

Cause, Magnitude and Management of Post-Harvest Loss Impact in Food Security of Ethiopia –Review

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Abstract

People in developing countries often facing losses of staple foods. Ethiopia is country depended on food imports to feed its population. Food security is one of most pressing issues that demand our immediate attention in Ethiopia there by post-harvest loss leads to food insecurity, higher food prices, and ultimately loss of scarce resources used in food production. The major post-harvest loss causes are, inefficient operational activities such as harvesting, handling techniques, packaging, storage, transportation facility, marketing situation and disease and pest. Its losses in developed countries are relatively high at consumer end, while in developing (Ethiopia) countries relatively high in early stages of farm level. Magnitudes of post-harvest loss along value chain have been above 5,000 metric tons per annum for all crops and their losses estimated between 10 to 50 percent in Ethiopia. In addition, Ethiopia's total post-harvest losses 2.04 million tons for a grain at a time when Ethiopia's import requirement is 1.16 million tons. So that, issue of food losses reduction is high importance in efforts to combat hunger, raise income and improve food security. Therefore, in order to achieve sustainable food security, producers, retailers, wholesalers, research institutes and other public and none governmental organizations need to have collaborate to reduce post-harvest loss at farm, wholesale, retail and consumer levels in Ethiopia.

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Introduction

As reports of Kiaya (2014), one of main global challenges is how to ensure food security for a world growing population whilst ensuring long-term sustainable development. Emerging problem to mankind is meeting food demand for rapidly growing global population. Population growth estimated to 9.1 billion people by year 2050, and about 70% extra food production will be required to feed them (FAO 2009) in addition to increasing urbanization, climate change and land use for non-food crop production intensify concerns of increasing food demands. Similarly, to limited food production, food loss after production has emerged as another major contributor to persistence of food insecurity. Food security remains one of most pressing issues that demand our immediate attention. Increasing agricultural productivity is very important issue for ensuring global food security. It is being challenged by limited land, water and increased weather variability due to climate change.

People in developing countries often facing losses of staple foods, mainly cereals, generally because of poor post-harvest practices (FAO 2017ab). According to FAO (2012) majority of undernourished people live in developing countries, where an estimated 791 million were chronically hungry. According to Melese(2016) post-harvest food loss is one of largest contributing factors to food insecurity and under-nutrition. Post-harvest losses have been broadly categorized into two groups as qualitative and quantitative loss. Qualitative loss is loss in nutritional and caloric value, loss of acceptability by consumers and loss of edibility of commodity while quantitative loss is loss of actual commodity causing reduction in amount available.

Ethiopia is country depended on food imports to feed its population. Losses after harvest are major source of food loss in country. Reduction of post-harvest loss neglected dimension in increasing food and nutrition Security (Dubale 2018, Ali 2017). Indeed, sustainably to achieve goals of food security; food availability needs to be also increased through reductions in post-harvest loss at farm, wholesaler, retail and consumer levels. Hence, main purpose of this review is to show Cause, Magnitude and Management of Post-Harvest Loss Impact for Food Security of Ethiopia.

Cause of Post-Harvest Loss in Food Security of Ethiopia



Source: - Ali (2017)

Food waste like inefficient operational activities within supply chains, such as handling, storage, transportation, harvesting, handling techniques, packaging facility, marketing situation, and disease and pest are major causes of post-harvest loss (Dejene 2017, Murthy et al. 2009) in Ethiopia.

Magnitude of Post-Harvest Loss in Food Security of Ethiopia

According to USAID (2016) globally, one third of food produced for human consumption is lost or wasted approximately 1.3 billion tons of food each year, worth nearly one trillion USD. Magnitude of cereal losses in Sub Saharan Africa alone has been estimated to exceed value of total food aid region received over past decade, roughly equivalent to annual caloric requirement of 48 million people.

