



Policy Brief: Maintaining urban green areas for a nice living environment and preserving biodiversity

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Preliminary note: All the statements listed below are taken from many publications listed in the extended version of this text below.

Urban green areas are composed of all public and private open spaces in urban areas, primarily covered by vegetation, which are directly or indirectly available for the users.

These Urban areas host 75% of the European population, settled on less than 3% of territorial area, the same figures apply worldwide.

Key benefits of urban green spaces

- **Exposure to nature:** such contact inspires toward active lifestyle, reduces stress, support children's learning performance and connection to the environment, and hence their sensitivity to its preservation. The contact with nature is widely recognized to reduce, among others, depression or high blood pressure prevalence, provided such spaces are close enough and accessible;
- **Protection of urban biodiversity:** recognized as the "Pigeon paradox", cities' green areas contribute to flora, insects and birds diversity and often help restore native vegetation. Such effect are significant provided the area set aside is sufficient;
- **Reduced pollution and noise:** trees and shrubs are acting as filters for pollutants, particles and gases, proportionally to their volume of canopy, they also absorb traffic noises;
- **Enhanced population well-being and health:** in addition of prevalence of some diseases (blood pressure, heart rate, stress, fatigue), studies show evidence of urban green areas influence on population attention, cognitive functions and mood;
- **Reduced urban heat island:** substituting or shading asphalt and concrete with vegetation reduce cities heat accumulation, temperature between 2 and 8°C and the energy needs for air-conditioning up to 47%. Trees, planted landscapes, walls or roofs are significant contributors to air cooling through insulation, shading and evaporation;

- Development of recreational activities: primarily used by children for playgrounds, and elder people for shaded areas. Their usage increases sharply when temperature increases.
- Heritage value: gradually Urban green spaces are taking on a heritage role, like monuments and contributing to the beauty of cities.

Finally, the benefits of urban green areas felt by the population is inversely proportional to the distance to their habitations. Maintenance quality of these spaces are key elements of frequentation and hence wellbeing perception.

Despite the undisputed consensus on the need for greener urban environment the irrigation of public landscapes and private gardens are often mentioned in discussions about extensive use of water. Instead of just turning our green areas brown there are different steps available to all stakeholders to plan and manage irrigation systems in a manner which ensures the use of only the right amount of water for plant growth and only when it is needed.

Adaptation to climate

- Optimizing water allocation: as Climate gets warmer and rainfalls more heterogeneous, optimizing water allocation to urban vegetation becomes strategic to safeguard its multiple effects on the long term. Depending on the area in Europe the use of various watering and scheduling methods will be necessary aiming at increasing landscapes resilience and preserving the, often, huge investments spent;
- Controlling irrigation: where irrigation is necessary to preserve the beneficial effects of the vegetation, it must be controlled. Controlled means technically efficient (low pressure, no leaks, uniform and precise distribution) and provided in the right quantity (dose and frequency), to achieve maximum efficiency (ratio between volume supplied and volume transpired);
- Being prepared to scarcity episode: natured areas should be designed to prepare for restrictions, share the resource with other uses and use water parsimoniously. This means, watering only when needed, based on sensors and models. Preparing green areas for scarcity means separating expensive and/or low resilience areas (greens, young trees, ???) from more resilient areas that can be cut off, capable of recovering after restrictions (lawns, large trees, ???);
- Adapting to low water uses: many urban green spaces are able to accept water of lower quality (treated wastewater, grey water, rainwater). The storage and rational use of these resources makes it possible to preserve good quality water for more demanding uses;
- Maintenance and retrofitting: Irrigation system efficiency and proper scheduling shall rely on adapted winterizing and constant repairing. Retrofit and improvement of existing irrigation systems allow efficiency gain with minimum investment and is the opportunity to invest in more embarked intelligence (sensors, controllers, forecasting models...).

Achieving better landscapes with less water - basics of irrigation system efficiency

- Water sourcing and water quality (always use the lowest water quality available: E.G. Reclaim water, Retention Pond water, well water before using potable. Combine (potable) systems with rainwater harvesting systems, ...).
- Filtration of the system.

- Irrigation system design and product selection (Low volume irrigation for plants, bubblers for trees and overhead irrigation for turf areas, ...)
- Irrigation system installation (proper head spacing, quality products, proper installation, ...).
- Irrigation scheduling, system operation and maintenance (irrigate early in the AM when evaporation is at its lowest level of the day, system efficiency and irrigation scheduling, most common repair requirements, system winterization and spring startup, ...)
- Retrofit and improvement of existing irrigation systems (upgrade existing systems to be more efficient, replace heads with leaky seals, install heads and drip tubing with check valves so not all the water in the zone lines runs out of the lowest head, add sensors so system will only run when really needed, ...).

Irrigation industry solutions for improved irrigation efficiency and water conservation in urban areas

- A large range of technologies and products are developed and available on the market to improve water conservation (products with water saving features by product category)
 - o Pressure compensated drip, check-valve drip, responsive drip.
 - o Xerigation solutions.
 - o Pressure regulated spray heads, check valve on spray heads, multi stream multi-trajectory rotating nozzles, matched precipitation rate nozzles.
 - o Rotor nozzle efficiency, rotors with pressure regulated systems.
 - o Pressure regulation benefits and solutions for valves, flow sensors.
 - o Smart controllers, controllers with flow management capacity and weather forecast adjustments.
 - o Multi-site irrigation management software and platforms.
 - o Weather and soil sensors.

Solutions for big cities managing multiple green areas to simplify and optimize maintenance by using new technologies such as centralized and integrated systems (smart cities etc).

- Benefits of centralized system scheduling.
- Benefits of system flow management.
- Optimizing maintenance costs with central control systems.
- Improving water use accountability through central control systems.
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Finally, we could say that a good irrigation system should be invisible, only its effect is to be recognized. Irrigation professionals, from the manufacture of components, the design of systems, their installation in the field, to their long-term use, have the capacity to develop a respectful and wise irrigation. Wasteful practices that are unfortunately visible are wrongly considered to be common.

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For example, R-VAN from RainBird or MP Rotator from Hunter Industries

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