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AN ANALYSIS OF AGRICULTURAL POLICIES
IN THE PHILIPPINES

by

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(Prepared under AID Contract No. 492-0249-C-100-1064-00)

The views expressed in this report are those of the author and do not necessarily reflect those of the Agency for International Development

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Introduction

Since the late sixties, there has been growing awareness that the narrow focus on import substituting industrialization and relative neglect of the rural-agricultural sector had not led to sustained and equitable development of the Philippine economy (28,36). The industrial sector established was found to be capital intensive, located mostly near large urban areas, and serving primarily the domestic market. The concern for equity and employment, the bleak balance of payments prospects, the serious food crisis in 1973, and the promise of substantive gains in productivity with the new rice technology all led to a stronger focus in rural development during the 1970's. The rice sector was the main emphasis, with expansion of irrigation, accelerated adoption of the seed-fertilizer technology, and increased credit support through the Masagana 99 Program particularly in irrigated areas as the principal policies.

With the easing of the food-grain crisis by the late 1970's, concern with new avenues for agricultural development gradually developed. Domestic demand for rice is limited and the wisdom of competing and relying on a highly volatile export market over the long-run is questionable. Furthermore, rainfed land which still comprise 58 per cent of crop area in rice and 88 per cent of total crop area, is perhaps more suitable to crops other than rice. Irrigation development will necessarily be slow as the easier sites that can be covered with low-cost

projects are exhausted. Potential for further land opening will be limited to upland types of agriculture and may be costly as we consider the external cost of forest depletion. Most of the rural poor are in regions dominated by rainfed agriculture and thus the uneven level and growth of income between irrigated rice and rainfed agriculture is a dimension of inequity within the rural-agricultural sector that needs to be addressed.

By the second half of the 1970's, a consensus emerged that development of rainfed agriculture offered a strong potential source of future agricultural growth as well as a direct means for improving income distribution. Consequently, large agricultural research and action programs are currently underway to generate more information and identify viable projects to develop rainfed agriculture. Since 1975 the International Rice Research Institute has started developing new rice varieties tolerant to drought conditions. The policy shift to rainfed agriculture in recent years is also evident from government programs such as the "Maisagana Program for Corn", "Industrial Tree Plantation Development", and several projects under the Kilusang Kabuhayan at Kaunlaran.

Most of the literature and discussions on rainfed agriculture in the Philippines have dealt with issues of size and definition of rainfed agriculture, availability of technology, environmental factors, and socio-political constraints. In this paper, we complement other studies by evaluating the prevailing policy environment in agriculture especially as it related to rainfed agriculture.

Our approach is comprehensive and somewhat unique for several reasons. The analysis takes the perspective of the whole agricultural sector including crops, livestock and poultry, fishing and forestry. Irrigated agriculture is relatively small and the impact of many policy instruments, such as those affecting prices, does not differentiate between crops produced under irrigated and crops produced under rainfed conditions. Also, data that clearly delineate policies affecting rainfed vs. irrigated agriculture, such as for public expenditures, frequently do not exist.

The coverage of policies includes those specific to agriculture and each subsector and also trade, fiscal, financial, and other broad economic policies which have been known to promote industrialization but in the process have had pervasive influence on resource allocation and income distribution within and between agriculture and non-agriculture. We will therefore consider not only how government policy affects allocation of resources within agriculture, but also between agriculture and non-agriculture. The economy's resource availability is fixed at any given point of time and thus the flow of resources into agriculture is influenced by the structure of agricultural incentives in relation to industrial incentives as a result of government intervention. Moreover, since welfare is a national concept, the level of income of rainfed agriculture should be compared not only to irrigated rice but also to non-agriculture.

Our analysis has been organized as follows: price intervention policies; financial policies; public expenditure policies with emphasis on research, extension, and rural roads development; and land use policies. The final section of this paper briefly discusses the implications of recent broad policy reforms in tariffs and interest rate structure and outlines future directions for policy research.

Price Intervention Policies

The effects of overall government policies on product and input prices or economic incentives in agriculture have not received adequate attention in the Philippines. The fact that small farmers are rational and price-responsive is already amply demonstrated in the literature (44). Price relationships therefore among crops, between agriculture and non-agriculture, between product and input prices have important consequences on cropping patterns, production techniques, and agricultural growth; on sectoral and regional allocation of resources and income distribution; on inflation and the balance of payments; and so forth. These price relations have been influenced by a complex set of government market interventions intended to achieve many different and often conflicting objectives: food self-sufficiency, a low food prices, stable prices, higher farm income, more government revenues, increased processing of agricultural products, among others. Price controls, export taxes, trade quotas, import tariffs and national marketing agencies have been important policy instruments affecting relative prices especially during the past decade. Domestic prices

have also been indirectly affected by government policies of other countries such as the US sugar quota policy prior to the 1970's and the US PL 480 program.

A current research project financed by the Philippine Institute of Development Studies and the Philippine Council for Agriculture and Resources Research analyzes the impact of economic policies on agricultural incentives. One of their recent papers reports preliminary estimates of nominal protection rates (NPR) and implicit tariffs (IT) in agriculture which provide an indication of the effects of some government interventions on the incentive structure facing Philippine agriculture (11). Both NPR's and IT's measure the percentage difference between domestic and border price but from the point of view of agricultural producers in the case of NPR and from the viewpoint of agricultural producers as users of inputs in the case of IT. Both NPR's and IT's measure the percentage difference between domestic price and border price of products and inputs, respectively.^{1/} Border prices (usually defined as CIF input price for importables or FOB export prices of exportables) converted at official exchange rates are used

^{1/}
$$\text{NPR} = \left[\frac{P_d^m}{P_b} - 1 \right] \times 100; \text{IT} = \left[\frac{P_d^u}{P_b} - 1 \right] \times 100;$$
 where P_b denotes border price, P_d^u = price paid by the user, and P_d^m = price received by domestic producers and importers. Prices are defined at a comparable point in the marketing chain to insure that differences between domestic and border prices are due to government interventions, rather than to real costs.

as basis of comparison because they represent opportunity costs of tradeable commodities. When border price is converted at the official exchange rates as in NPR or IT, the difference between domestic and border price is attributed to government price interventions such as trade, fiscal, and price policies. On the other hand, by converting border price by the shadow exchange rate, a measure of net nominal protection rate which takes into account all government policies including the general overvaluation of the exchange rate defended by the protection system is obtained.

Table 1 presents average NPR's by major commodity groups for two time periods to highlight the impact of increasing government regulation of the agricultural sector.^{2/} While government intervention in the later period was part of attempts to balance economic growth, many policies were instituted to cushion the impact on consumer prices of the floating of exchange rates in 1970 and the oil and food grain crises in 1973.

Import Competing Food Crops

Among the domestically marketed food crops, the food staples of rice and corn have historically been the objects of direct price interventions. Prices of other food crops such as vegetables, fruits

^{2/} Annual differences in nominal protection rates were not shown because they would in general be related to price fluctuations rather than to policy changes.

Table 1. Nominal protection rates in Philippine agriculture, 1955-1980.

	1955-1969		1970-1980	
	Proportion of value added	Nominal Protection Rate (%)	Proportion of value added	Nominal Protection Rate (%)
Food Crops				
Rice	.19	4	.18	- 7
Corn	.06	2	.06	1
Other crops	.09	0	.13	0
Export Crops				
Sugar	.06	60	.07	-23
Copra	.06	- 8	.06	-22
Other exports	.06	0	.09	- 4
Livestock and poultry				
Livestock	.13	28	.10	4
Poultry	.05	77	.05	48
Fishery	.16	0	.17	0
Forestry	.14	0	.09	-27
Average (Total)	(1.00)	11	(1.00)	- 4

nuts, roots, and tubers were less controlled except potentially by the tariff structure.^{3/} Domestic prices of rice and corn have been generally close to border prices. In the 1970's domestic rice price was below border price by 7 per cent in part due to the price interventions in 1973-1975 when world price of rice and fertilizer rose fourfold because of the oil crisis and world-wide grain shortage.

