

# THE IMPACT OF AGRARIAN REFORM PROGRAM ON RESOURCE UTILIZATION AND PRODUCTIVITY AMONG SELECTED RICE FARMING AREAS IN THE VISAYAS

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## ABSTRACT

Farmer respondents cultivated an average rice farm area of 1.2 ha in 1972 but this area slightly decreased to 1.15 ha in 1977 and 1.17 ha in 1982. However, their expenditures on fertilizers, herbicides, insecticides and other inputs showed an increasing trend. Among the innovative practices employed by farmers especially during the agrarian reform years are the use of tractor in plowing and harrowing, mechanical threshers, rotary weeders, and planting of high yielding varieties. The average yield per hectare before the implementation of the agrarian reform program was only 48.63 cavans. The yield slightly increased to 52.42 cavans in 1977 and 53.01 cavans in 1982. Annual family income also increased from P2,759 in 1972 to P7,416 in 1982. Yield was not significantly associated with the agrarian reform program. The determinants of crop yield included crop variety, fertilizer and irrigation. The effect of farm area was negative, indicating that smaller farms had higher yield per unit area than bigger ones.

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**KEY WORDS:** Impact. Agrarian reform. Resource utilization. Productivity. "Before-after" comparative approach.

## INTRODUCTION

Agrarian reform program in the Philippines was launched to achieve a

dignified existence for the small farmer (Agricultural Land Reform Code, 1973). This program became nationwide as early as 1972 but information

on whether or not the program has a positive impact on the lives of the farmers in the Visayas appears inadequate, if not missing.

The issue of resource allocation and productivity associated with tenure status is still controversial. As cited by Cheung (1969), classical economists have indicated that share tenancy results in less intensive and less efficient resource use than expected under a single owner-cultivator system. On the other hand, many investigators (Cheung, 1969; Reid, 1973; Roumasset, 1976; and Nemberry, 1977) reported that share cropping systems are operated with approximately the same intensity and efficiency as most of the owner-operator systems.

This paper attempts to compare levels of resource utilization and productivity between the "before" and "after" agrarian reform and to ascertain the impact of agrarian reform program on resource utilization and productivity.

## METHODOLOGY

Data for three time periods, i.e. 1972 (before agrarian reform), 1977 (5 years after), and 1982 (10 years after) were obtained from two major sources, namely: records from the Ministry/Department of Agrarian Reform, and personal interviews with household head respondents. In addition to the 815 rice farmers; 57 corn farmers, 24 landlords, 154 landless workers and 40 firm owners were also interviewed in the selected rice farming barangays in the Visayas.

The "before-after" comparative approach was adopted to assess the impact of agrarian reform. The "before" situation referred to the data in 1972 while the "after" situations referred to the data in 1977 and 1982. Percentages, ranges and averages were used to identify and quantify respondents' characteristics, resource use, costs and returns. The chi-square test was used to ascertain the association between agrarian reform program and the changes in resource utilization, productivity and other selected farm characteristics while the multiple regression analysis was employed to determine the effect of agrarian reform related variables on productivity.

## RESULTS AND DISCUSSION

### *The Farm*

In 1982, the mean farm size for the Visayas was 1.17 ha but most farmer-respondents cultivated less than 1.0 ha. Most of the rice farms surveyed were irrigated and more than two thirds (69%) had two croppings per year.

Cropping system in the irrigated farms consisted of two to three plantings of rice per year. For the rainfed area, farmers planted rice only once mostly during the wet season.

Farmers in Region VI had relatively the largest farm (1.44 ha) followed by farmers in Region VIII (1.08 ha). The respondents from Region VI were mostly aware of the importance of irrigation and application of fertilizers. They also employed longer time of hired labor. On the other hand, respon-

dents from Region VII employed more family and exchange labor.

### Resource Utilization

Farmer-respondents cultivated an average area of 2.07 ha in 1972, 1.98 in 1977 and 1.97 in 1982. Their rice

farms also decreased slightly from 1.20 ha in 1972 to 1.17 in 1982 (Table 1). Their expenditure for fertilizer increased from P301 per ha in 1972 to P556 in 1982. Their expenditures for insecticides and herbicides also showed an increasing trend but the amount was below P100.

**Table 1.** Average comparative land and purchased inputs utilization before (1972), 5 years after (1977) and 10 years after (1982) the agrarian reform program in Regions 6, 7 and 8.

Variable	1972	1977	1982	Percent Change*	
				1972-77	1972-82
<b>Land utilization (ha)</b>					
Average area cultivated	2.07	1.98	1.97	(4.35)	(4.83)
Average area of rice farm	1.20	1.15	1.17	(4.17)	(2.50)
Average area irrigated	0.43	0.46	0.59	6.98	37.21
Average area unirrigated	0.76	0.69	0.57	(9.21)	(25.00)
<b>Purchased inputs utilization (P/ha)</b>					
Average cost of fertilizer	301	438	566	45.51	88.04
Average cost of insecticides	46	67	92	45.65	100.00
Average cost of other chemicals	18	30	51	66.67	183.33

\* Figures in parenthesis indicate negative change.

