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Participatory Planning for the Drafting of a Regional Law on the Bioeconomy

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Abstract: In an increasingly complex global economic scenario, sustainability represents a fundamental compass aimed to guide actions of institutions and individuals. A nondissipative use of Earth's resources is feasible through a common effort that reconsiders the actual development system according to the key principles of the bioeconomy. It is vital to start from local contexts to reach the global dimension by exploiting the opportunities available in each territory. Starting from these assumptions, the participatory process activated in the Apulia region has represented the first step towards an intervention strategy in the panorama of the bioeconomy, and has made it possible to increase the awareness of a development based on the adoption of bioeconomy models and, therefore, circular economy ones through an effective inclusion process. A process has given rise to a project allowing all involved actors to reflect on the double economy–environment system, to share good practices and promote the adoption of lifestyles and consumption styles more compatible with the principles of the bioeconomy and to elaborate a proposal for a participatory regional law for the bioeconomy in the Apulia region as an expression of the collaboration between different bodies and institutions (universities, Confindustria and the council of the Puglia region).

Keywords: bioeconomy; sustainable development; 2030 Agenda; natural resources; participation

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1. Introduction

In line with the communication to the European parliament, the council, the European economic and social committee and the committee of the regions of 11 March 2020 [1], the European commission has defined a new action plan for the circular economy, entitled "For a cleaner and more competitive Europe", establishing a future-oriented program to reach the cited objective in cocreation with different actors [2]. Furthermore, the plan aims to accelerate the profound changes required by the European Green Deal, based on actions to the circular economy implemented since 2015. This plan aims to rationalize the regulatory framework, making it suitable for a sustainable future, ensuring the optimization of new opportunities arising from the transition and minimizing the burden on people and businesses. The same plan embeds a series of interconnected initiatives designed to establish a strategic framework for sustainable products, services and business models with the goal to help transform consumption patterns so as to avoid, in the first place, waste generation. In fact, the new regulatory framework has the potential to allow for the achievement of the objectives set out by the new directives on waste prevention, recycling and reduction in landfill disposal. At the same time, the same framework needs to support the transition to the circular economy by removing those administrative and

procedural criticalities that too often hinder and slow down its development, aiming to overcome the strong territorial inhomogeneities currently existing in the management of the waste cycle in Italy as a whole, as well as through the construction of necessary systems and infrastructures. As a consequence, it appears necessary that the process of drafting legislative decrees be accompanied by extensive discussions with stakeholders and that the deadline set for the transposition of the new directives into national law is respected. In this scenario, the bioeconomy [3–6] represents the answer to a large part of the current global challenges, from global warming to all the issues related to climate change, to smart agriculture limiting the adoption of pesticides. The bioeconomy [7–10], including the mentioned principles of the circular economy, fosters the adoption of a model of sustainable development, not only devoted to mere profits and profitability, but also to social progress, considered the driving force for achieving the objectives of the 2015 Paris Agreement, as well as the United Nations 2030 Agenda for Sustainable Development [11–13]. By virtue of this, Europe, as well as Italy, recognizing its key role, and has strived to implementing a sound strategy for the bioeconomy. As far as Italy is concerned, in May 2019, the update of the "National Bioeconomy Strategy" [14–17] was presented, with the related implementation program in view of the new "European Bioeconomy Strategy", strongly emphasizing the need to orient all sectors of the bioeconomy towards circularity and environmental, economic and social sustainability.

As for Italy, the European Green Deal [18,19] plays an extraordinary role and constitutes a precious opportunity towards development along a path of ecological transition; this necessarily requires that Italy be able to define its own coherent strategic framework and develop actions to effectively increase and use the financial resources made available by the European plan. The start of the process for a National Green Deal constitutes an essential reference from the point of view of the transition to a circular economy. However, this project needs to be significantly strengthened both from the point of view of public and private investments and from the point of view of a more comprehensive and coherent reorientation of all public policies towards the ecological transition and the circular economy, all within the framework of the European Green Deal. The different regions can play a decisive strategic role in the transition to a circular economy, as they have the necessary regulatory skills and responsibilities, in addition to the knowledge and experience on the different territories, capable of defining realistic objectives, to be pursued on a local territorial and differentiated scale, as "the regions are large enough to make a difference and small enough to make it happen". The OECD [12], through "The Bioeconomy to 2030: designing a policy agenda", defines a true industrial revolution capable of innovating mature sectors, such as those of raw materials, waste, energy production and of guaranteeing long-term environmental, economic and social sustainability within the global economic system. Taking into account the territorial processes included in the annual "Program for the participation of the Puglia Region pursuant to LR N.28/2017—Law on Participation" [20], into which the Manifesto for the Bioeconomy in Puglia (MaBiP) project [21] was inserted, it is vital to highlight, with regard to the issue at stake, the importance of participation from all stakeholders vital to combine innovation and environmental protection. Change is a collective action: the public expresses the needs and governs; the private sector provides skills and financial resources. Without collaboration and partnership, sustainability cannot be achieved (Goal 17, Agenda 2030) [11]. In order for the bioeconomy to win the challenge of "re-integrating economy, society and the environment", it is not enough to simply use biomass for industrial applications or to use renewable raw materials instead of fossil ones. It cannot all be considered a mere question of integrating biological knowledge into existing technology; to overcome the described challenge, the transition must also take place at a social level, stimulating awareness and dialogue, as well as supporting innovation in social structures in order to promote more conscious and aware behaviours.

It is, moreover, fundamental to enhance knowledge related to what is consumed (in particular food products and related processes) to favour the improvement of people's health and lifestyle, thus, stimulating a demand that pushes companies towards sustain-

able innovation. This process of transition in the economy and society, in order to truly benefit from it, requires a systemic approach according to which citizens must become the real protagonists of the social transformation that the bioeconomy can produce [9,10]. Social dialogue and an understanding of the challenges and opportunities related to the bioeconomy both play a decisive role in the level of demand for new products and services, and in the innovations and technological developments associated with them. Activities such as public procurement should be placed in the context of participatory processes, so as to foster involvement, understanding and the potential for replication. Consequently, the bioeconomy also represents a challenging playground for reconnecting with the environment, economy and society, generating economic value together with new social values and a new cultural approach [22–24].

