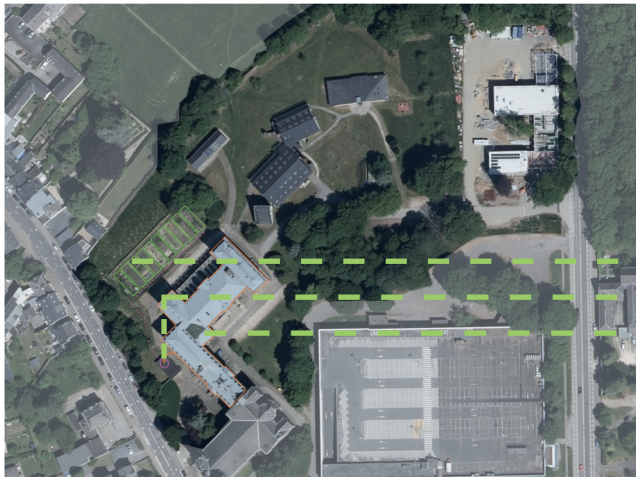


A LIVING LAB (OR VIBRANT CAMPUS): INTERDISCIPLINARY KNOWLEDGE FOR IRRIGATED AGRICULTURE

Wellens, J.^{1,2}, Peereman, J.¹, Bertholet, M.¹, Kirsch, E.¹, Davin, E.¹, Lang, M.¹, Denayer, D.¹, Jupsin, H.¹, Penven, L.¹
¹ UR SPHERES, Dept. of Environmental Sciences and Management, ULiège
² UR TERRA, Gembloux Agro-Bio Tech, ULiège



Though an economical and environmental sound option, urban agriculture is likely to be impacted by a growing and limited demand of water for irrigation; due to climate change and increasing competing water users. Even more in (peri-) urban areas. To face these challenges, alternative water resources, such as harvested rain-water, and more suitable irrigation management techniques, such as participatory decision-making and mutual exchanges of knowledge and learning, are to be adapted. To create this interdisciplinary knowledge for the development of sustainable irrigated agricultural practices, ULiège's Environmental Campus at Arlon created a living laboratory.

Small horticultural plots of 10 x 50 m²

Rainwater storage tank of 25 m³ + pump + adduction pipes

Impermeable surface of +/- 2,000 m² to collect rainwater

Rainwater is harvested from the main building and stored in an under-ground reservoir. A pump and pressurised piping systems bring the water to small horticultural plots, to be equipped with drip irrigation and soil moisture sensors.

1 EGOCENTRIC:

Accumulation of personal experiences

... I'm taking part in the project because I've always wanted to have a vegetable garden, which has never been possible before, and it allows me to get involved in a project outside the classroom ...

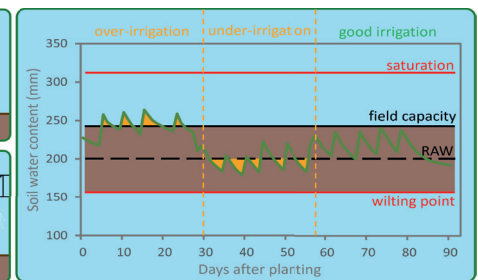
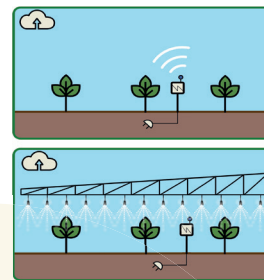
... bridging the gap between Irrigation know-how and technology and potential small holder users ...

... we have the space and the resources, so it's a pleasure to be able to share this with others and place the Campus more firmly in society ...

... I did my doctoral thesis on the food potential of gardening in Montreal. When I arrived on the Campus, I immediately reserved a plot. The Living Lab project is bringing my old experiences back to life, and it's an opportunity to really collaborate with students and colleagues on the Campus ...

2 TECHNOCENTRIC

Knowledge created based on technology by "experts"



By installing soil moisture sensors, it is possible to monitor irrigation events. The goal is to save water while maintaining the same yield by distributing the "right" amount at the "right" time. With the implementation of appropriate agricultural practices, it is possible to avoid over-irrigation (runoff and drainage) and under-irrigation (yield losses). The right amounts and frequencies are defined by theoretical aspects and monitored in the field.

3 ECOCENTRIC:

Approach by experts and stakeholders based on a systemic understanding



... Rainwater harvesting ...

- Rainwater is collected from surrounding roofs, on-site tested by the Lab of Hydraulic Resources and used for irrigation;
- A sustainable, local and healthy food production is pursued;
- A charter for "sustainable agriculture" is elaborated and signed by all users:
"The User is required to respect the nature of the soil. To cultivate it, they may only use natural products and must refrain from using any pesticides, herbicides, or fertilizers of NON-NATURAL origin. The User will favor the planting of native plants and ensure botanical balance"

4 Points of View¹

4 HOLOCENTRIC:

Learning by stakeholders to address systemic environmental issues

It started with some vacant fields, interested neighbors and some motivated researchers. An idea was launched. Aid in kind was provided by the Campus administration. A first project was written and obtained, and a second, ... Curious students and local grassroot initiatives joined the experiences to turn this Living Lab into a showcase for expertise and co-learning.



¹ Bawden R.J., (1997). Learning to Persist: A Systemic View of Development, in: Systems for Sustainability (F.A. Stowell, R.L. Ison, R. Armon, J. Holloway, S. Jackson and S. McRobb, eds.), Plenum Press, New York and London: 1-5.