

ANALYSIS OF THE PADDY CULTIVATION PATTERN IN GALLE AND MATARA DISTRICTS IN THE SOUTHERN PROVINCE OF SRI LANKA

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ABSTRACT

This study aims to determine the current trends of paddy cultivation in the Galle and Matara districts in the southern province of Sri Lanka. Moreover, constraining factors for paddy cultivation and the role of extension services to promote paddy farming are also analyzed. The required data was gathered from the field survey carried out using 400 farmers in Galle and Matara districts. The majority of paddy lands have single ownership in both districts while shallow and bog soil was dominant soil types in the paddy fields. Among the factors affecting paddy cultivation patterns, poor water drainage conditions and labor scarcity were the main reasons for the decreasing trend. Bog and shallow soil conditions of paddy lands have created the water drainage issue. The average cost of paddy farming in the Galle and Matara districts was Rs.39444 and Rs.39374 per acre respectively. The highest percentage of the cost is incurred for land preparation while the next highest cost is for paddy harvesting. The government farmer training programs were not sufficiently addressing the farmers' needs and did not contribute to increasing paddy farming in these districts. The frequency of farmer visits by advisory services was 2-3 visits per season, while farmers prefer to meet them at least once a week. Agrarian service centers and community-based organizations were the main farmer assistance services. Farmers expect government assistance mainly for the irrigation facilities to promote paddy farming in Galle and Matara districts.

Keywords: *Advisory service, Cost of Production, Decreasing trend, Extension Services, Paddy farming*

INTRODUCTION

Sri Lankan agricultural sector plays an important role in the rural economy despite the low GDP contribution compared to the service and industrial sectors. Since rice is the staple food of Sri Lanka providing half of the daily calorie requirement, and every government has given priority to the development of the paddy/rice industry at a national level. The land extent under paddy cultivation during the 2019 Yala season was 368,906 hectares, and the yield of paddy estimated for the 2019 Yala season was 4,896 Kg/ha. The largest extent of paddy cultivated in the Yala season was reported in Polonnaruwa district (61,624 hectares) which is 16.7% of the total extent of paddy cultivated in the country. The extent harvested during this season was estimated to be 346,010 hectares, and it is about 94% of the total cultivation. The highest average yield of 5,726 kg per hectare was reported during this season in the Hambantota district (Department of Census and Statistics, 2019). Among the total permanent agricultural land, 45 percent is used for paddy cultivation and the majority of the farmers (70%)

are small landholders who are cultivating less than 1 ha (Wijetunga et al., 2008). Moreover, in the year 2019, the paddy sector contributes nearly 3.5 % of the GDP (CBSL, 2019). In the global context, rice is the second most widely grown cereal crop and the staple food for more than half the world's population. More than 3 billion people, the per capita consumption of rice is more than 100 kg per year. Rice is cultivated on 155.5 million ha with an average growth rate of 0.39% a year, in the last 30 years.

In the near future, the possibility for expanding areas under rice-based systems will remain very limited because of the scarcity of global water resources for agriculture. The expansion of urban and industrial sectors in Asia where land is already limited and the high costs of developing new lands that are suited for rice production in Sub-Saharan Africa and Latin America (Van Nguyen and Ferrero, 2006).

About 45% of total permanent agricultural land is utilized for paddy cultivation in Sri Lanka. Nevertheless, at present, the paddy sector is facing an unparalleled crisis due to the decreasing trend of

paddy farming. As cited by many studies, one of the core issues is the slimming down of the net returns of paddy farming due to the discriminatory price offered to the paddy producers at the paddy market (Gunawardene and Somarathna, 2001). According to Wijetunga et al. (2008), this has led some farmers to move away from paddy farming.

According to the aforementioned facts, the Government of Sri Lanka has introduced several policies and programs to increase paddy production. In the context of the southern province in Sri Lanka, Galle, Matara, and Hambantota districts are mainly cultivating paddy as their major economic crop. Since 2008, the paddy sown extent in Galle district shows a tremendous decline despite its paddy land extent due to various socio-economic and political reasons. Production in Galle and Matara was well up to average, with harvests estimated at 37 000 tons and 40 000 tons, respectively (FAO, 2014). Statistically, paddy cultivation in the Galle district was rapidly declining every year due to several obstacles faced by the farmers. According to the district agricultural committee report, in Galle district, there is a significant number of abandoned paddy lands in Galle district. According to that, increasing cost of production, poor prices of paddy, filling of paddy land for road development projects, and facing hardship for water drainage issues and poor irrigation facilities were identified as key constraining factors. Therefore, this study intends to analyze the present situation of paddy farmers in the Galle and Matara districts, the nature of paddy lands, cost of production and key cost component, and farmers' need assessment in terms of paddy cultivation. In addition, this research will contrast the research findings with the national data issued by the Socio-Economic and Planning Division, Department of Agriculture in the year 2019.

