BioSTEP

Promoting stakeholder engagement and public awareness
for a participative governance of the European bioeconomy

Proceedings of the living lab activities in the Veneto region of Italy

Phase I: November 2016 – February 2017

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KEY MESSAGES

This document summarises the discussions, outcomes and findings of the first phase of BioSTEP's living lab activities that took place between November 2016 and February 2017 in the Veneto region of Italy. During this first phase, participants in the living lab discussed objectives and concrete ideas for the long-term development of the regional bioeconomy. The following key messages emerged from the discussions:

- A primary objective should be the creation of a regional network of bioeconomy actors. Such a network would benefit from a) a common glossary of bioeconomy terms and b) the adoption of an ethical code that protects patents and original ideas and prevents opportunistic behaviours that do not benefit the network as a whole.
- A strong network requires the cultivation of relationships between actors, particularly with university researchers, in order to create dialogue between the production and scientific research spheres. The ideal outcome of this is to optimize resource use and promote synergistic effects to increase productivity (systems, biomaterials, crops).
- Economic actors should strive for the vertical and horizontal integration of the supply chain, with the aim of building certified chains from the producer to the consumer. The creation of integrated supply chains between farmers, primary processors, and industrial users (even if belonging to different sectors, but interested in different biomass components) should be encouraged. This would ensure the emergence of integrated regional bio-refineries with the greatest environmental and economic benefits for the local communities.
- Crop diversification and herds in the wild can make a difference in the local economy of a region, preventing the abandonment of fields and ensuring sustainable management of the soil. However, they require a strategy of long-term support and development.
- Hemp cultivation and processing was identified as a possible way to realize the potential of the bioeconomy in the Veneto region. Questions still remain, however, concerning the related costs and timescale of implementation. Moreover, the existing unclear regulatory framework emerged as one of the fundamental issues to be dealt with. Potential strategic areas of business development to focus on relating to hemp development are seed, shives, straw and food and therapeutic uses.
- Participants of the living lab concluded that they are ready to focus on policy issues that they wish to be discussed by policy makers, local administrators and especially the Regional Government in the context of Phase II of the Veneto living lab. The activities carried out in Phase I were a preparatory step for the subsequent meetings, which will contribute to defining potential policy measures.

Introduction: Living labs in the context of BioSTEP

As part of its stakeholder engagement activities, the BioSTEP project aimed to design and implement so-called "living labs" to test good practices at the regional level. A living lab is a kind of public-private (and people) partnership that promotes shared open innovation among stakeholders who work in the same geographical area. The living lab approach is an innovative concept, where citizens and end users take an active role in so-called user-driven processes of innovation that could range from new products/processes or services to concerted regional strategies or policies/legislative proposals. Living labs allow for an interactive communication amongst actors in order to find innovative solutions to common needs. In this way, living labs can help to connect research and academia, centres for local development, exponents of the manufacturing sector like Chambers of Commerce, business clusters, trade associations, business incubators and experts as well as municipalities and other (local) government representatives.[1]

Specifically, BioSTEP applied and tested tools for participative governance of the bioeconomy in two regional case studies in Italy (Veneto) and Bulgaria (Stara Zagora). In the context of the living labs, alternative programmes of measures and their socio-economic and environmental impacts have been discussed with relevant stakeholders. The outcomes of the discussions are supposed to support regions in formulating appropriate and effective programmes of measures to foster their regional bioeconomies.

The living lab activities in the Veneto region of Italy were split into two phases: the first phase focusing on concept mapping and the second phase focusing on the development and discussion of concrete (policy) measures to support the development of the bioecomomy in the Veneto region (see Table 1).

