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URBAN INNOVATIVE ACTIONS

The Urban Lab of Europe !

The APPLAUSE project Journal N° 4

*Project led by the **Municipality of Ljubljana***

CIRCULAR ECONOMY

European Union
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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

APPLAUSE is heading towards the last few months of implementation. Some activities such as the harvesting campaigns or the design of new paper and wood products are finishing. Two workshops, the handcraft papermaking workshop and the wood type letter printing are in full operation while the wood working workshop is soon to be launched. The consortium is also accelerating the release of tools and resources to promote DIY culture in IAPS recovery and use.

All in all, the project has managed to achieve the following results from these activities:

- The collection of 59.3 m3 of woody IAPS and 10,928 kg of herbaceous IAPS since the start of the project,
- The organisation of 23 harvesting campaigns involving approximately 400 volunteers.
- The development of the final designs of 6 paper products and 13 wood products made of IAPS.
- The release of the DIY catalogue and accompanying videos.
- The organisation of 218 workshop activities (papermaking, letter printing, dye home-production, woodworking) involving 2,770 participants.

These results have led to **new lessons learned**:

- Not all collected IAPS biomass can be used for papermaking, woodworking or dye production. Sometimes it is not feasible from a technical point of view (e.g. certain species lack the properties required for paper production), but in other instances, it is just not viable from a practical or economical point of view (not sufficient quantities of a certain species, the process is too resource and cost intensive…). So, only a few IAPS can be used in APPLAUSE circular model:
    - o Herbaceous IAPS: Japanese and Bohemian knotweed, Canadian and giant goldenrod.
    - o Woody IAPS: Black locust, Tree of heaven, Honey locust, Box elder, Horse chestnut and finally Staghorn sumac as one of the most colourful ones.
- Citizens are invited to participate in harvesting campaigns to collect herbaceous IAPS biomass. However, these activities are not suited for everyone, since they require volunteers willing to undertake physical activity. One of the collectives that have been more keen to participate have been students from both high school and university.
- 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 much bigger quantities of herbaceous IAPS are collected by JP VOKA SNAGA, the municipal water and waste management public company, and TISA, a private company, collects wood IAPS biomass. For example, 1kg of IAPS biomass (which still needs to be delignified and refined) can produce 600gr of paper. As for wood, from a single log, only 40% of the biomass can be used to produce wood products. This

percentage is lower in urban trees compared to forest trees (which is about 60%) because urban trees often have mechanical damages (due to vandalism, metal inclusions such as nails, etc.).

- 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.

- Having DIY culture as one of the drivers of citizens' engagement not only empowers citizens to take action in tackling the problems caused by IAPS; it can also inspire them to become more engaged in other green or civic initiatives.

- Finally, the workshops are being a tremendous success, especially among schools. That is because they are able to combine environmental education with artistic expression and learnings about local cultural heritage. The effective collaboration between the environmental and educational departments of the City of Ljubljana has greatly contributed to such success.

The results of these activities and lessons learned are also helping APPLAUSE partners to scope the future scale-up of the circular model for the management of IAPS, once the project reaches its end in October this year. In this period, the City of Ljubljana has been leading a series of talks and workshops with partners that aim to secure the legacy of APPLAUSE. These have focused on: developing a common vision for the future scale-up of the circular model; understanding what activities can continue after the project and in which form; confirming partners' interest in the future business model; and scoping the need for new post-project alliances.

2. PREPARING THE LEGACY OF APPLAUSE

As we enter the last months of the APPLAUSE project, the efforts are now shifting from setting up processes and activities to gradually closing them. It is also a crucial moment for the project, as partners need to work on a future post-project scenario that secures the legacy of APPLAUSE.

The uncertainty of the post-project phase needs to be managed properly. In many occasions, the development of a plan that ensures the continuity of the operations once the grant funding ends comes too late, in the last months of the project. Then, partners have little time to react, and often realise that certain things should have been done differently to facilitate future use or exploitation.

