March 2019

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URBAN INNOVATIVE ACTIONS

The Urban Lab of Europe !

The APPLAUSE project
Journal N° 2

*Project led by the **City of Ljubljana***

CIRCULAR ECONOMY

European Union
European Regional Development Fund

Région Hauts-de-France

The APPLAUSE project

ApPLAuSE (Alien PLAnt SpEcies) - from harmful to useful with citizens' led activities will experiment a completely new approach to IAPS (Invasive Alien Plant Species) treatment. IAPS will be considered as a resource and starting point of a new business model. A big effort is dedicated to new green technologies in all aspects of IAPS treatment (e.g. pilot enzymatic processing of IAPS fibres instead of chemical) as well as circular economy principles in development of new products (re-use). Through a large-scale educational and awareness raising campaigns, citizens are encouraged to participate in IAPS harvesting and re-use. ICT technology will be used to address target groups and to produce open data, new knowledge and develop new services like IAPS monitoring. Collected IAPS biomass will feed three main ways of further transformation: at home (e.g. food, dyes), at tutored workshops (e.g. to produce wood or paper articles) and in craftsman laboratories (e.g. to manufacture innovative products with market potential in social enterprises and employing vulnerable groups).

Partnership

- City of Ljubljana
- SNAGA - waste management public utility
- University of Ljubljana
- Jozef Stefan Institute
- National Institute of Chemistry
- Pulp and Paper Institute
- Company for arboriculture and forestry (TISA)
- GDi GISDATA d.o.o. Ljubljana
- Centre of Excellence for Space Sciences and Technologies (SPACE-SI)
- Association for the development of sustainable design (TRAJNA)
- TipoRenesansa

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1. Executive Summary

During the last six months, APPLAUSE has been progressing in the development of its circular model for IAPS management.

The project is testing a new system for identifying, tracking and harvesting IAPS found in the lands owned by the City of Ljubljana. This new system combines fieldwork with IAPS detection through satellite and aerial imagery data. The aim is that the combination of both makes the entire process much more efficient. To further ease this process, APPLAUSE is developing a set of digital tools to support IAPS identification and geo-localisation while professionals as well as citizens are out on the field.

APPLAUSE partners are fully aware that good planning and organisation is key to make a circular model work. During the last harvesting campaign, carried out last spring, partners developed a protocol for IAPS management and harvestings that all actors have to follow (those in charge of IAPS identification, collection, pre-processing, transportation and final use). APPLAUSE is dealing with a primary material (IAPS) that is "alive" (plants), that grows in different places (in public parks, brownfields, along riversides, in gardens…) and that can sometimes be affected by natural conditions (rain, dry weather, fungi…) or even human conditions (vandalism). This context is important when collecting and pre-processing the IAPS material. Moreover, it is greatly influencing the choice of IAPS to be harvested, the amounts collected and the uses that can be given as secondary products.

With this in mind, APPLAUSE partners have been working intensively in assessing the potential for converting the different IAPS into new products. They have carried out laboratory tests to fully understand the physical and chemical characteristics of each species (in some cases, even studying the potential uses of different parts of the plant such as rhizomes, stems or flowers) and determine what are the most appropriate uses for the 25 IAPS being collected in Ljubljana. Even if the results are still ongoing, APPLAUSE already has an initial list of species that can be used to produce different paper products, wood products, dyes, food sources and organic pesticides. This is a key milestone for APPLAUSE which clears the way for the next phase in the circular model, the development of secondary products. In this regard, prototyping has started for a variety of products aimed at locals, families, schools and tourists.

In parallel to all this, APPLAUSE has been implementing a series of citizens' engagement activities to ensure that citizens play a key part in the development of the circular model. One of the most interesting aspects of the project is that the different activities have been designed in a way that citizens can choose between different levels of engagement (more independent DIY activities, guided workshops, campaigns, events). That makes it very easy for anyone to get involved. So far, APPLAUSE has organised harvesting campaigns for high school students and senior citizens, paper-making workshops at primary schools, a competition for food recipes and its annual IAPS festival, which was a great success. Citizens' engagement activities will ramp up this spring with the inauguration of the paper and wood workshops and the next harvesting campaigns.