Table 1: Overview of the Veneto living lab activities

	Phase I			**Phase II**			
Stage	Brainstorming / Creative Phase	Concept Mapping	Nominal Group Technique	Strategic Community Planning	Pilot Action	Developing drafts of strategies/policies	Developing draft of agriculture policy strategy
Meeting	30.11.2016 **Developing bioeconomy in Veneto** Definition of objectives, roles and activities to be developed (Part I)	20.01.2017 **Developing bioeconomy in Veneto** Definition of objectives, roles and activities to be developed (Part II)	01.02.2017 **Developing bioeconomy in Veneto** Definition of objectives, roles and activities to be developed (Part III)	16.02.2017 **Developing bioeconomy in Veneto** Development of stakeholders' strategic action plan	10.05.2017 **Developing bioeconomy in Veneto** Debate among local policy actors and stakeholders	17.05.2017 **Developing policy strategies** Discussion between Regional Department for Research & Innovation and stakeholders	28.06.2017 **Agricultural policy strategies** Discussion among represent-tatives of the agricultural sector

The Veneto living lab activities connected technologies, skills, different perspectives from stakeholders and local policy actors and, most of all, collected data to be analyzed and evaluated. This document summarizes the outcomes of the first phase of the Veneto living lab. To encourage involvement and co-creation, stakeholders participated in focus groups and brainstorming sessions followed by concept mapping and nominal group techniques sessions and in-depth interviews. All of these moments were crucial to sharing knowledge amongst experts (entrepreneurs, farmers, NGO/CSO representatives, and researchers), combining distinctive visions from different stakeholders, and drawing up possible policy actions.

[1] Detailed information on the Living Lab concept can be found in the Annex to this document.

Phase I of the Veneto living lab involved people who are committed to the improvement of the bioeconomy sector. Participants were recruited from a comprehensive list of stakeholders at the regional/national scale interested in discussions about the future development of Europe's bioeconomy. The group was then expanded through a snowball sampling procedure. The aim of the living lab process was to outline a set of policies that can enhance and boost best practices in order to coordinate and improve the effectiveness of bioeconomic actions. We collected the voices of different stakeholders and let them engage in a dialogue on different topics: the potential of networking with other bioeconomic actors, the critical issues to be addressed in the bio-business sector, the willingness to cooperate with other conventional and bio-actors, etc. The Working Group was composed of industry representatives, entrepreneurs, farmers, scientists and policy makers. Overall, 18 bioeconomy stakeholders from the Veneto region participated in the meetings.

Meeting 1: Brainstorming

The first living lab meeting took place on 30 November 2016 as part of the creative phase. The meeting was attended by 20 stakeholders representing companies and consultants belonging to the building and construction industry, small farmers from the mountains/high plains of the Veneto region, a large industry processing cereals and oilseeds, consortia and associations, research institutions, innovation agencies.

During this meeting, stakeholders were encouraged to freely express "items" (actions, initiatives, requirements, expectations) concerning what in their opinion should be implemented for (and by) an effective bioeconomy network at the regional/national scale. The objective of this brainstorming session was to define stakeholder views for long-term planning in the bioeconomy. The following issues were highlighted:

- The need to define a common glossary/language.
- The formulation of a code of ethics with confidentiality clauses.
- The definition of a specific disciplinary for production and tracking of bio-based products.
- The implementation of a bioeconomy marketing and communication strategy.

During the open discussion, the participants stressed that it is necessary to (re)construct the value chains related to the bioeconomy. This should be done in order to be able to return a part of the added value produced by the regional bioeconomy at the base of the supply chain and to highlight what is actually organic and what is (only) bio-based in the basket of consumer goods. In this context, some doubts were raised by participants concerning the soundness of the current Council Regulation (EC) No 834/2007 on organic production and labelling of organic products[2], e.g. because there is no explicit attention to existing biodiversity conservation as the focus is very much on agronomic procedures and less on the environmental context of organic agriculture.

Concerning the role and function that small and large-scale agriculture should play in the bioeconomy and their relationship with industry, participants agreed that it is fundamental to distinguish among:

- Mountain/marginal farming lands.
- Lowland agriculture.
- Power relations of agriculture with industry.

According to the participants, one of the main problems they face is that the primary sector and the processing and manufacturing industry are usually distinct poles that do not talk very much to each other. In fact, the construction sector (building materials, wood, coatings, adhesives paints, etc.) normally does not use Italian raw materials because of unsatisfactory trade-offs between costs and quality/levels of service, except in rare cases. The industry tends to stifle the primary sector by imposing price controls, size standards, product quantities and agricultural techniques that are

[2] http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2007:189:0001:0023:EN:PDF

difficult to reconcile with environmental and social sustainability and proper land management (as is the case of Prosecco wine, South Tyrolean apples or intensive dairy farms).