This takes renewed skills in building consensus for both the public and private sectors, and the opening of a social dialogue.

The challenge at stake requires the following:

- For private economic actors to provide business models that involve customers, workers, users and subjects interested in their activities (primarily citizens) in a common vision of sustainability; while new products, services and investments connected to the bioeconomy are created, new economic value, employment, relationships and interactions are created, thus, making it clear that the bioeconomy is able to meet social needs and improve the wellbeing of the community by also enhancing individual participation and involvement;
- On a public level, the widespread adoption of both a participatory approach to local development and of a new concept of territory, understood as a localized set of tangible and intangible assets and relationships between different public and private entities present in each region. Being aware of the territorial distribution of renewable resources, of the strengths and weaknesses, of the needs and of the barriers to development allows to recompose fragmented skills and knowledge into new stocks and flows of productive knowledge, forming an innovation matrix for the bioeconomy and contributing to creating a new territorial identity.

Starting from the above-described issues, the present contribution aims at deepening the analysis of the participatory process that led to the involvement, in a context such as the south of Italy, of various actors in sharing good practices in line with the principles of the bioeconomy; the final objective, through the same process that is detailed in the following paragraphs, consists of elaborating a proposal for a participatory regional law for the bioeconomy in the Apulia region.

2. Materials and Methods

2.1. Preliminary Considerations and Scenario Analysis: The "MaBiP" Project

As part of the public notice for the selection of participatory processes to be admitted to provide regional support within the annual program of participation of the Puglia region, pursuant to LR N.28/2017—Law on Participation-AD n.28 of 21.11.2018 [20]—the University Centre of Excellence for Sustainability of the University of Bari Aldo Moro, in partnership with the University Centre of Excellence for Innovation and Creativity and Confindustria Puglia presented the "Manifesto for the Bioeconomy in Puglia (MaBiP)" proposal [21,25], the winning result with resolution no. 238 of 16 December 2019 of the head of the special institutional communication structure. The MaBiP project was conceived as a continuation of the subscription on 20 March 2019 of the Manifesto for the Bioeconomy in Puglia by the presidency of the Puglia region, research bodies of the territory (including the University of Bari) and Confindustria, thus, involving all business world, a partnership extended to all stakeholders interested in what the OECD [12], through "The Bioeconomy to 2030: designing a policy agenda", defines a true industrial revolution capable of innovating mature sectors, such as raw materials, waste and energy, ensuring long-term environmental, economic and social sustainability within the economic system. As to the analysis conducted up to this point, it is fundamental, in order to increase

awareness of the importance to promote the definition of a new economic model based on the principles of the bioeconomy, especially in industrial areas that have a strong impact on the territory, to favour the promotion, transition, creation and adoption of bioeconomy models, and, therefore, the circular economy. All regional stakeholders need to be involved at various levels in order to: facilitate connection and dialogue between stakeholders belonging to different value chains; promote and disseminate the principles of the bioeconomy at all levels; frame the regional context in the field of bioeconomy for subsequent mapping; draw up a roadmap for the strategic development of the bioeconomy; promote the drafting of a regional law proposal on the bioeconomy [26].

2.2. Phases of the Process and Activities Carried Out

The entire participation process consisted of four main steps and took a total of six months, from June to December 2020. The activities of the participatory process were carried out in a mixed way: in presence and remotely. Despite the obvious difficulties in carrying out most of the activities foreseen by the project in person, due to the concomitant pandemic caused by the SARS-CoV-2 virus [27], the technological and multimedia support and the various video-calling applications managed to ensure that all the activities foreseen from the project could be realized. The expected methodology for reaching the objectives was to achieve learning content, the effectiveness of the interventions with an integrated assessment system and the active and participatory assessment of learning. The laboratories were carried out with a small group mode with support from expert facilitators.

The working method used was design thinking (DT). The DT approach is characterized by tools and methodologies that support the generation of ideas, such as the "How Might We", in which prototyping plays a very important role. The method is not limited to a mere definition of the steps aimed at conceiving an idea, a solution, but also allows for the work team to reach its realization by drafting a prototype (Table 1).

Table 1. Design thinking.

Steps	Activities	Thematic Working Groups N.04	Target Categories
1° Exploration	OBSERVE, UNDERSTAND, DEFINE (Open innovation design thinking) Set a track for the interview • The person (target category) • The map PLENARY Each group, through its representative, talks about the group's output	What they do: Each working group designs its own interview track using target categories. One facilitator for each group.	Citizens Enterprises Third sector Public institutions
2° Definition	DESIGNING • Identifying the opportunities • Benchmarking with other ideas and experiences, similar and distant • Brainstorming on possible solutions PLENARY Each group, through its representative, tells the group's outputs	What they do: Benchmarking Brainstorming	
3° Ideation and creation	PROTOTYPE and TEST The question "How can we . . . " to answer to meet the needs of our target PLENARY Each group, through its representative, tells the group's outputs	What they do: Define the "How Might We" question (HMW) Each work group designs and manufactures at least 3 prototypes to solve needs. The prototype can be composed of any means (real drawing, software, web, etc.)	
4° Sharing and validation	TEST AND ORGANIZATIONAL CHANGE PLENARY Each group, through its representative, tells the group's outputs	What to do: They share the prototype in plenary Acquire feedback with a shared word file, with chat and with direct intervention OUTPUT: Each group produces a work report	

2.3. The Hackathon

The "Circular Economy Action" [28] Hackathon, a "rally call" to map the best practices of the bioeconomy in Apulia, has represented a positive example of an effective methodol-

ogy. It aimed at searching through different actions resulting from start-up or company initiatives, from associations or individual citizens, with the objective of narrating the practices capable of generating experiences of new production and consumption models. The process envisaged the following phases: a launch of call; registration on the platform; evaluation; identification of models and mapping of best practices; drafting and processing of documents.