METHODOLOGY

Selection of farmers

All farmers in each Agrarian Service Center's (ASCs) division are registered in the Agrarian Services Department Office established. Agricultural Instructors of each division maintain a register of farmers with whom they have close contacts on paddy cultivation. In the project area of the Galle district, a list of 20 farmers was randomly obtained from the relevant 20 ASCs. In order to compare the farming practices and problems in the other areas of the same geographical area, 100 farmers from the Matara district were selected. A team of three graduate research students were

trained in collecting data and information from farmers by interviewing.

Method of data collection

To collect data and information, it was investigated the prevailing problems of the farmers, and a questionnaire was designed and pre-tested for appropriateness. It was designed to obtain the following information.

- a. Basic information of the farming system, general information about the farmer, size of the paddy field, farming experiences, soil characteristics of paddy field and nature of paddy land ownership,
- b. Information on the constraining factors of paddy production, each cost component of the paddy cultivation, which includes the operations of land preparation, the establishment of paddy, cultural practices, harvesting of the crop, threshing, storage, processing, and marketing, including expenses and income,
- c. Role of the Extension and Advisory Services in the paddy cultivation process and analysis the expectations of farmers from Extension and advisory services

Basic descriptive and inferential analytical tools were used to analyze the collected data.

RESULTS AND DISCUSSION

The following table summarizes the basic characteristics of the farming community of Galle and Matara Districts, representing farmers' age, farming experiences, size of paddy land and land extend of other cultivations.

According to Table 01, farmers have an average of 30 years of experience in farming in both districts. In addition, as obvious in many recent researches in the agriculture sector, farmers, aged over 50, have dominated in these two districts implying less youth involvement in paddy farming. Average paddy land belonging to the farmers was 2 acres of tea and cinnamon cultivations are other prominent cultivations in both districts.

Information related to paddy farming

According to the paddy land ownership, the majority of the farmers (84% & 85.06%) have the single owned ownership type. The second highest (21% & 21.27%) ownership type is the rental system and these two districts do not have Thattu maru and Katti maru ownership types. In the Katti Maru system, the specific land area is divided into no of farmers & they cultivate those land blocks

Table 1: General profile of the paddy farmers in Galle and Matara Districts

	Minimum		Maximum		Mean	
	Galle	Matara	Galle	Matara	Galle	Matara
Age (years)	29	30	90	85	58	59
Farming experiences (years)	4	4	40	40	30	35
Paddy land size (Acre)	2	1.3	3.5	2.2	2.15	1.9
Other land areas (Acre/farmer)						
Coconut	0	0.1	8	1.25	0.81	0.84
Rubber	0	0.1	3	2	1.13	0.65
Cinnamon	0	0.2	30	3	1.80	1.42
Vegetable	0	0.01	3	1.5	0.27	0.52
Tea	0	0.01	100	2	3.42	2.34

