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SPACE-ENABLED INTEGRATED DECISION SUPPORT SYSTEMS FOR POSTHARVEST LOSS

Abstract

According to the Food and Agriculture Organization, one-third of global food production is lost before it reaches the final consumer. In Africa, about 37 percent of food produced is lost between production and consumption resulting in food insecurity and loss of income for farmers. Scaling back postharvest loss has far-reaching implications for national and international food security, as well as the environment. The African continent is expected to account for more than half of the global population growth between 2015 and 2050. According to the UN, more than 28 of the poorest and most food insecure African nations are projected to double or increase their population by a multiple of five by 2100. As the population increases, there would be increased pressure on resources that satisfy the basic human needs of food, clothing, and shelter. At current production levels, Africa would only meet thirteen percent of its food demands in 2050. However, simply increasing productivity may not be sufficient to meet these demands.

These systemic agricultural challenges cut across the entire value chain and represent an opportunity for integration and optimization, with space technologies serving as a backbone for information generation, transmission, route optimization and decision support. Solving the post-harvest loss problem has long consumed the attention of actors in the engineering and development sectors. In the 1970s and 1980s, conventional wisdom offered modernization through technology adoption as the solution to the reduction of global post-harvest loss. During this period, attempts to reduce postharvest loss have adopted a 'one size fits all approach'. Technologies such as improved seeds were deployed to 'close the yield gap' and storage technologies were deployed to preserve the harvest. However, the effectiveness of these technology interventions has been inconclusive in Africa because of the heavy focus on the production and storage stages of food production.

In this paper, the author reviews the role of space-enabled integrated decisions support systems and present a conceptual framework for their implementation in agriculture, with a focus on addressing post-harvest loss. The decision support system combines space technologies such as navigation technologies, remote sensing technologies, and telecommunication technologies. This is to ensure that farmers and other stakeholders have the right information, to the right person, in the right format, through the right channel, and at the right time in the workflow, throughout the entire agricultural value chain, with the ultimate aim to reduce losses.