

Problems Associated with On-farm Storage Conditions of Paddy in Sri Lanka

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Abstract

Rice being the staple food, paddy is the major agricultural crop cultivated in Sri Lanka. Storage is essential as the harvest is seasonal. But the post harvest loss of paddy during storage is as high as 4 - 6 %. This study was conducted to assess the present status of the on farm storage of paddy in the north central province. Data were collected through a field survey using a questionnaire, key informant interviews and secondary data sources. The study revealed that of the average total harvest of 4,917 kg of paddy per season 51% was stored. The majority of the participants stored their harvest in a separate room inside the house itself and used any available free space or separate warehouse build outside their houses. The average capacity of these storage spaces were 7,203 kg of paddy while the average amount stored was 3,199 kg. The average percentage of respondents who used the total capacity was 52%. The participants stored paddy for consumption and for sale at a later stage. The main problems of storage was insect pest attacks and other problems were less ventilation, keeping of unsuitable things in the storage facility with paddy, darkness inside and not stacking problems. The average post harvest loss during storage was 5%. Therefore, it can be concluded that although farmers store nearly half of their harvest at on farm level both qualitative and quantitative losses takes place due to improper practices and conditions of storage.

Key words: Farmers, Paddy, Post harvest loss, Storage, Problems

Introduction

Sri Lanka has an agricultural economy with the agricultural contribution for the GDP being 11.1% in 2012. Rice being the staple food, is the major agricultural food crop cultivated in Sri Lanka. In 2012, the paddy production in Sri Lanka was 3.85 million mt. The contribution to the national GDP in 2012 of paddy was 1.5% which was the highest of all agricultural crops cultivated in the country (Central Bank, 2013).

Loss assessment studies conducted in Sri Lanka have shown that nearly 15 to 20 % of paddy is lost during postproduction operations due to adoption of improper post harvest techniques (Department of Agriculture, 2013). A major loss of grain in the post harvest system occurs during storage particularly at farm level due to improper and inadequate storage facilities. Studies on the assessment of storage grain losses have revealed that approximately 4 to 6% of paddy is lost during storage at farm level (Fenando, 1988).

However, the need for grain storage arises because harvests are seasonal and the consumers want their food at a fairly constant rate throughout the year. A regular supply of food for daily consumption can only be assured and maintained through storage. Therefore, excess grain has to be preserved in order to use in the off-season to ensure food security. According to Palipane (2000), almost 50% of all food grain produced is stored on- farm for several months in Sri Lanka.

Improving proper storage techniques may help in increasing farmers' income not only by reducing these qualitative and quantitative losses but also through sale of produce during off season at higher prices. In addition, improvement of on farm storage will assist in alleviating the problem of inadequate storage capacity in the country. Therefore, in depth studies at farm level are needed to understand the present status of the paddy storage conditions in the country.

Materials and Methods

North Central Province is one of the major paddy producing areas in Sri Lanka. Of the total 30 Divisional Secretariat divisions of the province, 10 Divisional Secretariat divisions (33% of total DS divisions) were proportionately selected from both districts on random basis. Of these divisions 150 paddy farmers from 30 villages were selected randomly for this study.

Both quantitative and qualitative data were gathered through a field survey using pre-tested semi-structured questionnaire. Furthermore, data were collected from key informant interviews such as Agricultural Instructors of the Department of Agriculture, and relevant officers of the Institute of Post Harvest Technology (IPHT). The presidents and other office bearers of the farmer organizations of the selected villages were also used as key informants. Information was also taken from direct observations and from secondary sources such as research and other reports of the IPHT. Data were analyzed using MS Excel.

Results and Discussion

According to the key informant interviews, at the point of harvesting, the farmer had no other option but to sell the produce to pay off the debts leading to less amount of paddy remaining to be stored for future use. All these participants (100%) of the study cultivated paddy at commercial scale. The average family size of them was 4 while it ranged from one to seven. The average age of the participants was 48 years and ranged from 22 to 71 years while the mode being 50 years. The majority of respondent farmers (66%) had passed G.C.E. (O/L) while 3% have attended less than grade six, 13% have received education in between grade six and 10, and 1% educated beyond G.C.E. (A/L).

The participants claimed to have an average total harvest of 4,917 kg of paddy, while it ranged between 1,575 kg

and 7,500kg per season. The study reveals that of the harvest 51 % was stored in average. Palipane (2000) also had given a similar value. The majority of the participants (61%) storied their harvest in a separate room inside the house itself and 21% stored paddy in any available free space within the house. These places were the kitchen and the living/dining rooms. 6% chose to store in both these places. Only 12% of the participants had a separate warehouse build outside their houses. 14% of the participants had improved their stores to make them suitable to store paddy. Some of these improvements were plastering the walls, cementing the floors, covering void areas with wire mesh to prevent entry of rodents and construction of pellets for stacking paddy bags.

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The capacity of these storage spaces had been on average 7,203 kg of paddy. The mode was 5,000 kg and the capacity ranged from 840 kg to 30,000 kg of paddy. But the amount that they stored was considerably less than the storable capacity. The average amount of

paddy being stored was 3,199 kg, while the mode and median both had been 2,000 kg; it ranged between 240 kg and 20,000 kg of stored paddy. The average percentage who used the total capacity was 52%, mode was 100% and median percentage was 40% while it ranged between 3% and 100% of the total capacity. And only 26% of the participants claimed that the storage space was not sufficient.

Of the total amount stored, the main purposes were for consumption and for sale at a later stage. Details on proportions stored are indicated in table 01.

When the problems associated with the storage conditions were assessed, participants responded to having six main problems during storage; presence of insect and rodent attacks to the stored paddy, less ventilation inside the storage facility, keeping of inappropriate things (such as broken chairs, boxes, old bags, wooden planks, etc.) in the storage facility with paddy, darkness inside the place and not stacked properly. Similar problems were reported by Adikarinyake, (2005) during the on-farm paddy storage. The percentages of the respondents claiming to have the insect attacks were 59% and having rodent attacks were 85%. This indicates the major problem in these storages was pest attacks which might have been facilitated by the presence of the other four problems. A 21% claimed that their stores have less ventilation and 52% said that they had unsuitable things such as broken furniture, unused utensils, wooden planks, etc. in the

paddy store. They admitted that this was due to having insufficient space in their houses. 30% of the respondents claimed that inside of their storage facilities were dark and 46% said that they had not stacked the paddy properly by stacking the paddy leaning to the wall. All these problems must have contributed to the post harvest loss. According to the respondents the average quantitative post harvest loss was 5% of the total stored paddy in each season. Other than the quantitative loss the study revealed that qualitative parameters were also being lost during storage. All respondents admitted that the colour, taste and odour of rice deteriorated with storage of paddy.

According to the key informants, one of the main essential components in order to reduce the loss was to improve the knowledge, skills and attitudes of the beneficiaries. Only 23% had received training on grain storage.

According to the study the participants were storing an average of 51% of their harvest. The major problem they faced was pest attack during storage and the total average post harvest loss during the storage period was 5%. The study should continue to assess the storage conditions in depth and in other parts of the country as well while continuous awareness and storage improvement programs should be conducted in order to improve the storage conditions of paddy and to reduce the post harvest loss.

Table 1. Proportions of paddy stored for different purposes

Criteria	For consumption		For Selling	
	Amount of paddy (kg)	% from total amount stored	Amount of paddy (kg)	% from total amount stored
Average	591	32	2349	68
Median	500	25	1370	75
Range	100-4000	2-100	0-18950	0-98

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