UNP Research Journal Vol. VII Nos. 43-51 January-December 1998

Status of Farm Mechanization in Ilocos Sur

MATEO L. CABANTING, JR.
AVELINO B. FELICITAS, JR., Ed.D.
CONCEPCION B. AZARES

ABSTRACT

This study sought to determine the status of farm mechanization in Ilocos Sur, specifically the socio-economic profile of the farmer-respondents, their mechanization patterns, their perception of the importance of farm mechanization, and their problems in the use of farm machines.

The respondents of this study were 946 farmers from 34 municipalities of Ilocos Sur. A questionnaire checklist was used in data gathering. Frequencies, percentages, and weighted means were used in data analysis.

Majority of the farmer-respondents were male, middle-aged, finished high school, and had a monthly income below the poverty threshold level. They used farm machines in crop production, harvesting, and postharvest activities. The most common farm machines they used were kuliglig, four-wheeled tractors, water pumps, power sprayers, power thresher, tractor/jeep with trailer, and rice mill. They perceived that farm mechanization had much importance in all their farming activities. Although they accepted the use of machines in farming, they were doubtful whether or not they could buy their own farm machines because they were very expensive.

The farmer-respondents had problems in maintaining their farm machines, high cost of spare parts and fuel, limited supply and low quality of spare parts, and difficulty in operating the machines. Government support particularly in purchasing and operating farm machines to be rented by the farmers was the foremost suggestion to solve these problems.

Introduction

Background of the Study

National development thrusts can be attained through relevant, appropriate and productive research management, prioritizing development projects and programs, and the proper employment of technology and mechanization particularly in agriculture.

Modem farm technology calls for proper use and management of machinery in all areas. This necessitates education of the farm technology users through scholarship grants, technology transfer, and in service trainings provided to the farmers in the countryside particularly those in the remote areas of the province. Farmers in the remote barangays tend to stick to their traditional methods of fanning because they tend to believe that their farm practices are always the best.

Modem mechanization in any endeavor always implies faster production with less effort and time. This has been proven by farmers who have realized the great advantage of farm machinery over traditional use of the "plow and the cow". However, this entails more expenses which makes it unacceptable especially among upland farmers. It takes lots of efforts to persuade farmers in remote areas to use machines in the fields, particularly in the interior municipalities of Ilocos Sur where government extension assistance along farm mechanization is almost nil due to poor/inadequate transportation services.

Objectives of the Study

In general, this study sought to determine the status of farm mechanization in the province of Ilocos Sur.

Specifically, it aimed to:

1. Identify the machines used by farmers in their crop production, harvesting, and postharvest activities.

2. Assess the farmers' perception on the importance of farm mechanization.

3. Assess the farmers' awareness of the government's thrust for modernizing the agriculture sector and their capability for farm mechanization.

4. Identify farmers' problems in farm mechanization and solicit their suggestions in solving these problems.

Review of Literature

The Philippine Rice Research Institute or PhilRice (1993) cites the development of the Rice Engineering and Mechanization Program geared towards maximizing the use of available riceland and water resources. Among the means to attain this goal were the promotion of farm mechanization and better uses of riceland and water resources and the development of postharvest technologies for rice and rice by-products.

To do these, PhilRice Central Experiment Station located in Maligaya, Muiioz, Nueva Ecija designed and developed rice machinery and equipment that would facilitate the production, harvesting, and postharvest activities of rice farmers. Among them were an improved floating tiller, modification of the IRRI paddy drum seeder, lever-operated knapsack sprayer, and paddy pre-dryer (PhilRice, 1993).

Reeta, Jr. et al (1992) also studied the on-farm adoption of micromill in selected areas of the Philippines. A small rice mill called micrornill, which was low-cost, simple to fabricate and operate, and could be brought to remote areas because of its small size and light weight was designed by the International Rice Research Institute (IRRI). A prototype of the micromill was brought by PhilRice to several remote areas in Ilocos Sur, Ilocos Norte, lsabela, Quirino, Kalinga-Apayao, Bicol, and Leyte to verify its perfonnance and to assess its acceptability under farmers' condition. The farmers adopted the mill because its perfonnance was better than the mini-cono (rubber roll) mills.

