

Research Paper

Harmonia Project

Shaping vertical and horizontal engagements to get real impact through locally rooted projects.

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Abstract

Cities and their activities are one of the main contributors to climate change. As the number of people living in these cities continues to increase, policymakers and the public will have to consider how to manage the growing population and related consequences on climate.

The urban population has a significant impact on the environment, the health of cities and their citizens. In order to effectively address the Climate Change (CC) issue, it is imperative to consider the various factors that affect the urban environment and the necessity to engage various pluralist methods.

The Harmonia project (H2020 EU, financed project) can help face this challenge as it aims at uniting the stakeholders around the common CC issues, allowing them not only to understand the impacts on their local environment but also to concretely visualise those issues through a Support System for improved resilience and sustainable urban areas based on GEOSS and Advanced Modelling Tools. The Harmonia project enhances cities' preparedness to respond to specific predictions and protect their residents and assets, making cities more resilient to climate change-induced risks. To achieve these goals, Harmonia is going to engage a wide-ranging of stakeholders at the local level, from experts to citizens.

Keywords

Climate Change, Resilient Cities, Co-design Planning process, Sustainable Development, Pluralist Engagement, Local Impacts.

1. Introduction

Climate Change has intensified the number and frequency of extreme events and poses a serious threat to the stability of urban structures and urban life. Indeed cities consume 78% of the world's energy and produce more than 60% of overall greenhouse gas (GhG) emissions while occupying less than 2% of the surface of the Earth (UN Habitat, 2016). Therefore, cities are the most vulnerable areas as they represent the physical places where most of the global population is –and will be– concentrated due to the consistent number of strategic activities and assets. Climate risks create future challenges for cities and policymakers to sustainably manage an additional urbanised population of 720 million people (World bank) in the next 10 years. The influence of cities on anthropogenic Climate Change (CC) and related consequences on human beings cannot be underestimated. Therefore, effective and sustainable decision-making in urban planning-related matters need to have a strong participatory planning foundation, being inclusive and taking into account both the changing behaviours and the urban metabolic processes, adapting them to fit the Paris Accord goals and recent COP26 agreements. Considering the complexity of the topic that involves several different domains, different levels of action need to be analysed to tackle the gap between general principles and local governments.

In this situation, the role of European research programs is to create synergies and links between the vertical and transversal levels of intervention within European partners' collaboration and exchange. The Harmonia project (H2020 EU, financed project nr.101003517) can help facing these open challenges as it aims at uniting the stakeholders around the common CC issues, through a co-design and co-participation process. Harmonia aims at leveraging existing tools and technologies to deliver an innovative Integrated Resilience Assessment Platform (IRAP) working on top of the Global Earth Observation System of Systems GEOSS. The main objective is to overcome the current lack of a dedicated process of understanding and quantifying Climate Change (CC) effects on urban areas, while the expected outcome is a platform usable by researchers, citizens and local administrators with a Decision Support System to help policy-making and adaptation processes.

The Harmonia Project allows the stakeholders not only to understand the impacts on their local environment but also to concretely visualise those issues. The IRAP system is enriched with various data as for example urban structure and historical climate extreme events supplemented with citizen-based data to deepen the scenarios according to local requirements and contexts. The strong social component of the project is a key aspect and among the main innovative points of the project, as it aims to reach, attract and engage all key urban governance actors, especially in the topics where they can make a difference for inclusive development processes at the urban scale. The Harmonia project enhances cities' preparedness to respond to specific predictions, such as floods or dust storms, and protect their citizens and assets, making cities more resilient to climate change-induced risks. To achieve these goals, Harmonia is going to engage a wide-ranging of stakeholders at the local level, from professional experts to citizens.

The following paper presents the importance of shaping vertical and horizontal engagements to get real impacts on local climate mitigation. The paper will first provide a general overview of the scientific research on multi-level engagement in environmental projects, then an insight into the engagement methods elaborated within the Harmonia project and finally highlight the need for a pluralist inclusion of a wide social base to support successful adaptive strategies and get local efficient effects.

