RÉPUBLIQUE FRANÇAISE
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INRAE

Bioeconomy for urban areas

Consortium 2024

URBIDENDRON

Consortium 'Trees in the city'

Identify gaps in our knowledge of trees and the ecosystem services they provide in an urban context

Trees in cities are generally viewed positively thanks to the services they provide. However, even though massive renaturing policies are increasingly popular, few people ask themselves how this should be done, what trade-offs it could Involve, or how to design efficient (re)vegetation plans. Examples of the adverse effects of poorly thought-out renaturing exist in the literature. For example, renaturation frequently fails to account for the uses and preferences of local residents. As a result, the different species used and renaturing projects can be perceived in very different ways by users. For instance, people who live in mainland France consider trees growing in the city as service providers, whereas people who live in the Caribbean may see them as a risk In the hurricane season. Failure to take these preferences and uses into account can lead to wasted public investment. Management of water resources in cities is another important issue, meaning we need to consider interactions between the cooling service provided by trees and local management of the water required by trees.

Goals

URBIDENDRON aims to study the main trade-offs and barriers to urban renaturing in the contrasting contexts of the French West Indies and mainland France.

The main task facing the consortium is identifying the gaps in the literature in terms of knowledge about trees and the ecosystem services they provide in an urban context. The anchor and starting point of the work is bringing together different points of view, expertise and skills in order to define research questions and issues around this theme, making sure to include the impacts of different contexts and topics on the integration of trees at multiple intersections:

- What are the perceived priorities and issues concerning trees in tropical and temperate urban environments?
- Does the nature of the tree species used (exotic, indigenous, adaptation to climate change) have an impact on ecosystem services? Invasive risks? The perception of trees and of Nature itself?
- Has there been any change in the species planted in urban areas? What are the advantages and disadvantages of the services provided? Does the diversity of ports have an impact on services, and can they be optimised?
- What is the impact of soil quality, in particular reconstituted urban soils, the risks of pollution and their potential consequences for trees? What are the impacts of and interactions involved

Coordination
Laurent Penet (UR ASTRO)
laurent.penet@inrae.fr

Keywords
Tree
City
Specific diversity
Harbours and canopies
Urban soil and reconstituted soil
Services and continuity of services
Biomass circularity

INRAE departments
ACT
AGROECOSYSTEM
BAP
SPE

in water resource management? What are the interactions with the quality of soil-plant-microclimate continuum services?

- What are the consequences of managing the plant biomass produced by urban trees: benefits or constraints? Bioeconomic analysis of the closing of plant biomass cycles in cities.
- What are the impacts of climate change on the services provided and on adaptation to the urban niche, including soil constraints.

URBIDEBDRON would also like to capitalise on current experiments in revegetation/restoration in Guadeloupe, mostly in wild or periurban areas, in order to support the use of indigenous species, which appear to be a trend in such projects.

Partners

INRAE Division	INRAE research units	Expertise and contributions
ACT	UMR TETIS	Environmental economics, urban planning, mapping ecosystem services
AES (AGROECOSYSTEM)	UMR IRHS	Ecophysiology and architectural plasticity of woody plants as a function of the environment and genotype
	UMR LSE	Environmental economics, urban planning, mapping ecosystem services
BAP	UR ASTRO	Genetics, plant breeding, disease resistance, genetic resources
SPE	UR ASTRO	Ecology of fungal pathogens, diversity, genetic resources

Partners	Team	Expertise and contributions
University of Lorraine-INRAE	UMR Soil and Environment	(Peri-)urban soil science.
Institut Agro Rennes Angers	EPHor Bioclimatology	Urban microclimates, thermal comfort for residents, urban agronomy, urban soil science, soil structure