According to Minten et al.(2019); World Bank (2011); FAO (2011, 2012) magnitude of post-harvest losses in food value chains increasing being debated among food system analysts and policy makers, along with design of policies to try to reduce losses. Magnitude of post-harvest losses issues increase receiving attention for two reasons (FAO 2011). First, it is believed that by reducing post-harvest losses, food security will be improved as lower post-harvest losses could ensure availability of more food at lower prices. Second, using resources for producing food that is ultimately wasted raises important environmental issues due to, misuse of water, land and fertilizer.

As reported by Hengsdijk and de Boer (2017) post-harvest losses in developed countries are relatively high at consumer end, while in developing countries relatively high in early stages of post-harvest system of farm level. According to FAO post-harvest losses in developing countries can range from 15 percent up to 50 percent (Susanna and Amanda 2014).

Similarly, Dubale (2018) reported that magnitudes of loss along value chain of selected crops have been above 5,000 metric tons per annum for all crops and their post-harvest losses have been estimated between 10 to 50 percent in Ethiopia. Similarly, Melese (2016) reported that Ethiopia postharvest loss rate ranged from 30 to 50% depending on crop type. Also according to African Union Commission post-harvest loss management strategy (AUCPHLMS 2018) in Ethiopia estimated total post-harvest losses stood at 2.04 million tons of grain at a time when Ethiopia's import requirement stood at 1.16 million tons.

Effect of Post-Harvest Losses in Food Security of Ethiopia

As reports of USAID (2016) farmers growing crops are facing high economic loss, because they have been no methods of increasing crops shelf life. Besides, country is not getting foreign exchange from crops due to low levels of post-harvest technology, which makes product of inferior quality, with no chance of competing in world market. Similarly FAO (2011), stated that postharvest losses cause not only loss of economic value of food produced but also waste of scarce resources such as labor, land and water, as well as non-renewable resources such as fertilizer and energy, all of which are used to produce, process, handle, and transport food.

Thus, despite of significant increases in area of land under cultivation and yield per acre over last two decades, food security in country Ethiopia remains fragile. An estimated 40% of population still remains less than minimum daily requirement of calories while production and productivity is low and post-harvest loss is

quite high, at where much effort should be made to generate technologies that would boost production and minimizes loss (Dubale 2018).

Management of Post-Harvest Losses in Food Security of Ethiopia

Handling, processing and preservation of crop produce at and after harvesting may be designated as "Post-harvest Management". Improved post-harvest management depends on quality and efficiency of handling, processing and preservation techniques used. Thus, whether gain in crop yield is marginal or significant, it could be nullified because of inappropriate or unreliable post-harvest management. To increase food security it is important to focus on ways to decrease post-harvest losses of food products and not only focus on agricultural productivity.

To reduce post-harvest losses, different strategies are required for developed versus developing countries. Developed countries typically have different post-harvest losses levels than developing countries, with more losses near consumer level in value chains in developed countries as opposed to near farm level in developing countries (Hodges et al. 2011; FAO 2011). Many authors in postharvest sector realize that appropriate post-harvest management is missing link between production and consumption (Kitinoja et al. 2011), contributing significantly to food insecurity problem. This is so because all food losses occur at a particular socio-cultural environment. In many developing countries there is a demand for more knowledge about supply chain management and implementation of improved post-harvest technologies (Kitinoja et al. 2011). They also need better education for producers, improved infrastructure in order for products to reach markets, developed value chains, collaboration between actors in supply chains and improved technologies in order to lower post-harvest losses (Hodges et al. 2011). Developing countries focus supply chains to improve and upgrade processes, quality and distribution (Susanna and Reneby 2014).

In Ethiopia, food losses occurring in postharvest system have not been given attention; that deserve and have been even, neglected for a long time (Tadesse et al. 2008). In food supply chain management major concerns are post-harvest losses (Susanna and Reneby 2014). An efficient supply chain management can be a way to decrease post-harvest losses (Shukla and Jharkharia 2013). This includes improving and upgrading all operations and activities in supply chain (Trienekens 2011). According to Susanna and Reneby(2014) there are three strategies to lower losses of fresh produce; (1) use cultivars that have potential to last long after harvest, together with good flavor and high nutrition, (2) maximizing yield without lowering quality and (3) optimal handling of the product at all post-harvest stages.

