

Solutions to Global Food Security: Reducing Post-Harvest Food Losses

William Benjy Mikel and Melissa Newman

Global food security is approaching a crisis point in many locations around the world, specifically in African countries. It is imperative that a comprehensive approach be derived that not only considers appropriate technological solutions, but also in-country institutional solutions that will ultimately determine success. With an increase in global population to over nine billion by 2050, the need for enhanced strategic food availability is paramount. Food security is a major concern in large parts of the developing world. Food production must clearly increase significantly to meet the future demands of an increasing and more affluent world population (FAO, 2011). This has placed a great strain on major agricultural producing countries to provide the world's food supply to a point where innovative solutions that are culturally appropriate must be devised and implemented globally to ensure continued food security.

A strategic food systems approach must target enhanced agricultural production technologies, food processing and preservation innovations, food distribution capabilities and ultimately human health within each culture. A successful systems approach must ultimately consider natural geographical resources and cultural tendencies and inhibitions. Numerous methods of approach and knowledge must be applied to overcome the system failure of food insecurity (Figure 1). The entire infrastructure must be established to assure local sustainability which may be adapted over time to enhance neighboring cultures.

The postharvest sector includes all points in the value chain from production in the field to the food being

placed on a plate for consumption. Postharvest activities include: harvesting, handling, storage, processing, packaging, transportation and marketing. The amount of resources used and the efficiency of production are contingent upon use of appropriate technologies, infrastructure, storage, processing, marketing and transportation (Mrema & Rolle 2002).

Estimates of the post-harvest losses of food grains in the developing world from mishandling, spoilage and pest infestation are put at 25 percent; this means that one-quarter of what is produced never reaches the consumer for whom it was grown, and the effort and money required to produce it are lost-forever. Fruit, vegetables and root crops are much less hardy and are mostly quickly perishable, and if care is not taken in their harvesting, handling and transport, they will soon decay and become unfit for human consumption. Estimates of production losses in developing countries are hard to judge, but some authorities put losses of sweet potatoes, plantain, tomatoes, bananas and citrus fruit sometimes as high as 50 percent, or half of what is grown. Reduction in this wastage, particularly if it can economically be avoided, would be of great significance to growers and consumers alike. (FAO, 1989)

Another study by FAO highlights the losses occurring along the entire food chain, and makes assessments of their magnitude. Further, it identified causes of food losses and possible ways of preventing them.

The results of this study suggest that roughly one-third of food produced for human consumption is lost or wasted globally, which amounts to about 1.3 billion tons per year. This inevitably also means that huge amounts of the resources used in food production are used in vain, and that the greenhouse gas emissions caused by production of food that gets lost or wasted are also emissions in vain (FAO, 2011).

Food is lost or wasted throughout the supply chain, from initial agricultural production down to final household consumption. In medium- and high-income countries food is to a significant extent wasted at the consumption stage, meaning that it is discarded even if it is still suitable for human consumption.

William Benjy Mikel, Ph.D.
Associate Vice President, International Programs
Executive Director, International Institute,
Mississippi State University, Food Science, Nutrition and Health
PO Box 9805, Mississippi State, MS 39762-9805
wbm50@msstate.edu

Melissa Newman, Ph.D.
Director, Food Systems Innovation Center
Animal & Food Science
University of Kentucky
204 Garrigus Bldg
Lexington KY 40546

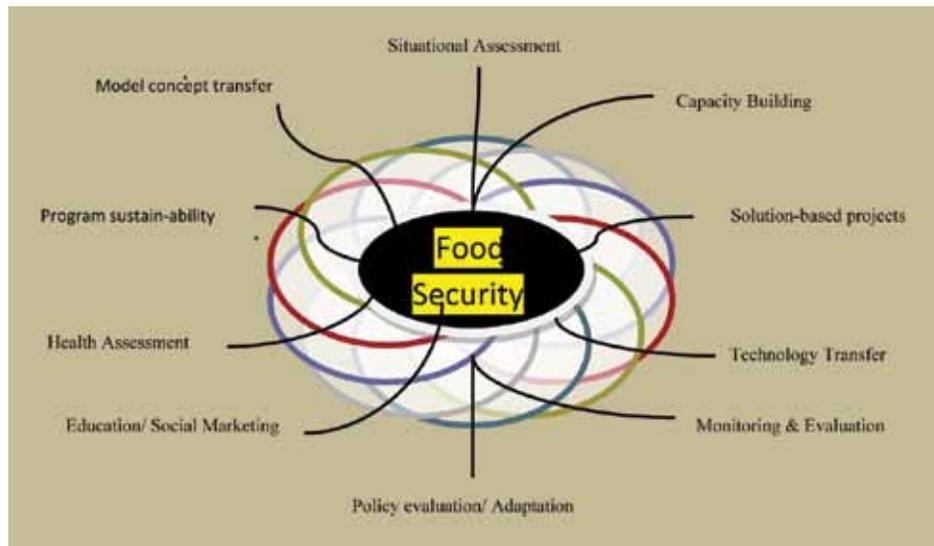


Figure 1.

Significant losses also occur early in the food supply chains in the industrialized regions. In low-income countries food is lost mostly during the early and middle stages of the food supply chain; much less food is wasted at the consumer level. Overall, on a per-capita basis, much more food is wasted in the industrialized world than in developing countries. It is estimated that the per capita food waste by consumers in Europe and North-America is 95-115 kg/year, while this figure in Sub-Saharan Africa and South/Southeast Asia is only 6-11 kg/year. The causes of food losses and waste in low-income countries are mainly connected to financial, managerial and technical limitations in harvesting techniques, storage and cooling facilities in difficult climatic conditions, infrastructure, packaging and marketing systems. Given that many smallholder farmers in developing countries live on the margins of food insecurity, a reduction in food losses could have an immediate and significant impact on their livelihoods.

The food supply chains in developing countries need to be strengthened by encouraging small farmers to organize and to diversify and upscale their production and marketing. Investments in infrastructure, transportation, food industries and packaging industries are also required. Both the public and private sectors have a role to play in achieving this. The causes of food losses and waste in medium/

high-income countries mainly relate to consumer behavior as well as to a lack of coordination between different actors in the supply chain. Farmer-buyer sales agreements may contribute to quantities of farm crops being wasted. Food can be wasted due to quality standards, which reject food items not perfect in shape or appearance. At the consumer level, insufficient purchase planning and expiring 'best-before-dates' also cause large amounts of waste, in combination with the careless attitude of those consumers who can afford to waste food. Food waste in industrialized countries can be reduced by raising awareness among food industries, retailers and consumers. There is a need to find good and beneficial use for safe food that is presently thrown away. This study revealed that there are major data gaps in the knowledge of global food loss and waste.

REFERENCES

- Food and Agriculture Organization of the United Nations. Rome, 1989.
- Food and Agriculture Organization of the United Nations. Rome, 2011.
- Mrema, C.G. and S.R. Rolle, 2002. Status of the postharvest sector and its contribution to agricultural development and economic growth. Proceeding of the 9th JIRCAS International Symposium, (JIRCAS'08), Value-Addition to Agricultural Products, Ibaraki, Japan, pp: 13-20.