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STATUS OF PADDY PRODUCTION IN A MAJOR PADDY PRODUCING AND HIGHLY ECOLOGICALLY VULNERABLE DISTRICT OF SRI LANKA- A STUDY IN ANURADHAPURA DISTRICT

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ABSTRACT

Rice is the staple food of the inhabitants of Sri Lanka and Anuradhapura district is one of the major paddy producing district and highly vulnerable to changes in climate. This study was conducted to find out the current status of paddy production in the Anuradhapura district. Proportionate sampling was done and 100 samples were selected for the study. Primary data were collected from the sampled paddy farmers of Anuradhapura through personal interviews using questionnaires. Descriptive statistics and Chi square analysis was done. Results revealed that the annual average income from paddy farming was Rs. 77800.00 per acre. Mean cultivated area was 2.15 acre in Yala and in Maha it was 2.24 acre. As well as the amount of paddy production was in Yala 1408 kilogram per acre and also in the Maha 1453 kilogram per acre. Most of the farmers were cultivating in both seasons, and 8% farmers were cultivating only in Maha season. In Mihinthale DS division 1131.825 Acres of lands and in Nuwaragampalatha central DS division 1976.82 Acres of lands were damaged by adverse climate effects during 2014/15 Maha season. A highly significant association observed between the Income from paddy farming and education level of paddy farmers (X^2=38.23, $p < 0.01$) and between engagement in paddy farming and education level of paddy farmers (X^2=24.49, $p < 0.01$). It is recommended to strengthen the agricultural extension systems with particular attention to paddy farmers who have limited resources to confront climate change.

Key words: Chi square, Maha, paddy production, Yala, Vulnerable

INTRODUCTION

Agriculture is one of the key sectors of the Sri Lankan economy, especially in view of the global food crisis and the heightened awareness on ensuring national food security. Asia contributes to almost 90% of the world's rice production. China, India, Vietnam, Burma, Indonesia, Bangladesh, and Sri Lanka are the major rice producing countries in Asia (FAO, 2012).Rice is the staple food of the inhabitants of Sri Lanka. Paddy is cultivated mostly as a wetland crop in all the districts. Total land devoted for paddy is estimated to be about 708,000 Hectares (Central Bank, 2011). Paddy cultivation is the livelihood of more than 1.8 million farm families in Sri Lanka. Production of paddy was 2.1 million tons of rice in 1980, and this has been increased to 4.3 million tons in 2010 (Central Bank, 2010).

Paddy is the leading cereal crop grown in Sri Lanka especially in the dry zone and the wet zone. Anuradhapura, Polonnaruwa, Ampara and Kurunegala district collectively account for nearly 50% of the annual production of paddy (HARTI, 2008).The estimated paddy production for 2014/2015 Maha season was increased by about 29 % compared with the previous Maha season. Accordingly, the paddy production in 2014/15 Maha season was 2,876,987 Mt. The highest production of 353,924 Mt of paddy was reported from the Anuradhapura District. Paddy production in the Anuradhapura District was accounted for about 12 % of paddy production of the country (Department of Census and Statistics, 2014).

In recent year's observation and quick assessments in Anuradhapura indicated and documented some changes in weather and climatic conditions. Such changes include increased dry spells, short-time heavy rains and perceived increase in average temperature (Eriyagama *et al*, 2010). Based on 20 mm weekly rainfall at 75% probability, the whole district was completely dry during Yala season. Total 100% dryness was observed in Elayapathtuwa, based on 10 mm and 20 mm weekly rainfall at 75% probability for Maha season. Average 96% of dryness was recorded in the district under 10 mm weekly rainfall at 75% probability in Yala season. The analysis depicted the risk on drought in the area for crop production. It indicated the irrigation need for the crop production in the district both in Yala and Maha seasons (Kumari and Navaratne, 2008).

