



## CHALLENGES IN NATURAL RESOURCE MANAGEMENT

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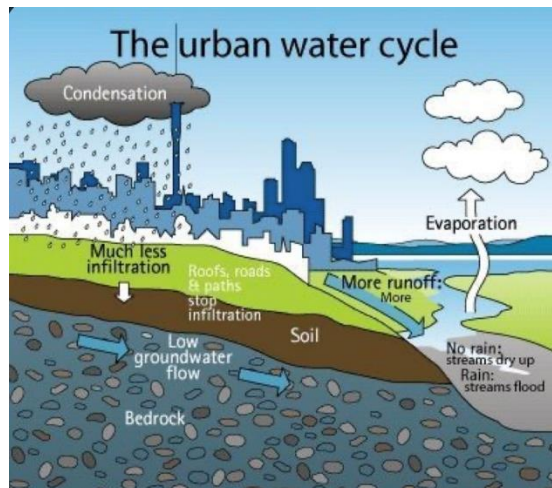
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All cities depend on large imports of energy and other natural resources to satisfy consumption of their inhabitants as well as local production. These resource flows are closely linked to global and regional sustainability issues such as resource scarcity, pollution and competition for land or water as well as local health, environmental, and distributional issues. How resources are consumed and managed in the expanding cities have strong implications for the global resource flows and related pressures in different scales. The goal of “sustainable development” puts into question many traits of current urbanization and city development, and calls for a sustainable urban transformation. Such a sustainable urban transformation needs to rely on sound, efficient, sustainable resource management and sustainable urban structures in terms of the built environment, transport systems, and green and blue structures. The handling of resources in cities and urban areas are in the core of this challenge. For increasing the capacity of local strategic action toward a more sustainable use of resources, it is essential to develop improved understanding of the urban resource flows [1,2].

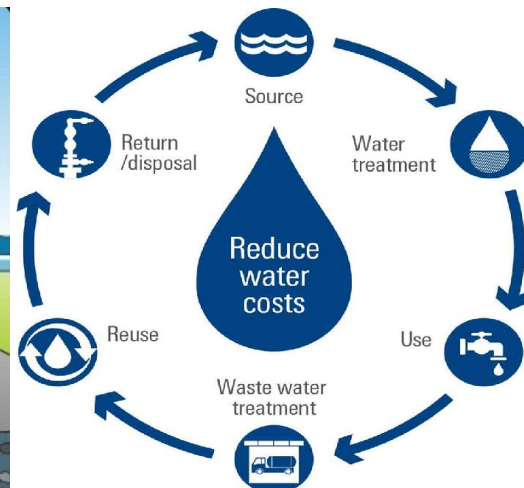
Managing natural resources in cities, particularly focusing on water, energy, and green spaces, poses several challenges. These challenges are often intertwined and require holistic approaches for effective management. Here are some of the key challenges along with emerging trends in addressing them:

### **Water Management Challenges:**

1. **Water Scarcity:** Growing urban populations lead to increased demand for water, resulting in water scarcity, especially in arid regions or areas prone to drought;
2. **Water Pollution:** Urbanization brings pollution from various sources such as industrial discharge, sewage, and runoff, degrading water quality;
3. **Aging Infrastructure:** Many cities have aging water infrastructure, leading to leakages, inefficiencies, and water loss [3].



a) Urban water cycle



b) Cycle of reducing water costs

### Energy Management Challenges:

1. Energy Consumption: Urban areas are major energy consumers, leading to high greenhouse gas emissions and environmental impact;
2. Reliance on Fossil Fuels: Many cities still heavily rely on fossil fuels for energy generation, contributing to air pollution and climate change;
3. Energy Inefficiency: Older buildings and infrastructure may lack energy-efficient features, resulting in wasteful consumption [4,5].

Certainly, here is a breakdown of some common energy management challenges and potential solutions:

- Transitioning to renewable energy sources such as solar, wind, hydroelectric, and geothermal power can mitigate reliance on finite fossil fuels.
- Implementing energy conservation measures and promoting energy efficiency to reduce overall energy demand.
- Increasing the share of renewable energy in the energy mix to reduce greenhouse gas emissions.
- Investing in domestic energy production, such as renewable energy projects, to enhance energy independence.
- Deploying off-grid renewable energy systems in rural and remote areas to provide access to electricity.

Educating consumers and businesses about the benefits of energy efficiency and providing technical assistance and financial incentives for implementing energy-saving measures. Addressing these challenges requires a coordinated effort involving governments, businesses, communities, and individuals. Collaboration, innovation, and investment in clean and sustainable energy solutions are essential for building a resilient and low-carbon energy future.

### References



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