Private and public actors were not mere spectators of the process but, indeed, protagonists within the entire project through moments of discussion, sharing of ideas and good practices already present in the region, with a particular view of innovation and highlighting the essential dimensions of circularity. The training activity, developed in a modular way for a total of 72 h, had the purpose of providing participants with in-depth knowledge related to the bioeconomy with the ultimate goal of activating specialized offices of Confindustria dedicated to the bioeconomy. The awarded operators were granted a free participation in the training course in management systems for sustainable development in the communities, a specialized module of the ISO 37101:2019 standard [29]. Thirty-four organizations participated in the "Circular Economy Action" [28] Hackathon award ceremony; despite the restrictions imposed by the COVID-19 pandemic situation [27], over three hundred people could participate and fruitfully share the experience.

2.4. Participating Laboratories

The workshops (4), led by expert facilitators, were delivered online through webinars; approximately two hundred people actively took part in them. In the course of the four participatory workshops, four themes considered as fundamental were addressed:

- Circularity, waste and climate change; circularity, food, health and lifestyles; circularity and new business models; circularity and the sustainable development of the territory;
- Each of the workshops, lasting four hours, included the following moments:
    1. Opening plenary, during which the organizers presented the methodology to conduct each workshop;
    2. Working groups divided by categories around the target themes in four virtual rooms, one for each of the themes in which the bioeconomy in Apulia had declined;
    3. Output: in this phase, each working group was asked to draw up a report embedding the main results that emerged;
    4. Closing plenary, during which each of the four working groups gave feedback on what was discussed and defined within the same working group.

    The detailed reports for each laboratory were uploaded to the Puglia Partecipa platform.

3. Results

3.1. Results of the Participating Laboratories

The participants in the described workshops totalled 202; out of these, 52% were female and had an average age of forty-six. As shown in Figure 1, more than 50% of the participants were between thirty-six and fifty-five years old. Rather marginal was the presence of young people under the age of twenty-five (only 1.2%). However, the youth segment of the Apulian population was still represented, taking into account that almost 18% of the participants were under the age of thirty-five.

Although the participants born in the province of Bari constituted 44% of the total participants, the data collected showed a representativeness of all the Apulian provinces (Figure 2).

The educational level of participants in the workshops was particularly high (Figure 3), with 86% having at least a bachelor's degree; it is worth noting the data related to those who declared to have the title of PhD (22%). Only 14% of participants declared that they held a high school diploma.

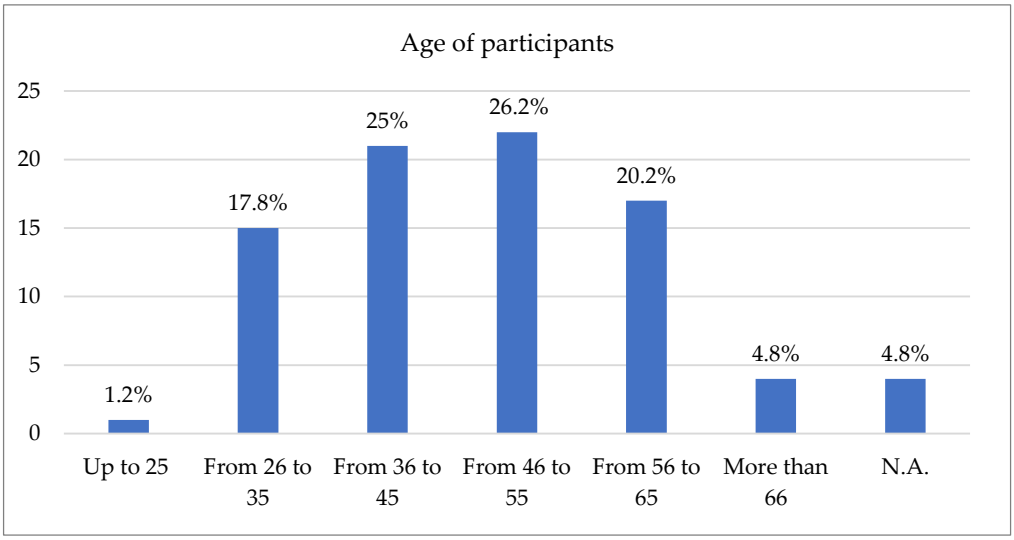

Figure 1. Age of participants.

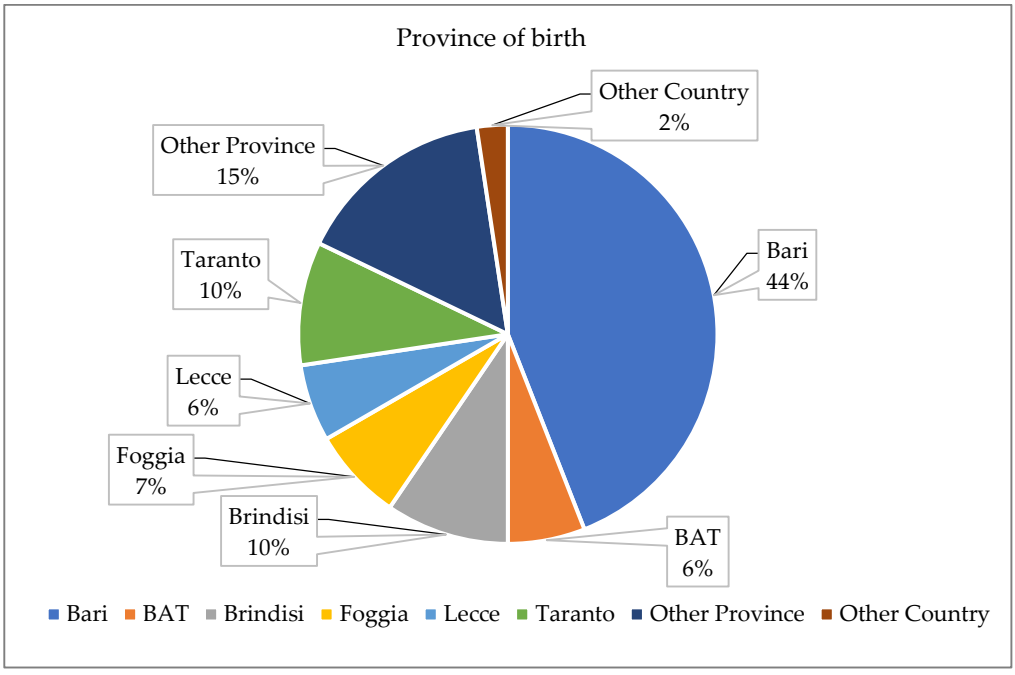

Figure 2. Province of birth.

