

their rice farms whereas 98% have experienced postharvest losses. Additionally, 89.81% and 93.51% of farmer's perceived losses of between 0 and 19% during harvest and postharvest stages respectively. The above result indicate that harvest and postharvest losses is a serious problem in the study area and the fact that farmers are aware of this issue suggest that well-targeted efforts to reduce harvest and postharvest losses may interest farmers and lead to their easy adoption of appropriate technologies.

- Farmers perceived mechanical factors, environmental factors and socioeconomic factors at 43.59% and 43.50%, 23.08% and 9.25 % and 22.22 % and 37.07% as the most common causes of harvest and postharvest losses respectively in rice production and hence needs to be taken into consideration in the design of appropriate harvest and postharvest equipment. Traditional rice harvest and postharvest methods were also found to increase losses. There is the need to consider all these factors in an attempt to improve the quality of the rice grain.
- Farmers perceived postharvest losses not to occur during production, but only after harvest. Again, the results indicate that it was at the harvesting and threshing stages that loses were predominant. Finally, the total yield and grain quality were influenced by factors such as type of rice variety planted, good crop management practices, timely harvesting of the paddy and good processing and handling methods.
- From the economics perspective, the result shows that harvest and postharvest activities constituted 21 % of total production cost, while accounting for nearly 20 % of total grain loss. The use of improved technologies and practices (e.g. appropriate mechanisation, rice varieties with lower grain shatterability, proper land management etc.) for reducing harvest and postharvest losses in rice production is very essential for decreasing the rice production costs for increased incomes among smallholders. This will not only increase rice outputs and productivity but also enhance the quality of grains produced for increased acceptability at the local markets.
- Furthermore, the results show that farmers have taken keen steps in attempting to reduce rice postharvest losses by using harvest machinery and some forms of postharvest equipment. This suggests that the design and fabrication of appropriate harvest and postharvest equipment is already a demand driven course as it is an essential need among the rice farmers in helping reduce harvest and postharvest losses and ensure good grain quality for increased incomes and food security among rice farmers in Ghana.
- Rice breeders must consider the attributes of Jasmine and AGRA which is mostly cultivated by farmers and develop new improved rice varieties with low shatterability. Also, Agricultural Extension services should ensure that other cultivated rice varieties such as

Amankwatia and Togo marshall which are perceived to have significantly lower grain loss due to their characteristically low shatterability becomes easily accessible to farmers.

- This study also identified the critical role being played by rice private out-grower scheme companies in improving total grain yield and enhanced grain quality through the provision of mechanisation support services for rice harvesting to smallholder farmers. It is recommended that government create the enabling environment for more of such companies to thrive in an effort to help increase total rice production while reducing the nation's heavy dependence on rice imports.
- The substantially high level of fertilizer usage (15% of total production cost) from the study results indicates the need for proper land management systems in rice growing areas through both government and private sector support. It is however recommended that detailed field studies be conducted in these rice growing areas to identify the extent and state of nutrient depletion and suggest sustainable solutions to arrest this challenge.

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Article title:

Assessment of Rice Farmers' Knowledge and Perception of Harvest and Postharvest Losses in Ghana

Abstract

Farmers' knowledge and perception of harvest and post-harvest losses in rice production across three agro-ecological zones of Ghana were examined using farm level data collected from 108 randomly selected rice farmers. To examine the perception and knowledge of farmers on harvest and postharvest losses, means of a 5-point Likert scale were estimated compared with the values of the individual perception statements. Results indicated that rice production was male dominated (80%) with an ageing farmer population (42 years on average), smaller farm sizes (~5 acres) with over 70% of farmers formally educated. This suggests the potential and need for mechanised interventions in rice production. Majority of the farmers sampled (over 95%) had experienced and were aware of harvest and postharvest losses in rice. Whereas over 50% of the farmers were cultivating the Jasmine rice variety, it was perceived by over 65% of the farmers to be associated with higher harvesting losses. Mechanical agent such as lack of appropriate harvesting machinery were perceived by over 40% of the farmers to cause harvesting losses. On the method of rice threshing, over 50% of the farmers used combines, 36% used the threshing by impact "bambam" method, 11% bag beating and 2% used mechanical threshers. Rice harvest and postharvest activities constituted 21% of total production cost, while accounting for nearly 20% of total grain loss. It is recommended that aside the mechanised interventions, efforts should be geared towards proper development of rice fields to ensure sustainable production and improved land productivity.

Keywords: paddy, perception, knowledge, farmers, harvest, postharvest, losses

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Public Interest Statement

Rice harvest and postharvest losses could greatly affect sustainable food security globally. Farmers' knowledge and perception of rice harvest and postharvest losses across three agro-ecological zones of Ghana were examined by interviewing 108 randomly selected rice farmers. From the study, it was noted that majority of the farmers sampled (95%) had experienced and were aware of harvest and postharvest losses in rice. The lack of appropriate harvesting machinery was perceived by over 40% of the farmers to cause harvesting losses. Farmers accepted the fact that traditional rice harvest and postharvest methods tend to increase losses and that it was at the harvesting and threshing stages that losses were predominant. The study results suggest that well-targeted efforts to reducing harvest and postharvest losses may interest farmers and lead to the adoption of demand-driven appropriate technologies and best agronomic practices for increased rice production nationwide.