOTAL	100.0	100.0	100.0

Source: M. S. J. de Leon, 1983, p. 27.

a. The major expenditure was for feeder roads.

b. From 75 to 80 percent of the total was for extension in all three periods.

The expenditures for irrigation, for agrarian reform, and for research and extension changed very little under the RCPCC. As in the previous period, extension and not research received the lions share of the funds in this category (about 80 percent of the total) (This also has been true in most other developing countries, see Evenson and Flores, 1978.) This created no serious problem in the case of rice, since the Philippines was able to reap a major windfall in research and technology development through the presence of the International Rice Research Institute at Los Banos.

The Masagana 99 Period: 1973-77

By 1969 the Philippines appeared to have achieved self-sufficiency in rice production. The apparent success of the program encouraged the government to turn its attention to other crops. The RCPCC was enlarged and transformed into the National Food and Agricultural Council (NFAC). The slackening of the government effort in rice just when the battle seemed to have been won, coupled with poor weather conditions resulted in two very poor harvest years in 1971 and 1972. Rice production in 1972 fell 17 percent below the 1970 level. This undoubtedly contributed to the political unrest that led to the declaration of marshall law in September 1972. By mid-1973 rice stocks were exhausted and there was no additional rice available on the world market. The Masagana 99 program was launched in the midst of this crisis.

The Masagana 99 Program

The Masagana 99 Program was designed to bring about a rapid recovery in

rice production and move the country once again toward self-sufficiency (Mangahas, 1975 and Samuel, 1982). The program focused on the intensification of management and input use following the 16 step package of practices developed through a pilot project in the Province of Bulacan. In addition to the training of technicians, the government undertook a major radio campaign to get the message across to farmers.

An important element of the program was a massive diffusion of agricultural credit. Extension agents and bank technicians were employed to disseminate to farmers non-collateral, low interest loans with which to buy fertilizer, seeds, and pesticides prescribed by the new technology. The 420 rural banks, 102 branches of the Philippine National Bank, and 25 branches of the Agricultural Credit Administration were mobilized to participate actively in the new program (Samuel, 1982 p. 41). Many of the loans were not repaid, and thus the program can be viewed as having an important element of income transfer. The very newly established law government was clearly willing to pay a high price to put the rice production program back on track.

Irrigation

The Masagana 99 program notwithstanding, irrigation development was perhaps the single most important factor accounting for the sustained growth in Philippine rice production throughout the 1970s (Hayami and Kikuchi, 1978). Between 1966-70 and 1973-77 investment in irrigation in constant pesos rose ten fold from 33 to 396 million pesos (Table 5).

The largest irrigation works constructed during this period was the Upper Pampanga River Project in Central Luzon. The Pantabangan Dam was the first

major storage reservoir built in the Philippines. The World Bank provided technical and financial support. The total project cost over a million U. S. dollars and allowed two crops of rice a year to be grown on a command area of 83,000 hectares(Tagarino and Torres, 1978).

Land Reform

Critics of land reform have pointed out correctly that the process has been all too slow. But in the case of rice the transfer from share tenancy to leasehold (fixed rent) had a major impact. The data in Table 6 taken from a survey of Central Luzon and Laguna farms (Ranade and Herdt, 1977) shows clearly that between 1966 and 1974 the landlord's share of earnings declined. Hired labor's share increased at first and then declined as real wages continued to decline. The share to operator and family at first declined but increased sharply as the transfer to leasehold was implemented after the declaration of marshall law.

Although few tenants received title under the land reform, the shift to leasehold strengthened the position of the larger tenants who were village leaders. Thus, in a political context the land reform proved to be extremely successful, insuring that most tenant farmers would support government in power.

Budget Allocations: 1973-77

The agricultural budget increased by three fold between the late 1960s and the mid 1970s (Table 5). However, agriculture's share of total government expenditures changed very little rising from about 8 to 10 percent (de Leon, 1983, p. 23). In both absolute and relative terms irrigation showed the

Table 6. Percentage Allocation of Earnings on Shareholder-operated Farms, Laguna and Central Luzon, 1966, 1970, and 1974.

Earners	1966	1970	1974
Landlord	36	31	30
Hired labor	19	24	19
Operator and family	35	31	38
Current inputs	10	14	13

Source: Ranade and Herdt, 1978.

largest rise. Irrigation investment accounted for less than 10 percent of government agricultural expenditures in the 1960s but rose to 37.5 percent in 1973-77. Agrarian reform was the only other major category in the budget showing a relative increase in 1973-77 over 1966-70. In absolute terms the budget for agrarian reform nearly tripled. Under the Masagana 99 program major budget increases occurred for credit subsidies and for extension. Because of the large expenditure for irrigation, however, the proportion of the total agricultural budget spent for price supports and subsidies, for feeder roads and community development, for research and extension, and for environmental management and conservation declined.