Moreover, Eulito Bautista et al (also of the PhilRice) undertook a study on the rice stripper harvester to improve harvesting from 1993-1996. They designed a model that was technically and economically suitable to the Filipino rice farmers. Among the benefits derived by farmers from using the technology were reduced harvesting cost, faster and timely harvesting, and production of fertilizer from rice straw PCARRD, 1997).

In a survey of the effects of the use of farm machineries in the province of Ilocos Norte, Pedro L. Cadelina found out that power tillers were mostly used in land preparation (plowing, harrowing, levelling), hauling products by pulling a trailer, and operating pumps, mills, or other farm machines through an engine pulley. The benefits mentioned were savings in time, reduction of labor, and increase in income derived from rentals of their tractors as well as production ([LARC, 1985).

Methodology

The descriptive method of research was used in this study. Questionnaire-ch was used to gather the data needed. A list of farmers requested from the Departm Agriculture (DA) Office in each municipality was used as basis in selecting the respon. Random sampling was used to determine the total number of respondents. Freq count, percentages, and weighted means were used in the analysis of data.

Scope of the Study

This study covered all the 34 municipalities in the province of Ilocos Sur. An survey on farmers using machinery was done prior to the conduct of the research. of 946 served as respondents of *this* study.

The study focused on the socio-economic profile of respondents, their mechanization patterns, their perception of the importance of farm mechanization, awareness on modernizing agriculture, problems they met in the use of farm machi and their suggestions to solve the problems.

Discussion of Results

This portion presents the analysis and interpretation of data gathered.

Socio-Economic Profile

Table 1 presents the socio-economic profile of farmer-respondents.

Sex. As expected in the Philippines setting, the farmer-respondents in *this* stud, were male-dominated (93.66%). The few female respondents (6.34%) supervised their farms particularly in hiring workers.

Age. The majority of the farmer-respondents were considered middle-aged. They belonged to the following age brackets: 40-49 years old (30.55%); *50-59* years (20.30%); and, 30-39 years old (18.82%). The rest were either young (below 30 years *old)* or *old* (60-70 years *old* and above). This implies that most of the farmer-respondents were *still* full of propensity and vigor to do farm work.

Educational attainment. Most of the fanner-respondents were high school graduates (54.02%). Others finished elementary (30.02%) and vocational courses (6.13%). It was interesting to note that about 10% of the respondents were college graduates, which implies that college graduates who cannot find jobs related to their college education prefer to work in their farms than to be unemployed.

Table 1. The socio-economic profile of farmer-respondents in Ilocos Sur.

SOCIO-ECONOMIC CHARACTERISTIC	NO.	%
Sex		
Male	886	93.66
Female	60	6.34
Age (years)		
70 & above	63	6.66
60-69	153	16.17
50-69	192	20.30
40-49	289	30.55
30-39	178	18.82
Below 30	71	7.50
Educational attainment		
Elementary	284	30.02
High School	511	54.02
Vocational	58	6.13
College	93	9.83
Monthly income (pesos}		
Below 6,000	598	63.21
6,000-7,999	260	27.48
8,000-9,999	53	5.60
10,000-11,999	26	2.75
12,000 & above	9	0.95

Monthly income. The respondents' monthly income was included in the study to determine their capability to procure fann machines. Almost two-thirds of the respondents (63.21%) received less than P6,000 as monthly income, while more than one-fourth (27.48%) eared P6,000-7,999 a month. Less than 10% eared P8,000.00-9,999.00 (5.6%), P10,000-11,999 (2.75%) and P12,000 and above (0.95%). This implies that only a few have the capability to buy fann machines.

Farm Mechanization

Use of farm machines. The farmer-respondents were asked whether or not they used farm machines in their crop production, harvesting, and postharvest activities. Table 2 shows that 75.69% of the farmer-respondents used fann machines, 2.11% did not use any, and 22.2% did not answer the question.

Table 2. Distribution of respondents according to their use of farm machines.

USE OF FARM MACHINES	NO.	%
Yes	716	75.69
No	20	2.11
Did not answer	210	22.20

Machines used. Table 3 presents the machines used by the farmer-respondents. It was noted that they used several machines in their fanning activities as gleaned in their multiple responses.