All in all, the key achievements resulting from the last 6 months of the project are:

- The successful test of a new App that assists botanists and staff responsible of green area management in the identification and tracking of IAPS.
- The detection of IAPS (concretely, Japanese knotweed) from aerial photos and current development of algorithms for detection from time series satellite images, to obtain geo-location of these species in a larger scale.
- The identification of which IAPS can be used for different products (paper-based, wood, dyes, food sources…).
- An initial selection of wood and paper-based products and the development of the first prototypes.
- The implementation of successful citizens' awareness activities including the IAPS annual festival or workshops at schools.
- The setup of the first collection bins for IAPS recovery at the city's household waste and recycling centre Povšetova.

This implementation period has also led to new lessons learned:

- The necessity for the circular model to not only take into account the seasonal growing pattern of the different IAPS, but also the varying natural conditions (rain, mud, morning dew…) and human impact (vandalism) that can affect the material quality and/or pre-processing requirements.
- The realisation that there aren't huge amounts of IAPS in the land owned by the City of Ljubljana compared to the quantity that can be found in neglected areas such as rail tracks, roads or brownfield. That means that for the duration of the project, production levels will be kept small. The main focus is however to develop products with high added value.
- The fact that some plants are more appropriate than others depending on the intended use (paper, wood, dyes, food source…). There are even some plants that cannot be used at all due to their characteristics (contain too much water).

2. The winter is here

One could say that APPLAUSE is very much influenced by the weather. In spring, when plants blossom, it's big time for harvesting. The different IAPS are geo-localised and collected for pre-processing and then they are delivered to the companies/NGOs responsible for closing the circle (by developing IAPS-based innovative products). This seasonal pattern applies to most of the 25 IAPS that are being tracked in APPLAUSE, with the exception of certain herbaceous materials (Japanese knotweed, Canadian and giant goldenrod) aimed for paper production that need to be harvested in autumn and winter when the level of cellulose is higher.

So what happens in APPLAUSE during winter time? It's time for progressing in the development of IAPS-based secondary products and assessing their viability; time for fine-tuning the tools and procedures for IAPS tracking and harvesting; and it is also time for engaging with citizens.

So even though in winter plants do not blossom, it is not a low season for APPLAUSE. Partners have kept busy during October 2018 and March 2019. See by yourself by reading the next pages…

3. Account on the progress made by the project since October 2018

3.1 Fine-tuning the IAPS tracking, harvesting and pre-processing

APPLAUSE is producing a wealth of knowledge and hands-on experience on how to organise IAPS tracking and harvesting.

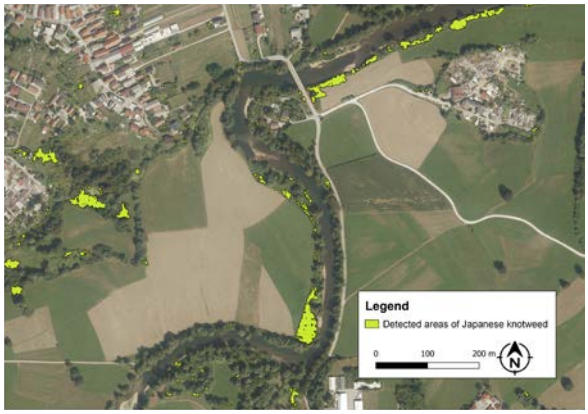
Botanists work together with staff from SNAGA (public waste management company in charge of green area management) to survey green areas owned by the city. The team localises and characterises the invasive species found in each location and reports back to the staff in SNAGA in charge of organising the harvesting. The team has been carrying out this work since day 1, starting with the larger plots and progressively surveying smaller areas scattered across the city. One thing to take into account is that while surveying large areas can be rather quick (the team drives around the area), the logistics of surveying smaller areas is more complicated and time consuming. Overall, it has taken more time to complete fieldwork (harvesting) than initially planned.

