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Support services provided to top rice producing farmers in irrigated ecosystem in Cagayan Province

Josie Y Bas-ong*

University Director for Extension and Community Service, Cagayan State University, Andrews Campus, Tuguegarao City, Cagayan Region 02, Philippines

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Abstract

This research study on the support services provided to top rice-producing farmers in the irrigated ecosystem in Cagayan province meant in determining the effectiveness of support services provided to rice farmers. This research study made use of a descriptive design. It was conducted in the seven barangays taken from three municipalities identified as the consistent top rice-producing municipalities and barangays in Cagayan Province in the past five (5) years who are tilling irrigated farms. The study results revealed that the top producing irrigated rice farmers in Cagayan province are in their middle age, males and all attended formal schooling with five members of the family. Farmer respondents have been in farming for more than two decades. They own the land they till with an average of 2.64 hectares and generate a yield of 4.2 tons and 3.7 tons during the dry and wet season. Most of the farmers availed the services of the National Irrigation Administration where they declared as very sufficient. The irrigated rice farmer respondents have received support services like; technical and farm inputs, training, IEC materials from the Department of Agriculture Region 02, Local Government Units, and Farmer-Led Extensionist. They also received technical assistance Moreover, respondents attended various trainings pertaining to rice production offered in their respective municipalities and barangays by government agencies. On the other hand, the different support service providers' extension modalities were assessed as effective, fair and not effective to few.

* **Corresponding Author:** Josie Y Bas-ong ✉ josiebasong@gmail.com

Introduction

Agriculture continues to be the engine of economic growth in most developing countries of the region. The Green Revolution's success was experienced in several Asian countries where the rapid adoption of modern agricultural technology resulted in dramatic gains in productivity. However, despite significant food production achievements, problems of food and nutrition security, poverty alleviation and regional imbalances still persist (Ferreira, Guilherme, & Ferreira, 2018; Malapit, *et al.,* 2020; Simoncini, *et al.,* 2019).

In many countries, governments have played a critical role in influencing both the production process by providing subsidized inputs, and marketing through procurement at minimum support prices (Alam, *et al.,* 2020). However, this places the considerable financial burden on the exchequer which most can ill afford as it reduces their capacity for investment in capital assets and development infrastructure. Cagayan, classified as first-class province, is the Regional seat of Cagayan Valley Region.

Like other provinces, most of the arable lands of Cagayan province are allotted to rice production compared to other crop production. Climate in Cagayan is characterized as dry season from March to June, wet season from July to October and cold season from November to February (Bohra-Mishra, *et al.,* 2017). Rivers and tributaries crisscross the province. Four major tributaries strategically located in the province feed the majestic Cagayan River These Rivers and tributaries along with small tributaries could be used as source of irrigation water (Liu *et al.,* 2009).

The total land area of Cagayan is about 900,270 hectares make it the second in land area in Region 2 and this constitute 3% of the total land area of the Philippines (Princepe, 2012). From the total land of the province 17.76% is classified as agricultural land. About 94,470 hectares of irrigated land is planted with rice. The average yield of 4.18MT/hectare during dry season for irrigated land, low land and upland and 3.84 MT /hectare during wet season for the same ecosystem is still considered (Liu, *et al.,* 2009).

Despite the low average rice productivity in Cagayan, the Province is still considered rice self-sufficient compared to other rice producing provinces. However, the Department of Agriculture as the lead agency in the promotion of rice sufficiency still believe the huge possibility of increasing rice productivity in Cagayan province and other provinces and regions. Thus, the Department keep on establishing various strategies to support and assist the rice farmers in the different regions, provinces and municipalities. Hence, this research study intends to assess the effectiveness of the numerous support services provided to the top rice producers in Cagayan province who are tilling irrigated lands.

Generally, this study, determined the effectiveness of support services provided to rice farmers in Cagayan province, Philippines. It specifically determined the following: (1) socio-economic profile of the farmer as to age, sex, household size, attained Education, length of farming, area cultivated (Dry and Wet Season), Total land area, Tenurial Status, Yield per hectare (Dry and Wet Season); (2) Identified the support services provided to top producing irrigated rice farmers; (3) Determined the perceived effects of technical support services provided to rice farmers

Material and methods

Research Design

This research study used a descriptive design that involves the description of all the variables utilized in the study.