Almost 36% of those enrolled in the participatory process took part in all four workshops included in the course. Approximately one point higher was the percentage of those who enrolled in a single laboratory. In total, 17.8% of the participants enrolled in two laboratories, and 9.5% in three laboratories (Figure 4).

Regarding the preference for the themes of each workshop (Figure 5), the recorded data showed that the percentage of those who enrolled in the workshop "Circularity and sustainable development" was slightly higher (29%). However, there was no particularly high percentage difference between this last topic and that of the other laboratories, namely, "Circularity, food, health and lifestyles", "Circularity, waste and climate change" (both at 24%) and "Circularity and new business models" (23%).

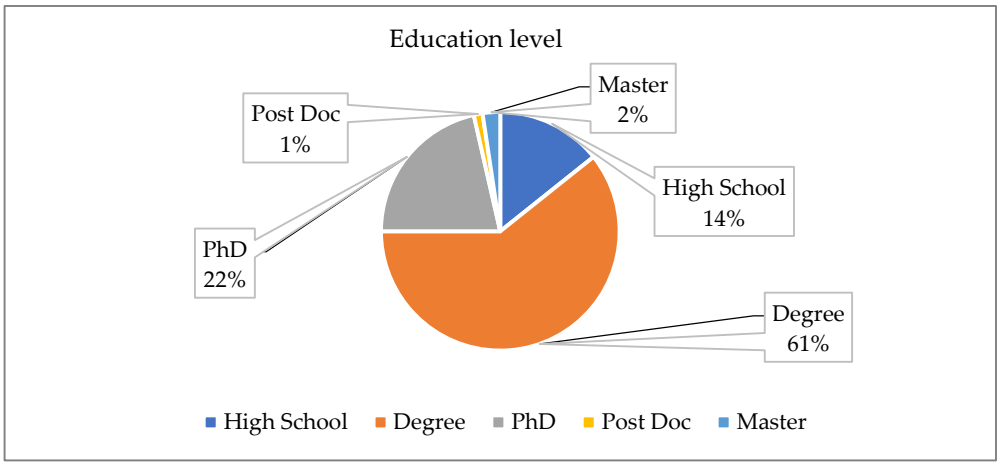

Figure 3. Education level.

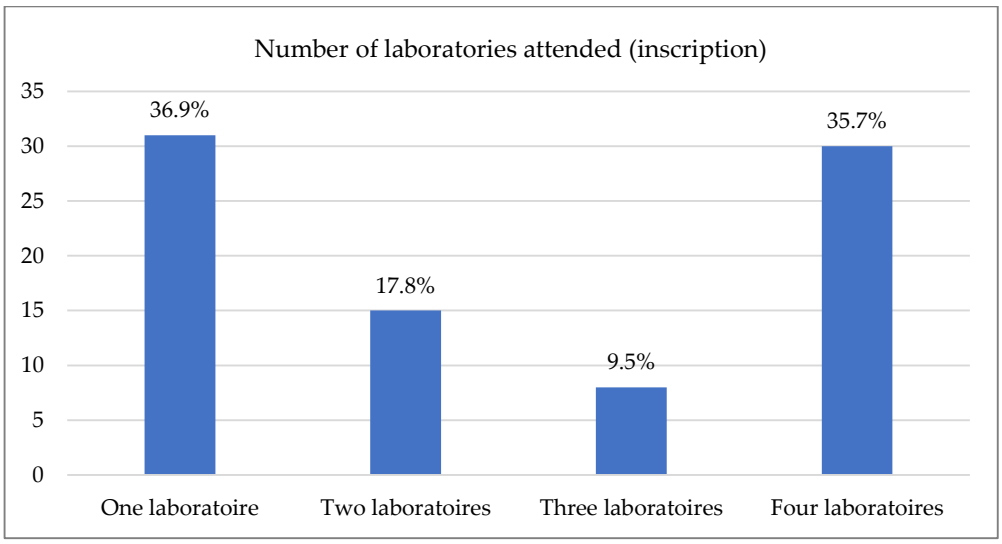

Figure 4. Number of laboratories.

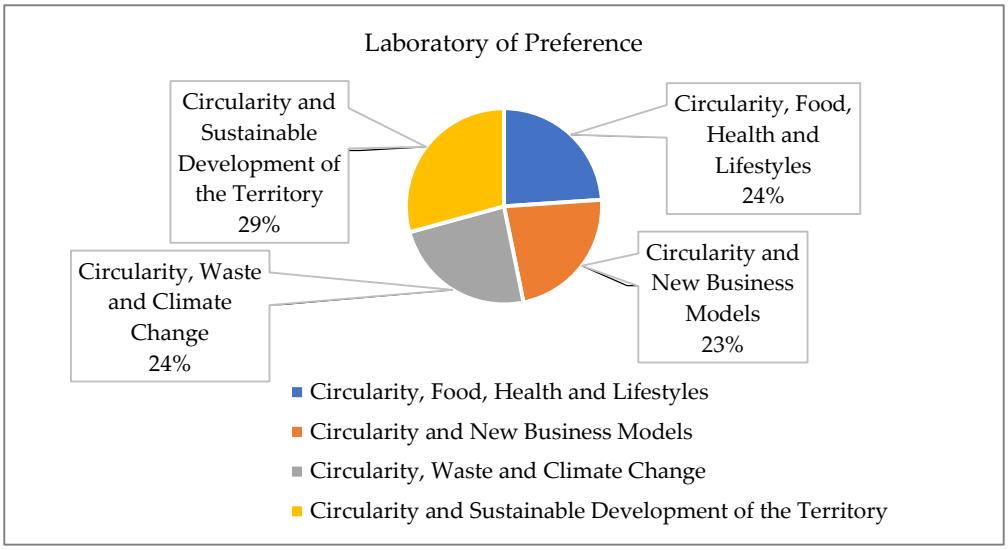

Figure 5. Laboratory of preference.