2. Pluralist engagement in environmental projects

2.1. Public-Private-People Partnership

Considering that the Harmonia project aims on uniting the stakeholders around the common Climate Changes(CC) issues, allowing them not only to understand and visualise CC impacts on their local environment and considering also the interdisciplinary characters and partners of Harmonia, this extensive group must be as open as possible, from experts in the scientific, urban, economic, education, financial and environmental fields to local inhabitants. To arrive at designing and implementing this system, the stakeholder identification process, therefore, had to integrate a multi-scalar and horizontal approach, known as the “Public-Private-People Participation” (PPPP/4Ps).

Public-Private-People Participation is a comprehensive approach where all stakeholders, including governments, donor agencies, private sector and civil society choose to collaborate (See Figure 1). It could be groups of governmental, non-governmental organisations, companies, and actors with different vertical and horizontal powers which have the role to ensure the understanding of the strategies, policies, and instruments connected to Climate Change issues, impact, and resilience. In PPPP, stakeholders find a common development pathway through setting up an integrated sustainable territorial approach, within a governance framework that is designed to accommodate different requests and which is looking to break sectoral thinking or top-down initiatives (Ajibade and al., 2012)

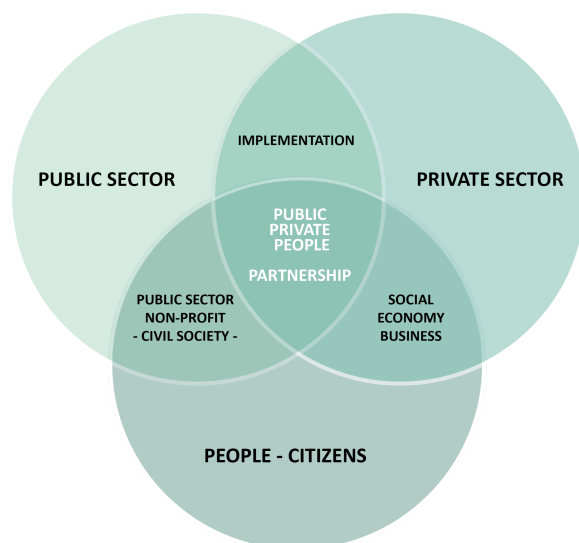


Figure 1. The Public-Private-People partnership approach. Source: URBASOFIA.

This recognizes people as main stakeholders apart from the public and private sectors. Nowadays, cities and citizens are under pressure to cope with a wide range of challenges, including climate change.

The contribution of all city stakeholders, including public entities, private companies and citizens, to the resilience-building process increases the effectiveness of the process (Maraña.al,2020). Studies demonstrate the importance of relationship management to counteract problems and create a synergic approach (Zhang and al., 2015).

A public-private-people partnership is composed of different stages of development. After a classifying of the different characteristics and future needs, semi-structured interviews, questionnaire surveys, case studies and a validation exercise through a focus group meeting were adopted to obtain empirical data

and develop the PPPP/4Ps framework. 4Ps is a circular concept between methodology, survey, interview and collection.

However, the final PPPP methodology depends on the pilot cases application and may be defined after full understanding and agreement on the defined responsibilities of the involved parties.

The Harmonia project has people and public participation in PPPP in all the fields of Harmonia executions at a very large scale, including housing, health, education, finances, infrastructure, etc. People's role in PPPP is to make contributions to set up networks (scientists, citizens, local area, etc.), as well as the demand and utilise value-added services.

2.2. Stakeholders' Engagement Plan

Stakeholder engagement plan comprises a set of guidelines for identifying stakeholders in the scope to elaborate the IRAP Platform and users' definition at the local level of each territorial partner. This plan reveals the methodology behind Harmonia's Stakeholders and users identification, it connects the project's scope and outcomes with the target users (and collaborators) of those outcomes, identifies and characterises the groups/types of stakeholders which should be involved (either as beneficiary or as provider) and then it creates a strategy to involve them (see Figure 2).