The National Food Authority is responsible for regulating food grain prices to achieve low prices for consumers and adequate price incentives for producers. It buys grains in the domestic market to defend a farm floor price, but the amount of imports or exports which are under government monopoly is the main determinant of grain prices. Previous studies had noted that providing a stable and low rice prices for urban consumers tended to dominate the objective of supporting farm price to raise income of small farmers (1, 32). This was achieved through imports during years of production short falls. After 1975, the domestic rice price became internationally competitive with some commercial rice exports since 1978 as a result

^{3/} Tariff protection is redundant for exportable crops and does not apply to food grains where only the government can import or export. It should also be noted that tariffs are expected to be effective in raising domestic price over border prices only in potentially import competing products. Since most of the agricultural commodities are either subjected to quantitative trade restrictions or are not significantly traded, price comparisons have been used to measure NPR instead of legal tariff rates.

of the new seed fertilizer technology and irrigation expansion. Price policy for corn, an important upland crop and the staple food for about 20 per cent of the population, mostly the poorest people, also has the same bias. Moreover, the policy of keeping the price of meat low for urban consumers is another reason for maintaining a relatively low price of corn.

Price comparisons were not done for the other food crops such as fruits, vegetables, roots and tubers because of the great heterogeneity of products within each commodity group and the fact that many of these crops are not significantly traded. Legal tariff rates are relatively high, up to 100 per cent for some crops, but fragmentary evidence indicates that, except for some fruits and vegetables consumed by the very high income families, these relatively high potential protection rates are not fully realized. Domestic prices for other food crops do not seem to be significantly different from prices in other countries and there are some small exports of fruits, vegetables, and coffee. Thus, it was assumed that in general, prices of other food crops have not been affected by the protection system, i.e., NPR is zero.

Export Crops

Growing regulation of agriculture in the 1970's has been more significant in the export sector. Prior to 1970, the government rarely intervened in the production and trade of export crops except

indirectly through the overvaluation of exchange rates and other regulations relating to foreign exchange. However, in the case of sugar, export quotas which limited exports to 60 per cent of production, were instituted in 1962 to protect domestic consumers from the increased access of Philippine producers to the highly protected U.S. sugar market after the Cuban crisis. Despite this, the incentive effect of the US sugar quota policy which provided an export price much higher than world prices from 1955-1969 had meant a high nominal protection rate of 60 per cent on domestic sugar production.

During the 1970's, government policies generally reduced domestic prices of export crops below those which would have prevailed under the previous policy regime. Since the floating of the exchange rate in 1970, many agricultural crop exports have been penalized by export taxes ranging from 4 to 6 per cent. The rate of 6 per cent is levied on traditional exports of copra and centrifugal sugar to promote new and higher degrees of processing of agricultural exports. Other export crops subject to a 4 per cent export tax are processed coconut products, molasses, abaca, bananas, and tobacco. Between 1973 and 1975, additional export premium duties were temporarily levied to siphon off part of the gains from higher world prices. These export taxes were initially imposed as stabilization measures, but they have been continued as a convenient means of taxing agriculture.

In the case of sugar and copra, the penalty or implicit tax on producers rose to more than 20 per cent due to new regulations in these

industries. Since 1970, sugar trading has effectively been nationalized, first under the Philippine Exchange, Inc. and currently under the National Sugar Trading Corp., which has become the sole wholesale buyer and seller of sugar in both domestic and international markets. Producers are paid a composite price which theoretically is a weighted average of export price, domestic wholesale price, and domestic reserve price. However, as in the quota system, this arrangement has served to lower the domestic price significantly below export prices thereby transferring income from domestic producers to domestic consumers.

Two taxes called the Coconut Consumer Stabilization Fund (CCSF) and the Coconut Investment Fund (Cocofund) have been imposed on the coconut industry since 1973. The tax rates have changed over time, typically rising and falling with the world price of copra. In some years, the CCSF levy in ad valorem terms represented a tax of about 20 per cent of border price. Although the tax is collected at the miller's level, the incidence of the tax is clearly at the farm level.

About twenty per cent of the revenues from the tax supports the direct subsidy on domestic consumption of coconut oil products. The remainder is supposed to finance development programs in the coconut industry such as replanting, vertical integration, and scholarships. Research to date, shows that only a small segment of the coconut industry actually receives the benefits from these programs (10, 15).

On the other hand, the gains from the replanting program are uncertain. It is not known how well hybrid seeds will perform under diverse Philippine conditions. Furthermore, small coconut farmers with no alternative source of income have been hesitant to face the prospect of waiting for three years to harvest a first crop. At least for the short run, the CCSF and Cocofund levies may be considered a tax on the industry.

Livestock and Poultry

The incentive structure for livestock appears to offer lower rewards than for poultry, but both are in general more favored than the crop sector. However, the general trend of declining incentives over time because of government policy also seems to have occurred. Domestic prices of livestock, specifically pork, and poultry were 28 per cent and 77 per cent higher than their corresponding border prices prior to the 1970's and slightly higher than those predicted by their tariff rates.^{4/} In the 1970's, percentage price differences declined to levels somewhat lower even than the legal tariff rates of 10 per cent for livestock and 70 per cent for poultry. This may be due to controls imposed on these products which were accompanied by price controls also on mixed feeds and feedgrains, higher imports of corn

^{4/} Since international trade in livestock and poultry has been minimal and confined mainly to imports of breeding animals, special cuts of meat for restaurants or of fats for the meat processing industry, border prices were represented by average CIF import unit values in Hongkong.

and other feedgrains to provide a reasonable margin for producers during this period.

Fishery

The fishing industry is another case where the potential high protection rate implied by the legal tariff rate of 100 per cent for fresh or chilled fish and crustaceans appear to be redundant. There are some imports but in the form primarily of canned fish. Exports, however, of fresh shrimps, prawns, and fish though still low compared to total production have been rising. Since domestic prices do not seem to differ significantly from import prices represented by those in Hongkong and Singapore at least for recent years, nominal protection rate for the fishery sector has been initially assumed zero for this study.^{5/}

Forestry

Forest products have been consistently one of the top ten exports, contributing up to 30 per cent of total export receipts in the late 1960's. The general push for promoting processing of raw materials in the 1970's has been much stronger in the forestry sector than in the other export crops because of the growing concern for conserving forest resources. As in other agricultural exports, forest products

^{5/} For shrimps and prawns, NPR should be -4 per cent because of the export tax.

have been subject to export taxes and premium duties since 1970 but the export tax for logs is 10 per cent compared to only 4 per cent for plywood and lumber. A more important source of penalty for logging, however, is the partial log export ban or export quota beginning in 1975 which reduced nominal protection rate for forestry (defined only as logging) from zero to -27 per cent in the 1970's. The impact of the partial log export ban is more clearly reflected in the average NFR for 1975-1980 which was -36 per cent.

This high penalty on logging mainly as a result of the export quota and export taxes may be viewed as a measure for extracting additional rental of forest resources. Forest charges including related fees at least up to 1980 have been relatively low amounting to less than 4 per cent of value of output and conservation of forest resources is indeed a desired policy goal. It should be pointed out, however, that the implicit tax derived from the use of this policy instrument will be unevenly distributed in favor of the producers granted export licenses, producers and consumers of processed wood who will gain from lower domestic prices. And furthermore, since the export license is valuable, the quota approach will most likely allocate part of this implicit tax to those responsible for granting the export licenses.

Overall Protection of Agriculture Relative to Manufacturing

The direction and rate of resource flows between agriculture and non-agriculture is influenced not only by the nominal rate of protection

on product prices; they also depend on the effects of policies on agricultural input prices and on the nature of incentives in the non-agriculture sector. The concept of effective protection rate (EPR) which measures the percentage difference between value added at domestic prices to value added at border prices takes the impact of price interventions on inputs into account. Since estimates of EPR for agriculture are not available, Table 2 compares the nominal protection rate in agriculture to the implicit tariffs paid by farmers for agricultural inputs and to EPR for manufacturing as estimated by Tan.^{6/}

Overall price effects of government policy seems to have created an incentive structure that is significantly biased against agriculture as consistent with the findings of two earlier Philippine studies in 1965 and 1974 and in more recent studies for other low income countries (6, 7, 3, 36).^{7/} While value added in manufacturing has been artificially raised by 44 per cent, price intervention policies undervalued agricultural production during the last decade through lower product prices and higher input prices. Traditional as well as new agricultural exports have been penalized by negative protection through export taxes,

^{6/} NPR's in agriculture are not expected to be substantially different from their EPR's because the proportion of intermediate inputs to value added remains relatively small in Philippine agriculture. Moreover, we can expect EPR's to be lower than NPR's because of higher protection on agricultural inputs.