Participants in the workshops reflected a clear expression of the great variety of organizational structures present in the Apulia region. In addition to the 33% composed

of citizens involved in the process, the rest was represented by the following: almost 24% came from the business world, 13.2% represented the world of associations and 10.7% belonged to public research bodies (in particular the ENEA [17] and CNR). Furthermore, albeit in a more limited percentage, the presence of cooperatives with a percentage of 5.9% and public bodies, at 2.4% (representing the Environment Council of the Municipality of Bari) was noted. On the other hand, 1.2% belonged to voluntary organizations.

3.2. Results of the Hackathon

As above-described, after the Hackathon, the award ceremony was attended by 34 organizations from the region, distributed at a prevalence of those based in Bari or the cities and towns of the same province (53%), followed in percentage by the organizations located in Taranto (17%) and Lecce (16%). Less than 10 was the percentage of the organizations coming from Foggia (9%) and from Brindisi and BAT (3% in both cases) (Figure 6).

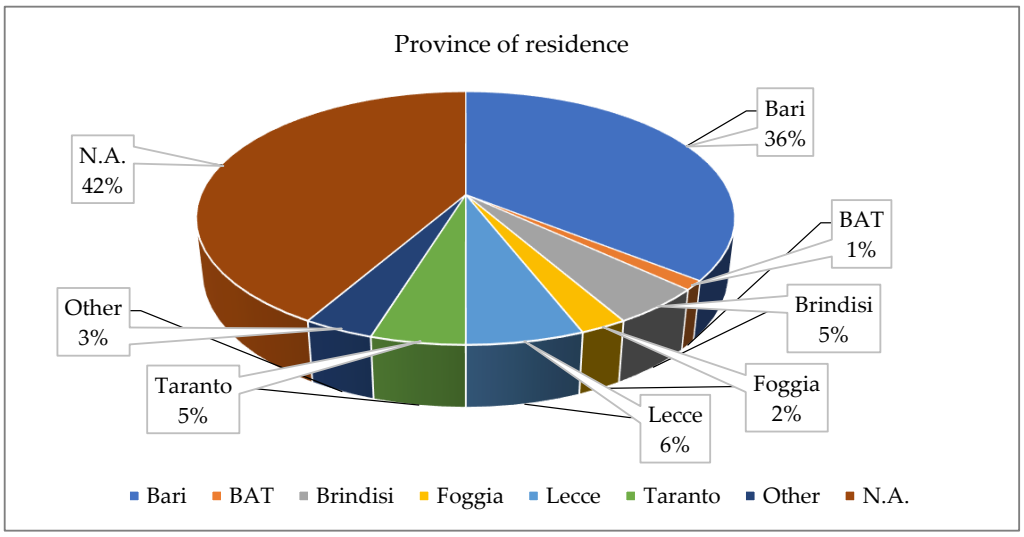

Figure 6. Province of residence.

The legal form of the organizations that took part in the Hackathon also varied (Figure 7). Companies with limited liability were obviously the most common legal forms among the participants, with a percentage that stood at 41%. Percentages greater than or equal to 15% were reported for cooperative enterprises (17%) or for associations (15%). Within the record "Other", including 18% of participants, social promotion associations, general partnerships and sole proprietorships in less significant percentages were included. In total, 9% of Hackathon participants declared they represented a natural person.

The data collected related to the sectors in which the organizations operated showed the great vivacity of the Apulia region in the field of the bioeconomy. The most represented sector was that of "Recovery, reuse and recycling", with a percentage of participating organizations equal to 32%. This was followed by the sectors of "Culture, Education and Information", with a percentage of organizations equal to 23%, that of "Technologies and solutions for the environment and the territory", with a percentage of 15%, and that of companies in the "Agrifood sector", with a percentage of 12%. Less than 10% were organizations belonging to sectors such as "Fashion and design" and "Food and fight against food waste", both at 6%, and "Sustainable mobility" and "Research and innovation", with a percentage of 3%.

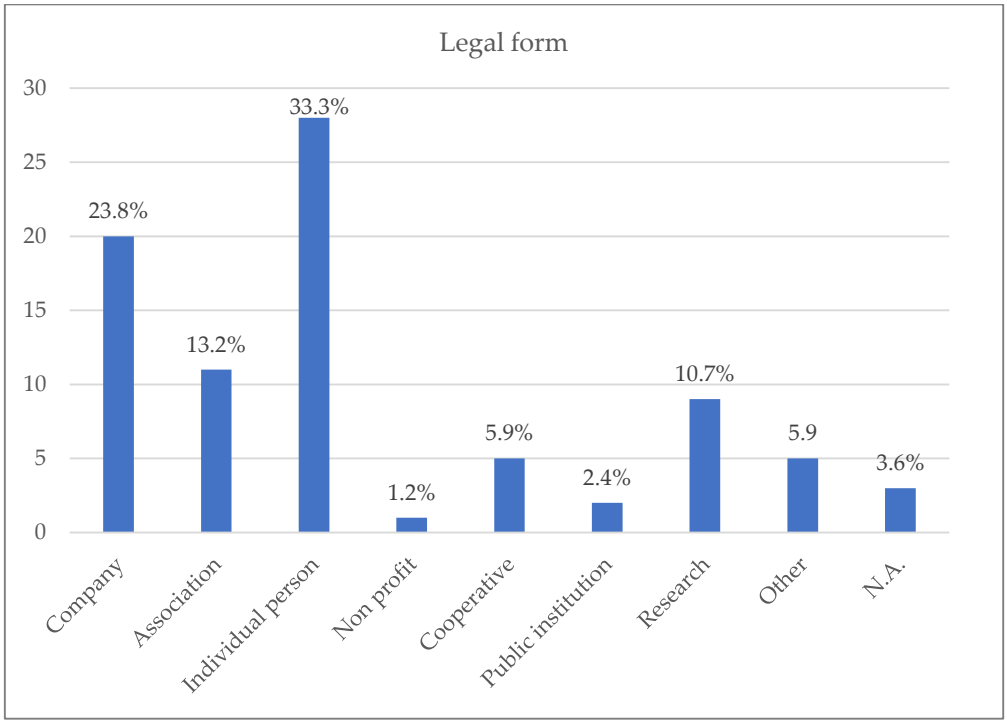

Figure 7. Legal forms of participants.