Beyond Rice

A number of important factors have led to the success of the rice program. First, rice production gains were dependent upon a very substantial investment in research to generate new technology and in infrastructure including, irrigation and feeder roads. Next, favorable pricing policy, credit programs, and massive extension supported the rapid adoption of the technology. Third, timely agrarian reform legislation assured that the tenants and not the landlords would be the major beneficiaries. Fourth, a slackening of effort after the first five years threatened the success of the program. Sustained investments and inputs are required over a long period of time. Finally, the success of the program required a coordinated effort among national and international entities. All parties agreed on the objectives, and each contributed in a substantive way to the program.

By the late 1970s, with self-sufficiency in rice apparently assured, attention once again turned to other segments of agriculture. However, the direction that a new strategy should take has been less obvious. There is clearly considerable scope for conflict in goals between and among the Philippine government agencies and international agencies in the absence of a clearly defined set of priorities.

The success of the rice program was mainly in the irrigated areas. Despite the rapid growth in irrigation, production of crops other than rice is carried out mainly under rainfed conditions. Thus the fortunes of most farmers depend on their ability to adapt to the vagaries of the monsoon rains. As a group the rainfed farmers are among the poorest people in the Philippines, but due to the heterogeneity of their environment, there is no simple technological solution to their problems.

Table 7 shows the area and value of crops in the Philippines. Irrigated rice amounts to a little over 12 percent of the total in both categories. A main target for many rainfed agricultural projects is the upland farmer who grows a wide diversity of crops including rice and corn as main staples. Developing a suitable technology for this group presents a major challenge.

Gradually it has been recognized that the Masagana 99 package approach used so successfully in irrigated rice was not appropriate for the more complex rainfed environment. A farming systems approach to research is being developed in which the farm is viewed holistically in order to identify the major constraints to increased production and major potentials for new technology. This requires interdisciplinary collaboration, and an intensive interaction among farmers and researchers to insure the development of

Table 7. Area and Value of Crops, Philippines, 1980.

Crop	Thousand Ha.	Percent	Million Pesos	Percent
Rice	3503	28.9	8031	21.4
Irrigated[a/]	1504	12.7	4628	12.3
Rainfed[a/]	1563	12.9	2958	7.9
Upland[a/]	400	3.3	445	1.2
Corn	3319	27.3	3091	8.2
Coconut	3126	25.8	9264	24.7
Sugar Cane	425	3.5	4227	11.3
Root Crops	487	4.0	1897	5.0
Abaca	236	2.0	436	1.2
Fruits	518	4.3	6284	16.7
Other	509	4.2	4299	11.5
TOTAL	12,123	100.0	37,529	100.0

a/ Based on data from Papacpac, A., World Rice Statistics, 1982 and, PCARRD, "Data Series on Rice Statistics in Philippines," 1980.

Source: NEDA, Philippine Statistical Yearbook, 1982.

appropriate technology. This new method for the development of agricultural technology for the rainfed areas is certain to be more costly and time consuming than was experienced with irrigated rice. There is a danger that the research program will become too diffuse. A recent report on Philippine research suggests that the increase in research investment from 1973 to 1980 has not been accompanied by a closer matching of research spending with crops of most economic importance (Evenson, Waggoner, and Bloom, 1981).

Adding to the problems imposed by the technical constraints of the rainfed environment, the policies of the Philippine government have further penalized the small rainfed farmers. Consider, for example, the corn program. Next to rice, corn is the most important crop in terms of acreage, yet even by Asian standards Philippine corn yields are low. For example, for an average of the three year period 1979-81 estimated corn yields as reported by the FAO were approximately 1 ton per hectare for the Philippines, 1.4 tons per hectare for Indonesia. and 2.1 tons per hectare for Thailand. Approximately 80 percent of the corn in the Philippines is white corn grown principally for human consumption. Yellow corn grown on the remaining 20 percent of the area is fed to livestock. The Philippines imports yellow corn. The best corn breeders have been hired by the private sector to develop hybrids. Even in the public sector the major research-extension focus is on yellow corn since the major objective of government policy is to achieve self-sufficiency or even to develop a surplus for export. But in contrast to the rice program, the bulk of the corn farmers are unlikely to benefit from this strategy.

Most of the rainfed farmers have not benefited in any measure from agrarian reform. Crops other than rice and corn do not fall under the agrarian reform

law, and even in those areas where the law does apply it has frequently not been implemented. Thus tenure continues to be a major unresolved problem.

