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Study on Impact of annual Post Harvest Losses of Grain and Post Harvest Technology in Ganye Southern Adamawa State-Nigeria

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Abstract: - This paper is devoted on impact of post harvest losses at stages of operations. The data balances of food supplied were analyzed and quantified to indicate poor processing and storage facilities in the study Zone Post harvest losses significantly endanger the livelihood of stakeholders and farmers across the value chain by reducing valuable income and profitability.
Research has shown that reduction of just one percent in post harvest losses can lead a gain of 40 million USD annually. Government investment will lead to huge reduction in post harvest and increase income levels of actors across various agricultural value chain.
Over the past half a century in developing countries with the exception of Ganye, Adamawa State-Nigeria had seen labor saving post harvest system engineering, adopted at unprecedented levels. Post harvest activities in the zone had created power bottle around threshing/shelling of maize, cowpea and groundnut but with adoption of post harvest machines, it had helped and enhance low unit cost with economic impact of 40 percent in the study. Information revealed from the study that farmers sale 20 percent of their grain due to problem of storage facilities. The general grain losses and waste responded by 52 percent of famers is 15-20 percent in the study zone. Quality of grain after post harvest operation with photo type machines is recorded fairly good.

Keyword: - *Post harvest, lossess, grain, machines storage structures*

I. INTRODUCTION

The study highlights the losses occurring along the entire food chain and makes assessments of their food magnitude. It identifies causes of food losses and possible ways of preventing them.
Ahmed, O.A.(2013) reported that post harvest losses is making Nigeria farmers poorer. For a very long time, Nigerian farmers have lamented the situation without getting meaningful assistance.
The result of the study suggest that roughly one third of food produced for human consumption is lost or wasted globally, which amounts to about 1.3 billion of tones per year. This inevitably also means that high amount of the resources used in food production are used in vain.

Patrick,T. [2013] reported that Nigeria records over 40 percent post harvest losses, which has led to an unprecedented hike in food importation in the country. In which significant losses occurs early in the food supply chain in industrialized regions. While in low-income countries, food is lost mostly during the early and middle stages of the food supply chain. Food supply is mostly wasted at the consumer's levels.
The main causes of food losses and waste in low-income countries are connected to financial management and technical limitation in harvesting, storage and processing techniques. The study revealed that there are major data gaps in the current knowledge of global food losses and waste in the study Zone. Further research in this area is urgent [Jenny Gustavasson et al 2011]. Food security is a major concern in a large part of the developing world. Food production must clearly increase significantly to meet the future demand of an increasing world population. Economically, food losses have a direct and negative impact on the income of both farmers and consumers. How much food is lost in the world today? How can we prevent food losses? There is no precise answer to this question and there is no much ongoing research in the area.

The federal government has been assisting farmers in mopping up excess farm produce and storing them at strategic reserves, which are sold to people at reduced prices during periods of need and food scarcity. Farmers and stakeholders also argue that storage facilities alone cannot conquer the problems of post harvest losses in Nigeria. Processing facilities are directly required across the country so as to add value to agricultural products for local consumption and export. Agro cottage, industries and factories should be established to take care of excess farm produce that farmers will make profit.
, For instance, the Dangote group has invested 4 billion USD in sugarcane, pineapple and tomato. In addition Dansa food has committed £36 million to process sorghum and transform to high value.
Adesina [2013] reported that about 2 million USD has been committed by the World Bank to support agricultural transformation agenda.

Government and private companies should develop new staple crop processing in the study zone to attract youth back to land and creation of job opportunity.

Thus, processing activities are undertaken to provide a greater yield from raw farm produce by either increasing the amount of finished product or to improve the net economic value of the product.

Post harvest system Engineering deals with threshing, shelling and processing with machine required to accomplish the stages of operation of finish consumer's goods. It involves cleaning, cooling, size reduction and other processing operations. The material has to be conveyed from one point to another, especially in processing industries.

Post harvest multipurpose machine are relatively scare in the study zone as shown in figure3.