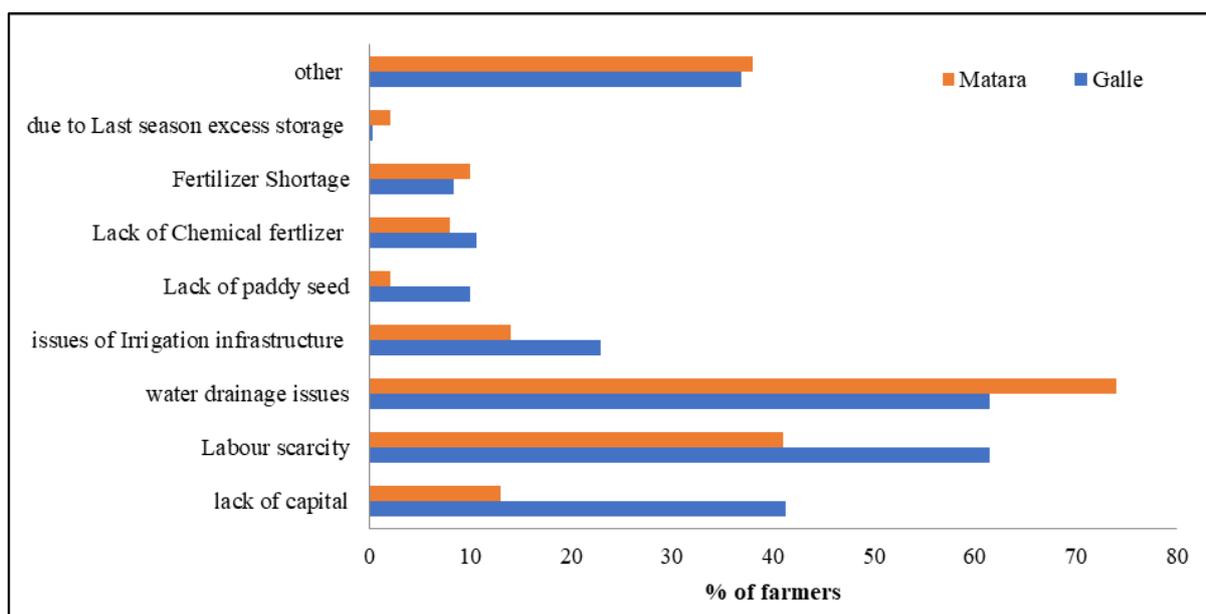
Source: Author's own data, 2019

with a seasonal rotation. In the Thattu Maru system, the specific whole land area cultivates by one farmer but the cultivation right will change year-wise with known farmers of that land area.

Furthermore, this research found that the last cultivation season and year were the year by the farmers in Galle and Matara District. According to the research findings, the last season of cultivation ranges from 1978 to 2017 in Galle District while

ranging from 1969 to 2017 in Matara District. Accordingly, it seems that some land has been abandoned for more than 40 years. Many reasons are being affected for the paddy land abandoned in Galle districts. Therefore, the possible reasons for abandoning paddy lands were investigated.

According to the reason for abandoning paddy farming (Figure 01), the water drainage issue was the main reason in both Galle and Matara districts.

**Figure 1:** Reasons for abandoning paddy farming

Source: Author's own data, 2019

However, these two districts showed labor scarcity as the second important reason for abandoning paddy farming. The lack of capital is another important reason in Galle district. The least affected reason for the abandonment of paddy lands in both districts was the availability of excess storage stored in the last season.

Constraints for paddy farming

Moreover, farmers of the study area were asked to prioritize the most affecting constraining factors for paddy farming in their area. Accordingly, poor water drainage condition was the most prominent constraining factor in the Galle district (at 1.33) (Figure 02). Lack of labor availability was the