In APPLAUSE, the ambition to secure the long-term sustainability of the project has been present since its start. One of the main objectives of APPLAUSE is to make the circular model for the management of IAPS self-sustainable. As a result, many processes and activities put in place, as part of this circular model, have been developed with that in mind. Here, I provide an exhaustive list:

- A new digital platform has been developed to assist botanists and green area managers in identifying, locating and tracking IAPS spread across the territory. This platform also includes a module for managing orders, arranging collections and organising deliveries of the pre-processed biomass. The platform will continue to be used after the project, making the entire process more efficient and easier to operate.
- Out of the 25 IAPS selected and analysed in APPLAUSE, research partners have studied the chemical and mechanical properties of all of them to identify those that are more suitable for paper or wood products, dyes or home formulations of organic pesticide. This research has led to some IAPS being discarded as potential raw material to be used in products, while others, whose handling and processing has proven to be cost-effective, will be turned into viable products. In that way, the future operation of the model only works with those species that make the circular model viable from a practical and financial point of view.
- Also, the consortia have gained a wealth of knowledge on when the right timing is to harvest each species and how to handle it afterwards. As a result, many lessons have been learned on how to continue the harvesting operations once the project ends.
- APPLAUSE has invested in two physical workshops, one for handcraft papermaking and the other one for woodworking. These workshops are two major new assets the city has gained for the benefit of all citizens beyond the project timeframe.
- JP VOKA SNAGA, the partner responsible for the business models has been doing market surveys to test the willingness to pay for a number of APPLAUSE products. This research will be really useful once the products are launched into the market after project end.

- The focus of APPLAUSE in citizen engagement can also be seen as a stepping stone to secure the continuity of the project beyond its timeframe. The project is creating a "critical mass" of citizens who are aware of the problems caused by IAPS, know how to identify different species and what to do with them (either transforming them into something useful or hand them over to a collection point). These citizens are the future consumers of IAPS-based products; therefore raising their awareness on the problems caused by IAPS is vital in order to make them appreciate the intrinsic value of these products. Only in this way, APPLAUSE can create sufficient demand to ensure the sustainability of its circular model over time.
- Finally, to further support citizens' engagement, APPLAUSE has been developing an App for citizens. This App, to be released in May 2020, allows citizens to take a photo of a plant and automatically recognises if it is a specific IAPS or not. Once the App has identified an IAPS, it gives to the citizen recommendations on what to do with it. This App can be a great tool in facilitating citizens' engagement beyond the project lifespan and can even become a promotional channel for the products/services.

These new tools, products, assets and learnings cannot be locked into a drawer once the project reaches its end date. The City of Ljubljana is determined to continue supporting the circular management of IAPS, but new leaderships need to arise within the consortium to secure the future continuity once APPLAUSE reaches its end in October 2020.

To jointly deliberate about the future of APPLAUSE circular model, last year, I hosted a discussion with the group of partners involved in the operation of the circular model. The aim was to develop a common vision on the future scale-up of the business model of APPLAUSE. To reach this vision, the session was divided into 4 parts:

1. Identifying key goals, objectives, activities to be fulfilled in the future business model once the project ends;
2. To think what key skills, experience and resources would each organisation be willing to bring to the future business model;
3. To analyse the situation by identifying key strengths, weaknesses, opportunities and threats to the future business model (SWOT analysis);
4. The last part focused on jointly develop an action plan to be implemented during the last year.

Participants used post-its of different colours to first write individually their ideas and later share them with the rest of the group.

Results of the discussion on the future scale up of the business model of APPLAUSE