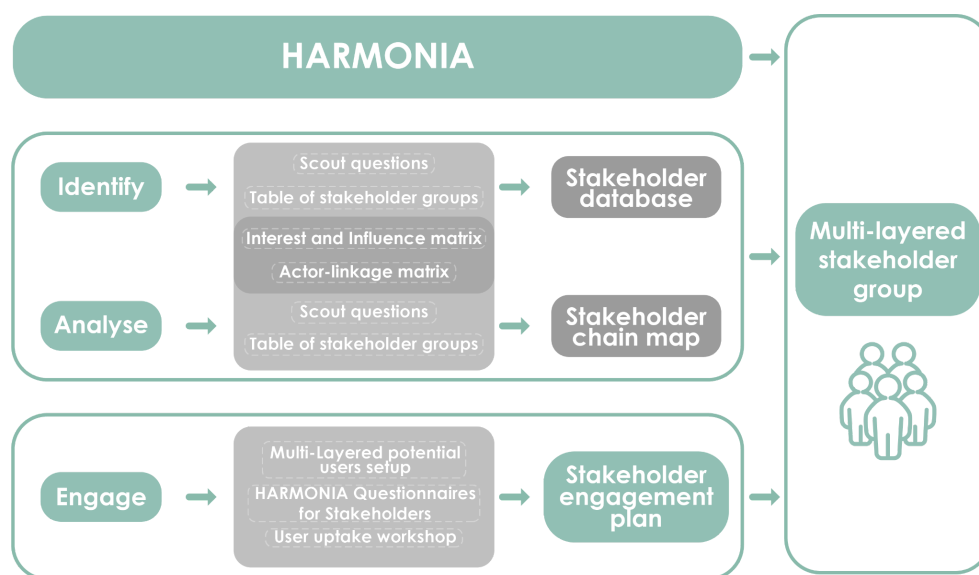


Figure 2. Harmonia SEP Overall Approach Diagram. Source: URBASOFIA.

The plan provides the main directions for stakeholders' identification, based on an importance and influence matrix and interest analysis, according to three main aspects:

- 1) interests and how the addressed topic affects the stakeholders,
- 2) capacity and motivation to contribute on the platform,
- 3) possible actions to address the various interests.

Furthermore, the Stakeholders Engagement Plan provides some tailor-made directions for engaging each identified stakeholders' category, creating a roadmap/strategy to involve them, answering the following questions: What needs? What key messages? How to deliver these messages? Which channels/events would work best?

2.3. Citizen Science

Even though historically, environmental data collection by volunteers wasn't widely recognized in the scientific literature, the citizen science approach has recently been introduced in several projects, and the number of volunteers who participate in it has grown over the last decade.

Citizen science is a grassroots initiative in scientific fields and the humanities that incorporates a variety of stakeholders at multiple levels, including citizens, scientists, organisations, and government bodies. These stakeholders' primary responsibilities include recording observations, collecting samples on the field using smartphone apps, contributing to data analysis, and assisting in the development of research topics. Volunteers are involved in several stages of the research process, including study design, research question formulation, and research result validation. Citizen science is a multidimensional approach that involves both experts and volunteers at various phases. It is expected to reduce research costs and time, increase citizen awareness, and provide continuous data collection.

Traditional data gathering methods, such as those used by government departments and international organisations, are expensive, hence data collection cycles are frequently rare. Collaboration with citizen volunteers allows for more regular data updates, resulting in more diversified datasets and early environmental warnings. Furthermore, it encourages citizens to become more aware of local environmental issues and alter their everyday habits in order to preserve the environment and biodiversity. Moreover, because citizens, as well as scientists, contribute data, the results and messages are more frequently resorted to in policymaking, resulting in a more balanced and comprehensive policy.

3. Pluralist engagement methods within the HARMONIA project

3.1. All across Europe: Four Pilot Cities

The success of the project largely depends on its future use in urban areas, therefore a need for strong local support caused the choice of 4 Pilot cities in various climatic zones: Sofia, Mila, Piraeus and Ixelles. The diversity of chosen pilots allows the creation of the platform that will be suitable for any city in the future after the project is finished.

Pilot cities, as end-users aiming to improve the lives of their citizens, will be able to use the platform early on, adapting the end result to their unique needs and enriching the platform itself. Additionally to that, the initial requirements for the platform were formed together with the pilots and their stakeholders, creating a rich set of information that is currently being used in shaping the platform and deepening the spatial understanding of the cities. Each Pilot has a unique setting and situation that brings a different list of necessary studies and interventions.

