

Wastewater for Forests: an innovative solution to addressing water scarcity

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> at the global level in a glance;

benefits in forestry and agro-forestry;

potential risks and restrictions in forestry and agro-forestry;

FAO role and ongoing/future projects





The globe at a glance:



- The AQUASTAT database of FAO estimates global freshwater withdrawals at 3,928 km³ per year.
- About 56% (2,212 km3 per year) of this withdrawal is released into the environment as wastewater in the form of municipal and industrial effluent and agricultural drainage water.
- · High-income countries treat about 70% of the wastewater they generate, while that ratio drops
- Upper middle-income countries about 38%
- Lower middle-income countries 28%
- Low-income countries, only 8% of industrial and municipal wastewater undergoes treatment of any kind (Sato et al., 2013).





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Benefits of wastewater use in forestry and agro-forestry:

- Combating desertification through the use of unconventional water resources
- Support the production of wood, non-wood forest products and nutrient-rich fruits and vegetables, specially in a water scarce climate
 → help Food Security achievements
- Nutrients recovery → may decrease the amount of fertilizer requirement and pollution release from agriculture
- Allows for a better water management and more beneficial allocation of scarce fresh water resources to other vital uses (e.g. drinking), and improves the water economy





Potential risks:

- If not SAFELY applied, contributes to public health and food safety issues
- Leading to soil salinity if not properly drained
- Adds to loads of pollution in ground water or/and surface water





Potential restrictions:

- Distance/slope from wastewater treatment plants to nurseries and irrigation fields
- Budget restrictions for collection, treatment and application technologies, expansions, etc.
- Public awareness for safe application
- Public acceptance





FAO's role in promoting treated wastewater for agriculture, planted forests and agroforestry





Global Framework on water scarcity – a global framework for action in a changing climate

using innovative techniques to address issues of water security and agriculture, including the use of treated wastewater

need to find smarter, more efficient ways to use water, and make agriculture more productive, to meet the rising demand for food and achieve the 2030 SDG and

need to do this while preserving the natural resource base and the integrity of ecosystems.

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→ this is where the Global Framework for Action to Cope with Water Scarcity in Agriculture in the Context of Climate Change – launched by FAO and partners at the climate meeting in Marrakech in late 2016 – comes in.





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Projects...

- 1) Expansion of the Safe Use of Wastewater (Recycled Water) in Agriculture and Agroforestry with Innovative Fit for Purpose Methodologies
- 2) Forest Restoration in Algeria, Egypt, Morocco and Tunisia Using **Treated Wastewater** to Sustain Smallholders' and Farmers' Livelihoods

Cabo Verde – a joint project with UNEP/UNDP







Publications

CHAPTER 7

FAO | Sara Marjani Zadeh

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AGRICULTURE



Report

The United Nations World Water Development Report 2017

WASTEWATER THE UNTAPPED RESOURCE







Sustainable Forest Management (SFM) toolbox

Use of Treated Water in Forestry and Agroforestry

Basic knowledge



Global changes in rainfall frequency and quantity are increasing the impacts of drought in arid and semi-arid regions, and such impacts are projected to increase under climate-change scenarios. In water-scarce environments, the safe use of wastewater can be an option for irrigating certain agricultural and forestry crops, helping to conserve freshwater. The purpose of this module is to provide forest and land managers with information on the safe use of wastewater for irrigation and soil amelioration in forestry and agroforestry systems in dry and degraded lands. The module aims at guiding users in planning reforestation and afforestation in drylands through the use of water produced in constructed wetlands and fertigation plants.



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FAO supports countries and also has an active role in joint initiatives:

- AQUASTAT
- Safe Use of Wastewater in Agriculture (SUWA II)
- Reforestation by using treated wastewater
- Watershed Monitoring for improving soil/water quality and human health
- Farmers Field School and Capacity Building
- Country projects: West Bank and Gaza Strip, Peru, Tunisia, Cabo Verde, ...



On-farm practices for the safe use of wastewater in urban and peri-urban horticulture

A training handbook for farmer field schools



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Thank you for your attention



Teheran, Iran – copy right: FAO Forestry