The participants held that, in order to continue building a local bioeconomy network, it is required to identify the processes underlying the bioeconomy that already exist, distinguishing between the bioeconomy that feeds the organic sector(s) and that which feeds into non-organic but bio-based products. Another output of the brainstorming session was that it is more appropriate than ever to focus on what can be truly innovative to avoid producing certain distortions typical of the green/bio-based economy[3].

Several Italian quality/origin labels such as Denominazione di Origine Controllata (DOC), Denominazione di Origine Controllata e Garantita (DOCG), Protected Geographical Indication (PGI) or Traditional Speciality Guaranteed (TSG) are very often insufficient to protect the quality of production, including the "talking label" (QR code) introduced as a possible tracking measure. The QR code is a well-established technology, which does not necessarily guarantee the traceability of the supply chain because it always depends on how the database to dip into has been built. In the case of small local productions (PPL), whether from plains or mountain origin, these are (more) sustainable by their nature, but one needs to understand what farmers need to be competitive and to make a dent on the bio-economy market.

According to the participants, small farmers are not taking advantage of the large-scale distribution channels and struggling to reach the final consumer despite possibly having an excellent product that they are not able to sell directly. The creation of integrated supply chains between farmers, primary processors, and industrial users (even if belonging to different sectors, but interested in different biomass components) should be encouraged. This would ensure the emergence of integrated regional bio-refineries with the greatest environmental and economic benefits for the local communities.

A successful strategy that aims to conquer markets and authoritativeness should include not only all the components that can contribute to success – farmers, industries of the various related segments, and research – but also large-scale distribution (e.g. packaging and/or disposable products), collection and disposal services and environmental associations (for dissemination activities, environmental education and awareness).

Crop diversification and herds in the wild can make a difference in the local economy of a region, preventing the abandonment of fields and ensuring sustainable management of the soil. But they require a strategy of long term support and development.

In case relevant actors decided to go for a feasibility study and business plan of hemp reintroduction in the Veneto region, market demand would need to be either existing or to be stimulated. The versatility of hemp as well as the versatility of many other natural textile fibres that just a few years back were cultured/grown in Italy (as is the case of nettle, silk etc.), has long been known, but their cultivation would need to be profitable today. The question is at what cost and what timescale an implementation can be envisaged.

According to the participants, it is important to promote the market for bio-based products through dissemination tools (exhibitions, fairs, etc.), to improve awareness and stimulate and incentivise green procurement on the other side. Stakeholders must promote the services and standards to ensure the maximum benefit of this transition to bio-based products (e.g. the separate collection of compostable products – i.e. compostable bio-plastics, cellulose, and organic fabrics – so as to ensure a sustainable final fate for these products). Participates stressed that it is very important to provide users and stakeholders with the information to develop tools such as information campaigns for the public, individual consumers, educational sector, young people, etc.

[3] http://web.unep.org/greeneconomy/blogs/price-right-signals-distortions-and-patches-greening-finance

Meeting 2: Conceptual maps, semantic clusters (clouds) and a draft pilot project for a hemp supply chain development

The second meeting focused on concept mapping activities and was attended by 18 stakeholders. A request that arose from the participants in the first meeting was to propose a possible pilot project to be implemented according to its feasibility analysis during the living lab. In response to interest across the majority of participating stakeholders, the potential development of a regional supply chain for hemp cultivation and processing was selected and experts were invited to describe how this could be accomplished.

The meeting took place on 20 January 2017 and the main activities were:

- Defining logical connections and semantic groups to cluster actions derived from the brain-storming phase.
- Discussing with experts about hemp cultivation and products/channels to reach the market.
- Developing ideas for connecting different stakeholders who focus on bio-products cascading from multi-functional hemp (and diverse crops) cultivation.

Items provided by stakeholders gave us the chance to derive a conceptual map of the whole net-work of participants as a result of a multi-dimensional scaling process, i.e. to bring together in clusters semantically-coherent actions. These will be further used the third meeting (Nominal Group Technique). During the concept mapping session, stakeholders selected the items (proposed actions) identified during the previous meeting and were invited to gather into clusters consistent actions that they believed to belong to the same semantic areas. The nexus can be of a causal relationship, or more simply of conceptual closeness.

