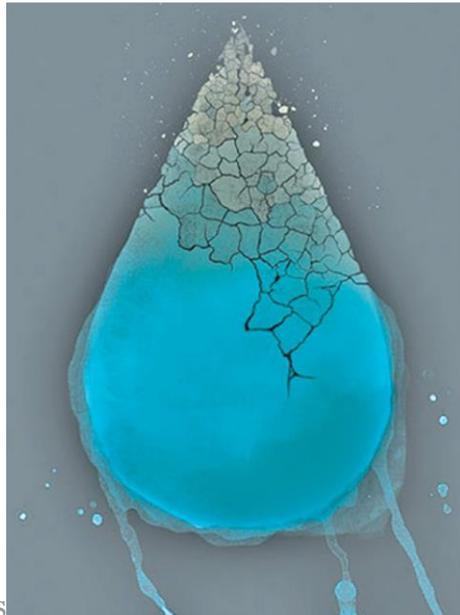


Dahal, P., D.D. Poudel, and K. Belbase. 2017. High and Dry: Keeping Food Safe and Available During Natural Disasters is as Important as rescue Efforts, The Kathmandu Post, Available at <http://kathmandupost.ekantipur.com/news/2017-09-03/high-and-dry-20170903074302.html>

High and dry

Keeping food safe and available during natural disasters is as



important as rescue efforts

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Published at : September 3, 2017

Updated at : September 3, 2017 08:24

The use of advanced technology saved many new buildings from falling down during the tremors that rocked the country in 2015. We can envision the availability of technology in the future to tame the mighty and rowdy rivers whose waters are needed to produce energy and food. Sadly, food supply is often neglected during reconstruction and recovery efforts, despite the fact that people need to eat daily even during such calamities.

Taming the rivers by building robust infrastructure should be the ultimate goal to minimise the effects of such natural disasters. Policymakers and politicians should have a long-term plan to build storage systems where food can be safely stored for emergencies. But there is a certain aspect of food management that traditional infrastructure cannot address. There is a simple basic science that needs to be used in buildings to minimise the adverse effects of rain and flood on food quality. Minimising the loss of nutrients is important for both the food produced and stored by households, and the food grain distributed during emergency response. However, food quality has not received due attention, especially in the developing countries, as everyone is focused on increasing yield to feed the burgeoning population.

Food management

The water of which we see too much during floods is needed for bumper harvests too. There are two distinct water management strategies for high-moisture foods like fruits, vegetables, meat and milk products, and low-moisture foods like grains, pulses and nuts. A cold supply chain is used to preserve perishable high-moisture foods in the developed economies. The cold chain concept is being slowly realised in Nepal too. However, an analogous dry supply chain for low-moisture food products has not been well realised. A dry chain is simpler as it involves drying food grain and packaging it in airtight and waterproof containers to maintain the initial dryness throughout the value chain. Unlike a cold chain, a dry chain does not require large infrastructure and refrigerators.

In Nepal, approximately 80 percent of the dry foods like rice, maize and wheat are harvested during the dry season. While the maize and rice can be sundried, the wheat harvested during March-April over dries after the harvest. Use of odour-proof hermetic packaging prevents excessive drying and moisture, mould and insect infestation during the subsequent rainy season besides protecting food grain from rodents to a large extent.

Apparently, traditional porous bags cannot maintain the desired moisture content in food. Several types of containers can be used to maintain initial moisture contents at packaging. They include triple-layer PICS bags, Supergrain bags and sturdy plastic and metal containers. Plastic containers must have a silicon seal to be effective.

The triple-layer PICS bags, initially supported by the Bill and Melinda Gates Foundation and USAID, and distributed by NAF Seeds in Patan, can be reused for four to five seasons. They are more effective for insect control than single-layer bags that can be punctured, for example, by unhusked rice. Hauling large quantities of grain would also be feasible in plastic bags, but a recycling system should be initiated with their use.

Adverse effects

Artificial dryers are needed for rapid moisture reduction during the rainy season. Ideally, foods should be dried to processing moisture contents within four to five days. Otherwise, toxic and carcinogenic invisible moulds begin to build up in the stored foods. A study carried out by the Johns Hopkins Medical University showed that 94 percent of the 4,926 pregnant women examined in Sarlahi had toxins in the blood that were derived from food. These toxins have several health effects, prominent ones being liver cancer and stunting. Animals and birds feeding on contaminated feed can transmit the toxins to meat and milk products. Moulds develop in improperly dried grains during storage, especially maize and groundnuts, that are harvested during the rainy season. Other dry food products that become wet during the rainy season and floods also harbor these carcinogenic moulds.

Sadly, we will hear more news reports about food quality and associated health problems as the floodwaters recede in the Tarai. There is no time to talk about quality during natural disasters, but there are health consequences of delivering poor quality foods. Both the government and the World Food Programme faced difficulties when they provided poor quality food in the aftermath of the earthquake and other previous disasters. Although moisture is managed in the pharmaceutical, processed food and seed industries, farmers and other stakeholders are not aware about adverse moisture effects on stored food. Thus, moisture management concepts are complementary, not supplementary, in multisector nutrition programmes.

Nutrition and health are compromised if innocent people are forced to eat food containing natural toxins. Nutrients also decline during storage at high moisture contents. Our big neighbours, where moisture concepts have yet to be realised, also lose about 75 million tonnes of grain annually. Clearly, it is time to embrace moisture management concepts in food and health security starting with the current disaster relief efforts in Nepal.

However, the ruling elite in Nepal and other developing countries cannot be blamed for not using the moisture concept. The blame should be laid on researchers who have not communicated this message to consumers, policymakers and the government. Disseminating nutrient sensitive dry chain knowledge through the education, health, food and communication sectors is essential so that dry foods can be saved in future natural disasters. Including moisture management concepts in the national five-year plans can prepare us for the next disaster. Such preparations would be a real tribute to the foods and lives lost during the recent floods in the Tarai.

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