Similarly, Ali(2017) reported that post-harvest loss in Ethiopia can be managed by creating awareness, Strong commitment, National post-harvest management Policy/strategy, improved institutional capacity, enhancing infrastructure, improved value chain and marketing system, developed national manual for post-harvest package, demonstrating post-harvest technologies and improved practices on farmer training centers (FTCs) and model farmers, inventory on indigenous and best practices, improved access to suitable, safe and affordable post-harvest technology and inputs technologies promote agro-processing and Value addition, generated and/or adapted technologies that are environmentally friend, least cost and socially acceptable and training personnel in postharvest and food processing at different levels to insure food security. Similarly, Parfitt et al. (2010) reported that post-harvest loss occurs within whole supply chain due to limited resources such as post-harvest technology, knowledge and infrastructure. As stated by Parfitt et al. (2010) level of post-harvest losses has a strong correlation with available technology and how developed markets.

Also, according to Kiaya (2014) post-harvest technologies can contribute to food security in multiple ways. They can reduce post-harvest losses, thereby increasing amount of food available for consumption by farmers and poor rural and urban consumers. For example, control of *Larger Grain Borer (LGB)* or *Prostephanus truncanus* greatly reduced loss of maize in on-farm storage among smallholders in a number of African countries, thus improving their food security (Goletti and Samman 2002). To minimize post-harvest losses of fruits and vegetables or cereals, it is of high importance for actors to apply suitable post-harvest technology procedures, in order to have long shelf-life and acceptable safety and quality of fruits (Kader 2004). Thus, Producers, retailers, wholesalers, research institutes and other public and none governmental organizations need to have clear understanding in post-harvest loss management of crops in Ethiopia Dejene(2017).

Importance of Reducing Post-Harvest Loss in Food Security of Ethiopia

Proper handling of post-harvest helps to ensure household and community food security until next harvest helps producers to avoid selling at low prices during glut period that often follows harvest (USAID 2016). Food insecurity is a great problem in Sub-Saharan countries that are suffering from poverty; food insecurity and a large part of population are a state of undernourishment. Reduction in post-harvest losses could increase amount of food available for human consumption and enhance global food security, a growing concern with rising food prices due to growing consumer demand, increasing demand for biofuel and other industrial uses and increased weather variability (Trostle 2010). In addition, reducing food wastage could alleviate environmental concerns

(Kummu et al. 2012). Also reduction in post-harvest losses could mitigate against import requirements by improving food availability.

According to Ministry of Agriculture, Ethiopia's agricultural production has not been able to meet total national food requirements with almost half population subsisting in absolute poverty (AUCPHLMS 2018, MoA 2015). A reduction in post-harvest losses could improve food security by increasing real income for consumers (World Bank 2011). Reducing its losses requires fewer resources and applies less pressure to environment in maintaining quantity and quality of food than through increased production to offset post-harvest losses (Ali 2017, Hengsdijk 2017). The consumers benefit from reducing losses includes lower prices and improved food security. The issue of food losses is of high importance in efforts to combat hunger, raise income and improve food security in world's poorest countries (FAO 2011). Therefore, it could be a major contributor to satisfying anticipated higher global food demand and to improving food security in Ethiopia.

Conclusion

Post-harvest loss is a major cause of food shortage problems in most developing countries like, Ethiopia. Reducing post-harvest losses make more food available without increasing pressure on natural environment. It contributes food security; in addition significant impact on food quality, safety and socio-economic development of Ethiopia. It is responsible for food insecurity thus; priority should be given to attain food self-sufficiency in a country. Therefore, reduction of postharvest losses is economically and environmentally safe to enhance food security and food availability. So that, this review could be show a pinpoint for cause, magnitude and management of post-harvest loss impact for food security of Ethiopia by giving attention to researchers, technologists, policy makers, administrators, farmers, industrialists, wholesalers and retailers to improve post-harvest handling techniques to minimize post-harvest losses in terms of food security.

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