

Urban wastewater for food security: Averting the next health crisis in Africa

Wastewater from sewage that is churned out by expanding cities and towns worldwide helps meet food security globally, especially in developing regions. It is the one resource (unlike land, labour, or fresh water) that is continuously growing in volume and used to cultivate vegetables, grains, animal feed, and fish at a larger scale than we ever realised.

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A [new study](#) shows how widespread this practice is among farmers who grow our food. Using satellite images, Geo spatial data sets, and computer modelling of the water cycle, the report estimates that because most wastewater remains untreated, 885m people are at health risk through the food chain, not counting those otherwise in contact with the water.

Gains made in increasing food supply could be wiped out by water-borne diseases

Health risks are most common in low- and middle-income countries, where facilities to treat wastewater have lagged behind population growth, and yet food production must rely on expanding wastewater flows because alternative freshwater sources for agricultural irrigation are increasingly scarce. Without action, we could be allowing diseases like parasitic worms, diarrhoea, and even cholera to wipe out the impressive gains made in increasing food supply.

West Africa - with its high population growth - is a particular hotspot, signalling an increased risk in a region already beset by health challenges. In Ghana, up to 90% of the fresh, leafy vegetables consumed raw in urban areas are grown in or near cities under irrigation with highly polluted water. A survey from the International Water Management Institute (IWMI), who contributed to the new study, showed that in Ghana only [16%](#) of wastewater treatment facilities are fully functional, treating a small fraction of the country's wastewater. As a result, water pollution is common, and unsafe irrigation water is used to grow vegetables eaten daily by about 800,000 urban dwellers.

Acting now is crucially important - the daily health risks and loss of life, especially of children, are

unacceptably high in low-income countries. At present levels of investments in wastewater infrastructure coupled with rapid urban expansion, most of these countries will never reach 80 or 90% treatment, it has taken Ghana decades to get its wastewater treatment up to 15%.

Risk "barriers" are needed along the food value chain

Fortunately, there are several alternative approaches where conventional wastewater treatment remains a distant prospect, that is approved by the World Health Organization (WHO). An IWMI estimate for Ghana indicates that investing in these options has a five-fold return in public health benefits.

Options to reduce risk exist from the moment wastewater is generated to the point contaminated food is eaten. For example, on-farm water treatment, protective clothing for farmers, safe irrigation practices that minimise the contact farmers and crops have with pathogens (disease-causing microbes), improved hygiene in markets and effective vegetable-washing in kitchens. Ideally, several of these [pathogen barriers](#) are used in combination.

Create market incentives to improve sanitation

Treating the pathogen-contaminated sludge in septic tanks and pit latrines receives scant attention and is severely underfunded in most developing countries. Yet, business opportunities exist across the entire sanitation value chain, as demonstrated through a recent [report](#) on promising business models published by researchers of the [CGIAR Research Programme on Water, Land, and Ecosystems](#) (WLE). Wastewater holds great potential to create marketable resources, such as fertilisers, energy, and clean water. If captured and sold, these could offer significant incentives for investment in treatment.

For example, more than 40m hectares of land could be irrigated with the added benefits of substantially meeting the crop fertiliser needs (up to 322 kilogrammes of nitrogen and 64 kilos of phosphorous per hectare per year). Alternatively, the global wastewater supply could generate enough electricity for about 130m households. If businesses or public-sector enterprises [tap into this market](#) to generate revenues, they would significantly improve sanitation and global health outcomes by responsibly managing health risks while still allowing treated water to be used in food production and other uses.

A twin solution: safe sanitation and food security in Ghana

In Ghana, the public and private sector have come together to launch a [compost plant](#) in Greater Accra. Taking household fecal sludge, which is often dumped illegally, the plant filters and dries this material on beds of sand. Next, the dried sludge is mixed with organic food waste or sawdust and "co-composted" for three months. This involves regular heaping and turning of the material as it decomposes.

Heat generated in the process kills pathogens in the compost that meets both WHO safety standards for reuse of human excreta and Ghana's fertiliser standards. For improved marketability, the compost is enriched with fertiliser and pressed into pellets. The production of the so-called [Fortifer compost](#) provides incentives for private sector engagement in the sanitation service chain, thus directly offering new jobs and a cleaner and healthier environment while generating revenues to cover operations and other costs. This is an impressive model for future businesses to take note of, also in view of the Sustainable Development Goal 6.3 and 12.5, which call for increased investments in resource recovery and reuse.

As we look for solutions to advance the Sustainable Development Goals - addressing wastewater challenges will make great strides in improving sanitation, safeguarding our food, and more effectively using

scarce water, land, and labour for the benefit of all.

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