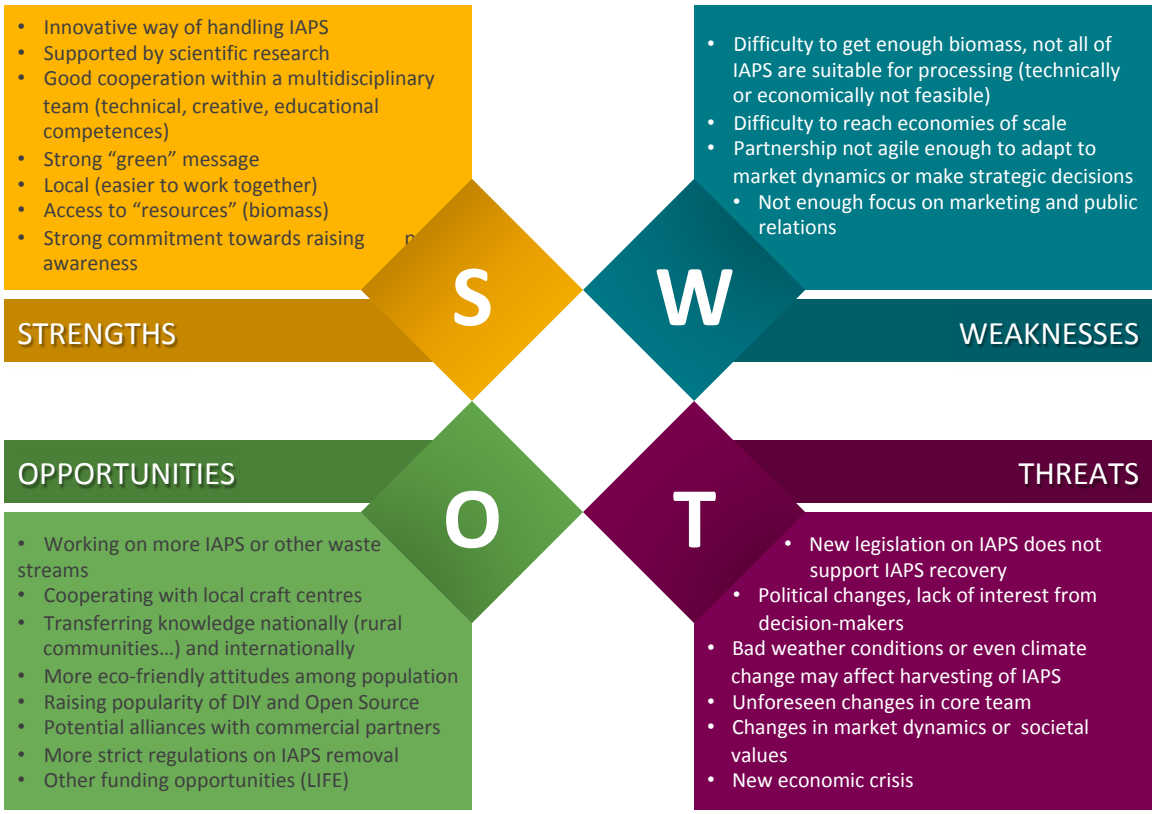
The first part enabled partners to share their vision on the future of the project. A vision that entails continuing inspiring citizens to live more sustainably (understanding what things are made of and promoting green consumption) while fostering creativity (design, cultural heritage) and increasing the quality of life in the city (solving the problems caused by IAPS). Once this vision was recognised by all participants, each one expressed what role they were willing to play in the future post-project scenario:

- For example, the City of Ljubljana plays and will play a key role as landowner and as decision-maker in the city. It is also responsible for maintaining the new digital platform and is willing to continue raising awareness after project end. Also, the City Administration is a purchaser of goods and products, a role that could certainly gain importance in the future business model.
- JP VOKA SNAGA, the city's water and waste management public company, is also a core partner in the future business model. Not only it is the one in charge of IAPS harvesting and collection (aided by its subcontractors) but it is also the owner of the workshop facilities (for handcraft papermaking and woodworking) and the collection points for IAPS disposal. Besides, the public company also delivers public education campaigns on correct waste management.
- The project counts on two partners, which are experts on wood making (Biotechnical Faculty, Department of Wood Science and Technology) and paper making (Pulp and Paper Institute). The Faculty is keen on continuing its task as

advisor on the design and production of wood products and as advocate of sustainable wood production practices. As for the Pulp and Paper Institute, the organisation can play a role in the promotion of the papermaking workshops and the development and commercialisation of paper-based products.

- Finally, the two creative partners, TRAJNA and tipoRenesansa, expressed their interest in continuing their involvement after the project phase by bringing in their expertise on product design (both wood and paper) and workshop facilitation.

Parts 3 and 4 of the discussion focused on jointly analysing the current vision of APPLAUSE circular model (through a SWOT analysis) and formulating a set of actions to prepare the future post-project phase. Some of the actions identified were: developing a post-project partners' agreement, identifying the minimum products and services that make the business model viable and developing an internal and external marketing strategy. The following figure summarise the SWOT analysis:



SWOT analysis for the future scale-up of APPLAUSE.

