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**Post Harvest Losses: Impact on Nigeria Economy**

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**Abstract.** As the produce continues to rise in the market due to low supply of food and increase in exchange rate of foreign currencies, the economic condition of the country in the area of food production and its losses is a thing of major concern for every Nigerian. Imported foods are no more affordable for average Nigerians and majority of the indigenous food produced are lost from one stage of production to the other. These stages are operations like harvesting, on the farm handling, processing, storage and transportation. This paper therefore examines the causes of these losses and its effects on Nigeria economy. Possible solutions are also recommended.

**Key words:** Post-Harvest, Losses, Crops, Nigeria, Economy

**Introduction**

The issue of food losses is of high importance in the efforts to combat hunger, raise income and improve food security in the world's poorest countries. Food losses have an impact on food security for poor people, on food quality and safety, on economic development and on the environment (FAO, 2011).

Postharvest loss can be defined as the degradation in both quantity and quality of a food production from harvest to consumption. Quality losses include those that affect the nutrient/caloric composition, the acceptability, and the edibility of a given product (Kiaya, 2014). Quantity losses refer to those that result in the loss of the amount of a product. Loss of quantity is more common in developing countries. According to Parfitt *et al.* (2010) Food losses refer to the decrease in edible food mass throughout the *part of the* supply chain that specifically leads to edible food for human consumption. Food losses take place at production, postharvest and processing stages in the food supply chain (Parfitt *et al.*, 2010). Food losses occurring at the end of the food chain (retail and final consumption) are rather called "food waste", which relates to retailers' and consumers' behaviour (Parfitt *et al.*, 2010).

A recent FAO report indicates that at global level, volumes of lost and wasted food in high income regions are higher in downstream phases of the food chain, but just the opposite in low-income regions where more food is lost and wasted in upstream phases (FAO, 2013).

Patrick (2013) reported that Nigeria records over 40% 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 (Mada et al, 2014). For these reasons, this paper examines the causes, stages and types of agricultural losses in Nigeria.

Table 1 below shows some food crops losses in Oyo state, Nigeria.

**Table 1. Food crops losses in Oyo State, Nigeria**

Crop	Harvesting and Transportation	Distribution and Transportation	Harvesting and Transportation	Distribution and marketing	
	Loss (%)	Loss (%)	Loss (%)	Loss (%)	Total (%)
Okra	9-10	10-15	2	4	25-30
Pepper	6-7	10-20	-	2	18-29
Tomatoes	10-15	1	3-7	-	14-23
Vegetables	1	2	-	1	4
Mangoes	10-20	-	-	20-40	30-60
Oranges	5-10	10-15	-	10-20	25-45

Marketable: damaged portion that can still be sold; unmarketable: damaged portion that cannot be sold.

Source: Ale (2005)

**Table 2. Post-harvest losses of fruits and vegetables in farms and markets (total farm and market losses) % loss**

Crops	Farms (%)	Market (%)	Total (%)
Pepper (fresh)	2.5	55.5	58
Pepper (dry)	4.875	7	11.9
Tomatoes	3	49.9	52.9
Okra	1.75	46.5	48.25
Leafy vegetable	1	29.5	30.5
Melon	12	0	12
Banana	0	20	20
Pineapple	1	22	23
Pawpaw	-	22	22
Plantain	0	18	18
Orange	1	15.3	16.3

Source: Ale (2005)

### **Causes of Post-Harvest Losses in Nigeria**

The causes of post-harvest losses in Nigeria are sub divided into the following factors.

#### *Biological and Environmental Factors*

Biological (internal) causes of deterioration include respiration rate, ethylene production and action, rates of compositional changing (associated with colour, texture, flavour, and nutritive value) mechanical injuries, water stress, sprouting and rooting, physiological disorders and pathological breakdown. The rate of biological deterioration depends on several environmental (external) factors such as temperature relative humidity, air velocity and atmospheric composition (concentration of Oxygen, Carbon dioxide and ethylene) and sanitation procedures.

#### *Socio-Economic Factors*

The biological and environmental factors that contribute to post harvest losses are understood and many technologies have been developed to reduce these losses, they have not been implemented due to one or more of the following socio – economic factors (Bolarin and Bosa, 2015).

#### *Inadequate Marketing Systems*

Farmer can produce large quantities of quality fruits, ornamentals and vegetables but if they do not have a dependable, fast and equitable means of getting such commodities to the consumer losses will be extensive. This is because of lack of communication between producers and receivers, and lack of market information.