Executing the IRAP platform in a diversity of geographics urban areas is important to reach at the end, the largest panel of cities with the same efficiency, whatever its specifics or sizes. The implementation of the activities in Milan, Ixelles, Sofia and Piraeus as well as the IRAP platform assessment is a starting point, but the project aims to go ahead of this border.

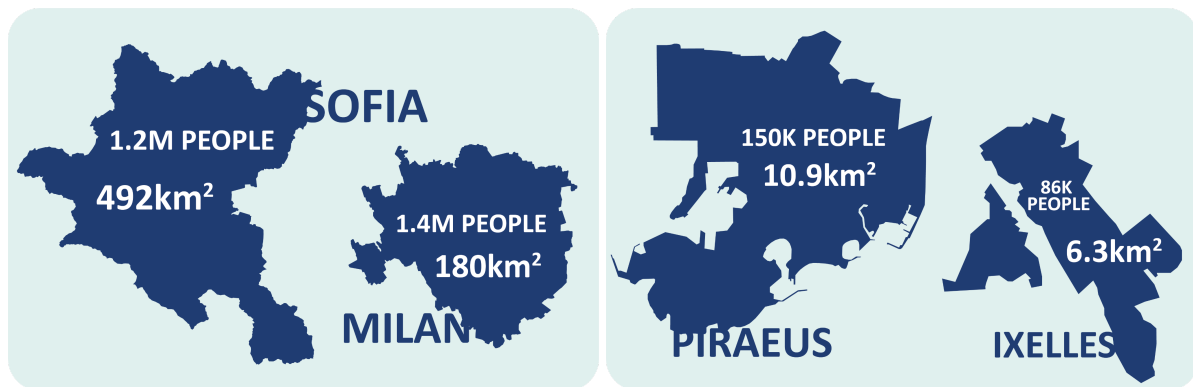


Figure 3. Data about population and area in the four pilot cities of Harmonia project. Source: URBASOFIA.

3.2. Co-designed activities with Pilot cities

As any project that aims at sustainable results, approved by the citizens, Harmonia pays great attention to citizens' participation in the project. Being the main end-users and data providers for the future platform, Pilot Cities of Harmonia participate in a handful of activities with the partners. Besides, they're also part of the designing team for the future citizen-engagement activities.

These activities are designed in cooperation with Pilot cities using five specific and easy-to-use co-design principles:

1. Be open & inclusive in the establishment of the CAO community

Co-design processes should be organised in a way that different types of knowledge, perspectives and needs are invited and addressed.

2. Be flexible

A successful co-design process requires adaptive methods within the project to fit the local specificities, experiences and needs.

3. Be experimental and innovative

Pilot Cities are spaces for experimentation. Ideally, they provide safe and diverse learning environments that allow participating stakeholders to create and test new technologies, services and/or methodologies in real-life contexts.

4. Be in a long-term vision

Projects such as Harmonia envision long-term results, accordingly, it is necessary to implement long-term activity with the citizens.

5. Be attractive to engage citizens

The interest and value of citizen participation in the scientific project is undeniable. The main challenge is to succeed in doing a solid engagement of the people in the activity related to the project. Citizen-as-Observatory must be attractive and friendly.

3.3. Harmonia Stakeholders Engagement & Harmonia Citizen-As-Observatory

Harmonia Stakeholder engagement and Citizens as observatory are the basic engagement activities of the project. Each of the activities has its specific aim and methodology. Stakeholder engagement's main

purpose was to guide the pilot cities in forming an initial community of the project, identifying the most useful stakeholders and inviting them to participate in the project by sharing their opinion about pressing CC events in each city.

Then, Citizens-as-observatory is an activity in the making, which aims to collect citizen-based data that will become a part of the decision support tool of the Harmonia platform. The activity will fully exploit the potential of the “citizens as observatories”, assisting the collection of citizen-based data to better understand and quantify the CC effects on urban areas from the point of view of the inhabitants. The integration of the outcomes has the potential to be sustained and maintained into the future.

3.4. Harmonia use a unique but flexible strategy

To be able to spread the project over the scale of four pilots in the future, the engagement and participation strategy needs to be unified, but also has to be suitable for different urban areas, no matter their specifics and size. Everyone has a different feeling about the effects of climate change in their daily life, due to their background, habits and/or personality. The inclusivity, as well as the diversity of methods to involve citizens in the environmental project, is imperative for long-term vision and project sustainability.