Table 3. Machines used by farmers in crop production, harvesting, and **post harvest activities.**

FARM MACHINE USED	**FREQUENCY OFMENTION**	%
In Crop Production		
Kuliglig	413	43.66
Tractor (four wheel)	371	39.22
Water Pump	369	39.01
Hand Tractor	245	25.90
Power Sprayer	138	14.59
Weeder	20	2.11
Transplanter	19	2.01
In **Harvesting and Post Harvest Activities**		
Power Thresher	352	37.21
Tractor with Trailer	347	36.68
Rice Mill	205	21.67
Jeep with Trailer	154	16.28
Power Tiller with Cart/Trailer	96	10.15
Truck	75	7.93
Power Dryer	51	5.39
Com Sheller	37	3.91
Reaper/Harvester	12	1.27

The most common machines used by the fanner-respondents in their crop production activities were the *kuliglig* (43.66%), four-wheel tractor (39.22%), water pump (39.01%), hand tractor (25.90%), and power sprayer (14.59%). Only few fanner-respondents used a weeder 2.11%) and transplanter 2.01%).

On the other hand, the machines commonly used in the farmers' harvesting and postharvest activities were power thresher (37.21%), tractors with trailer (36.68%), rice mill (21.67%), jeep with trailer (16.28%), and power tiller with car/trailer (10.15%). Only a few used a truck for hauling their products from the farm to their houses (7.93%), a power dryer (5.39%), com sheller (3.91%), and reaper/harvester (1.27%).

Importance of Fann Mechanization

The farmer-respondents were asked to rate the importance of farm machines in facilitating the different aspects of their crop production, harvesting, and postharvest.

Table 4. Level of importance of farm mechanization in crop production, harvesting, and postharvest activities.

FARMING ACTIVITY	WEIGHTED MEAN	LEVEL
Crop production		
Land preparation (plowing & harrowing)	4.03	Much
Planting (direct seeding and transplanting	3.6	Much
Fertilization	3.55	Much
Weeding/cleaning	3.48	Much
Irrigation/watering	3.99	Much
Crop protection (pest/insect/disease control)	3.79	Much
Harvesting	3.84	Much
Harvesting and postharvest		
Threshing/shelling	3.84	Much
Drying	3.45	Much
Sacking/bagging	3.26	Not so much
Hauling	3.85	Much
Storing	3.9	Much
Milling	4.06	Much
Marketing	4.03	Much

The weighted mean ranging from 3.45 to 4.06 derived from the farmer-respondents' ratings revealed that farm mechanization had much importance in almost all their crop production, harvesting, and postharvest activities. It was only in sacking/bagging where farm machines were rated not so important (Table 4). This implies that they derived many benefits from their use of farm machines.

Awareness of Modernizing Agriculture and Capability for Farm Mechanization

Awareness of government thrust in modernizing the agriculture sector. Table 5 shows that almost two-thirds (60.57%) revealed that they were aware of the government thrust in modernizing the agriculture sector; one-fifth (20.61%) were unaware; and 18.82% were uncertain of their responses.

Acceptability of the use of farm machines. Majority of the farmer-respondents (80.55%) accepted the use of farm machineries; 6.87% did not accept it while 12.58% were undetermined (Table 5)..

Capability to buy farm implements for crop production activities. About one-third (30.97%) claimed that they had the capability to buy their farm machines, **while a** smaller number (29.92%) claimed they could not buy their farm implements. A greater number of farmer-respondents (39.11%) were doubtful whether or not they could buy their fann machines (Table 5). This means that these farmers were aware of the value of farm mechanization and accepted it but they could not afford to buy their own machines. This could be due to the meager income they derived from their farming enterprise.

Capability to buy farm implements for harvesting and postharvest activities. Only few farmer-respondents (19.03%) said they had the capability to buy farm machines for harvesting and postharvest activities. One-third (33.51%) claimed they could not buy them, while almost one-half (47.46%) doubted their capability to buy their farm machines (Table 5). They revealed that their income could hardly meet the basic needs of **their** family, considering that they were still sending their children to school, hence, their uncertainty.

Ability to maintain the farm machines. Table 5 also shows that almost one-half of the respondents (46.93%) gladly claimed that they had the ability to maintain their farm machines while 43.23% were uncertain whether or not they were capable of maintaining their farm machines. Very few farmer-respondents (9.83%) said they could not maintain their farm machines. These findings imply that the farmers who were knowledgeable of the mechanics of fann machines have the capability to maintain them while those **who** claimed they were uncertain might not know the procedure of maintaining these farm machinery, hence their uncertainty.

