



ABSTRACT

The paper investigated preventive measure of agricultural waste. Using Silos. The study adopted a descriptive survey design. two research questions guided this study. The population for the study comprised all farmers and farm traders in Edo State. The sample size comprised fifty farmers and fifty farm traders using random

INVESTIGATION ON THE AWARENESS ON THE BENEFITS OF SILOS AS A PREVENTIVE MEASURES OF WASTING AGRICULTURAL PRODUCE.

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Introduction

Yearly in Nigeria, 123 million metric tons of food is wasted before getting to Market. The extent of food waste is higher in developed countries where foods are still suitable for human consumption are being disposed. In developing countries, food loss occurs mainly in the food supply chain at the postharvest and processing levels with less food waste at the consumer level (Sheahan and Barrett, 2017). Food waste consists of carbohydrates, proteins, lipids, and inorganic compounds. It is a biodegradable waste discharged from all waste management sectors from production to disposal. (Mamma, 2020). According to the FAO (2022) stated that global food waste is estimated at 1:57 billion tons per year of food produced for human consumption, which is being wasted throughout the supply chain, the food waste generated is mostly recycled as animal feed and compost, while the remaining quantities are disposed on landfills. The inappropriate disposal of food waste may lead to severe health and environmental



sampling techniques. The instrument for data collection was researcher's developed questionnaire based on four point Likert Scale. The instrument was validated by two experts. Reliability test was determined using test-retest method. Pearson product moment correlation has used to obtained coefficients of 0.73. The instrument were administered to the respondents and data collected were analyzed using mean and standard deviation. The study of the study revealed that some of Agricultural produce such as grain are wasted due to lack of adequate food storage, resulting from lack of fund. The study also revealed, that some farmers are not aware of the usage and importance of Silos. Based on the findings, the study recommended among others that Government should empower both farmers and farm traders in the provision of food storage facilities such as Silos to prevent food waste, farmers and farm traders should be trained on the importance and the use of Silos to prevent food waste.

Keyword: *silos; food storage; food waste; grains; benefits of silos; agricultural produce.*

issues such as greenhouse gas which contribute to climate change. (Gunjal, 2019). Food waste contaminates fresh water, occupies landfill space and increases carbon foot prints. According to the United Nations food and Agriculture Organisation (UNFAO) in 2019, about 4.4 billion metric tons of carbon dioxide was produced due to food waste disposal. Carbon dioxide emission has effect on human health (Agency 2019). Food storage facilities has been the major problem of Nigeria, one of such facilities used for preserving food is silos. Silo is a cylindrically shaped structure used for storing threshed food grains and paddy in most countries due to its long lifespan and insects and pest resistance. There are different types of Silo; mental, mud, concrete, and plastic (Adejumo, 2013) storage time in Silo varies between six months to a couple of few years, storage capacities varies between 0.5 to several million of metric tons (Omobowale, 2015).



Food losses and waste occur at every stage of the value chain, including during production, harvest, storage, transport, processing. In low income countries, the most significant causes of food losses are financial, managerial and technical limitations in the harvesting techniques, storage and cooling facilities located in difficult climatic conditions, infrastructure, packaging and marketing systems and related policy environments (FAO, 2018). Farmers lose crops to pests and plant disease, scientist have found that on a global scale, pathogens and pests are reducing crop yields by 10 to 40 percent, at a global scale, pathogens and pests are causing wheat losses of 10 to 28 percent, rice losses 25 – 41 percent, Maize losses 20 to 41 percent. California Department of food and Agriculture (CDFA) 2019.

Grain production needs increase in output in order to meet feeding consumption of mankind. The losses occurred during harvest and storage is very high, better harvest and storage conditions could prevent losses of grains. Grains are high in carbohydrates which provide energy to the brain and muscles. Such as rice, oats, wheat farrow, millets, barley, amaranth or products made from them. (Mesterhazy, Olah, and Popp, 2020). The primary function of Silos is to provide protection and to increase the storage life of grains. Silos support monitoring equipment used to track both temperature and quality of the grains. Agricultural Silos work by creating a pressurized area within a cylindrical container. Food is removed from Silos by using farm machines known as unloaders. The food must be removed within a certain period of time to keep the contents of the Silo fresh. (Wilson, 2016).