#### *Inadequate Transportation Facilities*

In Nigeria, roads are not adequate for proper transportation of agricultural products. Also, transport vehicles and modes, especially those suited for fresh horticultural perishables, are in short supply.

#### *Unavailability of Needed Tools and Equipment*

Even if growers and handlers of fresh agricultural products were convinced of the merits of using some special tools and/or equipment in harvesting and postharvest handling, they most likely will not be able to find them in the domestic market because most of the tools and equipment manufactured locally or imported are insufficient to meet demand. The unavailability of tool/equipment is one of the courses of post-harvest food loss.

#### *Lack of Information*

The human element in post-harvest handling is extremely important. Most handlers involved directly in harvesting, packaging, transportation, and marketing in Nigeria have limited or no appreciation for the need for or how to maintain quality of agricultural products. An effective and far reaching educational (extension) program on harvesting, packaging transportation and marketing of agricultural products is crucial for effective post-harvest handling.

#### *Poor Maintenance of Storage and Handling Facilities*

In Nigeria, some good storage facilities that were built for years ago are currently “out of order” or not functioning properly because of lack of maintenance. This problem is especially true of public sector facilities.

#### *Poor Storage Facilities and Lack of Infrastructure*

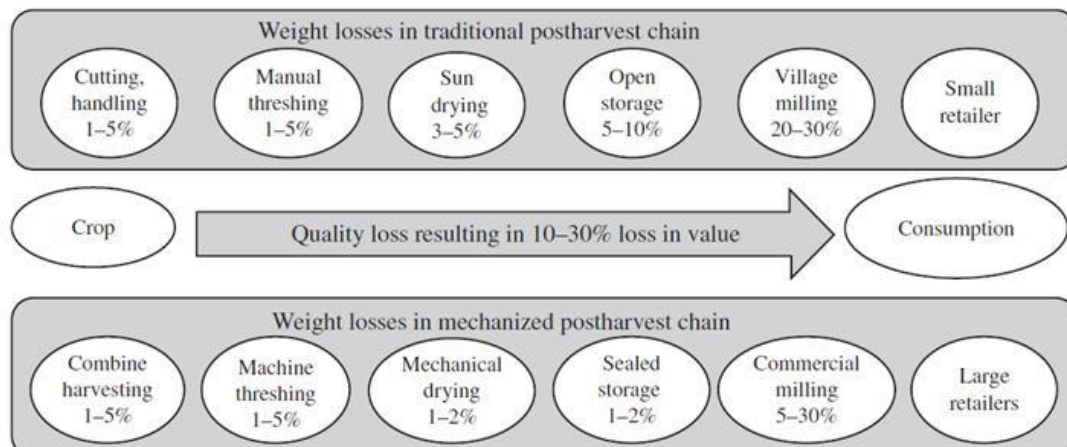
Fresh products like fruits, vegetables, meat and fish straight from the farm or after the catch can be spoilt in hot climates due to lack of infrastructure for transportation, storage, cooling and markets (Rolle, 2006; Stuart, 2009).

#### *Government Regulations and Policies*

It is vital to have consistent agricultural development policies and programmes in order to keep to guiding principles, strategies and tactics that are compatible with the nature of the post-harvest losses to be solved and to desired objectives. Policies, strategies and programmes should be compatible with and adjusted to the prevailing understanding and knowledge of the agricultural development process.

#### *Factors Contributing to Food Loss in Nigeria*

Factors that contribute to food loss range from mechanization of practices such as harvesting to handling, processing and others, to weather conditions, production practices, management decisions, transportation facilities, grading issues, infrastructure, consumer preferences/attitudes, and availability of financial markets. A typical post-harvest chain comprises of a number of stages for the movement of harvested output from the field to the final retail market. The losses incurred at each step vary depending upon the organization and technologies used in the food supply chain. For example, in less developed countries where the supply chain is less mechanized, larger losses are incurred during drying, storage, processing and in transportation.



**Figure 1. Traditional versus mechanized postharvest chain**

Source: Hodges, Buzby and Bennett (2011)

### Stages of Post-Harvest Losses in Food Production

- (i) Agricultural production: Losses due to mechanical damage/spillage during harvest operations;
- (ii) Handling and storage: Handling during transportation and distribution from farm, storage and market;
- (iii) Processing: Losses due to spillage and degradation during industrial or domestic processing;
- (iv) Distribution: Losses and waste in the market system;
- (v) Consumption: Losses during consumption at the household level.

