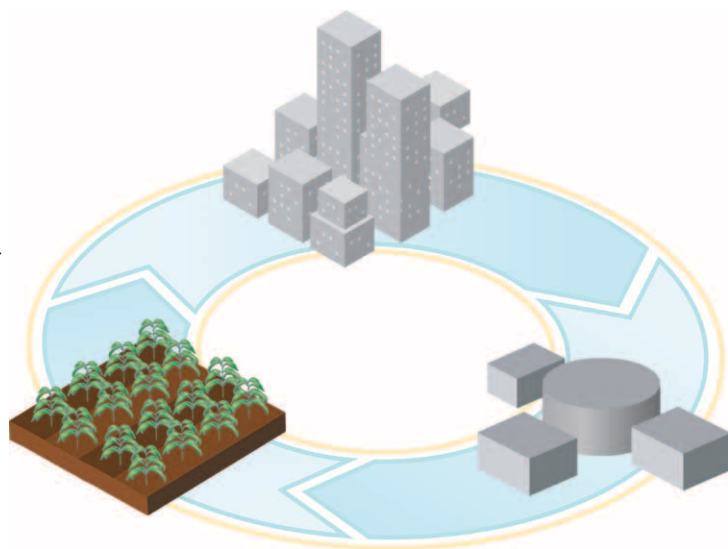


Rapid urbanization is coming together with great challenges regarding employment, food and nutrition security and infrastructures. Simultaneously, many rapidly growing cities are facing increasing water shortages, often aggravated by the effects of climate change, and insufficient sanitation coverage with higher exposure to contaminants.

The production and commercialization of vegetables in and around the cities can contribute to mitigate such problems by improving food availability, generating employment and income, creating greener cities and favoring the recycle of wastes.



WATER RE-USE

AGRICULTURE AND URBAN WATER MANAGEMENT IN A RECYCLING SOCIETY

Urban and periurban vegetable production translates into more water needed and may intensify competition for water resources among commercial activities, households and agriculture. However this competition can be successfully addressed: water can be used in the city and reused in agriculture with benefits for all.

Water reuse in agriculture has numerous advantages for all the parties involved as it provides a year round supply of water, together with nutrients and organic matter, to support crop production; providing food, income and employment to cities and improving urban landscape. In addition, well managed water reuse can lessen the pollution load on downstream watercourses.



Arguably, the traditional “linear society” approach to inputs and outputs is not sustainable, and a case is made here for adopting a more “recycling society” approach, to make productive gains in water use and reuse and reduce environmental pollution.



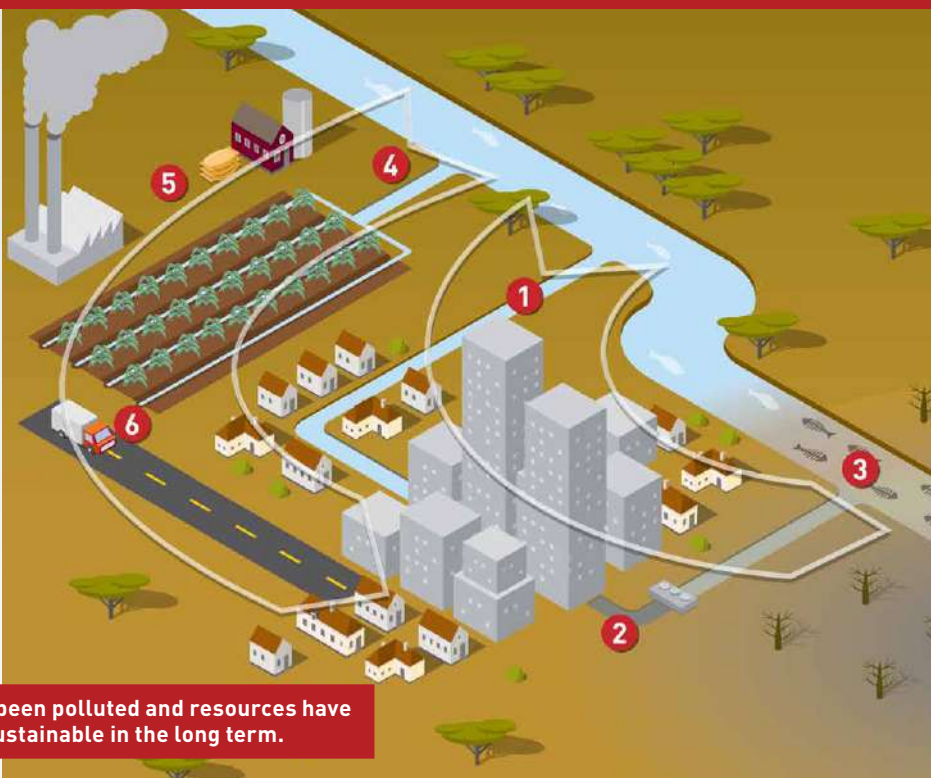
AN EXAMPLE OF LINEAR SOCIETY | INPUT/OUTPUT APPROACH

Input and output water in the city

- 1 Water is used in the city, in households and commercial activities.
- 2 When used, water quality worsens with pathogens and chemicals: it becomes wastewater.
- 3 City's wastewater is disposed back to the river with severe environmental impacts and health risks.

Inputs and outputs in agriculture

- 4 At the same time a peri-urban farm takes its fresh water supply from the closer water source
- 5 And purchases costly mineral fertilizers to provide nutrients for crops.
- 6 With these and other inputs vegetables are produced and then transported and sold in the city.



With this approach, rivers and air have been polluted and resources have been wasted making this practice not sustainable in the long term.

AN EXAMPLE OF RECYCLING SOCIETY | TOWARDS REUSE AND RECYCLING POLICIES

Water is used in the city and re-used in agriculture with benefits for all.

- 1 Instead of being disposed of in the river, the city's wastewater is now treated.
- 2 Harmful contaminants are removed while nutrients are left in to fertilize crops.
- 3 With the right irrigation practices (e.g. drip irrigation) contact between treated wastewater can be prevented to further protect farmers and consumers' health.
- 4 The farm's produce can now be transported and sold in the city.

With this practice water has been reused and nutrients have been recycled: Welcome to the recycling society!



To achieve this vision, policy makers and all stakeholders, including urban farmers and consumers, should be committed and understanding the benefits of water reuse. Roles and responsibilities have to be clear and solutions need to be negotiated and agreed by all parties aiming at maximizing net benefits of this practice while minimizing health and environmental risks. And, finally, a comprehensive city planning is needed to integrate water reuse for agriculture within urban water management and sanitation plans and to provide urban and periurban "farmers" with appropriate access to land to create incentives to invest in the resources they need.