There are several advantages using Silos. Such as, it has very large storage capacity, 25,00 to 50,000 tones and beyond. Low running costs due to larger quantities, save time, low wastage through spillage and rodents, low labour requirements due to high level of mechanization, complete control of aeration, effective, and efficient fumigation operation, less land area requirement, covers one- third space horizontally of warehouses, possible to mechanize all operations, possible to store the grain for very long time periods, possible to store



moist grain for short periods and complete protection against natural elements http://nirman.com/blog/2020/01/27/11_advantages-of-using-sibs-for-storing-grain/

Why Silos are the best form of bulk storage is that, it provides an efficient method of storing bulk quantities of grain. The step rise in the price of land has virtually made it impossible to keep buying land space in order to store food grain that is produced. Rather than opting for a horizontal method of storing, it is more better to go vertically and not worry about climate change. The temperature inside the Silos has to be regulated to assure the grains don't get damaged. That includes proper aeration to control the amount of humidity inside the closed container. (Singh. 2016). Generally, Silos is a large container used to store grains and bulk materials. It prevent agricultural produce from rodents, pest and insect whereby preventing food lost.

Problem of the Study

The problem of hunger and food scarcity becomes serious issues in Nigeria. Food waste during harvest seasons result to hunger, and difficulty in purchasing agricultural produce when they are not in season. A lot of agricultural produce wastes especially during harvest season. There is lack of adequate storage facilities to prevent food waste. One of the storage methods is silos, it is used to store large bulk of agricultural produce such as grains, silos prevent grains from rodents, pests, and insects. Therefore, the researcher want to investigate the awareness of the benefits of silos as a preventive measures of wasting agricultural produce

Purpose of the Study

The main purpose of the study is to examine the awareness of the benefits of silos as a preventive measures of wasting agricultural produce in Edo State. Specifically to:

- (i) Examine the cause of agricultural food wastage.
- (ii) Examine the awareness on the benefits of Silos as a preventive measure of waste of agricultural produce in Edo State.



Research questions

The following research questions were raised to guide the study.

- (i) What are the major causes of agricultural food waste in Edo State?
- (ii) Does people in Edo State aware of the benefits of Silos as the preventive measure of agricultural produce ? .

METHODOLOGY

Descriptive survey design was adopted for this study. descriptive survey design is a method of using questionnaire or interview to collect data from a sample that have been selected to represent population to which the findings of the data analysis can be generalized Gall, Gall and Borg (2007). The population of this study comprised of all farmers and farm traders in Edo State. The sample size of this study comprised of fifty farmers and fifty farm traders using random sampling techniques. The total sample for the study is one hundred respondents. The instrument used for this study is structured questionnaire. The instrument comprised two sections. Section A consists of demographic of the respondents. While section B based on the research area of investigation. The instrument was validated by two experts in vocational and Technical Education, Ambrose Alli University, Ekpoma, Test – re – test method was used for this study, pearson product moment Correlation statistics was used to obtained reliability coefficient of 0.73. The researcher and one research assistance administer the instrument to the respondents and retrieved the completed instrument immediately. Data collected were analyzed using mean and standard deviation.

Results

Research Question 1: What are the major causes of agricultural food waste?.

Table 1: mean and standard deviation on the causes of agricultural food waste.