3.3. Outcomes of the Participatory Process

With regard to the outcomes of the participatory process, it emerged that during the participated workshops, each of the participants in the different working groups, divided into the cited four thematic areas, highlighted the requests/needs that the regional law on bioeconomy should possess, as summarized in Table 2.

The "Circularity, Waste and Climate Change" group carried out a reflection on how it would be possible to overcome the culture of waste, highlighting the need to define a new economic model capable of combining both the health of the environment and that of citizens, to focus on renewable energy and on the circularity of production, especially in the agrifood sector, one of the strengths of the Apulian economic system.

The "Circularity, Food, Health and Lifestyles" group sought to reflect on the promotion of a culture capable of generating new lifestyles aimed at improving the health and wellbeing of citizens, as well as through the enhancement of small production chains.

The "Circularity and New Business Models" group reflected on the need to encourage the transition to a new model of production and sustainable management of businesses, enhancing their role in reaching an effective growth of the territory.

The "Circularity and Sustainable Development of the Territory" group wanted to reflect on the need to promote a widespread and shared awareness of sustainable development, highlighting the complexity of the issue and the need to address it in a multidimensional and multidisciplinary way.

The presentation of the results of the project with the delivery of the participatory proposal document, embedding the law proposal, which took place on 27 November 2020 [11], during the final workshop. A proposal for a participatory regional law on the bioeconomy that was presented during the final meeting was the result of a development vision that should permeate the regional political strategy in order to fully achieve all the described objectives.

Table 2. Results of participating laboratories.

Target	Thematic Groups			
	Circularity, Waste and Climate Change	Circularity, Food, Health and Lifestyles	Circularity and New Business Models	Circularity and Sustainable Development of the Territory
Citizens	Enhancement through reward systems of recycling and reuse practices; greater control in the management of waste services; widespread training and involvement of citizens as a vehicle for the improvement of products and processes.	Introduction of control mechanisms that can limit food waste and other unsustainable behaviours; definition and implementation of information and training courses also in view of the recovery of the sense of active and sustainable citizenship.	Involvement and information of citizens for the definition of sustainability problems and solutions, as well as through the design of apps for measuring the impacts of behaviour; implementation of training courses for schools of all types and levels in the field of circular economy.	Promotion of the use of participation tools (consultations, forums and civic networks) focusing on the bioeconomy by recovering the sense of active citizenship and belonging to the community; providing incentives, including economic ones, that favour a change in mentality and the adoption of new lifestyles; implementation of information and training courses on the bioeconomy from primary school.
Companies	Improvement in research and technological developments in the sector, as well as through specific funding and the regeneration of regional production districts; economic support for the development of MOCAs (mitigation of obsolescence cost analyses) for a reduction in production costs; creation of supply chains for the recovery and enhancement of waste and reduction in energy use, favouring a transition in line with the Green Deal.	Improvement in research and developments in the sector, with a particular focus on packaging; recovery of the ethical sense and CSR, applying the logic of fair trade to indigenous productions and limiting the use of natural capital as much as possible; promoting dialogue between small local businesses and large retailers in order to promote the visibility of the former by making them protagonists of the regional economy; attention to waste reduction by promoting the redistribution of leftovers and reusable waste.	Improvement in research and developments in the sector to anticipate the market; promoting corporate social responsibility and increasing the social return on investment (SROI) by collaborating with local associations and creating synergy with the nonprofit sector; to provide the presence of a resource manager in each company.	Improvement in research and technological and managerial innovations for the definition of a new economic model; to encourage the creation of business networks that collaborate with universities and research institutions; promotion of tax incentives for companies that provide for the presence of green jobs (reconversion such as reskilling, upskilling and/or new hires); introduction of ad hoc managerial figures, for example, sustainability managers; promoting dialogue between small and large companies, including through the creation of environmental consultancy services by the business confederations in support of small- and medium-sized enterprises.
Third sector	Promotion of the culture of sustainable consumption through information and communication campaigns, with particular attention paid to the issue of reducing plastics and waste disposed.	Creation of networks and associations between organizations and associations of the third sector and to promote greater awareness of citizens regarding the logic of the economy and the market; to support the fight against food waste and to promote sharing economy initiatives.	Promotion of dialogue between businesses and the third sector so that there is a mutual and territorial improvement; implementation of information, training and education courses for schools and citizens.	Improvement in the relationship and communication between citizens and institutions by providing greater opportunities for participation and the creation of bodies that favour and guarantee the above.
Public institutions	Investment in research and innovation, as well as by financing the creation of innovative start-ups and encouraging the intervention of business accelerators that make large investments possible, and the creation of "shared technology halls" in order to allow investments that would otherwise be impractical; adjustment in the reference regulatory framework in order to guarantee a "new life" to the greatest possible number of waste.	Establishment of reward systems rather than sanctions to promote waste disposal, the use of renewable resources, improvement in CO_2 compensation mechanisms; creation, involvement and enhancement of organic and local production chains, especially if attentive to reuse and recycling; promotion of information and training courses on the issues in question that also involve schools of all levels; identification of certifiable rating protocols on sustainable production models, identifiable with a logo that can be used on the labels.	Encouraging the forms and practices of a sharing economy; financial support for businesses to become sustainable and aim for continuous improvements; facilitation from a regulatory point of view of reuse and recycling by small, medium and large enterprises, simplifying the bureaucracy as much as possible.	Establishment of a control room to connect the human resources of companies, universities and research bodies to involve different skills in the management of circularity to create a new regulatory framework for sustainability; definition and calling of ad hoc calls to promote and encourage the green conversion of businesses; for the conception of tax relief tools (to de-tax citizens and businesses that implement actions with reduced environmental impacts).