^{7/} A number of agricultural industries are covered in their study but the coverage of the agricultural sector, as well as the agricultural policies specific to each crop is somewhat incomplete because the principal interest of these studies is on industrialization policies.

Table 2. Comparison of protection rates in agriculture and manufacturing sector, 1970's.

Agriculture (Nominal protection rates)	- 4
(Net nominal protection rates)	-39
Crops	- 8
Livestock and Poultry	16
Fishery	0
Forestry	-27
Agricultural inputs (implicit tariffs)	
Fertilizer ^{a/}	10
Agricultural chemicals ^{b/}	28
Hand tractors ^{b/}	46
Four-wheel tractors ^{b/}	24
Irrigation pump ^{b/}	46
Irrigation gravity (NIA system) ^{c/}	-55
Mixed feeds ^{b/}	33
Manufacturing ^{d/} (Effective protection rate)	44
(Net effective protection)	9

^{a/} Based on price comparison of urea, ammonium sulphate, mixed fertilizer and phosphates from 1973-1980.

^{b/} Based on legal tariff rate and sales tax.

^{c/} Based on comparison of NIA irrigation fee and estimates of annualized cost of irrigation system by Moya, P. F., L. Small, and S. Bhuiyan, "Cost of Different Types of Irrigation System in Central Luzon," Department Paper No. 80-10, Dept. of Agricultural Economics, IRRI, June 1980.

^{d/} Based on estimates by Tan, N. (49)

export quotas, special levies on coconut, and government trade monopoly. Commodities mainly for the domestic market may have generally modest protection, but at a level much below manufacturing.

Because low food prices tend to dominate the objective of agricultural product price policy, it was expected that government interventions in the agricultural input markets will try to offset this. However, it is only in the case of gravity irrigation, formal rural credit, and forest charges as will be discussed later where there appears to be some measure of government subsidy to producers. Implicit tariffs for agricultural chemicals, agricultural machineries, and feed mixes ranging from 24 to 46 per cent reduce the effective protection in agriculture as a result of the structure of legal tariffs and indirect sales tax.^{8/} Despite price controls and direct subsidies on fertilizer, there is still a positive implicit tariff for fertilizer(12). It appears that the protection of domestic manufacturing of these agricultural inputs which is also indicated by the level of IT (but is actually significantly higher for fertilizer because of direct subsidies) has been an important consideration of policy.

The overall magnitude of bias against agriculture is more completely reflected in the measure of net protection rates which includes the impact of the overvaluation of the exchange rate due to the protection system. Although the exchange rate has been allowed to float

^{8/} It should be noted, however, that the implicit tariff on mixed feeds may be somewhat higher than actually paid because it is the raw materials into mixed feeds which are subjected to relatively low protection that are imported and not the mixed feeds.

since 1970, the structure of tariffs and other trade restrictions has reduced demand for imports and thus increase the value of domestic currency. For the mid-1970's, Medalla estimated that the tariff and tax system resulted in a 32 per cent overvaluation of the pesos relative to a balanced free trade situation.^{9/} If this is taken into consideration, penalties to agriculture net of the disincentive effect of an overvalued currency would even be more severe (-39 per cent) while manufacturing still receives a 9 per cent net effective protection rate.

The general undervaluation of agricultural production especially of exportable products is typical of the pattern of incentives among low income countries, but opposite that of high income countries where agricultural prices are highly protected (3). This implicit taxation of agriculture has in part been used as a means of subsidizing consumers of these products. In forestry, this occurred inadvertently because of the policy to conserve the forest as well as to foster forward integration, the latter being important also in coconut and sugar. As a consequence of this general pricing policy, however, agricultural production is less than what it should be and for certain commodities such as forestry products, coconut products, and sugar, the level of domestic consumption may be somewhat higher than would be expected with no price intervention. The fact that agriculture survives and indeed grows suggests an inherent comparative advantage to compete effectively in the export or home market, an advantage that would be more effective, of course, in the absence of these policy biases.

^{9/}The situation since the mid-1970's has actually been one of a chronic and growing deficit on current account which has been financed by heavy foreign borrowing. This indicates an even higher percentage of peso overvaluation than that protected by the tariff and tax system alone.

Financial Policies

Credit policies have been an important policy instrument. In the early fifties, the Rural Bank Law was passed and the Agricultural Credit and Cooperative Farmer's Association (ACCFA) was established to promote financial institutions catering especially to the rural sector. Establishment of rural banks carries incentives which include a 50 per cent government equity contribution, access to preferential rediscount rates, tax exemptions, and technical assistance. There are currently more than a thousand rural banks operating in about 60 per cent of municipalities which have become the principal distributors of government sponsored supervised credit. The ACCFA was supposed to develop farm cooperatives providing production and marketing credit. Because of serious default problems, however, it was reorganized and renamed Agricultural Credit Administration which now administers small supervised credit programs for land reform program beneficiaries.

The government's objective of increasing the credit flow to agriculture has been frustrated by low interest rates policies. Up until the 1981 interest rate reform, interest rates and other financial charges have been regulated by the Monetary Board to conform with the 16 per cent ceiling stipulated by the Usury Law of 1916. During the past decade, allowable interest rates ranged from 12 to 16 per cent and additional loan charges from 2 to 3 per cent depending on the security and other terms of the loans. Supervised credit bears

a lower interest rate of 10 per cent with additional charges not exceeding 3 per cent. For savings deposits, the interest rates were about 6 per cent but higher for time deposits.

Since the late sixties, the official interest rates have been lower than the scarcity price of loanable funds with negative consequence on the rate of savings, investments in agriculture, and factor intensities (28). Because of rapid inflation, around 20 per cent during the 1970's, interest rates were negative in real terms. This price structure rewarded borrowers and penalized savers. This also created excess loan demand which limited the flow of loans to agriculture, especially to small farmers, where costs of transactions and risks for lenders were inherently higher.

To increase agricultural credit, the government instituted government regulations on the proportion of institutional credit for agriculture and initiated a number of agricultural supervised credit programs. In 1974, the Monetary Board directed all lending institutions, to allocate 25 per cent of their loanable funds to agriculture and at least 10 per cent of total to agrarian reform beneficiaries. Private commercial banks, however, have strongly resisted this rule and have simply purchased certificates of indebtedness and other government securities issued by the Central Bank to comply with the regulation because of the high cost of directly lending to farmers.

Table 3 lists the various special credit programs (SCPs) and their corresponding total loans granted during the period 1973-1980.

Table 3. Supervised agricultural credit programs from 1973 to 1980.

Program	Commodity	Loans Granted ^{a/} (P million)
1. Masagana 99	Rice	4,554.4
2. Masaganang Maisan and Masagana 77	Corn	521.2
3. Gulayan sa Kalusugan	Vegetables	22.2
4. Cotton Financing Progress	Cotton	71.0
5. Integrated Agricultural Financing ^{b/} for Virginia Tobacco	Tobacco	34.0
6. Rice-Tobacco Supervised Credit Program	Tobacco	3.4
7. Philippine Tobacco Administration (PTA) Farm Credit Assistance Program	Tobacco	3.2
8. PTA Facility Loans	Tobacco	1.2
9. Bahayang Barangay	Cattle	255.6
10. Biyayang Dagat	Fish	35.3

^{a/}As of December 31, 1980.

^{b/}As of 1979 only.

Source: Technical Board of Agricultural Credit.

Most of these programs linked low interest, non-collateral loans with extension. Between 1973 and 1975, this was also tied to a fertilizer price subsidy. Financial institutions were provided preferential rediscount rates, cheap seed money, loan guarantees, and assistance in loan administration within these programs which were financed in part with foreign loans.

Masagana 99 for rice accounted for almost 80 per cent of total loans granted by SCPs. Since the immediate objective of Masagana 99 was to recover from the serious crop losses in 1973, priority was given to irrigated areas where the potential for rapid expansion of rice production in the short-run is greatest. Programs after Masagana 99, although much smaller in scale, attempted to disseminate the concept of supervised credit to non-rice, rainfed agricultural producers.

Problems associated with these programs and policies are now well-documented (13). Over the past two decades, growth in agricultural loans came mainly from the Central Bank rediscount window rather than from additional equity capital or savings deposits. This is evidenced by the increase in the share of borrowings from the Central Bank in total resources of rural banks from 8 per cent in 1961 to 54 per cent in 1975. Low repayment rates have plagued almost all supervised credit programs, threatened the viability of rural credit institutions, and further damaged credit discipline among farmer borrowers. The impact of these programs on production at the farm level as well as at an aggregate level has remained unclear.