Research Areas

There seven (7) barangays taken from three (3) municipalities identified as the consistent top rice producing municipalities and barangays in Cagayan province in the past five (5) years (DA Region 02 2014).

Population and Sample Size

The stratified random sampling was used in drawing the actual sample size of 130 top producing irrigated rice farmer respondents. A sample size was determined using Slovins formula with a margin of error at 5%. Actual respondents were chosen by purposive stratified random sampling technique.

Research Instrument

A semi-structured survey questionnaire was designed as a primary tool in gathering data. The instrument captured; 1) socio-economic profile, 2) Identified the support services provided to top producing irrigated rice farmers and 3) Determined the perceived effects of technical support services provided to rice farmers.

Data Collection and Analysis

Enumerators and data encoders were hired, the Enumerators to conduct personal interviews to respondents and review responses at the end of the day before they are turned over to the encoders. Encoders designed the encoding Excel Template and they are responsible in storing data. They likewise maintain the accuracy and veracity of encoded and stored data. Data were analyzed with the aide of SPSS application, descriptive statistics like frequency counts, percentages, means and standard deviation are the statistical tools used in the analysis.

Results and discussion

Table 1. Top Rice Producing Municipalities and Barangays in Cagayan Province.

Classification	Municipality	Frequency	Percent
Municipalities	Lal-lo	11	8.46
	Lasam	20	15.39
	Tuao East and West	99	76.15
Total		130	100
Barangays	Centro	33	25.38
	Centro 01	10	7.68
	Centro 03	10	7.68
	Cullit	5	3.9
	Naruangan	33	25.38
	Palca	33	25.38
	Sta.Maria	6	4.6
Total		130	100

Table 1 presents the 3 municipalities; Lal-lo, Lasam and Tuao taken as sample research study sites in the province of Cagayan which are recorded as the top 3 irrigated rice producing municipalities in Cagayan province. Of the 3 municipalities covered in the study, 7 were chosen as sample barangays with a total of 130 irrigated rice farmer respondents. These barangays include; Bgy. Centro of Tuao, Centro 01 of Lasam, Centro 03 of Lasam, Cullit of Lal-lo, Sta. Maria of Lal-lo, Naruangan of Tuao and Palca of Tuao.

Table 2. Socio-Economic profile of the top producing irrigated rice farmer respondents.

Profile	Mean	Standard deviation
Age	49.8	12.5
Household size	4.7	2.0
Attained Education	High School Graduate	1.8
Length of farming	22	12.6
Area cultivated (Dry season Total land area =119 ha	2.64	2.62
Area cultivated (Wet season) Total land area = 119	2.64	2.62
Yield per hectare (Dry Season)	4.2 tons	1.4 tons
Yield per hectare (Wet season)	3.7 tons	1.3 tons
Profile	**Frequency**	**Percent**
Sex		
Male	90	69.2
Female	40	30.8
Land Tenurial Status		
Land owner	103	79.2
Amortizing owner	1	0.8
Shareholder tenant	35	26.9
Leaseholder tenant	15	11.5
Total	153	Multiple responses

The top irrigated rice producing farmers in Cagayan province have a mean age of 50, and a household size of 5. All the respondents joined formal education, barely one fourth of them are graduates of a four year college degree course, half of them are high school graduates and attained high school level. The rest are elementary graduates. They are in the farming industry for an average of 22 years with a standard deviation of 12.6 years, meaning that there are new who joined the industry and there are also those who are already long in the industry. The top producing farmer respondents are tilling a total of 119 hectares irrigated rice farms with an average land holding of 2.64 hectares and a standard deviation of 2.62 hectares. The yield generated by the respondents from their farm has an average of 4.2 tons during the dry season with a standard deviation of 1.4 tons. While an average of 3.7 tons was the yield generated in the wet season with a standard deviation of 1.3 tons. The disparity of yield among farmers was mainly attributed by the differences in location, terrain, and irrigation water sources.

The respondents are dominated by males exhibiting 69.2 percent of them. While women's participation in irrigated rice farming who are the top performing producers in the province are females, it has to be noted. Hence, women's participation in farming in the Philippines is increasing (Mishra, *et al.,* 2017; Ramirez, *et al.,* 2020; Rasheed *et al.,* 2020). Most of the respondents are land owners, tilling their own farms, others are amortizing owner, shareholder tenant and leaseholder tenants. Data indicates that farmer respondents are providing their best management in the farms they own.