The CAO strategy presumes activities that take place both in digital mode and in presence, making sure that no opinion is lost and no citizen is forgotten. Multiple types of instruments will be used in the process, starting from simple questionnaires and resulting in full brainstorming sessions and workshops. However, each Pilot is free to determine the best channels of communication in their case, activating, in addition, already existing initiatives that work closely with the citizens. This type of strategy allows a necessary level of unification that would make the strategy applicable to any city that might join the project henceforward.

4. Pluralist engagement reinforces, supports and makes the Harmonia project durable.

4.1. Vertical and horizontal participation push the collaboration

For several decades now participatory governance has experimented with different scales of action, the challenge of putting the public back into the governance and decision process. The past experiences driven by the demand for individual engagement and the desire to focus on the local level while the development of a digital era have paved the way for stakeholders' engagement and the related innovations which stem from it, in order to create new governance based on collaboration and exchanges. Exchanges happen at different levels: inside the project, as well as locally in the territory and produce reflection at the international/European levels. Exchanges happen at 3 levels: project level, local level and beyond through reach effect. Indeed the collaboration and its dissemination promote the project but also its methods or ideas and allow innovations outside the project.

However, we know that in many instances, collaborations among stakeholders, including researchers and community members, are strained by a lack of mutual understanding of each other's goals and expectations (Stokols, 2006). Through the vantage point of ecological systems theory (Bronfenbrenner, 1992), we also know that the collaborative efforts of stakeholders are influenced by macrosystem conditions. The collaborations face challenges such as the societal habits to create hierarchy and leadership, the lack of interest from stakeholders, and the limited place of participation given by some practitioners due to its new place in the governance organogram.

Practitioners should consider the "democratic cube" (Fung, 2015): different kinds of participants, different ways of speaking, hearing and exchanging information (e.g small groups) and different levels of empowerment and they should be clear about the intention of convening citizens and design engagement, in the way that envisions a clear path leading from engagement to the situation. This collaboration and the power in the hand of the policymakers are the keys to achieving collaboration and building capacities. Given that, one element to building capacity is to actively support citizen science initiatives. Policymakers should not only accept those initiatives but also strongly support such dynamics. Research and Innovative projects should include the facilitation of stakeholder engagement and citizen integration through co-design activities, scientific education and awareness. The Harmonia project is focused on this approach mixing technology and society.

4.2. Giving space to digital participation processes to enrich the results.

Digital mediation operates as an emancipation approach as it acts like a "mediator" on an unlimited scale. Digital tools for collective interactive exploration and intervention accompany the engagement and participation but without imposition. Indeed ordaining participation is not sufficient; it is necessary to create attraction and engagement through a well-organisation of community participation. The digital approach is based on the establishment of a reflective organisation that gives rise to new spaces of democratic relations.

The relationship of Harmonia with the digital methods is obvious as the project result is a digital technology which predicts climate change results but the place of the digital technology comes upstream with the project results. For several reasons (COVID crisis, and European consortium) Harmonia has worked from the beginning with digital and online methods. Consequently, the process to co-design the engagement has also been digital as well. Identify, contact and gather the Harmonia Local Stakeholders groups following a digital methodology. In terms of citizen engagement, also co-design process to implement CAO have been built online and the strategy defined includes a double approach: analogue and digital tool to collect citizen-based data. Co-designing innovative and collaborative web platforms and mobile apps can appeal to a citizen's natural willingness to contribute to Harmonia and offer channels to have unlimited voices heard, consequently the project result is enriched.

4.3. Stakeholders' participation gives a real impact on the Harmonia project.

Harmonia expects to affect the local level of European cities in this way; it is primordial to work in the perspective of inhabitants as a centre, which uses sense-making and local usable knowledge, across scientific, governance, and local practice boundaries (Kerkhoff & Lebel, 2015).