Although undoubtedly the Masagana 99 was instrumental in the rapid recovery of Philippine rice production from the global food grain crisis in 1973, the growth trend in rice production and adoption of the new rice technology since the late sixties cannot be solely attributed to Masagana 99 (26).

Despite these government interventions, Table 4 indicates that the real and relative levels of agricultural production loans granted (APL) have declined since the later 1960's. APL grew in real terms but most of this growth took place in the 1960's. The level of APL in 1979 was still far below that of 1969. APL as a per cent of net value added in agriculture and to total loans granted declined from 22 per cent and 20 per cent in 1955-1969 to 19 per cent and 11 per cent in the 1970's.

These trends are perhaps not surprising since technology and relative prices across sectors, commodities, and between inputs and outputs are more important determinants of relative profitability and hence direction of resource allocation. Past studies based on Latin American experience have already found that the use of credit policies to compensate for the effects of government policies which typically turn terms of trade against food and agricultural exports in most low income countries have limited effects (30,42). It is too often overlooked that preferential interest rates do not significantly affect relative profitability and, because credit is fungible,

Table 4. Selected indicators of trends in loans granted for agricultural production by bank and non-bank financial institution, 1951-1979.

Year	Value of ^{a/} agricultural loans (P million in 1972 prices)	Agricultural loans as a percent of ^{a/}	
		Agricultural value added	Total loans ^{b/} granted
1951	376	13	40
1955	534	17	24
1960	2,757	14	20
1961	3,636	19	22
1962	4,022	21	20
1963	4,461	24	20
1964	4,503	25	19
1965	4,420	23	19
1966	4,582	24	19
1967	5,556	27	20
1968	5,665	25	16
1969	5,794	22	16
1970	4,557	22	15
1971	3,943	21	13
1972	3,424	20	12
1973	2,590	19	10
1974	1,725	22	12
1975	1,718	21	09
1976	982	13	-
1977	1,096	06	08
1978	2,534	13	-
1979	3,378	19	-

^{a/} Refers to loans granted for agricultural production only.

^{b/} For later years, data on total loans granted have not been reported.

SOURCE: Technical Board for Agricultural Credit, Central Bank of the Philippines, National Economic Development Authority.

additional liquidity supplied by more credit will be allocated to the most profitable enterprise or to consumption, whichever provides the greatest utility.

To compare the quantitative impact of price policies to that of credit policies, the effective subsidy rate (ESR) which expresses the amount of interest rate subsidy as a percent of net value added in agriculture at border prices has been estimated. Subsidy is defined in terms of the difference in the cost of borrowing between agricultural and non-agricultural loans multiplied by the value of agricultural loans granted. Another method is to estimate the amount of subsidy accruing to the sector due to the difference between the nominal interest rate and the rate of inflation. However, the non-agricultural sector, perhaps even more than agriculture also benefits from this general distortion in the financial market.

Differences in interest rates between agricultural and non-agricultural loans from formal financial institutions is small, at most 2 per cent. Moreover, interest represents only part of the costs of borrowing. Typically, non-agricultural loans entail less transactions cost and risk though a major proportion of agricultural loans of formal financial institutions has similar characteristics because they are mostly granted to larger farmers with collateral. It is usually only in supervised credit programs where small loans are made without collateral. However, other costs such as service

charges, contributions to Barrio Savings Fund, etc., have raised the cost of borrowing to as much as 30 per cent per annum.

Assuming that interest rate policy has meant a cost of borrowing differential of 6 per cent in favor of agriculture, the effective subsidy rate amounts to only 1 per cent. Even if interest rate differential is increased two or three times in magnitude it is clear that the interest rate subsidy will not alter significantly the unfavorable incentive structure in agriculture vis-a-vis non-agriculture created by price policies. On the other hand, low interest rate policy seriously impairs the ability of rural financial markets to efficiently perform the financial intermediation process. It does not provide enough incentives for mobilizing financial savings and induces an allocation of credit that is based on size of collateral and wealth rather than productivity of credit use.

The impact of the low interest rate policy has been generally regressive. The subsidy is shouldered by the lower income population, i.e., holders of currency, bank deposits, and tax payers through inflation, low interest rates on savings, and direct government outlay. Only about 10 percent of the total implicit interest rate subsidy is received by agriculture. Within agriculture, credit allocation is also not consistent with employment and equity objectives. Low cost credit for agricultural machineries shifts the incentive system against use of labor without significant impact on yield nor effective

cropping area. Less than 15 per cent of the value of loan in the World Bank Credit Mechanization Program was used for power tillers of small farmers. Four wheel tractors and other larger farm equipment were purchased with the bulk of the loans by sugar farmers with 50 hectares or more who constituted less than 10 percent of total number of farmers.

In supervised credit programs, only farm operators are usually entitled to institutional credit despite the significant number of landless households in the rural areas. Rice has been the emphasis but rice farmers are actually better off than average farmers in corn, coconuts, tobacco, and other crops. Within the rice sector, priority was given to irrigated areas close to primary markets, i.e., relatively progressive locations with the greatest potential for rapid increases in production in the short-run. The procedure of setting loan limits on a per hectare basis means a higher credit ceiling for larger farms. Perhaps an even more important dimension of inequity in distribution of the implicit subsidies involved in these programs was reported by Esguerra in a recent analysis of Masagana 99. The study estimated that two-thirds of the implicit subsidies have been received by participating financial institutions as incentives to lend to small farmers and only one-third by the farmer borrowers mainly from non-repayment of loans. Furthermore, the distribution of the subsidies accruing to farmer borrowers has been biased in favor of larger farmers. The subsidy to farmers can be increased through higher

default rates but this would simply transform supervised credit into a costly vehicle for effecting income transfers.

Public Expenditures Policies

Thus far, our discussion has focused on policies affecting economic incentives. Aside from their impact on resource allocation, price and financial policies may affect technological development and income distribution which are also major concerns of agricultural development. However, public expenditure policy has been a more direct instrument of promoting technological change and improving income distribution in agriculture.

In this section, the changes in the level and distribution of public agricultural development expenditure by policy tools from 1955 to 1980 are examined. The analysis attempts to infer priorities pursued by the government from the allocation of the budget over time rather than to quantify the economic effects of the different types of public expenditures such as research, extension, and so forth.

The basic source of data is the national budget published by the Ministry of the Budget. These have been compiled and classified earlier by Capule but our figures are based on the updated and expanded estimates by de Leon in the IEPAD project (9,16). Public expenditures is the sum of current operating expenditures and capital outlays. In this analysis, only national government expenditures which comprised about 80 per cent of the total budget from 1955-1975 and about 90 per cent thereafter are

covered because the expenditures of local government cannot be broken down according to our classification of policy instruments. Furthermore, classification of public expenditures by sector and by policy instruments for agriculture was limited to economic development expenditures which formed about 15 per cent in 1965 to 40 per cent by 1980 of the total budget. Even within economic development, it was not possible to divide the infrastructure budget sectorally. And likewise, there were measurement problems in allocating expenditures for the other government functions: general administration, defense, education, health, and other social services. More detailed explanation of the methodology and analysis of data may be found in de Leon's paper.

Trends and relative size of public agriculture expenditure

The size of public allocation to agriculture provides a clear indication of government's commitment to that sector. In Table 5, the trends and relative importance of economic development expenditures on agriculture are presented. Public expenditures for agricultural development rose almost ten times between 1955 and 1980 or an average annual rate of 12 per cent in real terms. This high growth rate is consistent with the general acceleration of total government outlay especially for economic development during the past decade. The increased emphasis on infrastructure and non-agricultural development in the later period is apparent from the sharp rise in annual growth rate of total economic development budget from 5 per cent to 19 per cent between the periods 1955-1969 and 1970-1980 compared to agriculture which grew at 10 per cent and 15 per cent, respectively.

Table 5. Selected indicators of trends and relative importance of national public economic development expenditures on agriculture.