TAKE AWAY POINT

→ Leadership and strategic thinking to look beyond the project timeframe

As the project starts to reach its end, the pressure on the project leader increases. The coordinator needs to manage partners' expectations while jointly defining a strategy that secures the project legacy. The City of Ljubljana is managing this by: creating a core group of partners (a bit like a taskforce) who, due to the nature of the activities they implement, is keen on playing a part in the future business model; promoting individual leaderships within this core group; consolidating key partnerships with local stakeholders who have collaborated in the project (for example the city's educational department or the district-level community groups); and engaging the project steering group, which is led by the Deputy Mayor, to secure the buy-in from strategic allies.

3. ACCOUNT ON THE PROGRESS MADE BY THE PROJECT SINCE OCTOBER 2019

3.1 Gradually closing down the harvesting part

Throughout the project, APPLAUSE partners have learned that winter is the optimal time to harvest herbaceous biomass for papermaking. As for wood biomass, the best season to harvest them is in the autumn, when the material is dryer. This process does not come without challenges; one can expect snow, rain, mud, morning dew, etc. Importantly, once collected, the biomass needs to be properly pre-processed and stored to avoid any deterioration. Overall, project partners have managed to collect 1,606 kg of biomass during these last 6 months. This has been achieved thanks to the work of green area managers as well as the organisation of 23 harvesting campaigns, involving 408 volunteers.

Since harvesting requires volunteers to undertake physical activity, not everyone is keen to participate (older people, very young children, families…). A major success has been to secure the commitment of high schools and universities (especially those specialised in natural sciences and forestry), as well as associations interested in outdoor activities. Given the interest of these groups in repeating such experience next year, the City of Ljubljana is already planning to continue with these harvesting campaigns after the end of the project.

These harvesting campaigns are a great opportunity for citizens to learn to recognise IAPS and become aware of what damage they can cause to the local biodiversity, the ecosystem services or human health. But as stated above, not everyone can participate in these harvesting campaigns. In fact, much of the awareness raising is done during the papermaking or wood working workshops (see section 3.3) which always start with an educational talk about IAPS. Since it is often difficult to bring real plants to these talks, (herbaceous species deteriorate quickly and woody species are too big), APPLAUSE has used 3D printing technology to create models for certain IAPS species. Artisans have painted the models to make them look as real as possible. After using them multiple times, workshop facilitators have confirmed that these 3D models are a great educational resource, especially because they look so real.

3D-printed models of various IAPS found in the area of Ljubljana.

3.2 Gradually closing down the product design part

APPLAUSE has found out that not all IAPS harvested can be turned into paper or wood products. In some cases, the quantity of biomass is not sufficient (1 kg of dried IAPS biomass, which still needs to be delignified and refined, can produce 600 g of paper) or simply not available during a certain time of the year. In other instances, the quality is missing. Ljubljana has learned that sometimes trees found in urban environments can be damaged due to vandalism or metal inclusions such as nails or screws, requiring extra care during primary wood processing (timber cutting). As a result, on average, only 40% of the biomass collected can be used to produce wood products. The percentage is higher (about 60% utilisation) in the case of forest trees. However, those “scars” found in urban trees can give to the wood product a special pattern with more character and authenticity.

The quantity or quality of the biomass are not the only limiting factors. APPLAUSE research partners have undertaken thorough chemical and mechanical analyses to evaluate the technical feasibility of using different IAPS found in the area of Ljubljana to produce cellulose pulp or treated wood. They have found out that some species or certain parts of the plant (leaves, blossoms) contain little concentrations of cellulose, making the process of fibre production non-viable for papermaking. The conclusion of this research has been that Japanese and Bohemian knotweed, Canadian and giant goldenrod and Black locust species are suitable for paper-products. And Box elder, Black and

Honey locust as well as Tree of heaven are very suitable for wood products.