Based on the scientific literature and existing experience, the project partners work with technical experts and users to co-design and develop the tools, resources and data necessary to obtain successful results at the end of the project and ensure it is used after it. Bridging the technical partners with the municipalities and their local stakeholders through workshops and meetings in real-time all along with the project permits HARMONIA to adapt, deepen and if necessary bounce on the project activities with the local realities. These continuous interventions give multiple perspectives to root the project locally and replicate it all across the urban areas. The existing activated community is also a guarantee for the durability of the project; once engaged people are active to auto-adapt the project results with unlimited time and project resources. The engagement of vertical and horizontal stakeholders all together as a community ensures a complete achievement of project scopes, solves expected and unexpected implementing challenges and roots the project at the local level.

5. Pluralist engagement for healthy cities and governances

5.1. Adaptive methods to ensure local and European cooperation

The HARMONIA project has the purpose to address the objectives fixed by the European Commission through the HORIZON programme. Harmonia's project tackles the goals to provide advancement of global observation systems and its related data in adaptation to Climate Change (CC) with the challenge of extending social awareness and its participation in the climate challenges. This field of action is supported by a transversal consortium in order to integrate technological and social aspects. In this cooperative approach and to permit successful, various, and sustainable results the Harmonia group must be extended to a wide constellation of stakeholders. Harmonia, as any project aims to reach a sustainable result, accepted by the local communities, and therefore has to address as many diverse stakeholders as possible, to be able to gain a better understanding of how to tackle the goals and objectives of the project and adapt those under the influence of local requirements. The socio-ecological approaches that are emerging aim to gather examples of experiences, and pedagogical methods from a global perspective but for the local situations.

The inclusion of citizens' well-being parameters alongside the parameters of environmental risks and possible damage to the urban structure, makes it possible to bring the scientific discourse of European Research back to a realistic and concrete dimension of interest for citizens.

Stakeholders' engagement helps to provide strategic advice to the system requirements but is also necessary to succeed in supporting a green European recovery through sustainable development and data acquisition management. It is essential for Harmonia and environmental urban planning to gather expert advice and policy support from international networks as well as relevant public sector bodies and citizens across Europe. The Harmonia community participates in the creation of the framework, but also disseminates and communicates these new European tools to anticipate climate change without borders, support all cities and regions in understanding the current climate issues and predict future changes

5.2. The necessity of constant evolution

The Harmonia project is developed to provide an IRAP system which will predict Climate Change effects at the local level. Undoubtedly, these climate changes will continually change, evolve, and probably grow. Consequently, cities' requirements/needs will also change and in this manner, the platform should adapt, be open and flexible, and the project should be in evolution throughout its development. Considering this, it is important to keep in mind that the groups and the stakeholders' influence/interest will be different and to be considered at every stage of Harmonia and beyond.

5.3. Conclusion

Harmonia's approach to creating this decision-making platform is based on the proactive involvement of the cities; local knowledge provides invaluable support to facilitate the processes to design and implement their strategies as well as provides mitigation and adaptation measures to counteract Climate change's negative effects on our planet. Harmonia consolidates its community by engaging stakeholders and citizens as an active observatory of Climate Change phenomenon. The focus of the engagement process is on forming synergic relationships and developing a community around the co-conception of the IRAP Platform in order to raise their level of understanding, awareness and inclusiveness in and for the project.

Finally, the Harmonia Project aims to reach, to attract and to engage all key urban governance actors, especially in the topics where they can make a difference for inclusive development processes at the urban scale and finally help cities to go against indubitably predictions provided by EO data.

The Harmonia project explores holistic approaches to urban planning, policy, and governance that embrace innovative strategies for integrating public health and spatial and community planning through data collections and engagement methodologies.

Thus Harmonia integrates public and environmental health and citizen wellbeing in the core of its processes to enable practitioners, academics and policymakers to create healthier, more resilient and equitable cities and communities.

6. References

Ajibade, L., Ayeni, O. and Ahmed, I. (2012) 'Public-Private-People partnership for sustainable portable water supply system in Nigeria', *Journal of Sustainable Development in Africa*, volume 14 [online]. Available at: <http://digitalknowledge.cput.ac.za/handle/11189/760> (Accessed: 11th of November 2021)

Assembly, U.G. and 2nd Committee, 2016. Implementation of the outcome of the United Nations Conference on Housing and Sustainable Urban Development (Habitat III) and strengthening of the United Nations Human Settlements Programme (UN-Habitat): report of the 2nd Committee: General Assembly, 71st session.