Therefore a timely study on the current status of paddy production in the major paddy producing and highly vulnerable Anuradhapura district of Sri Lanka. The specific objectives were to study the socio economic status of paddy farmers and to estimate the current production of paddy in the district.

METHODOLOGY

The study was conducted in highly vulnerable five Divisional Secretariat divisions in Anuradhapura district of Sri Lanka. Proportionate sampling was done and from Nuwaragampalatha East, Nuwaragampalatha Central, Thalawa, Thambuththegama, and Mihinthale divisional secretariat divisions a total of 100 samples were selected for the study. Information pertaining to the study was collected from primary sources. Primary data were collected from the sampled paddy farmers of Anuradhapura through personal interviews using questionnaires. Before the commencement of the data collection, the questionnaires were pre tested to assess the suitability of the prepared questionnaires. Descriptive statistics was done for questionnaires to explore the socio economic status and paddy production. Chi square analysis was done to find out the association of different variables.

RESULTS AND DISCUSSION

Mean age of paddy farmers were 52.9 years and the annual average income from paddy farming was Rs. 77800.00 per acre.

Table 1: Demographic characteristics of paddy farmers

Individual Level Information	Percentage
1. Marital status	
Single	8
Married	75
Divorced	6
Widow	11
2. Household size(Number)	
0-2	24
3-5	69
Higher than 5(>5)	7
3. Engaged in paddy farming	
Fulltime	75
Part time	25
4. Age(in years)	
26-35	11
36-45	16
46-55	22
56-65	42
66-75	9

The most of the study participants were married (75%) as well as 75% of farmers were fulltime farmers. Results also indicated that most of the farmers were in the age between 56 –65 (42%) and also most of the farmers (75%) were involved in paddy farming as full time. But with in the farmers who involved in part time paddy cultivation, 13% were doing Government job and 11% involved in Business.

Paddy cultivation pattern and Land holding details

Most of the farmers were cultivating in both seasons, and 8% farmers were cultivating in only Maha season, but no one was cultivating only in Yala season. Most of the farmers were cultivating in their own lands (66%) for paddy cultivation.

Table 2: Paddy cultivation pattern and Land holding details

Information	Percentage
a. Cultivation pattern	
Only Maha	8
Only Yala	0
Both seasons	92
b. Land holding details	
Own land	66
Lease land	24
Own/lease land	10

Purpose of Production.

The data showed that 26 % of all the respondents cultivated paddy for cash, while 73% cultivated for both cash and subsistence depending on the amount of harvest. The remaining 1% cultivated for their subsistence.

Adverse effect of Climate on Paddy farming in different DS division during 2014/2015

In Mihinthale DS division 1131.825 Acres of lands and in Nuwaragampalatha central DS division 1976.82 Acres of lands were damaged by adverse climate effects during 2014/15 Maha season. During that period in Nuwaragampalatha central more than half of the paddy farmers were affected adversely.

Table 3: Paddy Farming details in different DS division

DS Division	Season	Total No. of farmers	No. of affected farmers	Total Cultivated land (Acres)	Damaged land (Acres)
Nuwaragampalatha East	2014/15 Maha	1409	340	2134	470.75
Nuwaragampalatha Central	2014/15 Maha	1652	1000	5286.02	1976.82
	2015 Yala	1559	500	4656.40	494.20
Thalawa	2014/15 Maha	2588	258	3408.5	330.25
	2015 Yala	2476	29	2605.3	41
Thambuttegama	2015 Yala	5080	27	12700	55
Mihinthale	2014/15 Maha	4396	1019	7232	1131.825
	2015 Yala	368	170	1845	168.5

(Source: Agrarian service centre)

Paddy production in Anuradhapura district

Table 4 : Details related to paddy production in Anuradhapura district

Agricultural activities details	Mean	Std. Deviation
Extent of cultivation area in Yala (acre)	2.15	1.2
Extent of cultivation area in Maha (acre)	2.24	1.2
Amount of paddy production in Yala (kg/acre)	1408.00	282.4
Amount of paddy production in Maha (kg/acre)	1453.00	133.7
Total Extent cultivation area(acre)	4.4	2.4
Total paddy production(Yield (kg/acre)	2861.00	359.3

The mean extent of cultivated area was 2.15 acres in Yala and in the Maha was 2.24 acres. As well as the amount of paddy production was in Yala 1408 kilogram per acre and also in the Maha 1453 kilogram per acre.