In order to achieve a circular and sustainable bioeconomy, it is vital that each political and strategic structure absorbs its principles and declines them in its own activities. The joint commitment of politics and citizenship prompted to elaborate, as part of the "Manifesto for the Bioeconomy" project in Apulia (MaBiP) [21], the following recommendations to the presidency of the Puglia region:

- The creation of a regional observatory on the bioeconomy under the guidance of the presidency of the Puglia region, through the participation office, with the objective to take care of relations and dialogue with the various departments and sectors involved in bioeconomy processes;

- Hinge the aforementioned observatory within the structures of the presidency and, in particular, of the participation office;
- The creation of a dedicated office on the bioeconomy to support companies;
- The activation of a participatory process that leads to the definition of a regional strategy for the bioeconomy that integrates with the regional forum for sustainable development and with the regional strategy for sustainable development;
- Promote the drafting of a roadmap that identifies regional models and best practices in the field of the bioeconomy.

Starting from the principles of evidence-based policy and participation, the proposed law aims at defining the regulatory principles for the establishment of a place of synergy and institutional capacity capable of facilitating the sustainable development of Apulia, structuring the collaboration between stakeholders. The participatory process produced the draft text entitled "Participatory Proposal Document", containing the proposal for a participatory regional law on the bioeconomy.

4. Conclusions

Through the described participatory process, it was possible to initiate a path of shared reflection on the double economy–environment system, with related intersections and implications. Economic systems always require positive growth rates and shun both stabilization and immobility; the environment, instead, requires balance and stability. Since there was no spontaneous convergence between the needs of the two systems, the real issue at stake was which of the two should give way to the other, whereas economy and nature should recognize the need for common subsistence and the necessary balance between themselves. A sound answer must be sought in the different degrees of modifiability in order to reach the objective to create an equilibrium in which both experience life and good health. The economy, as a human product, is, by its nature, modifiable through cultural, social, technological and design innovations, including possible changes in lifestyles to such an extent that it is possible to rely on an elasticity factor that is not only economic–technological, but also cultural–behavioural.

As to the case of the environment, it is worth noting that it is different, as natural balances have their own rules (including limits in the carrying capacity of each system) that cannot be modified or neglected by human activities. The natural equilibrium can "endure" up to a certain point, and the permitted threshold level cannot be shifted. There is no elasticity in natural balances with respect to human actions. This implies having to put aside prejudices, interpretations and absolute values, and devote time and energy to the critical and positive rediscovery of the distinctive characteristics that animate the two systems. For these reasons, recognizing the need and the potential that participation can have in the dynamics of sustainability, also in light of the contents of the United Nations 2030 Agenda (in particular Goals 4, 16 and 17) [11], the described process aimed at being innovative and multidisciplinary in order to promote the definition and enhancement of the economic and cultural model of the bioeconomy that was launched.

The participatory process retraced a creative path and a local, collective and inclusive reflection in the different contexts that experienced the same reflection. The "map" created was at the same time a participatory census, a business plan, a self-portrait and a collective biography. As a consequence, a participatory, innovative, inclusive and multidisciplinary methodological process was launched, designed to build the participation path around the four previously analysed themes.

This approach made it possible to favour the identification and sharing of development policies at a territorial level and disseminate success stories that constitute a fundamental example of how to activate bioeconomy processes, starting from existing good practices and outlining new horizons and projects that could contribute to the sustainable development of both the territory of belonging and of the entire regional area, respecting the vocations and specificities of the territories themselves.

The participated events and workshops involved companies, organizations, institutions and representative associations of all the six Apulian provinces, starting from the analysis of the different elements that contributed to the cited process.

The proposed participatory process promoted throughout the Apulian territory [26] the engagement of the main stakeholders and privileged observers in a path with particularly innovative effects; the result of the identification and sharing of new local production and consumption models strongly oriented towards sustainability in order to promote a business model that puts different and complementary sectors of the economy into a mutual dialogue, also in the context of urban policies. Not surprisingly, there was a growing consensus on the idea that to implement sustainable development paths, learning through experience and community-centred approaches is necessary.

By focusing on participation, it was possible to encourage the promotion and identification of effective and replicable bioeconomy models in the entrepreneurial and cooperative institutions that took part in the project, and in view of the setting of a regional strategic development model linked to the bioeconomy.

From an environmental point of view, the bioeconomy contributes both opportunities and challenges. Opportunities are connected to the gradual transition in the context of production processes, from the use of nonrenewable resources to renewable ones, so as to limit the environmental pressure on ecosystems and enhance their value for the purpose of their conservation, not merely considering their intrinsic value or the connection with ecosystem services that are "natural" solutions to combat climate change and hydrogeological risk, but also as a source of relevant services for the whole economy. Furthermore, the bioeconomy implies the possibility of reducing dependence on resources scarcely available in Italy. The strengthening of production activities deriving from renewable sources holds the potential to facilitate waste management, as these sources can be more easily assimilated.

However, the bioeconomy can also amplify a series of challenges as well as highlight the numerous examples of unsustainable management for the environment and human health, particularly in the food and fish industries. Furthermore, it is evident that it is often not necessary to increase the production of raw materials, but rather to increase their added value to society, improving the quality of products (e.g., in agriculture) and processes in response to the requirements of Objective 12 of the 2030 Agenda [11].

As a consequence, it is vital to proceed towards a sustainable economic system that assumes economic growth limited conditionally to the sustainability of material resources and leading to the valorisation of the new economic and cultural model of the bioeconomy in Apulia [26].