Year	Public expenditure in agriculture (# million, 1972) prices	Public economic development expenditure in agriculture as per cent of		
		Net value added in agriculture	Public economic development expenditures	Total public expenditures
1955	122	1.5	15.0	5.3
1956	176	2.1	18.4	6.9
1957	205	2.4	22.8	7.9
1958	167	1.9	21.0	6.8
1959	166	1.8	19.8	6.6
1960	179	1.9	18.2	6.3
1961	182	1.8	19.0	6.1
1962	206	2.0	19.3	6.4
1963	355	3.2	30.0	9.9
1964	306	2.8	27.1	8.4
1965	265	2.2	26.1	7.3
1966	264	2.2	26.0	7.1
1967	296	2.4	23.5	7.2
1968	416	3.1	27.6	8.8
1969	435	3.2	25.8	8.3
1970	361	2.6	23.5	7.1
1971	452	3.1	26.7	8.5
1972	567	3.8	20.7	8.9
1973	767	4.9	18.0	9.0
1974	1,081	6.8	20.4	10.4
1975	1,308	7.7	24.4	11.4
1976	1,018	5.7	19.8	8.3
1977	1,110	6.0	28.2	9.7
1978	1,646	8.5	32.4	12.5
1979	1,394	6.6	26.2	10.1
1980	1,242	5.6	17.7	9.0

Source: de Leon (1981).

Between 1955 and 1980 public expenditures in agriculture as a percent of agricultural value added increased much faster than the share of total government expenditures to gross national product (from 2 percent to 7 percent in agriculture compared to 10 per cent to 14 per cent for the total). It should be noted that this was not due to any dramatic sectoral shift in government priorities with respect to expenditures policy but rather due to the decline in the share of value added of agriculture. The share of agriculture to total government expenditures increased only slightly over time. However, in terms of the public economic development expenditures, agriculture's share while varying from year to year remained at about 23 per cent over the whole with infrastructure receiving the greatest allocation (from 60 to 70 per cent).

Table 6 presents the trends in public expenditure in agriculture by policy tools while Table 7 shows the same changes in terms of the percentage composition of expenditures. As noted in the footnotes, some limitations exist in the available breakdown of data but these would not significantly affect the general pattern indicated in the tables. It is obvious that public expenditure policies have been aimed primarily at raising productivity through irrigation, extension, and research and improving income distribution through agrarian reform and rural community development. Budgets for environmental management and conservation may be viewed both as a tool for enhancing long-run productivity in natural resources and the economy as a whole and improving income distribution between present and future generations.

Table 6. Distribution of direct national government expenditures on agriculture by type of policy instruments, CY 1955-1980* (in million pesos at constant 1972 prices)

Year	Price	Input Credit	Pricing and Marketing	Irrigation	Research and Extension	Social Development	Ext. & Conserv'n.	Land	Total
1955	-	-	-	-	43	37	3	12	95
1956	-	-	-	-	10	43	5	14	72
1957	-	-	-	-	10	45	20	16	91
1958	-	-	-	-	10	48	21	17	96
1959	-	-	-	-	12	48	10	18	98
1960	-	-	-	-	13	52	15	20	100
1961	-	-	-	-	15	55	14	23	107
1962	-	-	-	-	17	63	13	28	111
1963	143	-	-	-	17	87	19	32	241
1964	97	-	-	-	18	93	29	30	257
1965	41	-	-	-	18	98	33	31	271
1966	24	-	-	-	17	94	29	26	256
1967	25	6	-	-	17	89	31	57	295
1968	24	3	-	-	21	94	35	74	328
1969	27	2	-	-	22	97	38	87	371
1970	20	2	-	-	19	85	38	69	343
1971	14	3	-	-	19	90	45	58	319
1972	13	4	-	-	24	104	47	64	392
1973	30	9	-	-	44	107	83	56	427
1974	43	18	-	-	55	128	103	53	490
1975	33	22	-	-	56	135	98	54	478
1976	33	13	-	-	64	167	95	54	516
1977	39	4	-	-	77	170	103	56	549
1978	29	6	-	-	102	248	110	84	677
1979	30	5	-	-	108	224	143	62	673
1980	21	6	-	-	92	261	130	57	707

Price, Input Credit, Pricing and Marketing, Irrigation, Research and Extension, Social Development, Ext. & Conserv'n., Land, Total

Dept. of Agrarian Community, Dept. of Reform, Dept. of Forestry, Dept. of Land, Dept. of Ext. & Conserv'n., Dept. of Price, Dept. of Input Credit, Dept. of Pricing and Marketing, Dept. of Irrigation, Dept. of Research and Extension, Dept. of Social Development, Dept. of Ext. & Conserv'n., Dept. of Land, Dept. of Total

Table 7. Percentage distribution of direct national government expenditures on agriculture by type of policy instruments, CY 1955-1980^a

Year	Pricing and Marketing				Irrigation	Research and Extension			Social Development			Env'l. Mgt. & Conserv'n.		
	Price Support ^b	Input Subsidies	Credit Subsidy ^c	Total ^d		Research ^e	Extension	Total	Agrarian Reform	Community Devt. ^f	Total	Forestry Mgt. & Dev.	Land Mgt.	Total
1955	-	-	-	-	35.2	7.4	23.0	34.0	2.5	-	2.5	9.8	22.1	31.9
1956	-	-	-	-	48.9	5.7	18.8	24.5	2.8	-	2.8	8.0	15.9	23.9
1957	-	-	-	-	44.9	4.9	17.1	22.0	9.8	-	9.8	7.8	15.6	23.4
1958	-	-	-	-	29.9	6.0	22.8	28.8	12.6	-	12.6	10.2	18.6	28.8
1959	-	16.9	-	-	12.0	7.2	28.9	36.1	6.0	-	6.0	10.8	17.5	28.3
1960	-	12.3	-	-	13.4	7.3	29.0	36.3	8.4	-	8.4	11.2	17.3	28.5
1961	-	7.7	-	-	14.8	8.2	30.2	38.4	7.7	-	7.7	12.6	17.6	30.2
1962	-	6.8	-	-	17.5	8.3	30.6	38.9	6.3	-	6.3	13.6	15.5	29.1
1963	40.3	3.4	-	43.7	9.0	4.8	19.7	24.5	5.4	-	5.4	8.5	9.0	17.5
1964	31.7	2.9	-	34.6	5.9	5.6	24.8	30.4	9.5	-	9.5	9.8	9.8	19.6
1965	15.5	4.9	-	20.4	7.9	6.8	30.2	37.0	12.5	-	12.5	11.7	10.6	22.3
1966	9.1	3.8	-	12.9	9.5	6.4	29.2	35.6	11.0	8.0	19.0	13.3	9.8	23.1
1967	8.4	2.0	0.7	11.1	13.5	5.7	24.3	30.0	10.5	8.8	19.3	16.9	9.1	26.0
1968	5.8	0.7	2.4	8.9	8.4	5.0	17.5	22.5	8.4	26.7	35.1	17.8	7.2	25.0
1969	6.2	0.5	2.8	9.5	5.7	5.1	17.2	22.3	8.7	27.1	35.8	20.0	6.7	26.7
1970	5.5	0.6	1.7	7.8	10.8	5.3	18.3	23.6	10.5	21.6	32.1	19.1	6.6	25.7
1971	3.1	0.7	1.8	5.6	26.5	4.2	15.7	19.9	10.0	17.3	27.3	12.8	8.0	20.8
1972	2.3	0.7	2.3	5.3	33.0	4.2	18.3	22.5	11.8	8.3	20.1	11.3	7.8	19.1
1973	5.0	1.2	2.7	8.9	22.3	5.7	25.8	31.5	14.0	10.8	24.8	7.3	5.2	12.5
1974	4.2	1.7	1.8	7.7	38.0	5.1	18.7	23.8	11.8	9.5	21.3	4.9	4.3	9.2
1975	2.9	1.7	-	4.6	48.5	4.3	13.4	17.7	10.3	7.5	17.8	7.3	4.1	11.4
1976	3.2	1.3	-	4.5	37.5	6.3	16.4	22.7	9.3	9.0	18.3	11.6	5.3	16.9
1977	3.5	0.4	-	3.9	34.3	6.9	15.3	22.2	9.3	17.9	27.2	8.5	3.9	12.4
1978	1.8	0.4	-	2.2	52.5	6.2	15.1	21.3	6.7	6.8	13.5	7.2	3.4	10.6
1979 ^g	2.2	0.4	-	2.6	40.5	7.7	16.1	23.8	10.3	8.8	19.1	9.7	4.4	14.1
1980 ^h	1.7	0.5	-	2.2	33.6	7.4	21.0	28.4	10.5	10.1	20.6	10.5	4.6	15.2

Footnotes - Tables 7 & 8

^aFrom 1975, under a new format, the national budget presents support to government corporation under a separate chapter. This is included in our data for the 1975-1980 period. The 1979 and 1980 figures are estimates.