### Effects of Post-Harvest Losses on Nigeria Economy

The effects of post-harvest losses on Nigeria economy are sub divided into the following:

#### *Impacts on domestic food supply:*

- (i) Post-Harvest losses affects household food consumption and demand patterns by
- (ii) heightening the taste for foreign food (e.g. foreign rice, fruit juice).
- (iii) Post-Harvest losses result in high importation of foreign food as locally produced foods are not available during off-seasons due to lack of storage facilities to prevent the perishability of the local foods during their seasons.
- (iv) Shortage of food and raw materials.

#### *Impacts on domestic producers and consumers price*

Ahmed (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, due to the following:

- (i) Reduction in domestic producer price
- (ii) Reduction in consumer price: leading to consumer sovereignty. (Farmer is price taker)
- (iii) Reduction in farm income which is a disincentive to production; source farmers (young/inexperienced ones) leave.
- (iv) Reduction of farm profit

#### *Impact on environment:*

Post-harvest losses cause environmental pollution and health hazard

#### *Macroeconomic impact:*

- (i) Commercial food import is demanding on the economy (see table 3) below. What is spent on foreign exchange to import food with local substitutes could be used in direct investment in agriculture to achieve higher result.
- (ii) Reduction in Nigeria export commodities.

**Table 3. Food import Bill (Nb and US \$b) 1990 – 2001**

Currency	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001
Naira	3.47	7.79	11.74	1.395	16.77	88.35	75.95	1000.64	102.16	103.49	120.05	195.87
US \$	0.43	0.91	1.46	1.73	2.09	10.99	9.45	12.52	12.71	12.88	14.35	24.36

Source: Onunze (2012)

### **Possible Solutions to Post-Harvest Losses in Food**

#### *Sales closer to consumers*

Selling farm crops closer to consumers without having to pass the strict quality standards set up by supermarkets on weight, size and appearance would possibly reduce the amount of rejected crops. This could be achieved through, e.g., farmers markets and farm shops (Stuart, 2009).

#### *Investment in infrastructure and transportation*

Governments should improve the infrastructure for roads, energy and markets.

Subsequently private sector investments can improve storage and cold chain facilities as well as transportation (Choudhury, 2006).

#### *Careful handling of production*

Produce should be placed gently into containers, which are lined with grass cushions, and they should not be packed tightly in the containers. In case of fruits they should not be allowed to drop to the ground. They should drop into bags tied to tree branches in order to prevent bruises, which can cause quick rotting during transportation and marketing.

#### *Use of improved packaging method*

Perishable produce should be transported in containers in such a way that the containers will bear the weight of the produce and that they will not rest on one another. Wooden or plastic boxes that have high compressive strength which can be folded when not in use (to reduce storage space) should be used for packaging. These containers should have wide-open spaces for free flow of air (ventilation) to remove heat produced due to respiration of produce.

#### *Construction of feeder roads*

Harvested produce from some core-villages got spoilt due to lack of good roads which make the transportation of those produce to market difficult. Feeder roads should be constructed or improved on for easy transportation of perishable produce wasting away in the farms. This will enhance the immediate marketing and consumption in the urban centres.

#### *Construction of storage structures*

Low cost storage structure should be constructed at various farm centres and market place where farmers and market peoples can keep their produce until they are ready to be sold.

#### *Local government intervention*

Loss reduction programme should be set up by the government (especially, the local government which is the closest to the farmers) by provision of storage facilities in all farm settlement and markets. Organisation of periodic workshops for training farmers on how to reduce these losses should also be the responsibility of the government.

#### *Timely harvest of food production*

In case of fruits, they should be harvested when they are about to ripe so that, during the time of storage, they won't become too ripe and spoilt. The harvested fruits should also be sorted out as they become ripe, so that the ripe ones will be disposed off as fast as possible.



### Conclusion

In ensuring food security to stabilize the economy of Nigeria, it is very important to take steps to reduce the food losses incurred in postharvest operations like harvesting, processing and storage till it gets to the final consumers. As confirm by this review on crop losses, the food produced by Nigerian farmers if not lost on the process of harvesting and value additions should still be able to feed the nation and excess as export to other countries. It is believed that appropriate steps to reducing postharvest losses will provide food for Nigerians as well as strengthening its economy by having excess food for exports to earning the country reasonable foreign exchange.

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