Table 3. Sources of farm irrigation water.

Type of Farm	Frequency	Percent
Upland Deep well irrigation Wet Season (SWIP and STW)	14	10.8
Lowland Deep well Irrigation Dry Season (SWIP and STW)	14	10.8
Lowland NIA Irrigation Wet Season	116	89.2
Lowland NIA Irrigation dry season	116	89.2
Open Source Irrigation Wet season	26	20.0
Open Source irrigation dry season	26	20.0
Total	312	

*Multiple responses

Most (89.2%) of the top irrigated rice producing farmers claimed to have availed the NIA services as their source of irrigation water during the wet and dry season farm operation. While 10.8% of them revealed to have used Small Water Impounding Projects and Shallow Tube Well irrigation water provided by the Department of Agriculture in their wet and dry season farm operation.

This implies that top irrigated rice producing farmer respondents depend on government services through the National Irrigation Administration as their major source of farm irrigation water and the Small Water Impounding and Shallow Tube Well projects provided by the Department of Agriculture as alternative and supporting irrigation water sources in places that NIA irrigation services cannot cater.

Assessment of Support Services

Table 3. Sources of capital by the irrigated rice farmer respondents.

Capitalization Support	Frequency	Percent
Own money	96	73.8
Trader	70	53.8
Agricultural Supplier	10	7.7
Bank	3	2.3
Cooperatives	5	3.8
Relatives	21	16.2
Friends	27	20.8
Bombay	16	12.3
Total	248	

*Multiple responses.

Most of the top irrigated rice producing farmer respondents (73.8%) claimed to have utilized their own money to finance their farm operations. While 53.8% of them revealed to have sought capital support through loan from traders. Others sought capital from relatives, friends, agricultural supplier, bank, cooperatives and 16 or 12.3% obtained their farm capital from a Bombay. Finding indicates that though most farmer respondents are using their own money in farming, they also depend capital support and assistance through loans from different sources for their farm business operation. These farmers rely their capital needs to private money lenders.

Table 4. Sufficiency assessment on the irrigation water support for both the dry and wet season farming operation.

Particular	Dry Season		Wet Season	
	Freq.	%	Freq.	%
Lowland irrigated				
National Irrigation Administration	Freq.	%	Freq.	%
Very sufficient	47	40.52	47	40.52
Sufficient	34	29.31	34	29.31
Insufficient	24	20.69	24	20.69
Moderately insufficient	11	9.48	11	9.48
Total	116	100	116	100
Small Water Impounding Project (SWIP)				
Sufficient	2	14.29	2	14.29
Insufficient	7	50.0	7	50.0
Moderately insufficient	5	35.71	5	35.71
Total	14	100	14	100
OPEN SOURCE (Creeks, rivers etc.)				
Sufficient	26	100	26	100
Total	26	100	26	100
Shallow Tube Well (STW)				
Sufficient	2	14.29	2	14.29
Insufficient	7	50.0	7	50.0
Moderately insufficient	5	35.71	5	35.71
Total	14	100	14	100

Table 4 indicates the respondents' assessment on the sufficiency of irrigation water supply from different sources. Of the respondents availing irrigation services from National Irrigation Administration, 40.52 of them declared that irrigated water supply is very sufficient, 29.31 said sufficient, 20.69 said insufficient and 9.48 claimed that it is moderately insufficient. For those who are using irrigation water from SWIP, 14.29% of them assessed as sufficient, 50% gauge it as insufficient and 35.71 said moderately insufficient. While all of those accessing open source irrigation water claimed that it as sufficient. Those whose irrigation water are sourced out from shallow tube well (STW), 14.29% of them assessed as sufficient, 50% gauge it as insufficient and 35.71 said moderately insufficient.

Table 5. Other support services provided to top irrigated rice producers for the dry and wet season operation.