To ease fieldwork, during the past six months the team has been testing a new App for IAPS tracking. Through the App, botanists and ground service staff can geo-localise the different plant species and annotate the amount of biomass available. Based on this information, SNAGA and TISA organise the IAPS collection. This App is part of a new digital platform that aims to facilitate the entire circular business model, from locating the IAPS to arrange collections and organise the delivery to product developers. It is also being used to support citizens in IAPS identification. When citizens are out in their gardens or in a park and they believe they have found an invasive alien plant species, they can simply snap a photo of the plant, and an App tells them if it's an IAPS in a matter of seconds. This App is supported by an Artificial Intelligence (AI) software for plant image recognition. In fact, botanists carrying out the fieldwork have been taking multiple photos of IAPS (when they are blossoming, in different growth stages, from different angles…) to create a large online repository of plant images. The more pictures included in the repository, the more precise the AI software will be. Once the App has identified the plant, it gives to the citizen recommendations on what to do with them.

While the App for professionals is already in operation, the App for citizens is still in a beta version. The latter is expected to be released by project end, in 2020. The entire platform (database + professionals' App and Citizens' App) is one of the results of APPLAUSE that will continue to be used in the future, after the project has been completed.

Figure 1: APPLAUSE digital platform for identifying, tracking and processing IAPS.

Another innovation that is assisting APPLAUSE partners in identifying and tracking IAPS is the use of satellite images. Different materials on the Earth's surface (vegetation, houses, bridges…) reflect and absorb solar radiation in a different way. These different reflections can be processed and analysed by experts to quickly identify the different objects captured by satellites. In APPLAUSE, this is being done to identify Japanese knotweed in the area of Ljubljana. Algorithms have been used to distinguish this particular IAPS from other vegetation found in the area. The information given by satellite data is also cross-checked with data from aerial photos and field reference data. Thanks to this mapping, fieldwork and harvesting work can be organised more efficiently. Even if satellite data may sometimes detect "false" Japanese knotweed, it is much better to know where to look for IAPS (even if sometimes there are errors) than not knowing where to look for them at all.



Results obtained with automatic detection of Japanese knotweed (Fallopia japonica) from either aerial or satellite data. This image shows detection of this invasive species in detail in the suburbia of the city of Ljubljana (Zalog/Zgornji Kašelj). Credits: Space-SI

Same species stand over different spatial representation. Left is the cartographic map, middle is aerial and right over satellite image. Credits: Space-SI

TAKE AWAY POINT
→ Where to find IAPS? A problem of land ownership

One of the unexpected issues the APPLAUSE consortium has realised during the IAPS tracking activities is that the amount of biomass available is not as much as they initially thought. The project focuses on the green areas owned by the city of Ljubljana which are regularly managed by SNAGA (by pruning the trees, gardening, dealing with pests and diseases…). Such management prevents IAPS from spreading massively. On the other hand, where IAPS tend to grow the most is on neglected lands such as brownfields or along the railway tracks or roads which are not owned by City of Ljubljana. These areas belong to private owners, national government or other public companies.

The APPLAUSE team is confident that they will manage to collect enough IAPS biomass from lands owned by the City. However, in the future, if it wishes to scale-up the production, it might be necessary to engage other actors (in particular national government and surrounding municipalities) in order to secure sufficient amount of IAPS material.

After the first harvesting campaign, it became clear to all APPLAUSE partners that good planning and organisation was crucial to success. Because of that, they put together a protocol for IAPS harvesting and pre-processing. This protocol regulates different steps: partners in charge of developing new products identifying the quantities and types of IAPS needed; the placement of orders (taking into account field conditions); the identification of the appropriate areas for harvesting; the collection of the materials and its pre-processing; the delivery of the materials to producers, etc. The protocol even coordinates the collection of any biomass residues a week after delivery. Putting in place such protocol has revealed many insights:

- Some plant material is not available all year round. Therefore, the development of products should be planned more carefully to adapt it to the growing pattern of plants.
- Harvesting and pre-processing activities need to take into account the varying natural conditions (rain, mud, morning dew…) which can affect the material quality and/or pre-processing requirements.
- Stockpiling of IAPS wood material for a long time is not recommended as it can get easily damaged by wet or fungi. Therefore, it is much better to harvest only the quantity of material needed by partners and deliver it to them straightaway.
- Some of the biomass collected, especially herbaceous materials, contains large amounts of water. Therefore, once dried, the amount of biomass is much less than what was initially collected (in some cases it went down from 750Kg to 300Kg). A common terminology is then needed to avoid any misunderstandings between harvesters and producers.