Post harvest system engineering activities in cereal, legumes and oilseed in Nigeria is mostly comprised of traditional technique by growers', traders and the processor, resulting in considerable deterioration of physical and nutritional qualities of harvested crops. (Oni and Abiaka, 2000)

II. MATERIALS AND METHOD

The survey was aimed at investigating the levels and cause of post harvest losses of selected crops: cereal, legume and oil seed in Ganye, southern Adamawa state.

The survey was conducted in march 2013, using the method of investigate survey research approach (ISRA) (Anazodo etal, 1986). Information was collected using structured questionnaire which sought for the following information; types of post harvest losses, information on post harvest losses activity and post harvest Enginery system in the study zone.

The tools of analysis use in this study is descriptive statistic of the explanation variable both qualitative and quantitative

2.1 Food losses supply chain.

The Swedish institute for food a and biotechnology (SIK) has reconstructed mass flow of food aim to human consumption using available data in order to quantify food losses and waste

Food losses refer to decrease in edible food mass throughout the part of the supply chain that specially lead to edible for human consumption. Food losses take place at production, post harvest and processing stages in the food supply chain (Parfait et al 2010)

2.2 Food losses categories in the study zone.

Five system boundaries were discovered in food supply chain in study zone. Food losses were estimated and quantified along each segments as followings;

(i) Agricultural production: losses due to mechanical damage/spillage during harvest operations.

(ii) Post horst handling and storage: handling during transportation and distribution from farm, storage and market.

(iii) Processing: including losses due to spillage and degradation during industrial or domestic processing.

(iv) Distribution includes losses and waste in the market system

(v) Consumption: including losses during consumption at the household level.

III. RESULT AND DISCUSSION

The result of this study has shown that post harvest losses due largely to absence of viable storage and processing facilities in the study zone.

Farmers and stakeholders have been impoverished and discouraged their enthusiasm for farming as show table I:

Table1: Annual impact of post harvest losses in Ganye

S/N0	Activities	percent losses
1	Post harvest losses on maize	10
2	Post harvest losses on cowpea	20
3	Post harvest losses on groundnut	30
4	Sold grain due to storage problem	20
5	Grain losses and waste	15-20

Major post harvest losses largely arose from pest, disease, natural disaster, careless human action, inadequate storage facilities and processing (Foluke O, 2011). Government should provide storage facilities to minimize post harvest losses and make food available all year round.

Post harvest losses in Africa is above average, for instance 50 percent of Banana is wasted alone food supply chain , while Nigeria is situated in sub-Sahara estimate one-third of annual post harvest losses due to poor storage management (Hartman, 2011)
Thus, processing is very vital part of Agriculture; it extends life span of produce after harvest. However, federal government should broaden the strategic grain reserved program and construction of silos.
A huge volume of farm produce is lost and wasted alone five boundaries of supply chain as shown in table 2.