Type and Sources	Frequency	Percent
1.Department of Agriculture Region 02		
Technical information	130	100
Farm inputs	1	0.8
Training	19	14.6
IEC Materials	19	14.6
Marketing Information	0	0
2. Farmer Led Extensionist		
Technical information	130	100
Training	15	11.5
IEC	19	14.6
Marketing Information	0	0
3. Provincial LGU Technician		
Technical information	2	1.5
Farm inputs	1	0.8
Financial support	1	0.8
Training	11	8.5
IEC	11	8.5
Marketing Information	0	0
4. Municipal LGU Technician		
Technical information	130	100
Farm inputs	4	3.1
Training	19	14.6
IEC	19	14.6
Marketing Information	0	0
National Irrigation Administration	116	

*Multiple responses

When irrigated rice farmer respondents were asked about the other support services they received, all of them claimed to have received technical information from Department of Agriculture Region 02, Farmer Led Extension and Municipal, Local Government Units. Other support services received mentioned are; Farm inputs, trainings on rice farming, provision of farm inputs and distribution of IEC materials as sources of technical information on rice farming. Moreover, the respondents said that no marketing information was provided to them despite their problems on low and fluctuating market price of their rice products.

Table 6. Type and sources of rice support services provided to the irrigated rice farmer respondents during dry and wet season.

Services Delivered	Frequency	Percent
1.Department of agriculture		
Seed selection	130	100
Land preparation	130	100
Soil nutrient management	130	100
Pest and diseases control	130	100
Irrigation management	130	100
Organic farming	10	7.7
Provision of farm inputs	1	0.8
2.Farmer Led Extensionist		
Seed selection	130	100
Land preparation	130	100
Soil nutrient management	130	100
Pest and diseases control	130	100
Organic farming	10	7.7
3. Provincial LGU technician		
Seed selection	1	0.8
Land preparation	2	1.5
Soil nutrient management	11	8.5
Pest and diseases control	11	8.5
Organic farming	11	8.5
4.Municipal LGU Technician		
Seed selection	130	100
Land preparation	130	100
Soil nutrient management	130	100
Pest and diseases control	130	100
Irrigation management	130	100
Organic farming	19	14.6
Provision of farm inputs	1	.08
5. National Irrigation Administration Irrigation Management	116	89.23

*Multiple responses

For those who claimed to have received assistance from the Department of Agriculture Farmer Led Extension, and Municipal Technician from Local Government Units, all l of them mentioned the following: seed selection, land preparation techniques, soil nutrient management, pest and disease control. While few said that that they are also provided with information about organic farming

technologies, provision of farm inputs (seeds and fertilizer) by the Department of Agriculture Regional Office, Farmer Led Extensionist, Provincial LGU Technician and Municipal LGU technician. While all those provided with the services of the National Irrigation Administration (NIA) said that they are given information on irrigation management.

Table 7. Frequency of assistance/visit provided to the top producing irrigated rice farmer respondents during dry season of 2014 and wet season of 2013 rice farming.

Frequency of Assistance/Visit	Frequency	Percent
1.Department of agriculture Region 02		
Once a year	130	100.0
Twice a year	65	50.0
2.Farmer led Extensionist		
Twice a year	130	100.0
four times a year	20	15.4
3.Provincial LGU Technician		
Once a year	10	7.7
Twice a year	130	100.0
Four times a year	10	7.7
4. Municipal LGU Technician		
Every week	5	3.8
Once a year	20	15.4
Twice a year	3	2.3
Four times a year	130	100
5. National Irrigation Administration		
Four times a year	116	

For those who availed technical assistance from above mentioned sources, all (100%) of them claimed that DA region 02 visits them for once a year. Half (50%) of them said that they were visited for twice a year. The Farmer Led Extensionist visit the beneficiaries for twice a year as claimed all (100%) of them while 15,4 % declared four times a year. The Provincial LGU technician visited the farmers for once a year by 7.7%, twice a year by all (100%) of them and four times a year by another 7.7%. On the other hand, the Municipal LGU technicians visit the beneficiaries as often as weekly to 3.8% of the respondents, once a year to 15.4% and twice a year to 2.3% and all (100%) of them stated that they are visited for four times a year.

Table 8. Training/Seminar attended by rice farmer respondents.