Availability of agriculture inputs

The provision of farm inputs such seeds, machinery and equipment, fertilizer and agrochemicals is probably the most important factor in the productivity of farms. Highly

productive farmers require the right inputs, in the correct quantities, at the right time and at affordable prices. The effectiveness of input supplying industries in satisfying these requirements is largely influenced by the structure, conduct, and regulatory environment facing those (Shoji *et al*, 2008). In the study area, 32% respondents stated that they didn't have sufficient irrigation, but all the respondents had sufficient other all the agriculture inputs.

Table 5: Availability of agriculture inputs paddy farming.

Agriculture inputs	Sufficient (%)	Not sufficient (%)
Irrigation	68	32
Seeds	100	0
Fertilizer	100	0
Agrochemicals	100	0

Irrigation Methods

Almost all the farmers were using tank irrigation for the cultivation in both seasons.

Membership in farmer organization

Group is a stage where members meet and negotiate personal interests. Some members try to obtain power and status through groups and organizations (Pretty and Word, 2001). Farmer groups reduce transaction costs, improve marketing facilities, reduce cost of cultivation, and facilitate other services. In the study area 84% paddy farmers were joined to the farmer organization, but 16% farmers did not joined to the farmer organization. Farmers gain mutual benefits from group activities in paddy cultivation.

Extension Services

In order to mitigate the negative effect, the primary action should be taken to make aware both farmers and others who assist farmers regarding the relevant problems and the potential impact of climate change on paddy cultivation. In this regards, agricultural extension services have a responsibility to make prepare the farmers for such challenges created by climate change, because agricultural extension officers are the people who closely relate with many small scale paddy farmers in rural areas in Sri Lanka. Through them many technologies and innovations can be disseminated towards farmers to upgrade their knowledge, skills and attitudes (Fernando, 2010).

But in the study area of the farmers (53%) said that they were not satisfied with the extension service and the rest were satisfied. Poor extension services may hinder farmers' access to necessary information on climate change adaptation strategies.

Chi square analysis

Table 6: Chi square analysis between Income from paddy farming and education level

Independent variable	X^2	df	P value	Decision
Education level of the paddy farmers	38.23	18	0.004	Highly significant

There was a high significant association observed between the Income from paddy farming and education level of paddy farmers (X^2=38.23, $p < 0.01$).

Table 7: Chi square analysis between Engagement in paddy farming and education level

Independent variable	X^2	df	P value	Decision
Education level of the paddy farmers	24.49	3	0.000	Highly significant

There was a high significant association observed between engagement in paddy farming and education level of paddy farmers (X^2=24.49, $p < 0.01$)

CONCLUSION

This study aimed at providing an overall summary regarding Current status of Paddy production in Anuradhapura District. The annual average income from paddy farming was Rs. 77800.00 per acre whereas the mean extent of cultivation was 4.4 acres and mean paddy production was 2861 kg/ acres. It was also found that 26 % of all the respondents cultivated paddy for cash, while 73% cultivated for both cash and subsistence depending on the amount of harvest. In the study area, 32% respondents stated that they didn't have sufficient irrigation, but all the respondents had enough all other agriculture inputs. Considerable amount of land and farmers were affected by the vulnerable situation and in Mihinthale DS division 1131.825 Acres of lands and in Nuwaragampalatha central DS division 1976.82 Acres of lands were damaged by adverse climate effects during 2014/15 Maha season. It is recommended to strengthen the agricultural extension systems combined with education with particular attention to paddy farmers who have limited resources to confront vulnerable situations.

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