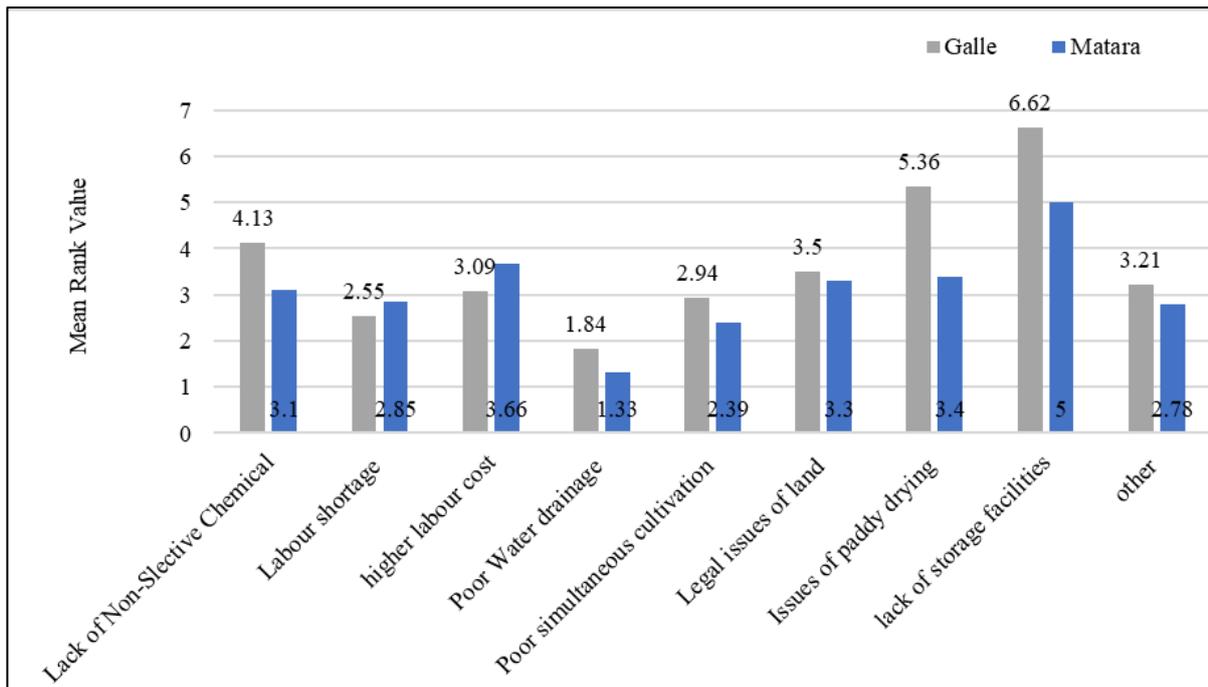


Figure 2: Constraining factors for paddy farming

Source: Author's own data, 2019

second important constraining factor in Galle district. Second Matara district also showed the lowest mean rank value (1.84) for poor water drainage factor, implying that poor drainage condition is the main constraining factor for paddy farming. Further, lack or poor simultaneous practices have been recorded as the second important constraining factor in the Matara district (2.85).

Characteristics of paddy farming in Galle and Matara district

Soil types in paddy field

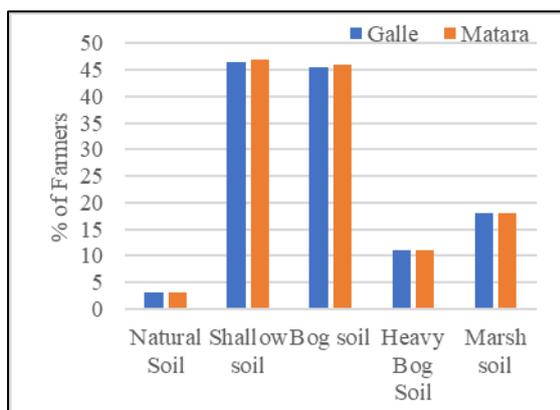


Figure 3: Different soil types in paddy fields

Source: Author's own data, 2019

This study has investigated the impact of soil types on the decreasing trend of paddy farming, and figure 03 shows the existing soil types in the paddy field in the study areas.

According to Figure 03, the majority of the soil types in the paddy fields are shallow and bog soil types in both Galle and Matara districts. The availability of natural soil in the paddy field was hardly observed in both districts. The soil type of the paddy field has a great impact on poor water drainage conditions.

Cost of paddy production

According to Table 02, the total cost of production of paddy farming in Galle District was Rs. 39444.12 per acre and Rs.39375.00 per acre in Matara District. When comparing these cost components with the national average cost of production, it was not identified any significant changes with the figures of the reports issued in 2019 by the Socioeconomic and planning center in Sri Lanka.

According to Table 02, both districts show similar total cost and % of TCP. However, Galle district has a higher cost for manual weed control (13%), land preparation (32%), and organic fertilizer (5%) activities than the Matara district. Both districts showed similar costs in pesticides (6%). However, the Matara district showed higher costs in chemical fertilizer (14%), weedicide cost (8%), harvesting cost (23%), and storage cost than the Galle district.

Table 2: Cost of paddy production in Galle and Matara District

Cost factor	Method	Galle		Matara	
		Cost (Rs/Ac)	% of TCP	Cost (Rs/Ac)	% of TCP
Weed control- Manual	water management, by tillage, chemical,	5180.93	(13%)	4145.31	(11%)
Land Preparation	tractor, manual, using cow	12407.73	(32%)	9436.86	(24%)
Organic fertilizer	paddy husk, compost	2020.59	(5%)	560	(1%)
chemical fertilizer	chemical	4787.27	(12%)	5530.43	(14%)
Pesticide	weedicide, traditional methods, manual	2479.31	(6 %)	2500	(6%)
Weedicide	weeding sowing	2631.97	(7 %)	3025	(8%)
Harvesting	tractor, combined harvester, manual	8150.43	(21%)	8879	(23%)
Processing	tractor	3840.22	(10%)	5664.55	(14%)
Storage		1570	(4%)	4500	(11%)
Total		39444.12		39375.00	39375.00

