The Urban Lab of Europe!

CASE STUDY

REPORT

Integrated development in action!

PROJECT

APPLAUSE - Alien Plant Species from harmful to useful with citizens' led activities

Ljubljana, Slovenia

TOPIC

Circular economy

EDIT 12 OCTOBER 2022

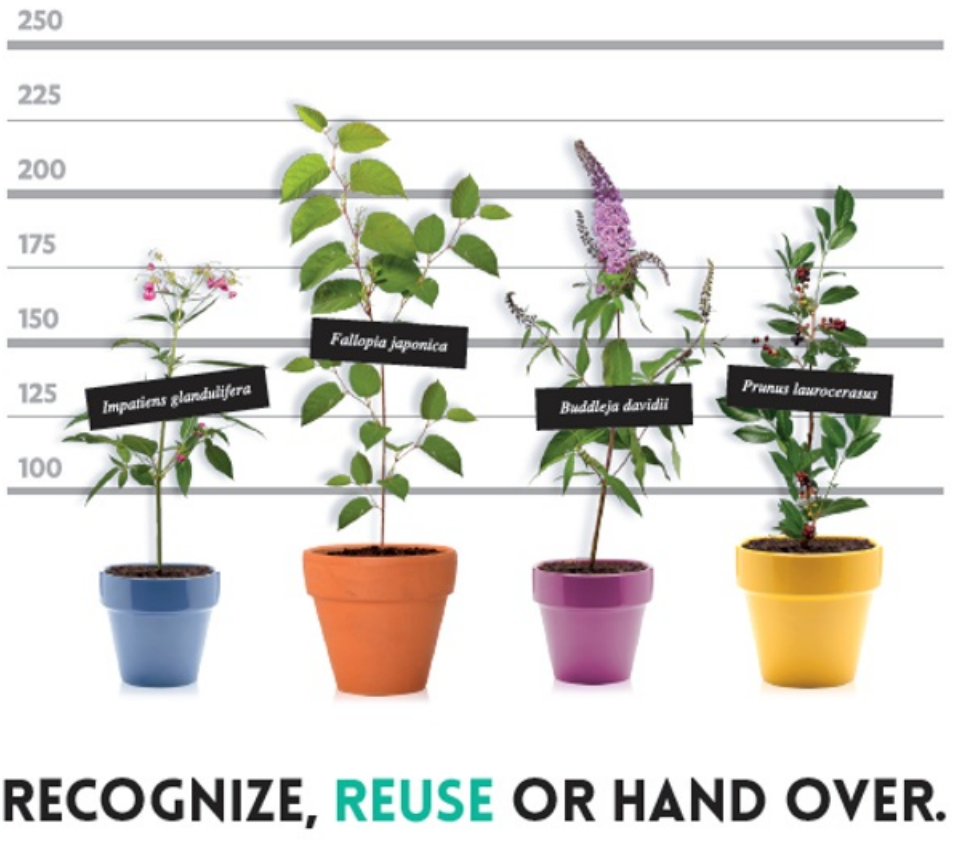
Ljubljana - APPLAUSE

See on UIA website

About APPLAUSE

This example shows how multilevel governance is at work through an innovative partnership with local companies and institutes of the city of Ljubljana (Slovenia) goes beyond typical zero-waste circular economy approaches. With UIA support, several new opportunities are tested such as (i) satellite imagery analysis for the creation of a public information platform on Invasive alien plant species (IAPS), (ii) biomass transformation for paper and wood products, food, dyes and hybrid coatings as well as pest control, (iii) fine artwork paper production, (iv) black waste liquid for industrial purposes (pharmaceuticals, cosmetics), nanofibrillated cellulose for biomedical use and (v) kitchenware out of wood-plastic composites.

But the real added value of the project lies in its sheer capacity to motivate citizens to cooperate on the identification, collection and reuse of invasive plants. The city accompanied a series of 28 voluntary harvest activities, together with Voka Snaga, the local waste management public company and the professional support from Tisa, a company for arboriculture and forestry.



APPLAUSE project cover illustration © city of Ljubljana

Hundreds of alien plant species can be found in nature, of which at least a third is invasive or potentially invasive, especially in private and public urban space. Between 2017 and 2020, the city of Ljubljana (Slovenia) tested a pilot business model with the participation of its citizens, treating Invasive Alien Plant Species (IAPS) as a social, economic and environmental resource instead of waste.

Context

As the Green capital of Europe in 2016, the city of Ljubljana had an environmental-friendly commitment to maintain and develop.