^bIt has not been possible to obtain the complete figures for 1955-1962 based on the level of disaggregation of our data. It should be noted, however, that during this period the National Rice and Corn Corporation (NARIC) was already engaged in price stabilization activities, mainly in the form of rice procurement and distribution. Our working table shows expenditures for the administration of sugar and other quota products. These are relatively small and have been omitted here although these are included in the totals. Note also that a major part of the total outlay for price support is accounted for by expenditures of the Rice and Corn Administration, later the National Grains Authority (1963-1980).

^cAs explained in the text, the data under this policy refer only to expenditures related to the administration of the Agricultural Guarantee and Loan Fund (AGLF) and are available only for 1967-1974.

^dThe 1955-1962 totals include the omitted expenditures of the Sugar Quota Administration (see footnote b above)

^eExcludes research expenditures of state colleges and universities.

^fA large part of expenditures on community development were allocated for the construction and maintenance of roads and bridges.

Source: da Leon (1981).

The change in the policy focus of public expenditures after 1970 is clearly shown by our data. Direct government expenditures for price and marketing policies which cover government interventions in rice, corn, sugar, fertilizer, and seeds have not been completely documented prior to 1963 but a declining share, only 4 percent of the total in the 1970's seems to be the trend. This supports the earlier observation of declining government support for improving price relationship facing agriculture. Indeed an increasing implicit taxation of agriculture resulted from the over-all government policies affecting relative prices.

Extension received the highest allocation prior to the 1970's (27 per cent), surprisingly even higher than irrigation from 1959 to 1971. Its share has declined except during the peak of Masagana 99 in 1973/74 while expenditures for research have steadily increased, but the latter is still only about one-fourth of extension. Expenditures for social development may also have been as significant as extension in the early period because for the years with available data their share averaged 22 percent. Agrarian reform activities consisted mainly of land resettlement projects in the pre-martial law period and administration of land reform in rice and corn after 1972. Rural community development programs included grants in-aid, self-help projects and cooperatives development.

Irrigation investment has been subject to short-run fluctuations, high in the late 1950's and picked up again in the 1970's. Hayami and

Kikuchi found a strong a correlation between shifts in investment and changes in the world price of rice (25). The decline of government expenditures for other policy tools in favor of irrigation investment in the 1970's may also be related to other factors. Studies at IRRI in 1976 indicate that irrigation investment has a higher social benefit-cost ratio than price support and fertilizer subsidy except when a high discount rate is used for large-scale high cost projects (23).

Policy thrusts of international financial institutions such as the World Bank and Asian Development Bank which have financed a major part of rehabilitation and construction of new irrigation systems may have influenced the government's own choice of policy priorities. Changes in the sectoral distribution of official development loans reported in Table 8 indicate that this may be the case. The growth in the share of agriculture from 22 per cent to over 30 per cent in the 1970's was due primarily to expansion of irrigation investment.

Agricultural Research

With the growing land constraint, technological change through research and extension will increasingly be an important means of augmenting agricultural production. However, the productivity of research and extension depends not only on their total budget but also in the way these budgets are utilized. The following discussion essentially summarizes previous analysis of Evenson on the nature and direction of research and extension in the Philippines (20, 21, 22).

Table 8. Distribution of official development loans by sectors, 1954-1979.

(per cent)

	1952-1969	1970-1974	1975-1979	1970-1979
1. Agriculture	22.0 ^{a/}	25.1	33.1	31.1
a. Agriculture ^{b/}		18.3	9.5	11.7
b. Irrigation		5.8	17.5	14.6
c. Integrated Area Development		1.0	5.1	4.1
d. Rural Infrastructure		-	1.0	.7
2. Industry	29.0	18.0	15.3	16.0
3. Power and Energy	36.0	22.8	16.7	18.2
4. Transportation	11.0	22.2	19.1	19.9
5. Others ^{b/}	2.0	11.9	15.8	14.8

^{a/}No breakdown is available

^{b/}Includes education, population and water supply loans

Source: National Economic and Development Authority.

Although the agricultural research system in the Philippine is generally regarded as one of the more advanced in Asia, expenditures for both research and extension which amounted to only 0.45 per cent and 0.91 per cent of value added of agricultural production, respectively are relatively low by international and even by Southeast Asian standards. As in other developing countries, extension programs have been emphasized to a much greater extent than research. Moreover, except for sugar, most of agricultural research and extension is supported by the public sector with some assistance from external agencies.

Economic benefits from research will be highest in areas/commodities where potential improvements in technology and size of market are great. In practice, allocation of research has been influenced by supply of scientific manpower and other social objectives such as improving nutrition levels and equitable geographic distribution of research expenditure. In terms of congruence between distribution of research and size of markets which is presently the only quantifiable variable, Table 9 indicates that relatively more research investments have been directed to commodities of minor economic importance, neglecting some major commodities as shown by the ratio of research spending to gross value of the commodity. The inconsistency between distribution of research budget and commodity value seems to have worsened between 1973 and 1980; their correlations decreased from 0.91 to 0.73. Thus the increase in real research investment over this period has not been accompanied by a closer matching of research spending with economic importance.

Table 9. Measures of importance of agricultural research expenditures by commodities.

Commodities	Research spending as % of gross value by com- modity	Commodity research share in total research spending		Commodity share in gross value of all commodities	
	1980	1973/74	1980	1973/74	1980
Crops		.440	.448	.592	.621
Coconut*	.125	.072	.058	.084	.087
Corn and Sorghum*	.132 ^{a/}	.060	.039	.065	.065
Fiber crops	.994 ^{b/}	.040	.041		.007
Fruit crops*	.087	.040	.026	.070	.078
Banana	.004				
Pineapple	.003				
Mango	.070				
Citrus	.046				
Other	.250				
Legumes*	1.28	.030	.051	.007	.008
Ornamental horticulture		.002	.014		
Plantation crops		.006	.011		.042
Rubber	.130				
Cacao	.206				
Coffee	.004				.037
Cereals	.047	.060	.047		
Rice	.034			.187	.169
Wheat	high				
Root crops	.540	.014	.072		.030
Sugar cane*	.011	.058	.011	.050	.053
Tobacco	.594	.020	.034		.005
Vegetables	.430	.040	.044		.019
Fisheries*	.150	.080	.158	.118	.174
Forestry*	.190	.132	.144	.111	.092
Livestock*	.080	.170	.067	.177	.112
Beef-carabeef	.035	.060	.021	.066	
Pork	.070	.04	.007	.052	
Poultry*	.400	.04	.005	.047	.041
Dairy			.009		
Pasture		.039	.021		
Socio-economics		.050	.101		
Soil and water resources		.067	.072		

The correlation between shares in the research budget used in the value of all commodities was 0.91 in 1973/74 and 0.73 in 1980. The nine commodities correlated are identified by "".

^{a/} For corn, this figure is .095%.

^{b/} For abaca, this figure is .163%. The relatively higher research expenditure is for cotton.

Source: Adopted from Evenson, Waggoner and Bloom (22).

Sugar, pineapples, bananas, citrus, fruits, and coffee, which are all important export crops appear to have very little research budget. Cotton, legumes, tobacco, root crops, vegetables, and poultry which are of lesser economic importance receive relatively high research attention. A relatively low priority is given to corn, an important crop and the staple food and major source of income of the poorer farmers. Also, judging from our very low yields compared to Thailand which has a similar resource endowment and has only recently become a major exporter of corn in the region, there seems to be a strong potential for expanding corn production in the Philippines. Research in coconut and forestry is comparatively small and funded mainly from taxes directly levied on their producers for this purpose in contrast to other commodities where the cost of research is shouldered by the taxpayer in general.

In rice research which has primarily been conducted at the International Rice Research Institute (IRRI) since 1962, the newly developed technology has been generally regarded as more suitable to irrigated conditions. The fact that modern varieties have been adopted in 70 per cent of rainfed areas, however, demonstrates the potential of technology development in rainfed areas (5). The same study by Barker and Herdt further estimate that if the cost of irrigation development is included, increasing production through investment in rainfed rice may have a benefit-cost ratio greater than for irrigated rice. In recent years, IRRI has devoted more resources to develop rice varieties especially suited to rainfed areas.