Table 5. Farmer-respondents' awareness of modernizing agriculture and their capability for farm mechanization.

AWARENESS OF AND CAPABILITY FOR MODERNIZING AGRICULTURE	NO.	%
Awareness of government thrust in modernizing the agriculture sector		
Yes	573	60.57
No	195	20.61
Uncertain	178	18.82
Acceptability of the use of farm machines and equipment		
Yes	762	80.55
No	65	6.87
Undetennined	119	12.58
Capability to buy/procure farm implements for crop production activities		
Yes	293	30.97
No	283	29.92
Doubtful	370	39.11
Capability to buy/procure farm implements for harvesting and post-harvest activities		
Yes	180	19.03
No	317	33.51
Doubtful	449	47.46
Capability to maintain the fann machines in harvesting		
Yes	444	46.93
No	93	9.83
Uncertain	409	43.23

Problems Met in Farm Mechanization and Suggestions to Solve Them

Table 6 presents the problems met by the farmer-respondents in the use of farm machines and their suggestions to solve them.

Table 6. Problems met in the use of farm machines and suggestions to solve them.

ITEM	FREQUENCY OF MENTION	%
Problems met in the use of machines in farming		
Difficulty in maintaining the machines		
High cost of spare parts	655	69.24
High cost of fuel	603	63.74
Limited supply of spare parts	573	60.57
No person dared to hire the farm implements	565	59.73
Difficulty in operating the machines due to small landholdings	358	37.84
Low quality of available spare parts	282	29.81
	118	12.47
Suggestions to solve the problems		
The government should support the cooperatives in purchasing farm implements and, in tum, the cooperatives sell/lend them to farmers at reasonable prices.		
'', The provincial government should purchase and operate farm machines like tractors, mechanical dryer, big irrigation pump and charge the farmers at subsidized prices.	632	66.81
Supplement DA funds with RA 7171 funds for use.	623	65.86
Financing institutions should provide low interest rates to farmers for buying farm machinery.	623	65.86
Government should extend soft loans to farmers for procuring farm implements.	506	53.49
The government should spearhead all programs for development.	505	53.38
Less requirements from lending institutions should be made available to farmers.	365	38.58
Ready market for products.	295	31.18
Organization or revival of farmers' association to cater to the farmers needs.	260	27.48
Cooperatives should program incentives to their members.	245	25.90
Market in the province where spare parts could be bought.	242	25.58
Minimal price for spare parts.	168	17.76
	150	15.86

Problems met. The most common problems met by the farmer-respondents concerned the economic aspects of farm mechanization, namely: difficulty in maintaining the machines (69.24%); high cost of spare parts (63.74%); high cost of fuel (60.57%); and limited supply of spare pars (59.73%). More than one-third of the farmer-respondents (37.84%) claimed that no person dared to hire their fann implements, while less than one-third (29.81%) had difficulty in operating the machines due to small landholdings. More than one-tenth (12.47%) said their problem was the low quality of available spare parts of the farm machines.

Suggested solutions. To minimize or solve these problems, a majority of the farmer-respondents suggested that: the government should support the cooperatives in purchasing farm implements and, in turn, the cooperatives would sell them to the farmers or allow them to rent them at reasonable prices (66.81%); the provincial government should purchase and operate farm machines like tractors, mechanical dryer, big irrigation pump and charge farmers at subsidized prices (65.86%); DA funds be supplemented with RA 7171 funds for farmers' use (65.86%); financial institutions should provide low interest rates to farmers for buying farm machinery (53.49%); the government should extent soft loans to farmers for procuring farm implements (53.38%).

About one-third of them suggested that the government should spearhead all programs for development (38.58%) and that less requirements from lending institution should be made available to farmers (31.18%). Only one-fourth of the respondents suggested a ready market for their products (27.48%), organization or revival of farmers' association to cater to farmers' needs (25.90%), and cooperatives should program incentives to their members (25.58%). Less than one-fourth suggested a market in the province where spare parts could be bought (17.76%) and minimal price for spare pars (15.86%).

Conclusions

Socio-Economic Profile of Respondents

Majority of the farmer-respondents were male, middle-aged (30-59 years old, the age propensity for work), finished high school, and had an income below the poverty threshold level.