The group, after having discussed possible pilot projects, had the opportunity to reflect on the mar-gins and costs to be incurred from the cultivation and subsequent processing of hemp; to this end, experts on the subject were invited to share their experience and point of view. As far as hemp cultivation is concerned, the seed harvest allows for the production of other products; however, the seeds can only be harvested during a several-month time frame each year, and one must look at several varieties of hemp to get more results.

With regard to the regulatory framework, it is of relevance here is that the Ministry of Health recently issued a new law, No. 214 of 2017 and the implementing regulations on the allowed rate of THC (*Tetrahydrocannabinol*). A new provision for the promotion of hemp cultivation will be published soon. At the present time, the relative uncertainty in regulations concerning hemp cultivation and more specifically the THC content allowed are slowing down the possible implementation of such a supply chain on a larger scale. The topic of the missing/unclear regulatory framework for the bioeconomy emerged as one of the fundamental issues to be dealt with.

Hemp can be used for making flour and oil. Considering the history of the crop in Italy and especially in Veneto, it is disappointing to think that hemp was supplanted with the arrival of oil and fossil-based sources and that now Italy imports some 85% of the product. The necessity of operating with appropriate varieties of hemp and with machines suitable to the type of hemp and to the harvesting of different hemp parts (dry straw, seeds, leaves, flowers to produce medicines, nutraceuticals, cosmetics, oils and food supplements etc.) requires experience and an attentive evaluation of trade-offs. From 800 kg of seeds per hectare (the optimal yield for some hemp varieties), around 250 litres of oil can be extracted. This oil contains 1% CBD (cannabidiol, 10 mg/kg); that is, 2.5 litres could be sold for 7,500 €. Overall, however, the cannabinoids present can reach 20% in weight of the inflorescences and an output of 30,000 € per hectare when using a 10% fraction of the plant.

In green construction, hemp-based panels are used as coats for buildings and provide exceptional thermal and acoustic insulation. Hemp can also be used to substitute wood, thereby delivering a lighter material. For instance, the furniture giant IKEA is thinking about using it to reduce the weight of its panels, which constitutes the greatest deterrent to the purchase of furniture to be assembled. According to the presentations held by the experts, the four strategic areas of business development to focus on are: seed, shives, straw and food and therapeutic uses, although the latter remains to be developed, partly because of gaps in national regulations. Furthermore, hemp allows for a high production of biomass and it requires little fertilizer. The use of bio-digesters could favour the

processing of hemp fractions that do not yet have strong market penetration, thereby increasing revenues.

The participants concluded that it is time to start growing hemp extensively again. Every year there are farmers who sign contracts to make their fields available to third parties for this purpose, but many of them are cheated. The bioeconomy Working Group is an opportunity to seriously invest in the creation of a transparent and innovative supply chain.

This meeting allowed the people present to deepen their knowledge about hemp, including those who belong to the agricultural world but also to the field of biomaterials, biofuels and the construction sector. Together, they were able to evaluate the opportunity to reconstruct from an innovative, circular/bioeconomy perspective the supply chain of an industrial crop with a long history of cultivation that could also provide raw materials such as feedstock for various industries today.

Meeting 3: Nominal Group Technique (NGT)

After conducting the creative phase of brainstorming and defining clusters of actions with close semantic meaning, the objective of the third meeting, which took place on 1 February 2017, was to develop a draft bioeconomy action plan for the Veneto region. Specifically, the focus of the meeting, which was attended by 13 stakeholders, was on the definition and ranking of objectives, together with the roles and activities to be developed.

The discussion was facilitated by the Nominal Group Technique (NGT)[4], a technique for managing structured interaction between experts. The aim was to outline a long-term perspective, i.e. identifying items to focus on for a bioeconomy action plan in the Veneto region. To this end, the results of Meeting 2 as schematised in the overall conceptual map were systematised and ranked to create a list of priorities for the various clusters of actions and thus a shared action plan. Priorities were ranked by importance and feasibility.

The Working Group agreed that if they managed to find a common goal that also solves problems from an economic point of view, it would be convenient for everyone. The intent was to develop and integrate a series of niche industries and, at the same time, a new market. This required a new paradigm for the comparative analysis and concerted ranking of items as well as for the participative definition of the feasibility of such developments and the concrete actions needed for their implementation.