In addition to paper and wood products, APPLAUSE has tested the viability of using flowers, leaves and roots to produce sustainable dyes. Several species have been studied such as Japanese knotweed, Goldenrod flowers, Staghorn sumac drupes or Himalayan balsam flowers. Some of them are only good for printing paper, while others are more suitable for dyeing textiles. Japanese knotweed gave excellent results, both on paper and textile substrates. An important aspect to take into account is that paper printing requires a large quantity of dye, and therefore of raw IAPS biomass. Therefore, from a practical point of view, only those species that are widely spread in the area of Ljubljana (e.g. Japanese knotweed) are suitable for the production of IAPS-based dyes.

This selection process, based on the technical, practical and economic viability of using IAPS as raw material for different products, has led to some problematic IAPS such as common ragweed (*Ambrosia artemisiifolia*) or giant hogweed (*Heracleum mantegazzianum*) being left off the list. In these cases, a circular model cannot be applied and these species, once located are properly removed from the environment and sent for waste treatment.

With treated wood and pulp paper made from the selected IAPS, APPLAUSE partners have been involved in an intense creative process of prototype development that culminated early this year with the final product designs. During this process, it was important not to lose sight of the intrinsic values of APPLAUSE in terms of sustainability, nature preservation, responsible consumption and revival of cultural heritage. That is why nature-friendly approaches and traditional craft techniques have been applied to design and production. Also, partners have taken into account how the daily use of these products can support consumers in moving away from unsustainable practices such as single-use or fast fashion. Finally, some of the products have been specially designed to support education and awareness raising on the topic of IAPS and nature preservation.

The design process has culminated with the following selection of products:

- Wooden products: office table, dining table, wooden frame, wardrobe, bookshelf, green roof birdhouse, composter, xylophone, serving plate and a Christmas tree.
- Paper products made of machine-paper: puzzle, memory game, DIY gift box,
- Hand-made paper products: foraging calendar, creative herbarium, seed paper & planting pot, flower envelopes, paper brick, paper decorations.

Roof birdhouse made of IAPS wood (Source: TRAJNA)

Seed embedded paper made of IAPS (Source: TRAJNA)

In addition, IAPS-based paper has been used to develop promotional materials for the project. APPLAUSE has also put together the mobile exhibition "Can invasive alien plants be useful?", which will be displayed at 20 frequently visited public places during 2020.

TAKE AWAY POINT
→ Fostering creativity through a participatory approach

Product design has been led by one APPLAUSE partner, TRAJNA, which specialises in sustainable design. However, to make the process more open, it has counted with the participation of other project partners as well as students from the Academy for Fine Arts and Design of University of Ljubljana. One of the workshops with students was organised as a cooperative experience that enabled students to empathise with local organisations working on sustainability issues in Ljubljana (fair farming, responsible consumption, green urbanisation, social inclusion). The experience of these local organisations served as inspiration for the students to then experiment, learn and create products made of IAPS. Such open approach really enhanced the creative process behind APPLAUSE products. Also, the Department of Wood Science and Technology from the University of Ljubljana adopted a participatory approach. They encouraged their students to use wood from invasive species in their product development projects. Thanks to the research undertaken in APPLAUSE, students knew beforehand the specific properties of each species (strength, durability, colour, texture…) and used this knowledge to create more innovative and optimal IAPS wood products.

3.3 Promoting civic engagement and green activism through DIY culture

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. In the last few months, APPLAUSE has also produced short DIY videos on paper and wood products, which are available on YouTube (only in Slovenian). Another project activity that promotes DIY culture are the culinary recipes contests that take place on an annual basis. The only requisite to enter this contest is that the recipe includes edible IAPS (Jerusalem artichoke tubers or the cherry plum fruits) as main ingredients. Some of these recipes are available online.

Such DIY approach is one of the three pillars of APPLAUSE citizens' engagement strategy. The other two pillars are the "Let's do it together" (inviting citizens to participate in workshops and volunteering actions) and the "Hand over" (the more traditional approach to recycling or waste disposal that simply asks citizens to collect and dispose IAPS responsibly). Introducing such DIY angle and linking it to circularity is one of APPLAUSE innovations. The DIY tools provided by the project not only support its circular model, they are also aimed at stimulating citizen's creativity (alone, with the family/friends, or during the workshops), developing green consciousness and hopefully inspiring them to apply such DIY approach to other aspects of their life (social activism, music, clothing…).