Agricultural Extension

Although the commodity breakdown of extension expenditures is not available, the emphasis of extension in rice is quite evident. The Masagana 99 Program caused the jump in extension expenditures in 1973/74 as extension agents assumed the role of loan administrators. In Table 10, the regional breakdown of extension shows the ratio of extension expenditures to value added in agriculture to be higher in the major rice producing regions of Central Luzon and Southern Tagalog especially when the budgets of the U.P. College of Agriculture and the government agencies in Manila are allocated to these regions. The relatively intensive extension in Ilocos is consistent with the high research expenditures and numerous supervised credit programs in tobacco and cotton reported earlier.

Most assessments of extension services in the Philippine stress the problems of organization and quality of personnel. Evenson, on the other hand, raises a more fundamental issue as he tries to explain the much heavier investments in extension compared to research in Philippine agriculture (20). Part of the reason is clearly the cheaper cost of manpower for extension versus research. But perhaps more important, there seems to be a general belief among policymakers that agricultural technology is highly transferable from regions with high research focus to regions with a high extension emphasis. It is not clear, however, that the technology exists or is being produced by other nations especially for rainfed agriculture. It should be stressed therefore that the value of extension depends essentially on availability of appropriate technology.

Table 10. Public expenditures for agricultural extension by region, 1979.

Region	Agricultural Extension (₱ million)	Value Added in Agriculture (₱ million)	Extension Expenditures Relative to Agricultural Value Added (per cent)
Ilocos	9.9	2,987	0.33
Cagayan Valley	5.5	3,069	0.18
Central Luzon	13.2	4,246	0.31
Southern Tagalog	17.6	8,639	0.20
Bicol	4.4	3,725	0.12
Western Visayas	9.9	6,236	0.16
Eastern and Western Visayas	5.5	5,153	0.11
Central & Northern Mindanao	6.6	7,278	0.09
South & Western Mindanao	9.9	11,978	0.08
UPCA Manila	27.5	-	-

^{a/} Due to data constraints, the figures for agricultural extension is based on 1975 proportions by region.

SOURCES: Evenson, Waggoner, and Bloom (22) and NEDA.

Recent analyses of supervised credit programs and the nature of inefficiencies on rice farms lead us to question conventional approaches of current extension programs. First, technical inefficiencies tend to be more important than allocative inefficiencies in explaining low productivity of rice farms (31).^{10/} This is consistent with empirical studies which overwhelmingly show that farmers in less developed countries maximize expected profits (44). Thus an effective extension program should focus on teaching principles of new farm technology or farm practice rather than emphasizing application of recommended input levels. Extension workers cannot be expected to make better decisions than farmers given the great heterogeneity of physical and market condition across farms. More often than not, uniform levels of fertilizer and agricultural chemicals are simply recommended over a wide geographic area without due consideration to individual farmer's resource condition.

Second, the common belief that extension would be more effective if tied with low cost credit and vice versa is not clearly borne out by empirical evidence. In the case of rice, the modern varieties introduced in 1967 has already been rapidly adopted in 67 per cent of irrigated areas and in 45 per cent of rainfed areas prior to the Masagana 99 Program. The fact that the rate of adoption has increased to 85 per cent and 71 per cent, respectively, in 1979 cannot be attributed to the Masagana 99 Program but rather should be viewed as a continuation of the long-run-adoption process of the new technology.

^{10/} Technical inefficiency refers to the inability of farmers to achieve potential maximum output for every level of input. Allocative inefficiency refers to the inability of farmers to use the optimal level of inputs given their resources and level of knowledge.

In the case of corn, there has been little dissemination of new varieties developed in the early 1970's despite the Maisan 77 and Masaganang Maisan programs because the new technology apparently did not offer higher profitability for the farmer. Extension and development of financial markets are indeed important components of rural development but the strategy of linking the two should guard against dissipating the efforts of scarce competent technicians in loan administration because this has not significantly raised repayment rates in supervised credit programs.

Infrastructure Program

Development of infrastructure has been the primary thrust of public economic development expenditure, its share reaching up to 70 per cent of total by the end of the 1970's. Although this may not directly contribute to increases in agricultural productivity, its level of development has a profound impact on the profitability and therefore resource flows into agriculture, on the rate of growth of rural industries, and on the quality of life in the rural sector. Unfortunately, except for irrigation there is very little macro-level economic analysis of other types of infrastructure. For irrigation, issues such as the economic impact of irrigation, the benefit-cost of irrigation investment versus output or input price interventions, and the factors affecting government investment in irrigation have already been studied. Undoubtedly, it is conceptually and empirically more difficult to evaluate the impact of investments in roads, electricity, telecommunication, and so forth compared to irrigation where the major source of benefit is directly related to rice production. However, it should be noted that economic analysis of other non-conventional type of inputs like research, extension, and schooling which are equally difficult appears to have received more research attention.

The allocation of the benefits of transport, communication, and power development is admittedly very difficult to determine. Infrastructure linking urban and rural centers benefits both sectors. Even construction of farm to market roads which is usually viewed as opening markets for farm produce also encourage the development of rural industries and other off-farm activities. One way to examine government's concern for rural development in terms of its infrastructure is by looking at the distribution of type and by region as reported in Tables 11 and 12, respectively.

Prior to 1975, over half of public infrastructure investment had been allocated to the development of the transport system, mainly the construction of roads and bridges. The picture has changed since then with the generation of power now receiving the greater bulk of infrastructure spending. The shares of irrigation investment also expanded together with rural electrification and other water resource development but at a more modest rate.

Up to the mid-1970's, public investment expenditure per capita had been heavily concentrated in Metro-Manila and Central Luzon. For on-going infrastructure projects in 1974, Metro-Manila per capita investment was twice that of Central Luzon and the latter was about 50 per cent higher than national average. The concentration of irrigation investment and the correlated investment in transport and power in Central Luzon account for this. It is heartening to note that official intentions of shifting regional allocation of infrastructure investments to poorer regions, as stated in the Five Year Development Plans 1978-1982, are

Table 11. Distribution of total public infrastructure expenditures by type of infrastructure.

(per cent)		
Type	1967-1975 (1)	1976-1979 (2)
Transport	56.9	26.5
Power	6.8	42.9
Rural Electrification	2.2	4.7
Irrigation	10.8	12.5
Flood Control	3.7	5.4
Water and Sewerage	5.2	3.3
Others	14.4	4.7
Total	100.0	100.0

Sources: (1) NEDA, as reported in the World Bank Report (48).

(2) NCSO, Philippine Yearbook, 1981.

Table 12. Regional allocation of public investment expenditures.

(P/capita, current prices)

Region	On-going projects (Dec. 1974)	Projects to be implemen- ted FY 1974	Projects to be implemented after FY 1974
Metropolitan Manila	754	24	167
Ilocos	174	85	145
Cagayan Valley	138	85	972
Central Luzon	375	93	107
Southern Luzon	83	58	367
Bicol	146	27	287
Western Visayas	74	27	196
Central Visayas	54	31	162
Eastern Visayas	131	30	173
Northern Mindanao	215	99	442
Western Mindanao)	69	55	179
)			
Southern Mindanao)	225	62	227
Philippines	243	55	255

Sources: "Regional Distribution of Public Investment," NEDA
Development Digest, Vol. 2-22, April 1975.

already reflected in projects planned after 1974 which should substantially alter the regional pattern of investment in favor of the relatively depressed areas such as Cagayan Valley, Bicol and Mindanao.

Land Use Policies

In recent years, there has been a stronger interest in the conservation of natural resources. Because of a declining land/man ratio and the increasingly destructive impact of the high rate of forest depletion on the environment, the government's thrust has taken a longer run perspective for attaining the most efficient use of our land resource. In the allocation of steeply sloped land and forested areas characterized by substantial externalities, the ordinary market mechanism may not lead to socially optimal land use. The government therefore has established two guiding rules with respect to land use.

First, public lands shall henceforth remain publicly owned and can be appropriated for private use only on a leasehold basis. This is intended to assure that the control and rental of these lands remain in public hands.

Second, to maintain a desirable ecological balance, at least 40 per cent of land area shall remain under forest cover. All lands with 18 per cent slope and over shall be classified as forest land and only the remainder may be considered alienable and disposable. There are several issues related to this second policy.

A critical information for its implementation is the current inventory of land use. Unfortunately, independent estimates of researchers

show much less existing forest cover than official estimates published by the Bureau of Forest Development (see Table 13).^{11/} Based on the target forest cover of 40 per cent or at least 12 million hectares, Bonita and Revilla project that 4.5 million hectares will have to be returned to permanent forest use, including the 1.5 million hectares of forests which have already been alienated. They recommend the following approach: minimal reforestation of one million hectares for forest rangeland, vigorous reforestation of 1.4 million hectares of denuded forests for protection purposes, and 2.1 million hectares for thinly stocked timber products forest.