Trainings Seminars	Frequency	Percent
Farm planning management	1	0.8
Farm production	1	0.8
Fertilizer application	1	0.8
Integrated pest management	4	3.0
Launching of new products related to rice	1	0.8
Seed selection	1	0.8
Self sufficiency in rice production	11	8.5
Soil nutrient management	5	3.8
Vermicomposting	5	3.8
Conducted/sponsored by:		
Deoartment of Agriculture Regional Office	17	13.1
Provincial Local Government Unit	1	0.8
Municipal Agricultural Office	30	23.1
Phil Rice	1	0.8
Seed Producer	3	2.3

The irrigated rice farmer respondents revealed to have attended various trainings related to rice production, like Farm planning management (0.8%), Farm production (0.8%), Fertilizer application (0.8%), Integrated pest management (3.0%), Launching of new products related to rice (0.8%), Seed selection (0.8%), Self-sufficiency in rice production (8.5%), Soil nutrient management (3.8%), Vermicomposting (3.8%). The venues of trainings were in their respective municipalities and barangays except for few who went to PhilRice San Mateo, Isabela. Trainings attended by respondents were sponsored by Department of Agriculture Regional Office, Provincial Local Government Unit, Municipal Agricultural Office, Phil Rice and Seed Producer.

The farmer respondents assessed the effectiveness of the extension modalities employed by the different support service providers. The Techno Gabay IEC materials of the Department of Agriculture was found “Effective” by 44.6%, “Fair by 3.8% and “Not effective” by 3.8%. Radio Agri Program is assessed as “Effective” by 7.7%, “Fair” by 13.1% and “Not effective” by 0.8%. The TV Agri Program was assessed “Effective” by 3.1%, Fair by 9.2%, “Not effective” by 0.8%. The Department of Agriculture Field Technicians were assessed as “Effective” by 80.77% and “Fair” by 19.2%, While Farmer’s field technician are “Effective” by 7.7%, “Fair” by 100% and Not

effective to 0.8%. Seminars/Trainings are "Effective" to 11.5%, "Fair" to 2.3% and "Not effective" to 1.5%. Field/Farm Demonstration are weighed as "Effective" by 7.7%, "Fair" by 2.3% and "Not effective" by 0.8%. While the Farmer's Field day was "Not effective" to 11.54%.

Table 9. Effectiveness of extension modalities employed by the support service providers.

Techno Gabay IEC Materials		
Effective	58	44.6
Fair	5	3.8
Not effective	5	3.8
Radio Agri Program		
Effective	10	7.7
Fair	17	13.1
Not effective	1	0.8
TV Agri Program		
Effective	4	3.1
Fair	12	9.2
Not effective	1	0.8
Department of Agriculture Field Technician		
Effective	105	80.77
Fair	25	19.2
Farmer's field technician		
Effective	10	7.7
Fair	120	100.0
Not effective	1	0.8
Seminars/Trainings		
Effective	15	11.5
Fair	3	2.3
Not effective	2	1.5
Field/Farm Demonstration		
Effective	10	7.7
Fair	3	2.3
Not effective	1	0.8
Farmer's Field day		
Not effective	15	11.54

Conclusion

1. The top irrigated rice producing farmers in Cagayan province have a mean age of 50, and a household size of 5 and majority of them are males. They all attended formal schooling, barely one fourth are college graduates and are high school graduates. They have been in the farming industry for more than two decades. They own the land they till with an average of 2.64 hectares and generate a yield of 4.2 tons and 3.7 tons during the dry and wet season.

2. Most of the farmers availed the services of the National Irrigation Administration where they declared as very sufficient. Others rely on Small Water Impounding Project (SWIP), Shallow Tube Well (STW) which are generally gauged as "insufficient" and Open Water Source (OSW) as "sufficient" source of irrigation water.

3. The irrigated rice farmer respondents have received support services like; technical and farm inputs, training, IEC materials from the Department of Agriculture Region 02, Local Government Units, and Farmer-Led Extensionist.

4. The respondents' technical assistance was seed selection, land preparation techniques, soil nutrient management, pest and disease control, organic farming technologies, provision of farm inputs (seeds and fertilizer), and irrigation management.

5. The support service providers visit the respondents as often as weekly, four times a year, twice a year and once a year.

6. Respondents attended various trainings pertaining to rice production offered in their respective municipalities and barangays by government agencies.

7. Extension modalities employed by the different support service providers were assessed as effective, fair and not effective to few.

Recommendations

1. Government agencies concerned should design a more effective intervention strategies in support to irrigated rice farmers to further increase their productivity,

2. More frequent visit and assistance should be provided to farmers.

3. Micro finance, marketing and extension services support should be provided to rice farmers to drive them improve their management practices and productivity.

4. Strengthen government-NGO-farmer partnership is necessary.

5. Increase efficiency of irrigation water sufficient enough to sustain rice farming requirements.

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