Based on the cost of cultivation of crops, 2018/2019 Maha, we contrast the cost-production of Galle and Matara districts with the other paddy cultivating districts under a rain-fed system (RF). Furthermore, the agricultural-ecological factors of the Galle and Matara districts are much more similar to Kalutara District. Therefore, we can contrast our research findings with the Kalutara district figure as well. The estimated cost of cultivating an acre of paddy under a rain-fed system is about Rs. 39, 572.00, and the cost of production of a kilo of paddy is Rs. 36.00. However, the present guaranteed price of a kilo of paddy is varied from Rs.39.00 to Rs. 41.00. Anyhow, paddy farmers in Matara and Galle districts do not intend to sell their products. According to this study, only 27 percent of the farmers in Matara district sell their paddy production while only 24 percent of the farmers in Galle district sell their production. Accordingly, the majority of farmers in both districts are doing paddy farming basically for their consumption purpose rather than a commercial purpose.

Furthermore, this study investigated the recent farm gate price for paddy they received, the maximum price they have received so far. Table 03 shows the information on paddy prices in Matara and Galle districts.

The farmers in Galle districts have received a relatively higher unit price for paddy compared to the farmers in Matara. The possible reason for these observed differences could be due to different

sample sizes in this study. Otherwise, there wouldn't be such remarkable price differences between the two districts in the Southern province.

Table 3: Paddy Farm gate price in Galle and Matara District

	Galle	Matara
	(Average prices Rs/Kg)	
Price of 1 kg of paddy at the last time of selling	Rs.39.74	Rs.31.00
Highest farm gate prices received so far	Rs. 41.80	Rs.36.39

Source: Authors own data, 2019

Fertilizer application for paddy farming

This study intends to analyze whether farmers are heavily relying on chemical fertilizer and how many farmers follow the recommendation given by the Department of Agriculture. Anyhow, we were unable to gather information on the amount of applied fertilizer due to inadequate information available with the farmers in this study. Table 04 shows the percentage of farmers who apply NPK (Nitrogen, Phosphorous, K for Potassium) fertilizer Basal, Top I, II, and III application regularly to their paddy lands.

According to Table 04, though the higher percentage of farmers in both districts applies N, P, K application as Basal and Top I, and II, fewer percentages of farmers apply NPCs as Top III application. According to the report, issued by the Department of Socio Economic and Planning

Center (2019), the total average use of fertilizer use was 155 kg/ac in irrigated water regimes, and it was 124 kg/ac in rain-fed water regimes. The usage of the basal mixture was 54 kg/ac in irrigated water regime, whereas it was 29 kg/ac in a rain-fed water regime.

Table 4: Percentage of farmers who applied fertilizer at each stage

	Galle (% of farmers)			Matara (% of farmers)		
	N	P	K	N	P	K
Basal	13	65	13	10	90	8
Top I	69	10	59	92	3	79
Top II	68	9	61	82	3	80
Top III	15	1	12	8	0	7

Source: Authors own data, 2019

Supporting services and subsidies for promoting paddy farming in Southern province

The department of Agriculture in the Southern province has organized different training and awareness programs with the assistance of the Agrarian extension service center to promote paddy farming. This study has evaluated those training programs exploring the number of the participants as a percentage and analyzing the perception of farmers in regard to the usefulness of the training program for their farming. Table 05 shows the research finding in Galle and Matara districts. The participation of the farmers for the training session is satisfactorily higher (55% & 77%) in both districts. However, the majority of the farmers in both districts don't perceive the training session as useful.

Table 5: Farmers' training program on paddy cultivations

	% of Farmers			
	Galle		Matara	
	Yes	No	Yes	No
Participation	55	45	77	33
Perceived as useful	26	74	25	75

Source: Authors own data, 2019

Role of Extension and Advisory service in the promotion of paddy farming

Meeting with Agriculture Instructors

There is vital role-playing by agriculture extension and advisory services for the development of the agriculture sector. In Galle and Matara districts, extension services insert their effort to promote paddy farming due to the higher percentage of abandoned paddy lands. Table 06 shows the

frequency of farmer visits and the purpose of visiting in the Galle and Matara district.