Collaboration with some of the UIA project partners was already ongoing in the context of the city's 'zero waste' strategy and the city of Ljubljana supported several local NGOs projects involving IAPS. Since 2015, the 'Gloves on' campaign organises guided tours and educational-working actions for its citizens on the topic of IAPS removal. The campaign is well appraised locally and nationally, representing a successful trademark for a holistic approach to IAPS issues.

The city of Ljubljana officially received the title European Green Capital 2016. With 542 square metres of public green space per resident, the city features over 80 hectares of green spaces © city of Ljubljana

Description

Invasive alien plant species (IAPS) are considered a starting point of a circular economy business model: through large-scale educational and awareness raising campaigns, citizens are encouraged to participate in IAPS harvesting and use. The collected biomass is then processed in three different directions: (i) performed at home (e.g. food, dyes), (ii) at tutored workshops (e.g. to produce wood or paper products) and (iii) in craftsman laboratories (e.g. to manufacture innovative products with market potential in social enterprises, employing vulnerable groups).

While these harvesting campaigns are a great resource for raising awareness, the quantity of biomass harvested is not sufficient to cover the demand of APPLAUSE product developers. That is why bigger quantities are collected by the municipal water and waste management public company as well as a private forestry company.

APPLAUSE empowers citizens to take independent action on IAPS identification, removal and use. In this way, the entire circular model for IAPS can become a bit more self-sustainable. To support such efforts, APPLAUSE has produced a DIY (Do-It-Yourself) catalogue with instructions on how to make handcraft paper at home, build a wood birdhouse, prepare homemade formulations of organic pesticides, etc. All these DIY activities use IAPS as raw material.

Green technologies are introduced such as pilot enzymatic processing of IAPS fibres instead of chemical, reuse of wastes generated during primary wood processing and paper production, transformation of residues into liquefied wood, development of biotech-based biorefinery device for the conversion of liquor, production of 3D bio-composites, dyes, coloured coatings, development of a model of IAPS's dye based solar cell and development of home-made formulations against plant harmful organisms.

The patents generated by processing IAPS are an innovation as such that was not really planned; results from research in environmental and chemical sciences were important for economic modelling.

A participatory and open approach to product design has been very beneficial in terms of creativity. The final products are attractive and at the same time incorporate intrinsic values of APPLAUSE in terms of circularity, environmental awareness and responsible consumption. 'Reviving the old knowledge' (i.e. handmade paper) was something that came out unexpectedly: preserving old machines and techniques with the circular principles embedded in the model.

Kitchenware made of recycled alien plants is one of the innovative outputs of the APPLAUSE pilot project. © City of Ljubljana

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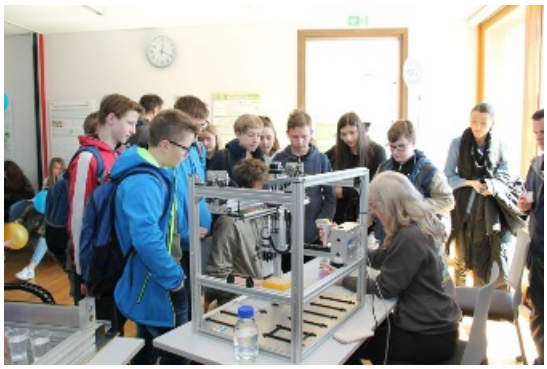
Nature of integration

Optimal level of cross-departmental collaboration is part of the working culture of Ljubljana. It is not only restricted to city departments but expands to Ljubljana's 'one big city family' of organisations delivering public services in the city. The concept is widely acknowledged by all public employees who are used to working together both at technical and political level.

The processing of invasive alien plants into useful products and zero waste industrial materials is a typical example of an innovative value chain, illustrating the 'short supply chain' business model. This 'market/non-market' (voluntary work is included in the supply chain) illustrates a strong integration capacity of the city of Ljubljana. In addition, the cleaning of natural areas in the city is continuing; it is even part of the local high school curricula for environmental science.



During the JoŽef Stefan Research Institute Open Days in March 2019: testing bacterial aggregates for the decagating of biological polymers such as lignin. ©Radojko JaČimoviĆ

Takeaways

- Citizens' participation: this is a basic building block of the APPLAUSE project, with special focus on the development of new tools for identifying IAPS through open data, education and research of the potential for processing IAPS into various raw materials and products. Even though the plant identification through the mobile app did not come out as well as expected, they learned a lot about how Artificial Intelligence can provide operational results.
- This project is a proof of concept for the sustainable implementation of a 'market/non-market' value chain, mixing volunteer input from citizens with high level green tech performance.

Further reading and selected key resources

- Project city news

See on UIA website