This "new" economy, despite being an interconnected whole on a conceptual level, can be divided into two parts. The first, measurable in material and energetic terms, is necessarily limited in its expansion within the natural carrying capacity, which is constant. The second component, on the other hand, being immaterial, keeps its virtually "unlimited" peculiarity. It is based on information in the availability of services in the required times and methods, as well as in the quality, in particular of relationships, both on a global level and on a territorial one.

It necessarily requires institutional and regulatory interventions with respect to the current market. Accelerating the transition towards the bioeconomy is fundamental to increase not only the competitiveness of regional industry, research and training to strengthen the position Apulia deserves in the national and international context, but above all to safeguard the environmental and sociocultural heritage of the territories. Through the dynamics of debate and comparison, the participatory process aimed at simplifying relations between regional actors on the subject of the bioeconomy, favouring transversal connections and allowing for the dissemination and use of good practices and ready-to-use technologies on the territory in order to reach a sound exploitation of the resources that the Apulian context offers.

The described participatory process enabled us to obtain a strategic vision on how to intervene in the main macroareas of the bioeconomy in Apulia (the environment, economic

development and agrifood chain) with an approach devoted to effective sustainability and based on a circular logic, one that does not subtract resources from the territory, but maximizes the opportunities for reuse through technological innovation.

The fundamental objective is to generate a change in the mindset and generate a value of all the actors involved, from companies to institutions to individual citizens to such an extent that it is possible, through the participatory process, to implement a shared strategy of the development of the territory not connected to profit but, instead, to the protection of the Apulian context from an environmental and social point of view. A real industrial revolution that, from below, contribution by contribution, had as its objective the drafting of a law on the bioeconomy through a participatory process [13].

As a result, following the participatory process on 20th May at the headquarters of the Puglia regional council, the draft law "Provisions on the Bioeconomy" was presented; a proposal, originating from the described process carried out by the Centres of Excellence for Sustainability of the University of Bari Aldo Moro, in collaboration with Confindustria Puglia, had the aim of recognizing, for the Apulia region, the importance of fostering a territorial development inspired by the principles of the bioeconomy, in line with the objectives of the 2030 Agenda and the NRRP (National Recovery and Resilience Plan) [11].

Europe and Italy, recognizing their key roles, have proceeded to implement a strategy for the bioeconomy. However, being the achievement of global challenges necessarily based on the active involvement of territories and strategic levers for a sustainable revolution, it is fundamental to commit to create an alliance between institutions, research and the industry. A partnership extended to all stakeholders interested in what the OECD, "The Bioeconomy to 2030: designing a policy agenda" [11], defines a true industrial revolution capable of innovating mature sectors such as raw materials, waste, energy ensuring long-term environmental, economic and social sustainability within the economic system.

A participatory process linked to the bioeconomy [30–32], in view of its enormous innovative potential, can be a response to most of the regional and global challenges to be faced in the coming years, from environmental remediation to the problems of climate change, to the invention of new medicines, to the need to feed a world in which food needs are predicted increase by 70% between now and 2050, reconciling the economy, the environment and society.

The "transversal" nature of the bioeconomy offers a unique opportunity to face, in a comprehensive and systemic way, the mentioned cogent social challenges [33,34], as envisaged by the EU The communication "Innovation for sustainable growth: a Bioeconomy for Europe" [35,36].

In the described scenario, it is of particular interest to carry on a reflection on how bioeconomy intertwines with EU policies related to actual cogent challenges.

Among them, it is important to mention climate change; as a matter of fact, the council and the European Parliament set specific goals as to the climate for the near future. In line with these goals, the fit for 55% relates to the objective of cutting down net greenhouse gas emissions by at least 55% by 2030. As a consequence, the fit for the 55% package contains a whole set of legislative proposals to ensure that EU legislation are in line with the cited 2030 reduction goal.

As the described package deals with a comprehensive series of sectors, from agriculture to industry and the energy sector, in the framework of the present contribution, it is of particular relevance, as it addresses all aspects at the core of bioeconomy and, moreover, represents a crucial witness of how participation (at the core of this article) plays a vital role in reaching a sound and effective legislation at different levels, including the regional one [37].

Furthermore, the actual global scenario has been deeply affected by the Russia–Ukraine conflict; consequent challenges relate, as easily understood, to the supplies of gas being weaponised from Russia. The manipulation of energy markets has led to skyrocketing energy prices in the EU. In addition, unpredictable events and connected risks of the

discontinuation or even the interruption of supply holds the potential to create additional pressure on energy markets.

The alternative option proposed by the renewable energy technology field has been strongly supported by means of a series of recent policies in other regions, leading to a weak outlook on the competitiveness of the European renewable energy technology industries and value chains.

In the described context, it is vital to address the exposure of consumers and businesses within the EU to increasing and volatile energy prices; this objective could be achieved by means of fostering supplies from renewable sources, thus, as well, increasing the security of the supply itself.

As a matter of fact, regulation 2022/2577 aims at accelerating the deployment of renewable energy sources through the adoption of ad hoc urgent measures mostly effective in the short term. The time frame is connected to the importance of allowing member states to adopt these same measures rapidly and to ease the permit-granting process applicable to renewable energy projects without requiring burdensome changes to their national procedures and legal systems, and ensuring a positive acceleration of the deployment of renewables in the short term. This reflects the important role that renewable energy can play in the decarbonisation of the European Union's energy system, by offering immediate solutions to replace fossil-fuel-based energy and by addressing the aggravated situation in the market [38].

The issue of sustainability is, of course, a huge challenge; it is difficult to promote sustainability, as it implies a broad vision, a strong determination and a great balance. These three characteristics of vision, determination and balance are necessary, and the open challenges appear epochal and require deeper, faster and more ambitious responses and integrated solutions, to initiate the social and economic transformation necessary to achieve the Sustainable Development Goals (SDGs) of the 2030 Agenda [11]. The present contribution, through the described process, carried out a comprehensive analysis of the participatory process that led to the development of a proposal for a participatory regional law for the bioeconomy in the Apulia region through the involvement, in a context such as the south of Italy, of various actors in sharing reflections and good practices. The outlined path represents an important case study both in the local described context and with a broader perspective.

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