A harvesting campaigns from 2018.
Credit: Zala Strojin Božič

IAPS wood material being stored at SNAGA premises.
Credit: Jorgina Cuixart

- Finally, the primary wood processing of trees from urban environments needs careful management. Due to vandalism, trees may have metals encrusted (nails or screws) which can make timber cutting very time consuming and it can even damage saw blades.

3.2 Assessing the viability of the future innovative products made of IAPS

APPLAUSE assesses the viability of turning the biomass collected from IAPS found in the area of Ljubljana into innovative products, closing in that way its circular business model. The city, working with the different experts who are partners in the project selected 25 species, out of the 150 IAPS identified in the city area, due to their potential to be transformed into an actual product.

In fact, there are some very problematic invasive plant species which are off the list. One of these is Common Ragweed (*Ambrosia Artemisiifolia*) which is highly pollen allergenic. Since the plant is largely made of water, once harvested it weakens very quickly and cannot be used as secondary material for any product. Another example is Common Milkweed (*Asclepias syriaca*). This perennial herb plant produces poisonous milky sap. Since part of the harvesting activities are carried out by citizens, including high school students, it was decided not to select this plant as potential raw material, in order to avoid any harmful effects on participants. On the contrary, one harmful plant which has been included in the list is the Tree of Heaven (*Ailanthus altissima*). In this case, the sap inside the plant can also produce skin reactions, but with the right pre-processing (drying), it becomes harmless. While it is not one of the species collected during the citizens-led harvesting campaign, Tree of Heaven is collected by TISA and once pre-processed, it is used as raw material for secondary products.

Photo of a Tree of Heaven (Ailanthus altissima).
Credit: Branka Trčak

During the last few months, the technical and scientific partners of APPLAUSE have been finalising their laboratory tests to characterise the different IAPS collected and assess the material suitability for processing into different products. Five main uses are being tested: wood products, paper products, dyes, organic pesticides, food components and biochemical compounds.

Lab tests included the analyses of anatomic structures and morphology, mechanical, thermal or chemical properties of both woody and herbaceous IAPS. To assess the potential of certain IAPS as organic pesticides, researchers from University of Ljubljana also conducted field trials (on endive and chicory orchards) to determine their insecticidal, fungicidal, herbicidal, acaricidal and molluscicidal efficacy.

All these analyses have culminated in an initial selection of IAPS that can be used for different products (this analysis is still ongoing, especially for the biochemical compounds):

Figure 2: Legend Overview of IAPS selected for each potential use

TAKE AWAY POINT

→ A circular model for IAPS-based products not only needs to adapt to the plants' seasonal patterns but also should take into account the high variability of the raw material

A crucial aspect that has been thoroughly assessed when deciding on the potential uses has been the inherent limitations of each particular IAPS material (in quantity, quality and pre-processing needs). For example, large quantities of IAPS raw material is required for producing just a small quantity of dye. Therefore, only those species with large populations can be selected for dye production. Also, sometimes the quality of the wood material may vary due to weather conditions (too wet or too dry) or as a result of vandalism. These factors can sometimes limit production. Partners have also realised that for certain species the required pre-processing methods would be too complicated and/or time-consuming (e.g. separating flowers one by one) making the entire production too unpractical. The final selection of IAPS' uses has taken into account all these factors in order to put forward a circular model that is flexible enough to adapt to all these changing conditions.