S/N	ITEMS	MEANS	S.D	REMARKS
1.	Lack of good road lead to food waste	3.28	0.82	Agreed
2.	Lack of control of pest infestation lead to food waste	3.132	0.78	Agreed



3.	Inadequate storage facilities results to food waste	3.29	0.82	Agreed
4.	Lack of money to acquire good storage facilities lead to food waste	3.32	0.83	Agreed
5.	Lack of government assistance to provide storage facilities lead to food waste	3.10	0.78	Agreed
6.	Lack of transportation from farm to market can result to food waste	3.38	0.85	Agreed
7.	Problem of marketing and distribution can lead to food waste	3.25	0.81	Agreed
8.	Lack of credit facilities to acquire good storage facilities can result to food waste.	3.32	0.83	Agree
9.	Lack of adequate processing facilities result to food waste	3.42	0.86	Agreed
10.	Problems of collateral to acquire loan for agricultural purposes result to food waste	3.16	0.79	Agreed

Table one above shows that the respondents agreed with the items listed above can result to food wastage. Meaning that, lack of good road, lack of pest control, inadequate storage facilities, lack of assistance from Government among others can result to food waste.

Research Question 2: Does people in Edo State aware of the benefits of Silos as the preventive measure of agricultural produce from waste?.

Table 2: Mean and standard deviation on the awareness on the benefits of silos as a preventive measures of wasting agricultural produce .

S/N	ITEMS	MEANS	S.D	REMARKS
11.	Silos helps to prevent fungi growth, thereby preventing food spoilage	2.48	0.62	Disagree



12.	Silos is used to store seeds and grains from moisture	2.18	0.55	Disagree
13.	Silos prevent food waste	3.32	0.83	Agree
14.	Silos can preserve food effectively	2.32	0.58	Disagreed
15.	Silos prevent agricultural produce from rodents	3.40	0.85	Agreed
16.	Silos increased the shelf life of agricultural produce	2.26	0.57	Disagreed
17.	Silos is used to prevent insect a infestation	3.18	0.80	Agreed
18.	Silos is used to prevent food crops from weather that can cause food waste	3.26	0.82	Agreed
19.	Silos is one of the effective food storage to preserve agricultural produce	3.32	0.83	Agreed
20.	Silos can be used to improve Agriculture produce	2.45	0.61	Disagreed

The table two above showed that the respondents rated items 13, 14, 16, 18, and 20 as agreed. The items 11, 12, 15, 17, and 19 were rated as disagreed. This implies that the respondents agreed that silos is a good storage method that prevent waste but they do not understand all the benefits of silos.

Discussion of the Findings

Findings in table 1 showed that lack of good road, inadequate storage facilities, pests infestation control, problem of transportation, problem of marketing, lack of adequate processing facilities, and problem of distribution causes food waste in Edo State. The findings is in accordance with that of Sheahan and Barrett, (2017) who affirmed that in developing countries, food loss occurs mainly in the food supply chain at the post- harvest and processing levels. FAO, (2018) also agreed



with this finding, who stated that food losses and waste occur at every stage of the value chain, including during production , harvest, storage, transport, processing in low income countries.

Findings in table 2 showed that, silos prevent grains from moisture, silos prevent food crops from weather that can cause food waste, silos helps to prevent food from rodents , silos prevent pests and insects and silos effectively preserve grains and prevent waste. The findings agreed with Wilson, (2016) who stated that the primary function of silos is to provide protection and to increase the storage life of grains, Silos support monitoring equipment used to track both temperature and quality of the grains Also, Adejumo, (2013) opined that silos is used for storing threshed food grains and paddy in most countries due to its long lifespan including pests and insects resistance.

Conclusion

Based on the findings, it was concluded that various factors causes loss of agricultural foods such as lack of adequate storage facilities, lack of fund to acquire storage facilities, lack of government assistance to provide storage facilities, lack of credit facilities to acquire storage facilities and problem of marketing and distribution. It was also confirmed that the respondents do not understand some of the benefits of Silos, efficient method of storing bulk quantities of grains, which prevent losses of grains.

Recommendations

Based on the findings, the following recommendations were made:

1. The Government should empower both farmers and traders in the provision of agricultural storage facilities such as Silos to prevent food waste.
2. Farmers and farm traders should be trained on the importance and use of Silos to prevent food waste.
3. Farmers should be assisted by granting them loan to acquire Silos.



4. Government should create awareness on the use and importance of Silos.

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