Most hired laborers came from the barangays where the respondents resided and only few came from other municipalities (Table 2). The wage rate of hired laborer was P9.11 and P15.40/man-day in 1972 and 1982, respectively. The amount of seeds used per hectare was only 3.42 cavans in 1972, 3.99 in 1977, and 3.95 in 1982. Direct seeding of appropriate rice varieties was widely adopted in many

rained areas especially in Region VI. This enabled the farmers to sow a second crop and increase rice production per year. Other innovative practices employed by farmers especially during the agrarian reform years included the use of tractor in plowing and harrowing, mechanical threshers, rotary weeders, and planting of high yielding varieties.

**Table 2.** Comparative rates and sources of various resources before (1972), 5 years after (1977) and 10 years after (1982) agrarian reform program.

Variable	Percent Change*				
	1972	1977	1982	1972-77	1972-82
<b>Sources of hired labor (%)</b>					
in the barangay	96.15	96.17	96.57	0.02	0.42
other barangay within the municipality	1.25	1.57	1.53	0.32	0.28
other municipalities	2.23	2.12	1.77	(0.11)	(0.46)
other provinces	0.37	0.21	0.14	(0.16)	(0.23)
<b>Classification of hired labor (%)</b>					
landless	32.58	31.70	32.15	(0.88)	(0.43)
other farmers	67.37	68.23	66.89	0.86	(0.48)
others	0.15	0.21	0.19	0.06	0.04
<b>Hired labor wage rate (P/man-day)</b>					
	9.11	12.28	15.40	34.80	69.04
<b>Amount of seeds used (cav/ha)</b>					
	3.42	3.99	3.95	16.67	15.50
<b>Sources of credit (%)</b>					
bank	78.26	82.65	56.58	4.39	(26.07)
cooperative store	0	0	0.28	0	0.28
credit union	0	1.02	4.76	1.02	4.76
landowner	0	0	0.84	0	0.84
money lender	4.35	9.19	25.49	4.84	21.14
merchant/trader	0	2.04	4.20	2.04	4.20
relatives	17.39	3.06	5.60	(14.33)	(11.79)
others	0	2.04	2.25	2.04	2.25
<b>Interest rate/year (%)</b>					
	7.50	10.83	14.67	3.33	7.17
<b>Land tax/ha (P)</b>					
	7.91	22.50	23.76	184.45	200.38
<b>Irrigation fees/ha (P)</b>					
	32.97	48.46	78.42	46.98	137.85
<b>Rental for tractor/ha (P)</b>					
	70.67	160.34	249.20	126.89	252.62

\* Figures in parenthesis indicate negative change.

Table 3. Comparison of resource productivity before (1972), 5 years after (1977) and 10 years after (1982) agrarian reform program.

Variable	Percent Change			
	1972	1977	1972-77	1972-82
<b>Wet season</b>				
Land productivity (cav/ha)	55.35	57.95	4.70	4.90
Marketed surplus (cav/ha)	16.02	20.66	28.96	42.45
Labor productivity (cav/man-day)	0.65	0.78	20.00	38.46
Value of production (P/ha)	1,905.12	1,995.60	4.75	68.25
Net farm income (P/ha)	679.24	1,030.00	51.64	93.27
<b>Dry season</b>				
Land productivity (cav/ha)	41.92	46.89	11.86	14.41
Marketed surplus (cav/ha)	11.59	16.07	38.65	42.45
Labor productivity (cav/man-day)	0.63	0.76	20.63	49.21
Value of production (P/ha)	1,441.65	2,083.90	44.55	82.56
Net farm income (P/ha)	914.41	1,301.97	42.38	83.46
<b>Annual (Household)</b>				
Net farm income (P)	1,674.77	2,370.64	41.55	142.15
Net income from other sources (P)	1,083.95	1,869.26	72.45	210.00
Total household income (P)	2,758.72	4,239.90	53.69	168.81

Farmer-respondents availed loans from banks and non-bank sources. Their borrowed money was mostly spent in the purchase of current inputs such as fertilizers and farm chemicals. Others used it for paying hired laborers and other farm operational expenses.

### *Productivity*

Comparison of resource productivity "before" and "after" implementation of the agrarian reform program is presented in Table 3. Land productivity was higher during the wet season than the dry season. During the "before" agrarian reform situation, the average yield per hectare for two seasons was only 48.63 cavans; 52.42 cavans 5 years after; and 53.01 cavans 10 years after its implementation.