3.4 Delivering environmental and artistic education through workshop activities

APPLAUSE has set up three main workshops that use IAPS as a resource, these are:

- A handcraft paper-making workshop;
- A wood type letter printing workshop; and
- A wood working workshop

The papermaking and woodworking workshops are located within the premises of JP VOKA SNAGA, the municipal water and waste management public company. While the wood type letter printing is part of a local heritage typography studio, tipoRenesansa. In addition to these three big workshops, APPLAUSE organises other "let's do it together" workshop sessions that do not require big infrastructure. For example, the culinary sessions (organised by NIC, National Institute of Chemistry) and the workshops on home preparation of IAPS-dyes and home dyeing textiles (organised by NIC and the Faculty of Natural Sciences and Engineering, Department of Textiles, Graphic arts and Design of the University of Ljubljana).

The handcraft papermaking workshop and the wood type letter printing workshops have already been operating during the past few months to great success. Because of that, they have increased the number of workshops sessions they had initially planned. The wood working workshop took longer to set up, due to difficulties

faced in refurbishing the premises, and recruiting the staff. Nonetheless, some wood working sessions that did not require the big machinery were organised during the last few months.

Before and after of the wood working workshop (source: JP VOKA SNAGA)

Overall, APPLAUSE has organised:

- 57 handmade paper workshops;
- 7 wood workshops;
- 13 letterpress printing and poster design workshops;
- 6 free culinary workshops;
- 21 public talks about the traditional use of selected IAPS, including health benefits and risks;
- 16 dye home-production workshops.

In total approximately 2,770 people have participated in the activities. These workshops are an opportunity for children and adults to develop some handcraft and artistic talents while learning about a complex environmental issue such as IAPS. These activities have also become a great way to recover some old heritage techniques, such as wood type letter printing or handcraft papermaking.

TAKE AWAY POINT

→ A showcase of cross-departmental working within the urban authority in environmental and artistic education

One of the main reasons why these workshops have been successful has been the good cooperation between the city's environmental and education departments. These workshop activities, in particular the handcraft papermaking, are targeted to kindergarten and schoolchildren. Since the start of the project, both departments have worked together, even if one of them (the educational department) is not formally involved in APPLAUSE, to engage schools across the city. Since these workshops started in December 2018, the feedback from children and teachers have been very positive. Given the value these activities bring to schools in terms of environmental and artistic education, the educational department has already expressed its willingness to continue supporting such activities (even financially) after the end of the project.

The APPLAUSE team, in particular JP VOKA SNAGA, is now busy developing the business plan for the future operation of these workshops in the medium to longer term. While schools workshop sessions will remain a key activity of the workshop, JP VOKA SNAGA is looking for other opportunities that maximise the use of its workshop's space and machinery (teambuilding activities, events hosting, training, workspace for artisans/students, etc.).

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** ⇔	Since the end of the project is approaching fast, leadership remains a critical aspect for APPLAUSE. The City of Ljubljana is strongly supporting and encouraging project partners to get involved in the development of a common vision for the future of APPLAUSE and jointly implement a strategy that ensures that the circular model for IAPS can be continued in the post-project phase. This circular model will be presented to the project steering committee, chaired by the deputy mayor, prof. Janez Koželj in May 2020.
Public procurement	**Low** ⇔	This challenge remains low, as most of the large procurement (purchase of machinery) has already been completed. No major procurements are foreseen in the post-project phase.

Challenge	Level	Observations
Integrated cross-departmental working	**Low** ⇔	The City of Ljubljana set up efficient internal organisational arrangements since the very start of the project. The core project team already includes members from different departments. Such cross-departmental setting is a demand that comes directly from the Mayor and it happens in all projects implemented by the City. Also, part of the success of the workshop activities can be attributed to the good cooperation between the environment and educational departments (please see Chapter 3.4). Such optimal level of cross-departmental collaboration is part of the working culture of Ljubljana. Importantly, it is not only restricted to City departments, it rather expands to Ljubljana's "one big city family" of organisations delivering public services in the city. The "one big city family" concept is widely acknowledged by all public employees, who are used to working together, both at technical and political level.
Adopting a participative approach	**High** ⇔	A circular economy tends to be more complex than a linear one. To handle such complexity, it is important to connect different disciplines and adopt a participatory approach. APPLAUSE has been capable of delivering a coherent project thanks to a multi-disciplinary consortium that includes experts on social sciences, natural sciences, economics, digital technologies or arts & design. Occasionally, there are different understandings and approaches to a certain topic (that happened more frequently at the beginning of the project when partners did not know each other that well yet). But having such differing views has helped to implement better and more innovative solutions. Public campaigns on IAPS have been running in Ljubljana since 2015. APPLAUSE has scaled them up and managed to maintain a high level of engagement thanks to the motivation and commitment of project partners. Also, the participation of external partners in certain activities (for example students of arts & design participating in product design workshops) has enriched the results of APPLAUSE even further. Even if by now, good working relationships have been established, it is important for Ljubljana to keep this challenge high in their agenda.