Farm Mechanization

Many farmer-respondents used farm machines in crop production such as *kaaliglig*, four-wheeled tractors, water pumps, hand tractors, and power sprayers. Very few used a transplanter and weeder.

In harvesting and postharvest processing/storage of products, many farmer-respondents used a power thresher, tractor with trailer, jeep with trailer, and rice mill. Very few used power tiller with cart/trailer, truck, power dryer, com sheller and reaper/ harvester.

Importance or Benefits Derived from Farm Mechanization

Fann mechanization had much importance in crop production, harvesting, and postharvest activities of the fanners.

Awareness in Modernizing Agriculture and Capability for Farm Mechanization

Most of the farmer-respondents were aware of the government thrusts in modernizing agriculture. Although the majority accepted the use of machines and equipment in fanning, more were doubtful than sure whether or not they could buy their own farm machines. Almost one-half of the respondents had the ability to maintain their farm machines.

Problems Met in the Use of Machines

Problems. The farmer-respondents had problems in maintaining their farm machines, high cost of spare parts and fuel, limited supply and low quality of spare parts, difficulty in operating the machines due to small landholdings, and no one to hire their farm implements.

Suggested solutions to the problems. To solve these problems, the majority of the farmer-respondents suggested the following:

1. The government should support the cooperatives in purchasing fann implements and, in turn, the cooperatives would sell or lend them to the farmers at reasonable prices.
2. The provincial government should purchase and operate big farm machines and charge the farmers at subsidized prices.
3. DA funds should be supplemented with funds from RA 7171 for farmers' use.
4. Financing institutions should provide low interest rates to farmers for buying farm machinery.
5. Government should extend soft loans to farmers for procuring farm implements.

Minor suggestions concerned spearheading of all programs by the government, less requirements in acquiring loans, market for their produce, organization/revival of farmers' association, incentives to members of cooperatives, proximity of market for spare parts, and lower price of spare parts.

Recommendations

Based on the foregoing findings and conclusions, the following recommendations are hereby forwarded:

1. Although majority of the farmer-respondents had been using machines in their crop production, harvesting, and postharvest activities, it would do well for government agencies such as the Department of Agriculture, Department of Interior and Local Government, and Non-Government Organizations to work together and procure farm machinery to be rented by farmers at reasonable prices.

2. Agricultural technicians, in coordination with barangay officials and cooperatives, should schedule seminars to create awareness and awaken the farmers' interest in the use of farm machinery to facilitate their farming activities. Likewise, seminars on how to maintain farm machines would be very helpful to those who are incapable of maintaining their machines.

3. The government, both local and national, should extend soft loans to farmers for the procurement of farm implements and lending institutions should minimize requirements so that farmers could easily avail of these loans. It would be very beneficial for the farmers if they could provide low interest rates so that these farmers would not have difficulty in paying their loans.

4. The provincial government, through RA 7171 funds should support cooperatives in the purchase of farm implements and in turn, the cooperatives would offer them for sale or for rent by farmers at reasonable cost.

5. Moreover, the provincial government should purchase and operate farm machines like tractors, mechanical dryer, big irrigation pumps, and the like and charge farmers at subsidized prices.

6. A follow-up study on the cost-benefit analysis of farm mechanization in the province would provide a broader picture of this concern. It would do well to include the farmers' knowledge, perception, expectation, and attitude towards farm mechanization. Moreover, statistical analysis on the data gathered should be done to give deeper substance to the results.

References

ILARC. 1985. *Agriculture Research Compendium*. Batac, Ilocos Norte, Philippines: Ilocos Agricultural Research Center.

PCARRD. 1997. *PCARRD Highlights '97.* Los Baros, Laguna, Philippines: Philippine Council for Agriculture, Forestry, and Natural Resources Research and Development pp. 2.

PHILRICE. 1993. *Philippine Rice R & D Highlights for 1992.* Maligaya, Munoz, Nueva Ecija, Philippines: Philippine Rice Research Institute. pp. 142-157.

RECTA, FEDERICO **R. JR.** et al. 1992. *"On-Farm Adoption of Micromill in Selected Areas of the Philippines."* In Philippine Rice R&D Highlights for 1992. Maligaya, Munoz, Nueva Ecija, Philippines: Philippine Rice Research Institute. pp. 156-157.