Total annual household income of the respondents also increased. The use of irrigation, fertilizer and farm chemicals were major factors that augmented their productivity and income. These factors also added farm (both on and off farm) labor employment opportunities to both the respondents and other laborers.

### *Agrarian Reform Program and Resource Utilization*

The agrarian reform years was positively associated with the use of high yielding varieties. The farmers became increasingly aware of the advantages of planting high yielding varieties like the C-4 and IR varieties. Findings also revealed a shift by some

farmers in utilizing less labor in their farms during the agrarian reform years. This was because some farmers started using machinery and equipment like tractors, rotary weeders, mechanical threshers and sprayers.

Fertilizer expenditure and the agrarian reform program also had positive and highly significant association (Table 4). A higher proportion of the farmers spent more for fertilizers during the years 1977 to 1982. The higher fertilizer expenditure was true in all regions in the Visayas. This was attributed to the acceptance of farmers on the importance of fertilizers to crop yield.

No significant relation was noted between farm size and agrarian reform years (Table 4). This implies that the farm size cultivated by a farmer in 1972 did not significantly change in 1977 and 1982. Apparently, the change in farm size was not expected because Operation Land Transfer (OLT) beneficiaries were prohibited by law to subdivide or sell their farms to other persons.

Table 4 likewise shows positive and highly significant association between agrarian reform program and family expenditures. A significant number of respondents who spent less in 1972 had higher expenditures in 1977 and 1982. The respondents had probably more money to spend "after" than "before" the agrarian reform program.

### *Agrarian Reform Program and Productivity*

Except in Region VI, yield per hectare showed a non-significant association

Table 4. Summary of chi-square tests on the relationship between selected variables and agrarian reform years.

Variable	X <sup>2</sup> Value	d.f.	Level of Significance
Fertilizer expenditure	25.82	4	highly significant
Region 6	38.07	4	highly significant
Region 7	20.55	4	highly significant
Region 8			
Farm size	1.27	4	not significant
Region 6	0.22	4	not significant
Region 7	4.00	4	not significant
Region 8			
Family expenditure	82.71	4	highly significant
Region 6	62.76	4	highly significant
Region 7	36.06	4	highly significant
Region 8			
Yield per hectare	13.67	4	highly significant
Region 6	6.05	2	not significant
Region 7	3.93	2	not significant
Region 8			
Annual family income	133.65	4	highly significant
Region 6	47.70	4	highly significant
Region 7	46.81	4	highly significant
Region 8			

with agrarian reform program whereas family income and agrarian reform years had positive and highly significant association (Table 4). The non-association between agrarian reform program and crop yield confirms the previous findings of Cheung (1969), Reid (1973), Roumasset (1976) and Nemberry (1977) that efficiency in

farm operation is not related to tenure status of the operator. On the other hand, the significant association between agrarian reform program and yield per hectare in Region VI could be attributed to more farmers using better irrigation system in 1977 and 1982.

The significant increase in family income after agrarian reform implies

that the program brought about not only land tenure improvement but also other supportive services that generated additional employment. Further, the increase in income could be the result of increased product prices and marketable surplus.

A multiple linear regression analysis from 1972 was made with the yield in cavans per hectare as the dependent variable. The explanatory variables included the dominant variety used during the wet and dry seasons, cost of fertilizer, total labor, educational attainment of respondents, area of rice farm, source of water for the farm and expenditure as living index.

In general, the chosen explanatory variables explained only 21 percent in 1972, 15 percent in 1977, and 32 percent in 1982 of the total variation of the dependent variable.

Findings revealed that dominant variety used during the wet season, cost of fertilizer and source of water for the farm showed a positive and significant effect on yield per hectare. This means that irrigated farms planted to high yielding varieties (HYV) and fertilized at high levels enjoyed a significant yield advantage over those planted with traditional varieties, no fertilizer and no irrigation system. These findings sup-

port the usual contention that variety, fertilizer and irrigation are major determinants of rice yield.

The effect of farm area was negative and significant. This suggests that those with smaller farms had higher yield per unit area than bigger farms. Apparently, it is more efficient to operate a smaller farm in the Visayas because these farms receive more productive inputs (labor, management, etc.) on a per unit basis than bigger ones. Total labor, educational attainment of respondents, rice variety used during the dry season and expenditures as living indices did not significantly affect yield per hectare. This was because of very little variability on labor per hectare and most respondents had obtained primary level of education only. Likewise, rice variety used during the dry season did not significantly affect the yield per hectare due to lack of water supply during this period especially on rainfed areas.

The non-significant relation between expenditures as living index and yield per hectare indicates that farm expenditure was not a significant part of the total family expenditure and/or variability on the observed family expenditure in the survey areas was small.

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