In this context, issues to consider are existing regulations and market development. The participants held that there is a need for economic means to set up a supply chain with the proper characteristics as well as economic and territorial agreement models. There must be mutual benefit and cost-effectiveness for the sectors involved, and the health factor should also be evaluated.

As a result of the NGT exercise, five main groups of items to focus on were identified:

1. The activities of the network must first be triggered internally and then extended outwardly.
2. The restriction of supply chains within regional borders is not a meaningful goal; it would be beneficial to be open supply chains to other Italian regions.
3. The social media marketing factor appears crucial to promoting and developing relevant activities.
4. Adopting sustainable logistics should be a priority.
5. Adopting a life cycle perspective a main objective.

The next step was to identify the role of each Working Group member according to his or her sector and propensities, knowledge and network of contacts. Participants held that it does not make any sense to continue to act within “watertight compartments”; companies need greater knowledge through interactions with schools and businesses. Unfortunately, this is a mentality rooted in the history and in the local culture, which often leads the failure of commercial enterprises. The lack of interaction between sectors as well as between companies and the research community is a bad

[4] Detailed information on the NGT can be found in the Annex to this document.

habit that needs to be addressed. Interacting with schools and academia was also deemed of high importance.

The participants felt that developing a brand called "'BIO VENETO QUALITY MARK" could generate new start-ups, and the Working Group could grow into a network and enable small- and medium-sized enterprises (which represent the vast majority of enterprises in the Veneto region) to be known and to grow; to engage in target markets; and to export and internationalize. All of this would be much more difficult without cooperation across a network and without a brand that attests to the value of the products. In this context, the product-territory link is essential, and the issue regarding the circumscription of the brand to Veneto remains open to the idea of involving other regions too (in order to promote the Italian quality).

At the end of the meeting, the Working Group concluded that they are ready to focus on policy issues that are to be submitted to policy makers, local administrators and especially the Regional Government (Phase II of the Veneto living lab). The activities carried out were a preparatory step for the subsequent meetings, which will contribute to defining the policies to be implemented. According to the participants, the Working Group "offered food for thought", and some stakeholders got even more involved in the concept and practices of the bioeconomy. For example, one participant decided to plant two hectares of hemp; another provided contacts for suppliers and helped members of the Working Group to resolve problems through his contacts. This helped trigger new commercial contacts with suppliers of raw materials to employ in their business, including for textile material recovery for the realization of new products; green building; transforming materials into semi-finished products and alternative products. This meant re-engaging them in the business world in the form of products for sound absorption, thermal insulation, padding materials cleaning and curtains of various kinds. Working Group participants are becoming facilitators in local areas and are spreading information and knowledge.

Thanks to the three living lab meetings held so far, BioSTEP has created a network of stake-holders interested in the bioeconomy – and in the overall objectives of the BioSTEP project. Participants have not yet managed to find a common objective to implement a pilot project, but the synergies between these actors are strongly developed. The debates on certain issues and the follow-up meeting on certain themes or issues have provided for a support mechanism and mutual exchange of information and contacts, as well as opportunities for doing business.

ANNEX

Living Labs: Concept and methods

Participatory Design started from the simple standpoint that those **affected** by a design should **have a say** in the design process. Existing skills could be made a resource in the design process.

Two types of values strategically guided Participatory Design:

1. The social and rational **idea of democracy** as a value that leads to considerations of **conditions that enable proper and legitimate** user **participation**—what we refer to as "staging" and "infrastructuring" design Things.
2. The importance of making **participants' tacit knowledge** come into **play in the design process** — not just their **formal and explicit** competencies, but those practical and diverse **skills** that are **fundamental to the making of things** as objects or artifacts.

Hence, Participatory Design, as it emerged in the 1970s, might theoretically and practically be seen as a "modern" example of ***Things*** (socio-material assemblies dealing with matters of concern).