Barsukova, Y., Duivon, L., Elisei, P., Dimitriu (Leopa), S. (2021). *Harmonia Stakeholders Engagement Plan, D2.1*, HARMONIA. Horizon 2020 Grant Agreement No 101003517, European Commission, 34 pp

Barsukova, Y., Duivon, L., Elisei, P., Dimitriu, S. (2021). *User & stakeholders groups identification and collection of requirements, D2.2*, HARMONIA. Horizon 2020 Grant Agreement No 101003517, European Commission, 78 pp

Bronfenbrenner, U. (2005). Ecological systems theory (1992). In U. Bronfenbrenner (Ed.), Making human beings human: Bioecological perspectives on human development (pp. 106–173). Sage Publications Ltd.

European Commission (2020). *Integrated GEOSS climate applications to support adaptation and mitigation measures of the Paris Agreement*. TOPIC ID: LC-CLA-19-202 Funding & tenders (europa.eu)

European Commission (2020). *Horizon 2020 Work Programme 2018-2020: 12-Climate action, environment, resource efficiency and raw materials*. h2020-wp1820-climate_en.pdf (europa.eu)

Flaspohler, P.D., Meehan, C., Maras, M.A., & Keller, K.E. (2012). *Ready, willing and able: Developing a support system to promote implementation of school based programs*. *American Journal of Community Psychology*, 50, 428 – 444

Flaspohler, P.D., Meehan, C., Maras, M.A., & Keller, K.E. 2012; Palinkas et al., 2011; Wandersman et al., 2008). *Implementation efforts must address the various needs of these stakeholders* (Palinkas et al., 2014).

Fung, A., 2015. Putting the public back into governance: The challenges of citizen participation and its future. *Public administration review*, 75(4), pp.513-522.

Kosmala, M., Wiggins A., Swanson A., Simona B. (2016) 'Assessing data quality in citizen science', *Frontiers in ecology and the environment*, volume 14 (issue 10), 8pp.

Liu, H.-Y., Kobernus, M., Broday, D., & Bartonova, A. (2014). *A conceptual approach to a citizens' observatory – supporting community-based environmental governance*. *Environmental Health*, 13(1), 107. doi:10.1186/1476-069X-13-107 PMID:25495204

Maraña, P., Labaka, L., Mari Sarriegi, J. (2020) 'Title of articleWe need them all: development of a public private people partnership to support a city resilience-building process', *Technological Forecasting and Social Change*, volume 154.

Moskalyk, A. (2011). *Public-private partnerships in Housing and Urban development*. E-book format [online]. Available at <https://unhabitat.org/public-private-partnership-in-housing-and-urban-development> (Accessed: 15th August 2022)

Metz, A., Burke, K., Albers, B., Louison, L. and Bartley, L., 2020. A Practice Guide to Supporting Implementation: What Competencies Do We Need?. *National Implementation Research Network*.

Palinkas, L.A., Fuentes, D., Finno, M., Garcia, A.R., Holloway, I.W., & Chamberlain, P. (2014). *Inter-organizational collaboration in the implementation of evidence-based practices among public agencies serving abused and neglected youth*. *Administration and Policy in Mental Health*, 41, 74-85.

Revi, A., Satterthwaite, D., Aragón-Durand, F., Corfee-Morlot, J., Kiunsi, R.B., Pelling, M., Roberts, D., Solecki, W., Gajjar, S.P. and Sverdlik, A., 2014. *Towards transformative adaptation in cities: the IPCC's Fifth Assessment*. *Environment and Urbanization*, 26(1), pp.11-28.

Stokols, D., 2006. *Toward a science of transdisciplinary action research*. *American journal of community psychology*, 38(1), pp.63-77.

Van Kerkhoff, L.E. and Lebel, L., 2015. Coproductive capacities: rethinking science-governance relations in a diverse world. *Ecology and Society*, 20(1).

Zhang, J., Zou, W. and Kumaraswamy, M. (2015), "Developing public-private people partnership (4P) for post-disaster infrastructure procurement", *International Journal of Disaster Resilience in the Built Environment*, Vol. 6 No. 4, pp. 468-484. <https://doi.org/10.1108/IJDRBE-06-2014-0040>