

Using wastewater as an agricultural resource

Rather than continuing to treat wastewater like garbage, it should be managed as a resource that can be used to grow crops and address water scarcity in agriculture, says the FAO.



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Properly managed, wastewater can be used safely to support crop production — directly through irrigation or indirectly by recharging aquifers — but doing so requires diligent management of health risks through adequate treatment or appropriate use.

How countries are approaching this challenge and the latest trends in the use of wastewater in agriculture production will be the focus of discussions by a group of experts taking place this week in Berlin during the annual Global Forum for Food and Agriculture (19-21 January). The event has been convened by FAO along with the United Nations University, Institute for Water, Environment and Health (UNU-INWEH), the UN's Educational, Scientific and Cultural Organisation and the Leibniz Research Alliance Food and Nutrition.

"Although more detailed data on the practice is lacking, we can say that, globally, only a small proportion of treated wastewater is being used for agriculture, most of it municipal wastewater. But increasing numbers of countries — Egypt, Jordan,, Mexico, Spain and the United States, for example — have been exploring the possibilities as they wrestle with mounting water scarcity," says Marlos De Souza, a senior officer with FAO's Land and Water Division.

"So far, the reuse of wastewater for irrigation has been most successful near cities, where it is widely available and usually free-of-charge or at low cost, and where there is a market for agricultural produce, including non-food crops. But the practice can be used in rural areas as well — indeed it has long been employed by many smallholder farmers," notes De Souza.

The important thing is that wastewater be managed adequately and safely used in a way that is appropriate to local conditions, he adds.

An alternative source of a critical resource

Water is of course fundamental for food production, and the intensifying scarcity of this important natural resource — likely to be more intense in a context of climate change — has very significant implications for humanity's ability to feed itself.

Globally, population growth and economic expansion are placing increasing pressure on freshwater resources, with the overall rate of groundwater withdrawals steadily increasing by 1% per year since the 1980s. And those pressures are now increasingly being exacerbated by climate change.

Already, agriculture accounts for 70% of global freshwater withdrawals — with demand for food estimated to grow by at least 50% by 2050, agriculture's water needs are poised to expand.

Yet demand from cities and by industries is on the rise as well.

Greater use of non-conventional, alternative sources of water — including the urban effluent and farm-runoff — can help mitigate this competition, if properly treated.

In addition to helping cope with water scarcity, wastewater often has a high nutrient load, making it a good fertiliser. "When safely used and managed to avoid health and environmental risks, wastewater can be converted from a burden to an asset," De Souza says.

Managing risks

Untreated wastewater often contains microbes and pathogens, chemical pollution, antibiotic residues, and other threats to the health of farmers, food chain workers, and consumers — and it also poses environmental concerns.

A number of technologies and approaches exist that are being utilised around the globe to treat, manage, and use wastewater in agriculture, many of them specific to the local natural resource base, the farming systems in which they are being used, and the crops that are being produced.

In Egypt, for example, where water supplies are limited and wastewater tends to be highly contaminated, constructed wetlands are proving to be a promising, economically viable approach to treatment. In Egypt, and also in Tunisia, wastewater is being widely used in agroforestry projects, supporting both wood production as well as anti-desertification efforts.

In Central Mexico, municipal wastewater has long been used to irrigate crops. In the past, ecological processes helped reduce health risks. More recently, crop restrictions — some crops can be safely grown with the wastewater, while others cannot — and the installation of water treatment facilities have been added to the system.

In Jordan, reclaimed water represents an impressive 25% of all total water use in the country.

In the United States, treatment and managed aquifer recharge is a common practice, especially in the West.

Beyond helping tackle the problem of water scarcity, reducing environmental contamination, and supporting food

production, infrastructure and management systems for reclaiming, treating, and re-using wastewater can be job creators, according to De Souza.

The Global Forum for Food and Agriculture, organised by the German Federal Ministry for Food and Agriculture (BMEL) takes place every year, bringing together high-level decision makers, technical experts, researchers and farmers to discuss pressing issues affecting agriculture worldwide.

The forum's theme this year is "Agriculture and Water - Key to Feeding the World." An organising partner of the event, FAO is taking the lead on a number of events at the forum.

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