

# Chapter 92

## Postharvest Management Strategies

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### ABSTRACT

*Climate change will pose many challenges along the food value chain and will threaten not only food security but also poverty alleviation and economic growth in SIDS. Building resilient food systems for vulnerable farmers should focus not only on improving yields and on use of more suitable crops under changing climatic conditions but also on climate-smart postharvest adaptation strategies. In this chapter, strategies to raise awareness about climate change and its effects on postharvest losses are discussed. The authors recommend several actions: training of farmers to build functional adaptive capacity on the ground, increased investments in technological innovation, the continuous sharing of traditional/ research-based knowledge with farmers and stakeholders in the food supply chains. Success will also depend on incentives, monitoring systems, appropriate application of approaches, tools and technologies, and involvement of farmers and policy makers. However, there is no one-size-fits-all solution to this issue.*

### INTRODUCTION

Over the next few decades, it is predicted that billions of people, particularly those in developing countries, will face shortages of water and food and increased risks to health and life, as a result of climate change. Current world population is expected to reach 10.5 billion by 2050, with most

of this growth coming from developing countries further adding to global food security concerns (Aulakh and Regmi, 2013).

Climate variability particularly with respect to changing temperatures and rainfall pattern is a major concern for farmers in the developing world (CTA, 2011). Concerted action is needed to enable developing countries to adapt to the effects

DOI: 10.4018/978-1-4666-9814-7.ch092

of climate change that are happening now and predicted to worsen in the future. The environment in which crops will be grown in the next 10–20 years may change markedly with an expected rise in atmospheric CO<sub>2</sub> concentrations at a rate of 1.5 µmol year<sup>-1</sup> (Magan, Medina, and Aldred, 2011). The Intergovernmental Panel on Climate Change (IPCC) projects that the global temperature is expected to rise by up to 6°C during this century. As a result of this, there could be serious effects on reduced crop yields in tropical areas which can lead to an increased risk of hunger, spread of climate sensitive diseases such as malaria, and an increased risk of extinction of 20%–30% of all plant and animal species (UNFCCC, 2007<sup>a, b</sup>; UN, 2008; Brown, 2010). Climate change is anticipated to have far reaching effects on the sustainable development of developing countries and threatens food security. For each 1°C rise in temperature above the norm during the growing season, farmers can expect a 10% decline in wheat, rice and corn yields (Brown, 2010).

The small island developing states (SIDS) account for less than 1% of global greenhouse gas (GHG) emissions but are among the most vulnerable, in terms of sustainable economic development and alleviation of poverty as a consequence of the potential adverse effects of climate change. The livelihoods of many farmers, processors, exporters, traders, wholesalers and retailers in SIDS are under threat as a result of environmental and climate change impacts as these affect not only food security but food quality and quantity. SIDS are most vulnerable to these effects because they have fewer resources to adapt: socially, technologically and financially. At the same time, SIDS are forced to implement appropriate strategies to adapt to increasing threats resulting from greenhouse gas forcing of the climate system, to which they contribute little (UNFCCC, 2007<sup>a, b</sup>).

In the Caribbean, powerful hurricanes, which are increasing in number in the region, have a major impact on the agricultural sector. In 2004, the hurricane season caused damages estimated at

USD 2.2 billion in the Bahamas, Grenada, Jamaica and Dominican Republic alone (UN-OHRLLS, 2009). These events have caused the diversion of limited resources from other development priorities towards relief, rehabilitation and reconstruction activities. Hurricanes have been predicted to become more frequent with climate change. Other climate change impacts in the Caribbean are projected to include temperature rise, sea level rise, ocean warming and changing rainfall patterns. It has been estimated that the potential economic costs of climate change as a percentage of GDP to Caribbean SIDS, could be on average of 14% of GDP by 2025, if no action is taken to reduce such adverse impacts (Griffith and Gibbs, 2009).

Adaptation is a process through which societies make themselves better able to cope with an uncertain future. As a result, SIDS require a diversity of adaptation measures (in processes, structures and policies) very much depending on individual circumstances. The threat posed by global climate change on agriculture and food production in SIDS is two-fold (CIAT, 2013):

1. It can jeopardize production and supplies and hence negatively impact consumers and the private sector and
2. It can hinder rural and national development by affecting growth and distribution of incomes and thus undermine food security.

In SIDS, farming practices are based on risk-mitigation strategies. Such strategies do not allow for the development of highly productive agriculture to counteract the food shortages as a result of increasing demand due to the growing population and the decreasing supply as a result of climate change. The projected impacts of climate change on agriculture in SIDS is likely to intensify due to a general increase in temperature, more frequent occurrence of dry spells and droughts, storms and flooding and increased rainfall, as well as, a lack of proper water supply, loss of soil fertility and shortening of the growing season. Such risks to

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