Challenge	Level	Observations
Monitoring and evaluation	**High** ⇧	Ljubljana has managed to set up a good procedure for monitoring Key Performance Indicators (KPIs) which includes monthly reporting by relevant partners. Since Applause is the first project dealing with IAPS in a circular approach, not only in the area of Ljubljana but also in Slovenia, the indicators used to measure performance can directly pinpoint to the actual effects (number of IAPS removed, biomass turned into products, number of people participating in the activities). In addition to these KPIs, there are other indicators that capture the economic, social, environmental, and cultural benefits of APPLAUSE. These need to be projected into the future to fully understand the potential impact of applying a circular model for the management of IAPS. These indicators and their potential long-term effects are the "evidences" that the team can use to convince decision-makers and strategic partners to support the continuation of APPLAUSE after the end of the project. Because of that, the level of importance of this challenge has risen.
Communicating with the target beneficiaries	**High** ⇔	This challenge remains a high priority for Ljubljana. To be as effective as possible, the team always tries to use existing communication channels (the city's social media accounts, national newspapers, TV) as well as well-established local events (such as the neighbourhood day) to communicate with citizens. Project partners as well as members of the policy guidance group and project steering committee also contribute to such outreach. For example, one of APPLAUSE partners, the University of Ljubljana, used its own communication channels to invite students to the harvesting campaigns. Likewise, two members of the policy guidance group are teachers. They quickly made the link with the educational sector in order to use the project as an opportunity to improve their curricula. In addition, APPLAUSE has implemented two major communication actions, the annual IAPS festival as well as the mobile exhibition to reach out to more citizens, both locally and nationally.

Challenge	Level	Observations
Upscaling	**High** ⇔	As the project is quickly reaching its end, upscaling is of vital importance. The City of Ljubljana together with a core group of partners have already held some talks to discuss post-project arrangements. The workshop held on the future upscaling of the APPLAUSE circular model was a good occasion to kick-start such discussion (please see Chapter 2). APPLAUSE partners have realised that not all measures implemented as part of the IAPS circular model can be continued. For the most important ones, such as the IAPS collections or the workshops, partners (individually or in a small group) are working on post-project business plans and long-term sustainability strategies.

5. CONCLUSION

The project is quickly wrapping up, which means that the interest is shifting from the implementation phase towards the post-project phase. The way in which APPLAUSE was initially conceptualised, already facilitates the future continuation of the new circular model for the management of IAPS. The tools developed (e.g. IT platform), the investments made on the workshops and the knowledge gained on IAPS harvesting and resource recovery can be easily integrated and used in the future scaled-up model. Obviously, the intensity/frequency of certain activities or the level of commitment from different partners may change. Therefore, a new setting and new leaderships (from within the consortium or outside the consortium) are required.

As we head towards the last six months of APPLAUSE, we might expect the release of the public App for automatic identification of IAPS, the opening of the woodworking workshop and the consolidation of the business plans for various products (paper, wood) and services (workshops).

However, as I finish these lines, I cannot avoid thinking about the difficult and uncertain times we are currently living as a result of the COVID-19 outbreak. This health crisis is putting the world on hold, and obviously, it might affect some of the activities planned in APPLAUSE. I sincerely hope that we will start to see the end of this crisis soon and somehow, we will recover from it with renewed values towards solidarity, support to public services and green consciousness. The essence of APPLAUSE is very much aligned with these values.

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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