In parallel to the laboratory tests, the partners in APPLAUSE who are responsible for product development have been working intensely on an initial list of potential products. The fact that these products will be made of IAPS gives them great singularity. In fact, the APPLAUSE team is very aware that such singularity needs to be the centre of the value proposition of all products. However, these products can only be successful if other key aspects are also taken into account. These are:

- The intended final use of the products (the items need to be intrinsically useful for citizens on their day to day, on special occasions, for educational purposes…).
- Their design needs to be as circular as possible (selection of materials, quality, durability, recyclability…).
- They have to deliver a message about sustainability, contributing to raise environmental awareness among the population.
- They have to align with the own interest and area of expertise of the producer (some partners of APPLAUSE are experienced in designing items for children, others are more focused on graphic design, etc.).
- And finally, some of these products need to be simple enough to be handcrafted by the citizens themselves (either at home or at the workshops). Others can be professionally produced.

Based on these principles, APPLAUSE partners have unleashed their creative minds and come up with more than 20 different possibilities, targeting the products to locals, families, schools and tourists. Some of the most original ideas are:

- A set of seed papers made from IAPS to plant flowers or vegetables in your garden or balcony.
- Paper bags for organic waste collections capable of eliminating odours (using natural zeolite to eliminate smell and a wetting ingredient to make the sachet resistant to wetness)

- A DIY insect hut and/or birdhouse made from woody IAPS that can be placed in gardens or balconies to provide a welcome shelter to local wildlife.
- A creative herbarium made from paper sheets of IAPS and wood cover to promote the recognition of IAPS and other plant species in urban environments.
- A pre-assembled compost set suitable for end users in houses, garden facilities and schools with gardens.
- A DIY set for making handmade paper at home. It includes a cellulose brick, sieves and moulds, all made from IAPS.
- A calendar for harvesting plants.
- A pre-assembled DIY set to build a wooden windmill and water grinder.
- A table game on the detection of invasive plants and their use.

In addition, the team has identified four services that will be based on IAPS products. Some of these services are already part of APPLAUSE citizens' workshop activities, others could be offered independently by some of the partners in the project:

- A guided DIY paper-making workshop where citizens will be using IAPS-based tools and equipment to produce their own IAPS-based paper products (origami folding bag, a compostable flower pot, custom made puzzle, etc.)
- IAPS-based wood equipment will also be used during the guided DIY workshop of finished wood products (dining table, stoker, wardrobe, bed, wood ornaments for spruce, xylophone, etc.)

A citizen making handcrafted paper made of IAPS during the annual IAPS festival, October 2018. Credit: City of Ljubljana

- A rental service of an IAPS-wooden mobile kitchen that can used for picnics, parties or to organize small events.

For some of these products, partners have already been developing prototypes. This process has required partners to exchange a lot of information and know-how in order to gain a common understanding on the production schedule, any technical limitations of certain IAPS materials, the requirements of the creative design, etc. Evaluation meetings were regularly scheduled to exchange experiences and a detailed timetable for the development and implementation of each individual product has been drafted.

APPLAUSE partners are now preparing a market survey (questionnaires for public administration officials, schools, tourist information centre…) to assess the demand for these products and to determine the different pricing strategies.

3.3 Citizens' engagement activities

The third core area of activity within APPLAUSE is citizens' engagement. Through different educational and awareness raising activities, citizens are invited to identify, collect and process IAPS into new circular products. The target of APPLAUSE is to train at least 2,350 citizens during the project lifespan.

The project's citizens' engagement strategy is based on three pillars of IAPS transformations:

(1) Do it yourself

(2) Let's do it together

(3) Hand it over

The "Do it yourself" DIY principle empowers citizens to take independent action on IAPS identification, removal and use. Large campaigns, public events and a broad range of informative material have been prepared to assist citizens in carrying out these tasks. One of these public events is the annual IAPS festival which had its first edition on 11 October 2018. Anyone passing by the festival's tents could learn about the problems caused by IAPS, the different species found in the area of Ljubljana, the potential uses, etc. They could also try making handmade paper themselves or stamping with IAPS-based dyes. The City of Ljubljana has estimated that 500 people participated in the event, which was a great success.