The controversy about the exact size of existing forest cover at the aggregate as well as at a regional level can be resolved only through the completion of land classification. As of this date, 24 per cent of land area is still unclassified. At the present rate of its progress, it may take 40 years to complete this task. The importance of accelerating the process of land classification for planning the attainment of land use objectives has been adequately stressed, but additional resources for this have not been budgeted. Despite this, however, the government has already adopted concrete policies and programs to increase and conserve the present forest area.

^{11/} For an explanation of the difference in the methodologies used in deriving these figures, see Bonita, M. L. and A. V. Revilla (8).

Table 13. Pattern of land use according to two sources, 1976.^{a/}

	Official estimates		Bonita and Revilla	
	(million ha)	(%)	(million ha)	(%)
1. Total forest land	<u>17.0</u>	<u>57.7</u>	<u>9.0</u>	<u>30.0</u>
a) Production forest	9.7	32.4	3.8 ^{b/}	12.7
b) Protection forest and national parks	1.7	5.7	2.0	6.7
c) Open land/cultivated	4.3	14.3)	3.2 ^{c/}	10.7
d) Forest range/pasture land/others	1.0	3.3)		
2. Non-forest land area	<u>13.0</u>	<u>43.3</u>	<u>21.0</u>	<u>70.0</u>
3. Total land area	<u>30.0</u>	<u>100.0</u>	<u>30.0</u>	<u>100.0</u>

^{a/} Although there are official estimates for 1980, the 1976 data are presented because the purpose of the table is to illustrate the controversy in estimates of existing forest cover done in 1976.

^{b/} Classified as old growth forest.

^{c/} Includes forests in alienable and disposable lands (1.5 million has) and cut-over forest (1 million has).

Sources: Official estimates are from the Bureau of Forest Development, Ministry of Natural Data. Estimates by Bonita and Revilla are based on LANDSAT photographs (8).

The question of whether the target forest cover is attained or whether land use is socially optimal does not depend solely on proper land classification nor on rules regulating land use. The task of enforcing rules relating to the use of 12 million hectares and to the cutting of trees is tremendous and therefore public policy in land use should include the modification of the market signals given via economic incentives so as to induce private actions consistent with public policy (43).

For the non-forest land where externalities are not important, there is little direct government intervention. However, since use of land for agriculture, non-agriculture, or residence is essentially determined by relative profitability, it will indirectly be affected by the impact of economic policies on resource allocation as discussed earlier. The role of economic policies through relative prices in influencing land use between food and export crops is clearly illustrated in the study of Treadgold and Hooley (48). They showed that the 1962 devaluation which raised producers price of exports over domestic food crops led to the expansion of crop area devoted to export crops relative to food crops.

For the forest land, we describe government policies according to the following broad objectives:

1. Attainment of the 40-60 forest-non-forest land use ratio to achieve ecological balance. A major effort is now going on for reforestation and afforestation through projects directly supported

by public or foreign agencies such as the Program for Forest Ecosystem Management or those indirectly supported by credit incentives, tax exemptions, liberal term leases, and technical assistance. The principle of sustained yield management imposed by the Bureau of Forest Development on forest licensees aims to achieve a balance between growth and harvest, as a part of the conservation approach. Wildlife, watershed areas, natural parks, mangroves and other areas considered critical forest zones are supposed to be protected from human and natural destruction.

2. Increasing value added from forest resources given the land-balance ratio. Forward integration of the industry through higher domestic processing of logs is the principal intention of many policies adopted in the 1970's. The most important instrument has been the log export ban initiated in 1974 but which up to now is still effectively an export quota. Others are the differential export tax between logs and processed wood, linking of export licensing to wood processing capacity, credit policies, tax exemptions and other incentives granted by the Board of Investments, public research and extension in the wood processing industry.

The push for agro-forestry, and energy development through dendrothermal sources and other multiple uses of forest resources is reflected in the priority areas selected by the government for direct and indirect public support. There are also government policies to increase long run efficiency of logging. The selective logging system to maximize log output from a given forest area has been a long-standing

policy, but the problems of implementation are also well-known. The rules on tenure, size of concession, and forest charges have also been recently revised to improve the long-run efficiency of logging. The term of lease was increased from 25 to 50 years to encourage selective logging and reforestation. Larger concessions were granted to take advantage of economies of scale and to simplify government's management task. There was a simplification and significant upward adjustment of the forest charges in 1981 because in the late 1970's, forest charges including other related fees amounted to less than 4 per cent of value of output.

3. Spreading opportunities for exploiting forest resources.

Whereas "kaingineros" were formerly considered simply as illegal entrants to forest land and the major cause of forest destruction, they have now become regarded as legitimate users of the forest. The approach taken is to assist kaingineros in the transition to environmentally sound agro-forestry practices mainly through assistance and provision of security of tenure. In the reforestation projects, the participation of kaingineros was also enlisted through communal tree farming projects, and so forth. In the Kilusang Kabuhayan at Kaunlaran program, small scale forest activities are given priority.

Concluding Section

Our literature review indicates that the few existing macro-level policy analyses in agriculture focus only on issues relating

to rice, irrigation, and credit. A number of policy related studies available for other agricultural commodities have been largely descriptive. Research in the economic of agriculture and natural resources has been generally concentrated on production and to some extent marketing issues.

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 1970's, this bias was due mainly to the policy objective of promoting industrialization via tariff protection. However during the 1970's, the growing regulation of the agricultural sector has led, perhaps inadvertently, to implicit taxation or negative protection in agriculture particularly in the major export crops. Credit policies to increase loanable funds to agriculture have had little impact. It was also shown that interest rate subsidies will not significantly alter the unfavorable pattern of economic incentives caused by price intervention policies. Public expenditure policies, however, tended to promote agricultural development through extension, research, and infrastructure construction. Macaranas has also observed a low explicit taxation of agriculture (33). He estimated that at least up to the mid 1970's, agriculture's contribution to government tax revenues has remained below 15 percent.

In general therefore, the government seems to have relied more heavily on the formal tax and expenditure policies to protect agriculture. Price intervention policies which turned incentives against agriculture have been used to promote industrial-

ization by shifting investment into manufacturing and providing low food prices. Since agricultural producers have now been found to be price responsive, this policy pattern will likely have negative long-run consequences on production and thus on the objectives of food self-sufficiency, increasing exports and improving income distribution.

The policy implication of our analysis is not simply to increase protection in agriculture but to reduce distortions created by economic policies in general. The broad reforms in the tariff and interest rate policies currently being instituted have a potentially favorable impact on the agricultural sector. The general reduction in tariff protection in manufacturing will reduce the bias of incentives against agriculture. A flexible interest rate policy may allow more financial resources to flow into agriculture. Unfortunately, the attempt to increase long-term loans by keeping interest rate lower for short-term loans will limit resources available for agriculture production loans that are typically short-term. Furthermore, the move to keep interest rates lower for agriculture while letting them float for other types of loans will exacerbate the bias against the flow of funds to agriculture.

This paper is an initial attempt to draw out policy issues important in developing the less-favored sector within agriculture or rainfed agriculture. Although our analyses have had a general agriculture focus, the over-all conclusions are nevertheless important for rainfed agriculture which dominates the sector.

Furthermore, it was pointed out that credit and public expenditure policies tended to emphasize the irrigated agriculture.

A number of policy issues need more research attention. For example, the government has been moving towards nationalizing marketing of commodities beyond the staple crops. Our analysis has shown that this has led in some cases to implicit taxation of agriculture. A relevant question also is whether this has increased economic efficiency in the marketing activities.

Substantial amounts of public funds are allocated to research and infrastructure development. Much more economic consideration would be involved in the planning of priorities if economic research relating to which commodities or geographic locations would have high potential pay off in terms of investment in research and road construction, respectively is available.

The choice of policy instruments to achieve a policy goal usually have side effects. In agriculture, the frequent use of quantitative restrictions and other government fiat to regulate producer's actions rather than market mechanisms has frequently produced undesirable consequences especially in challenging the integrity of public servants. Cost-effectiveness of various types of policy tools should be evaluated. For instance, are export quotas or forest charges more effective means of conserving natural resources.

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