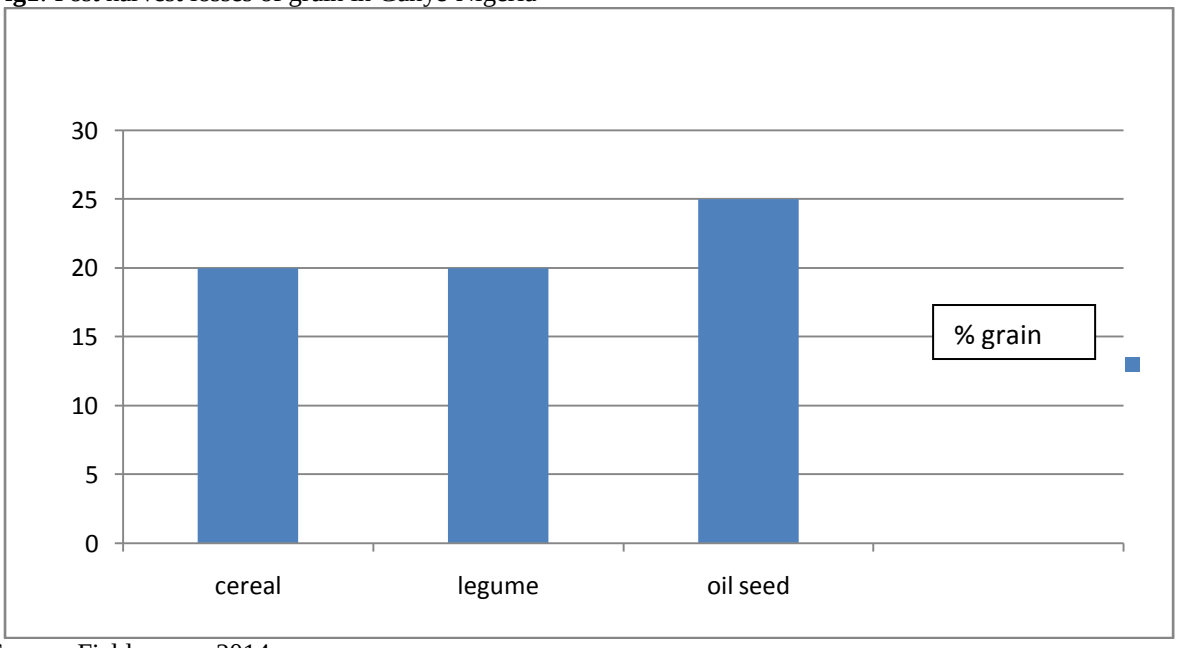
Table 2: Types of grain losses /waste in Ganye

s/NO	Types of grain losses	Percent losses	Percent of farmers responded
1	Mechanical damage/spillage during operation	15-20	62
2	Transport / distribution	5-10	60
3	Processing	10-15	70
4	storage	15-20	42
5	Consumption at household level	5-10	46

Source: Field survey 2014

Table 2 shows data of grain losses and waste in the study zone. Food security is major concern in large parts of developing countries, especially in Ganye. The main causes of grain losses and waste in low income countries are connected to financial management and technical limitation. Figure 1 indicates mechanical damages on grain after post harvest operation with photo type machines.

Fig1: Post harvest losses of grain in Ganye-Nigeria



Source: Field survey 2014

Post harvest machinery are relatively scarce in developing country especially in the study zone few existing one are prototypes machine as shown in Figure 3.
Mechanized post harvest activities are classified into man, Animal and engine power technology. It is on the basis of sophistication, capacity to work, cost and in some cases precaution and effectiveness as shown in table 3.

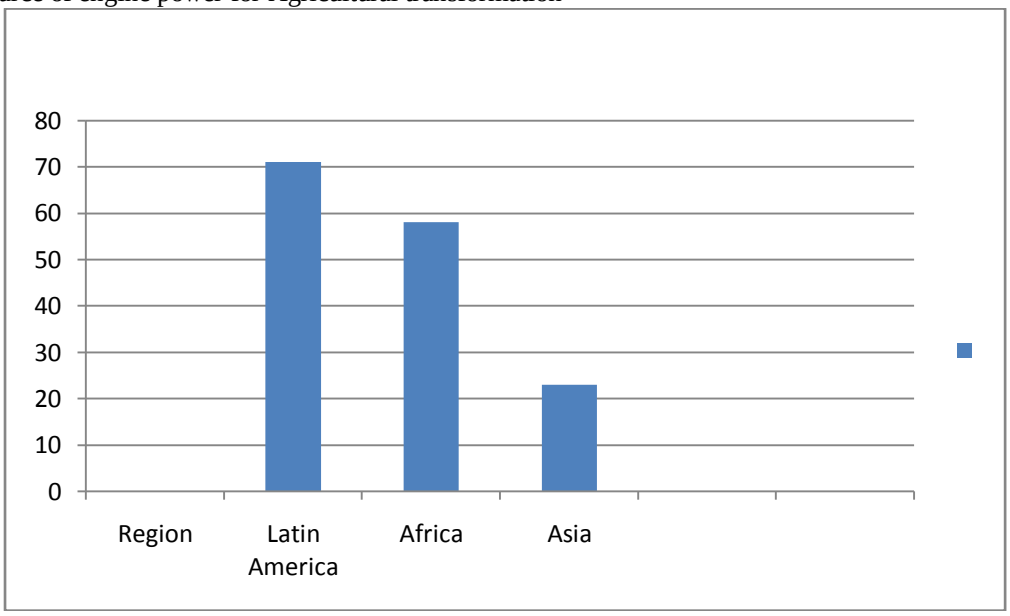
Table 3: Agricultural power by source and geographical region