Rainfed farmers have also been penalized through price policy. Table 8 compares the relationship between the domestic and the export (border) prices for agricultural products in percentage terms. A positive value indicates the percent that domestic prices are above export prices, while a negative value indicates the reverse. Government pricing policy in the 1970s discriminated against three of the Philippines major exports - sugar, copra, and forest products. The following quotation taken from David (1982) summarizes the findings of a recent study:

> Our analysis suggests that economic policies affecting prices of outputs and inputs have created an incentive structure that substantially favors non-agriculture over agriculture. Prior to the 1970s, this bias was due mainly to the policy objective of promoting industrialization via tariff protection. During the 1970s the growing regulation of the agricultural sector has led perhaps inadvertently to even lower protection, and in major export crops implicit taxation of agriculture. This implicit taxation of agriculture in part has been used as a means of subsidizing consumers of these products. In forestry, this occurred because of the policy to conserve the forest as well as to foster forward integration, the latter being important in coconut and sugar. As a consequence of the general pricing policy, however, agriculture is less than what it should be and for certain commodities such as forest products, coconut products, and sugar, the level of domestic consumption may be higher than with no price intervention. The fact that agriculture survives and indeed grows suggests an inherent comparative advantage to compete effectively in the export and home market, an advantage that would be more effective, of course, in the absence of these policy biases.

Thus, while agricultural exports over the years have played a critical role in economic development, government policy doesn't appear to reflect the importance of this sector. Government in the 1970s moved toward nationalizing the marketing of the export crops, and this seems to have led to an implicit taxation of these commodities. In short, government policy, perhaps inadvertently, has been very effective in squeezing farmers. Export

Table 8. Comparison of Domestic to Border Prices for Agricultural Products (Nominal Protection Rates) in the Philippines, 1955-1980 (percent).[a/]

	1955-1969	1979-1980
Food Crops		
Rice	15(-6)[b/]	3(-19)
Corn (yellow)	42(11)	22(- 1)
(white)	23(7)	3(- 4)
Other Crops	0	0
Export Crops		
Sugar	-3(45)[c/]	-21
Copra	-1	-24
Other exports	0	- 4[d/]
Livestock and Poultry		
Pork	54	7
Beef	25	- 4
Chicken	109	56
Eggs	54	14
Milk	1[e/]	16[f/]
Fishery	0	0
Forestry	0	-27
Average[g/]	15	4

a/ [Domestic price / Border price - 1] x 100. Domestic wholesale prices are used except for the ratios in parenthesis which refer to farm prices. They are converted to dollars at the official exchange rates. Border prices: a) rice is CIF import unit value for most years but FOB export unit values for 1960, 1968, and 1977-1980; b) corn is Philippine CIF import unit value for 1970-1980 but Japan CIF import unit value for 1955-1969; c) sugar, coconuts, and forest products are FOB export unit values; d) pork, chicken, eggs are Hong Kong CIF import unit-values; e) beef is U.S. import unit value.

b/ Pertains to average of 1960-1969.

c/ Border price is Japan CIF import unit value to represent free market price instead of the U.S. sugar protected price at which the Philippines sold during this period.

d/ Based on the export tax on abaca, and tobbaco. There is also a 4 percent export tax on bananas and pineapples which are classified in other food crops.

e/ Pertains to dairy products. This is based on legal tariff and advance sales tax as estimated in Power, J. (25).

f/ Based on legal tariff and advance sales tax as estimated in Tan, R. (27).

g/ Weighted by proportion of value added.

Source: David, 1982.

earnings from agriculture disproportionally support capital intensive, import-dependent industries that service mainly high income consumer demand in urban areas, particularly greater Manila.

The major government program directed toward the rainfed areas has been the Kilusang Kabuhayan at Kaunlaran (KKK) or National Livelihood Program launched in August 1981. The KKK provides credit and presumably technical support for a wide range of projects initiated at the local level by farmer groups. During the first full year of operation in 1982, 375 million pesos were loaned out. The bulk of the loans were for agro-forestry and fisheries projects. A major problem of the KKK is that it reflects no real development strategy and is highly politicized. Thus, its impact on agricultural development may be minimal. Loan repayments have been extremely low; some say less than 10 percent. But this income transfer, largely to the better off in the rural community, may have achieved significant political gains.

In summary, the success achieved in the rice program is not being extended to other major sectors of agriculture. In the rainfed areas, the technical constraints are severe. Research and infrastructure investments have been too weak to create the economic opportunities. Price, credit, and agrarian reform policies, instead of being supportive, have constrained agricultural development. In contrast to the rice program, there has been no agreement on goals, and no coordinated effort. In the Philippines, and in many other Asian countries as well, the political imperatives and economic opportunities that have existed for rice do not seem to extend beyond rice.

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