

...per cent still depend on unimproved sanitation solutions. In countries with proper water management practices, including protecting the water ecosystem, curbing leakage, treating waste water and ensuring quality of drinking water, there is extensive, near-sustainable access to reliable water supply and sanitation. Many countries also have some of the best levels of non-revenue water.

...to facilitate augmentation of existing measures to develop and sustain water resources, such as the protection of water towers. Losses of 20 per cent or less would bring down cost of water losses to Sh6 billion or less. As populations grow, demand for water is also growing, but water scarcity, calls for stricter measures to conserve the valuable resource and its sources. Ecosystem degradation is one of the

...director of Embou water and Sewerage Company (EWASCO). "Farming is good, but there are people who use devious means, diverting the county's potable water to irrigate their farms, leaving other farmers and the community at large without water," says Mr Karugendo. After the farmers have had their fill, the water flows to waste, since the damaged pipes remain unrepaired. If not noticed on time, water losses are incurred and revenue is lost.

The Kenya Water Insitu... have been training water service providers on identifying locations where water losses occur, pinpointing the problem and instigating control measures to minimise non-revenue water. The training focuses on building capacity and setting up support and reduction frameworks to ensure better access to clean water for health, food security and energy.



## Food-grade lime, ash can reduce harmful aflatoxins in grains



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"Soaking maize and other grains in food-grade lime can reduce levels of the micro-organism that causes aflatoxin in maize.

"The process reduces effects of aflatoxin by between 30 to 58 per cent. Food-grade lime is not readily available in the country, but farmers can use maize cob ash," says Dr Elizabeth Wanjekheche, a food technologist at the Kenya Agricultural and Livestock Research Organisation (KALRO) in Kitale.

"Mix the grains with food-grade lime or cob ash before putting them in boiling water for 25 to 30 minutes till the grains loosen up, then wash the grains thoroughly with clean water, while rubbing the maize coats to remove the lime," says the researcher.

After that, the farmer may choose to use the maize to cook githeri, or mill the wet grains using a meat mincing machine to get *masa*, a soft product that can be used to make *kebab*, *chapati* or *mandazi*. The grains can also be dried in the sun for two to seven days, depending on the amount of sunshine available, and then milled or stored for later use. The grains should be dried until they attain 13.5 degrees Celsius moisture content level.

KALRO is also promoting the use of *alfasafe*, a biocontrol solution made of roasted sorghum coated with non-poisonous strains of *Aspergillus flavus*, to naturally outcompete their aflatoxin-producing cousins.

Results from Nigeria, where *alfasafe* has been tested since 2007, show a reduction of between 80 to 90 per cent aflatoxin contamination in maize and groundnuts. A similar product being developed and tested in Kenya

and Senegal has returned encouraging results. The Food and Agriculture Organisation (FAO) estimates that 25 per cent of the world's food crops have aflatoxin, which presents a hurdle in improving nutrition. Children below five are the most vulnerable, with exposure to aflatoxins damaging their immunity and causing stunted growth.

Aflatoxins are highly toxic, cancer-causing fungal metabolites that cause immune-system suppression, growth retardation, liver disease and death in both humans and domestic animals. The main fungi, *Aspergillus flavus* which produce these mycotoxins thrive under favourable conditions on a wide range of foods and feed such as maize and peanuts.

Aflatoxin contamination can occur before harvest when the crop undergoes drought stress due to elevated temperatures at the grain filling stages and when wet conditions

occur during harvest. Contamination also occurs when there is insect damage, delayed harvesting and high moisture levels during storage and transportation.

Improper handling of grains leads to moulds which colonise and contaminate food before harvest or during storage, especially if followed by prolonged exposure to an environment with high humidity or to stressful conditions such as drought.

"The mould does not always indicate that harmful levels of aflatoxin are present, but it does indicate a significant risk," says Dr Naftali Busakhala, a physician and senior lecturer at the Moi University.

"Acute aflatoxicosis can cause liver necrosis. Chronic exposure causes hepatitis, cirrhosis and liver cancer. It has also been associated with gallbladder cancer and oesophagus cancer," he adds.