Region	Total kw/ha	Percent available Kw/ha		
		engine	man	Animal
Asia	0.16	23	26	51
Africa	0.08	58	35	7
Latin America	0.19	71	24	26

Source: Giles (1975)

Patrick, O. (2013) reported that Nigeria record over 40% post harvest loses, which has lead to an unprecedented hike in food importation in the country. Whereas the geographical region for Nigeria in table 3 is using the highest percent human power which is located in Africa.

Fig2: Source of engine power for Agricultural transformation



Source: Fundamental of Engineering for Agriculture (2006)

For mechanized post harvest operation to succeed in Nigeria especially in study zone, there must be adequate electric motors, diesel and petroleum Engine for threshing, shelling and processing produce. The source of power for overall agriculture is shown in table 4.

Table4: Source of power for overall agricultural production.

Source of power	Africa %	Nigeria %	USA %
Human	89	90	4
Animal	10	8	7
Engine	1	2	95

Source: Odigboh and Onwualu(1994).

Whereas 2% of power for agricultural activities in Nigeria comes from Engine, it is up 95% in the U.S.A

IV. CONCLUTION

This study has summarized and analyzed a magnitude of data reported on food Losses. The result in the study must be interpreted with great caution. The study revealed the major quantitative data in current knowledge with regard to post harvest machines in the study zone.

Another point to be stressed is losses /waste of food supply chain in boundary system which should be minimized, transformed and consumed in different part of the world as export commodities. The economic impact of using post harvest machines had recorded 40 percent reduction in food supply chain in the study zone..Post harvest photo type machines were introduced 6-10 years in the study zone. Farmer's sale 15-20 percent of their grain due to problems of storage facilities. An estimate field record 52 percent of farmer's losses 20% of grain and food waste.

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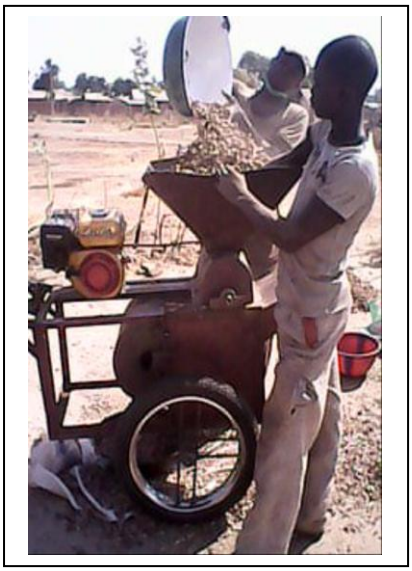

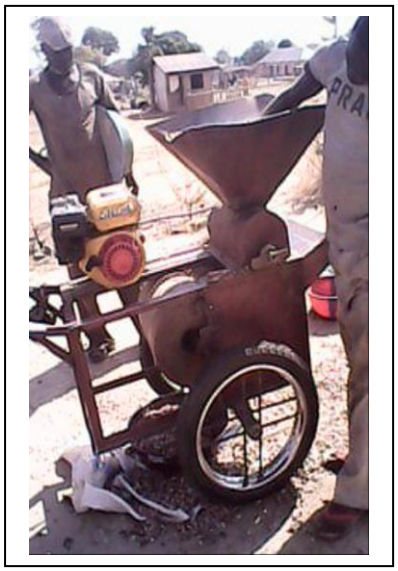

Figure3: Photo type of a multipurpose post harvest machine for shelling and threshing maize, cowpea and groundnut. It was introduced in 2009 to reduce excess post harvest losses in the study zone. (Source:Authors'file)