Table 6: visit of agricultural extension and advisory services

	Galle (Average)	Matara
Meeting frequency	2-3 times per/season	1-2 time per/season
Purpose of meeting	When necessary	When necessary

Source: Authors own data, 2019

According to Table 06, the farmers meet the agricultural instructors only when necessary, in both districts. The meeting frequency of both districts is 1 to 3 times per season (Yala or Maha). When compared with the other districts, the meeting frequency seems to be inadequate to give necessary information and advice to the paddy farmers. Moreover, farmers were asked to mention their convenient time to meet extension officers to get assistance whenever they required. Table 07 showed that the majority of farmers in both districts preferred to meet extension and advisory services at their office on Wednesday. The possible reason might be the availability of extension officers who are supposed to be at their office every Wednesday. However, the majority of the farmers in the Galle district have shown their preference to meet agricultural advisory services on other weekdays rather than Wednesday (22%) and are also willing to meet them over the phone (54%).

Table 7: Most convenient meeting schedule with Agricultural advisory services

	Galle (% of farmers)	Matara (% of farmers)
Office Day (Wednesday)	75	84
Other weekdays	22	12
Over the Phone	54	31
Others	30 (meeting, at the field)	44 (meeting, at the field)

Source: Author's own data, 2019

Supporting service providers and institutions for the paddy farming activities

Farmers require frequent supports from particular personal and institutions for their farming activities. Therefore, it was studied the existing supporting services of the paddy farmers in the study areas. This study investigated the most supportive providers or institutions for their farming activities and ranked them according to the importance perceived by farmers. Figure 04 shows

the different service providers and their importance based on the farmers’ perceptions. Accordingly, the Agrarian service center and community-based organizations are the most supporting service providers to the paddy farmers in Galle and Matara District.

Moreover, farmers were asked to specify the particular farming activities that they require

support from the aforementioned supporting services and ranked them based on the responses. Farmers request supporting services for the rehabilitation of irrigation canals. Thus, labor issues, land preparation problems due to bog soil conditions, and business startup issues have been prioritized by the farmers. Figure 05 shows the different farming activities which were requested as supporting activities by the farmers.

