KEY POINTS:

- *The increasing scarcity of clean water in and around many urban areas leads to intense competition for its use*
- *The water requirements of urban and peri-urban horticulture can be met through alternatives such as the safe use of wastewater and harvested rainwater*
- *Water efficiency practices and the use of appropriate irrigation technologies can save substantial amounts of water*

WATER MANAGEMENT FOR URBAN AND PERI-URBAN HORTICULTURE

As cities grow, municipal authorities can help urban horticulturalists adapt to the decreasing quantity and quality of water resources

Whether grown in small gardens or larger fields, using traditional or high-tech practices, horticultural crops have high water requirements. The quality of water used in horticulture is also critical, since water-borne pathogens on crops eaten uncooked can cause diseases such as typhoid and cholera.

As cities grow, so does their demand for water, both for drinking and for use in urban economic activities, including horticulture. Over the past 20 years, access to water has improved and demand increased in many cities and slums. As a result, water resources have become increasingly scarce in the urban environment. Furthermore, inadequate wastewater management has led to progressive degradation of the quality of surrounding water courses and aquifers.

Fierce competition for water poses a major challenge to urban water management. Wise and efficient use of available water resources can only be achieved through integrated water and sanitation planning strategies. Water and sanitation institutions, therefore, have a crucial role to play in ensuring adequate quantities of safe water for horticultural production in urban and peri-urban areas.

WATER SUPPLY MANAGEMENT

Sustainable alternatives can provide a year-round supply of low-cost water for urban and peri-urban horticulture and, at the same time, minimize competition for domestic and industrial water. The key is to adapt horticultural production to the use of more marginal quality water in order to minimize health risks for producers and consumers.

TREATED OR PARTLY TREATED WASTEWATER

Untreated wastewater is already widely used for growing fresh vegetables in many low-income developing cities. For producers, the use of wastewater makes good economic sense: it is readily available and produce has relatively high value.

When appropriately treated for agricultural re-use, wastewater from domestic sources is safe and can supply most of the nutrients needed to grow fruit trees, vegetables and ornamental plants.

HARVESTED RAIN WATER

Urban horticulture can also make good use of rain water harvested from roofs: it is low-cost, less polluted than other sources of water in urban areas, and – by reducing growers' dependence on the municipal water supply – reduces competition for drinking water.

Rainwater harvesting also helps to mitigate urban flooding and soil erosion.

WATER DEMAND MANAGEMENT

As urbanization accelerates, water demand management – aimed at reducing the quantity and quality of water required to accomplish a specific task – will become probably even more important than supply management. In the event of water shortages, flooding or a decline in the quality of local water supplies, urban horticultural producers can apply various strategies to optimize their water utilization. Water conservation measures need to consider not only soil and crop types, but behavioural and cultural factors as well. Growers need access to affordable technologies designed to reduce water loss, waste or use – such as irrigation through better control of drainage systems, low pressure drip irrigation systems, hydroponics, mulching and conservation agriculture approaches that minimize soil evaporation.

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Assistance to improve food security of vulnerable households in Niger - The project aims at improving food security and nutrition of 32, 100 households through agro-pastoral production activities (agriculture and small livestock).

POLICY CONSIDERATIONS: "TWO SCALES OF INTERVENTION"

Major constraints facing horticulture in urban environments include growers' lack of physical access to viable water sources, economic barriers to access (such as high water use charges), legal restrictions and regulations, health and safety issues, and the potential for environmental pollution. FAO says two scales of intervention can help secure safe water for horticultural production.

Decision makers and urban planners

Mainstreaming UPH into national and municipal policies, legislation and institutional agendas is the essential first step. It empowers water resources managers – local authorities, and water and sanitation operators – to integrate urban horticulture in water planning, design and legislation, in line with WHO/FAO/UNEP guidelines for safe wastewater use.

There is an urgent need to increase public awareness of wastewater reuse, both to minimize health risks in food production and consumption, and to overcome strong cultural and psychological taboos. Action is also needed to convince water and industry ministries, local governments, water and sanitation operators and citizens of the need to switch from a "linear" to a "circular" approach to water use, aimed at optimizing the "wealth of waste". That can be achieved by:

- Promoting decentralized sanitation systems, such as waste stabilization ponds.
- Transforming wastewater into resources for horticulture production (e.g. irrigation water and fertilizer).
- Increasing the availability of freshwater for domestic purposes by using wastewater for irrigation.
- Improving the quality of the urban environment by creating horticulture "green belts" and reducing pollution.
- Improving irrigation and fertilization techniques using conservation agriculture.

Horticulture producers

To help fruit and vegetable growers in and around cities to cope with the decreasing quantity and quality of water resources, municipal authorities can help:

- improve producers' access to and adoption of affordable technical innovations;
- promote training that enables growers to reduce health risks owing to the use of low-quality water along the chain from "field to fork";
- raise producers' awareness and improve their knowledge of health hazards derived from vegetable cultivation using low quality water (selection of crop and irrigation techniques);
- Since small-scale growers have an interest in expanding their businesses, market-driven solution may often be appropriate.

FURTHER READING

- *The wealth of waste: Economics of wastewater use in agriculture*, FAO Water Reports 35 (FAO, 2010);
- *WHO Guidelines for the safe use of wastewater, excreta and greywater.* Volume II: Wastewater use in agriculture (WHO, 2006);
- *Wastewater use in irrigated agriculture, confronting the livelihood and environmental realities* (International Water Management Institute, 2004).

GUIDELINES TO PROTECT GROWERS AND CONSUMERS

WHO/UNEP/FAO Guidelines for the safe use of wastewater, excreta and greywater in agriculture aim at informing governments about health issues affecting consumers, agricultural workers and members of communities where wastewater-fed agriculture is practised. The guidelines present "safe use" concepts and practices, outline approaches to ensure the microbial safety of wastewater, and introduce a health impact assessment for new wastewater projects.

SAFE USE OF TREATED WASTEWATER FOR HORTICULTURE: PROS AND CONS – A FARMER'S PERSPECTIVE

Positive impact	Negative impact
Contains nutrients essential for plant growth	Phytotoxic in high concentrations
Reduces need for fertilizers	Can stimulate excessive foliar growth and delay maturation
Available year-round	Leads to biofilm (slime) in pipelines
	Promotes algal growth in canals

Source: FAO

This factsheet was prepared by FAO's Water Development and Management Unit (**www.fao.org/nr/water**)

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