A key tool that will enable the "Do it yourself" principle is the App that helps citizens to identify the different IAPS (see section 3.1 for details). Also, as mentioned before, there are several products that has been specifically designed to encourage DIY. Examples of these are the set for making handmade paper at home, the creative herbarium to collect and preserve samples of IAPS and other plant species found in the urban environment or the calendar for harvesting plants.

APPLAUSE partners have already started working on a "Do-it-yourself" catalogue that will guide citizens step-by-step through all stages of transformation of the selected IAPS into useful products.

The second pillar is the "Let's do it together" which focuses on guided activities for IAPS collection and use. During spring last year, APPLAUSE organised the first harvesting campaigns (9 campaigns with 140 participants in total). Everyone can participate in these campaigns. For these campaigns it is important to choose a relatively small area. The end goal of these campaigns is not that much to collect huge amounts of biomass but rather to encourage citizens to take part and raise their awareness on the challenges posed by IAPS in the city. In the past month or so, the team in Ljubljana have been busy preparing the 30 harvesting campaigns due to be launched in spring 2019.

TAKE AWAY POINT
→ How do you get citizens' on board? Mobilise local actors!

Ljubljana has a long tradition working with schools in environmental issues, in fact, they already start in kindergartens where children learn about recycling, sustainable consumption of food, etc. For engaging the wider population, it is a bit more challenging. The City informs and invites citizens to participate through articles in the newsletter *Glasilo Ljubljana* (121,800 free copies sent to every household 9-10 times annually), the newsletters of the 17 Ljubljana districts as well through digital channels (web page, FB, YouTube), and digital displays in public buses. Another very effective way to reach citizens is to work with local community groups. For the voluntary activities that will take place in April and May 2019, the city is inviting NGOs from the 17 districts and youth environmental organisations to take part.

As part of the "Let's do it together" pillar, APPLAUSE will offer tutored workshops to produce wood and paper products. To date, these workshops have taken place in primary schools. During the first part of the workshop, children learn about IAPS, the problems they pose to our environment and the potential to turn them into a resource. The second part is more practical (children make their own paper, use IAPS dyes to stamp letters and patterns on a drawing…). A key milestone for APPLAUSE will be the inauguration this spring of a paper workshop and a wood lab, both open to the general public.

Children learning about IAPS uses during the IAPS festival, October 2018. Credit: City of Ljubljana

Another key activity under this pillar is the food workshops. These workshops aimed to raise public awareness about the beneficial aspects and nutritional value of selected IAPS. Using as main ingredient three IAPS that are suitable for human consumption (Cherry plum - *Prunus cerasifera*), Jerusalem artichoke - *Helianthus tuberosus*) and Black locust - *Robinia pseudoacacia*), participants prepared a wide range of dishes ranging from appetizers, soup, main courses, side dishes and desserts. A competition for best recipes was also organised and prizes were awarded last October during the IAPS festival. The next round of food workshops will take place this April and May.

Finally, the last pillar of APPLAUSE's citizens' engagement strategy is the "Hand it over". In this case, Ljubljana's residents are encouraged to remove IAPS from their gardens and simply bring the collected biomass to an IAPS collection point. As a pilot test, 11 appropriately labelled containers (one for each selected IAPS) have been placed at one of the city's household waste and recycling centre. The material collected is pre-processed by SNAGA in order to convert this waste into a resource. A promotional campaign for the new collection bins will be launched in spring time, coinciding with the beginning of the next growing season.

4. Summary on implementation challenges

The different projects within the Urban Innovative Actions programme face similar implementation challenges. These have been grouped in seven thematic areas. The following table provides an overview of how these challenges are impacting the APPLAUSE project (**red**: high importance, **yellow**: medium importance and **green**: low importance). Arrows indicate if they have raised in importance (⇧), lowered in importance (⇩), or remained the same (⇔) compared to the previous journal.