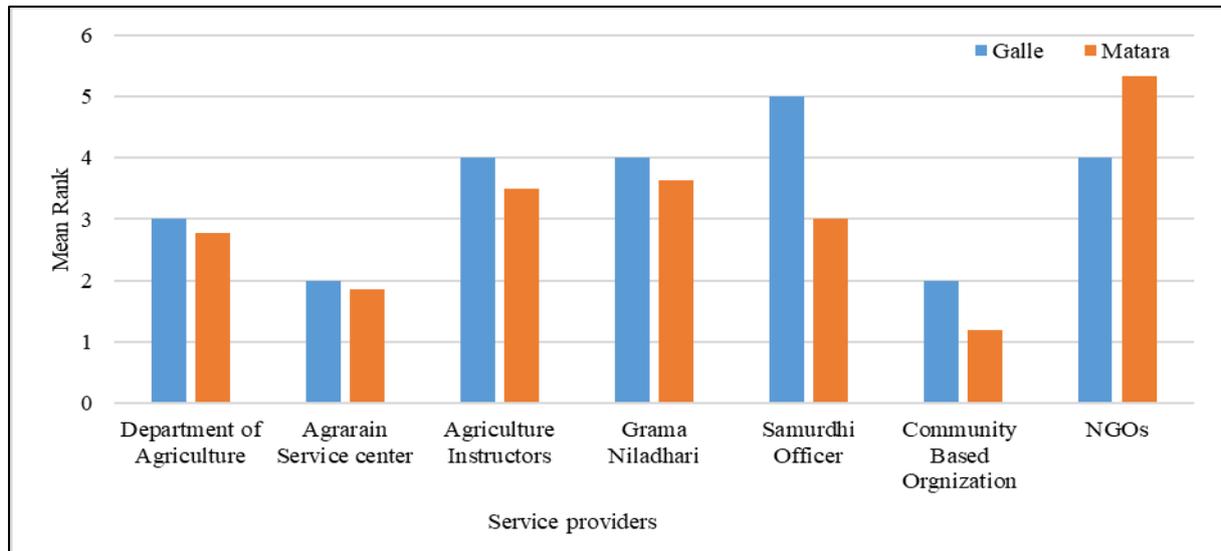


Figure 4: Service providers for the paddy farmers

Source: Author’s own data, 2019

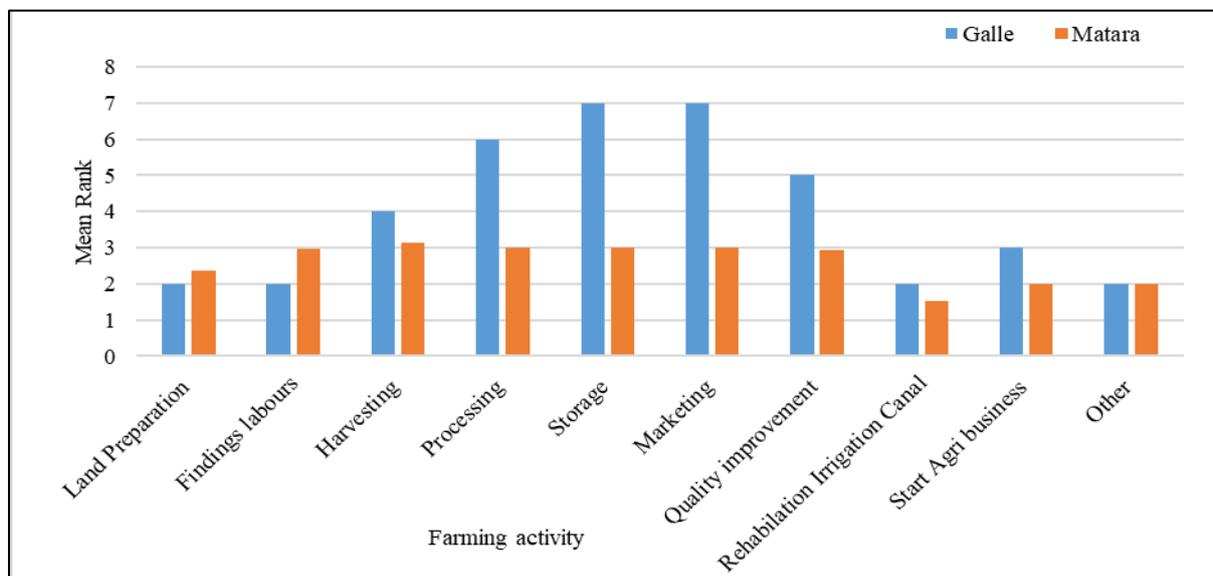


Figure 5: Assistance required paddy farming activities

Source: Author’s own data, 2019

CONCLUSIONS

This research study revealed that paddy farmers in Galle and Matara districts have their paddy fields even though they have neglected farming mainly due to water drainage issues and a few other reasons. Furthermore, this study revealed that paddy farming had been constrained by poor water drainage and scarcity of labor for farming

activities. The poor water drainage issues have been affected by the shallow and bog soil conditions of the majority of paddy fields in the Galle and Matara District. Nevertheless, there was no significant gap between the national average cost of production with the cost of production of the Galle and Matara districts. The highest cost components were for the land preparation activities. However, when compared to the national

statistical data on the cost of production, there is no significant difference between the cost values of Galle and Matara, implying cost of production would not be the possible reason for abandoning paddy lands. Farmers in both districts have incurred considerably high costs for fertilizers, and, basically, they are applying NPK as basal dressing and Top 1 and II dressings. Anyhow, this research has a limitation of quantifying the amount of applied fertilizer as NPK due to the poor response rate by farmers.

In context to the marketing of paddy, the majority of farmers in Galle and Matara district do not intend to sell their production to cover their cost of production, and they are mainly cultivating paddy for their family consumption. Moreover, research findings have shown that extension and advisory services visit farmers when only they require it, and it is hardly seen any regular farmer visit system in the study area. Accordingly, the ineffectiveness of extension and advisory services provided by government institutions has shown the poor visiting frequency. Therefore, the majority of farmers are expected to meet advisory and extension officials every Wednesday, which is considered the official meeting date for farmers at the agrarian service center. Even though the participation of farmers in the training and advisory session was satisfied in both districts, many farmers haven't perceived these training sessions as useful training for their farming activities.

The role and functions of community-based organizations and Agrarian service centers were perceived as the most important service providers for the paddy farmers in both districts. Moreover, farmers requested us to assist them to rehabilitate irrigation canals and to find a solution for labor scarcity when introducing new technologies which consume less manpower as well as are suited for the swallow and bog soil conditions. This research will suggest some policy initiatives to motivate paddy farmers to cultivate paddy in their abandoned lands.

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