Challenge	Level	Observations
Leadership for implementation	**High** ⇔	As lead partner, the City of Ljubljana has to provide direction and vision to the project. Even if cooperation with partners from different disciplines (scientific, design, practitioner) has become easier with time, it is still ranked as an issue of high importance. One should take into account that partners with little experience in European projects and/or a small number of employees require more support.
Public procurement	**Medium** ⇔	There is not a huge amount of procurement in APPLAUSE. The main difficulties faced by partners are related to the fact that some of these public procurement processes involve buying used equipment or even equipment that is very old, almost antique. In those cases, it was difficult to find different suppliers to choose from and in several occasions, partners had to validate the state of the equipment or undertake some renovation works. Arranging the transportation for such old equipment can also be a challenge.
Integrated cross-departmental working	**Low** ⇔	As mentioned in the previous journal, Ljubljana has a long tradition in cross departmental working. In fact, the core team of APPLAUSE is already cross-departmental. Because of that, this challenge remains ranked as low importance.
Adopting a participative approach	**High** ⇧	As the project develops this challenge raises on importance. Internally, project partners have already adopted a participatory approach. As the project develops, it is now crucial to expand this participatory approach to local NGOs and community groups. The involvement of these stakeholders can help APPLAUSE to encourage citizens to take part in the different project activities.

Challenge	Level	Observations
Monitoring and evaluation	**Medium** ⇧	APPLAUSE partners have realised that setting up the circular model for IAPS is more complex than anticipated. Some issues are not easy to monitor and sometimes indicators need to be modified. Regular monitoring and evaluation of these indicators is key for assessing the viability of the different circular business models being tested in APPLAUSE.
Communicating with the target beneficiaries	**High** ⇔	Communicating with citizens continues to be very intense although it has become easier and more targeted. APPLAUSE makes use of the existing communication channels of the City of Ljubljana (YouTube, Facebook, Instagram) which proves very efficient in reaching a high number of citizens. This approach requires the active involvement of the city marketing managers. Also, as mentioned before, the city works with local NGOs and community groups in order to involve them in the citizens' engagement activities and ensure high levels of participation.
Upscaling	**Medium** ⇔	The team in Ljubljana continues to be confident that the business model developed in APPLAUSE will be self-sufficient. They are conscious it will never involve massive levels of production (in IAPS-paper, wood products, dyes) but that is not the main focus of APPLAUSE in any case. Production can be kept small and self-sustaining. The most important thing is to have good coordination structures and agreed protocols to manage the entire process (IAPS identification, harvesting, pre-processing, use) efficiently.

5. Conclusion

Winter is definitely not a low season for APPLAUSE. The present journal shows that there have been a lot of advancements in the project during the past six months: in the development of digital tools to support IAPS identification and monitoring; in deciding which plant species are best for each intended use; in prototyping different products; and in planning and delivering citizens' engagement activities.

Partners have realised that implementing a circular model based on the recovery of IAPS is complex. It requires a change in working procedures, excellent planning and smooth coordination. A key aspect to take into account is that production of the raw material needs to adapt not only to the seasonal growing patterns of plants but also to different conditions in quality, quantity and pre-processing needs. APPLAUSE has never intended to achieve high production throughput. Instead the focus is on delivering products that deliver high value to their intended users (locals, schools and tourists). This value relies in the fact that products are made of a material considered harmful (IAPS) and that with the collaboration of everyone (including citizens) it has been converted into something useful.

With the spring blossom, APPLAUSE will continue its activities. Readers of the next journal will expect to learn about:

- The next round of harvesting campaigns
- The selection of IAPS for biochemical compounds
- The inauguration of the paper-making workshop and the wood laboratory
- The results from the market survey for the new IAPS-based circular products
- The development of the first APPLAUSE products

Spring has finally arrived!

Urban Innovative Actions (UIA) is an Initiative of the European Union that provides urban areas throughout Europe with resources to test new and unproven solutions to address urban challenges. Based on article 8 of ERDF, the Initiative has a total ERDF budget of EUR 372 million for 2014-2020.

UIA projects will produce a wealth of knowledge stemming from the implementation of the innovative solutions for sustainable urban development that are of interest for city practitioners and stakeholders across the EU. This journal is a paper written by a UIA Expert that captures and disseminates the lessons learnt from the project implementation and the good practices identified. The journals will be structured around the main challenges of implementation identified and faced at local level by UIA projects. They will be published on a regular basis on the UIA website.

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