Participatory design:

- shifts from designs with pre-defined groups of "users" towards engagement with "milieus" (ecosystems);
- signals movement towards participatory design in open public spaces rather than within an organisation;
- signals movement away from "projecting" (predefined achievements) and towards processes and strategies of "infrastructuring" and "thinging";
- encourages open-ended infrastructuring and close experimental working to produce innovation outcomes hard to achieve within pre-defined project settings;
- fosters innovation in a broad sense of the word: social instead of narrow technical innovation;
- stresses the agonistic element: "agonistic public spaces";
- demonstrates how design and innovation have become distributed [ICT development made possible some empowerment of "people"]; and
- blurs borders among producers, partners, clients, and users.

A BioSTEP definition/perspective of/on living labs

Living labs can be seen as innovation environments, as they:

- establish long-term relationships
- allow participants to become active co-creators
- demonstrate common characteristics among the more than 200 EU LLs:
  - situated in real world environments;
  - are user-driven;
  - collaborate with research, companies and the public (administration);
- aim to collaboratively develop new services and products also as a response to innovation environments that were too closed → often resulting in failure to innovate !!
- design labs: collaborative learning environments;
- design for social innovation;
- social innovation can be a principle, an idea, a piece of legislation, a social movement;
- view society as a whole is a huge laboratory.

Living labs can also be seen as platforms of social innovation:

- The frame of reference is the agonistic approach in the "democratic paradox" (Mouffe 2000)[5].
- It is not always possible to achieve a consensus and rational conflict resolution, but rather a polyphony of voices and mutually vigorous but tolerant disputes among groups.
- These are political acts always taking place in a background of potentially challenged egemony.
- Public spaces are always plural, and where different projects confront one another.
- The goal of democratic politics is to empower a multiplicity of voices in the struggle of hegemony and at the same time to find constitutions to transform antagonism into agonism, and conflict between enemies to constructive controversies among adversaries;
- They are activities full of passion, more close to creative innovations than rational decision making processes.
- Questions of democratising innovation are always political hegemonic controversies and as such they concern the constitution of agonistic public places.
- The agonistic view on democracy brings us back to the Scandinavian model of participatory design and struggles for democracy at work.
- Maybe the match-making process between NGO's, commercial companies and academia from this perspective can be seen as too consensus driven, and acknowledging too little the role of existing hegemony in shaping the innovation space.
- On the other hand, this approach, especially with its focus on open-ended participatory social innovation, challenges the hegemonic view on innovation processes.
- There is movement from a purely technocratic view of innovation (the hegemonic view today) towards judging the value of an innovation by:
    - The degree to which it opens up constructive and sustainable questions and possibilities within a specific geographically and historically located situation; and
    - The degree to which it enhances democratic practices and/or living conditions.

Living labs, (existing) networks and networking

A central challenge for participatory design today is providing alternative perspectives on participation and democratisation. This means actively exploring alternative ways of organising milieus for innovation that are more democratically-oriented than traditional ones focusing on expert groups and individuals (moving from the dominating technocratic view of innovation, moving from things to THINGS, where differences and controversies are allowed to exist, dilemmas are raised and possibilities explored).

The design researcher role becomes infrastructuring agonistic public spaces mainly by facilitating the building of arenas consisting of heterogeneous participants – legitimising those marginalised – maintaining network constellations, and leaving behind repertoires of how to organise socio-materially when conducting innovative transformations.

Living labs and consensus methods

Living Labs have received limited attention in the literature, linked to the novelty of the phenomenon, the high heterogeneity of cases and the consequent lack of definitions and acknowledged frameworks for scholarly analyses.

Using an analysis of the literature and case studies, Dell'Era & Landoni (2014)[6] proposed positioning this methodology among other design methodologies and highlight its peculiarities. They underline the co-creative potentialities, the awareness of users and the real-life settings. In particular, they clarified the peculiarities of the Living Lab methodology and introduced a model to support manager adoption of the appropriate Living Lab methodology.

[5] Mouffe, C. (2000): The Democratic Paradox. New York, NY: Verso.
[6] Dell'Era, C. and Landoni, P. (2014): Living Lab: A Methodology between User-Centred Design and Participatory Design. Creativity and Innovation Management, 23: 137–154. doi:10.1111/caim.12061.

1. On the one hand, the users are involved and aware of the process, as opposed to users studied by applied ethnography.
2. On the other hand, the users are not special in terms of skills or knowledge of the technologies as they are during lead user innovation.

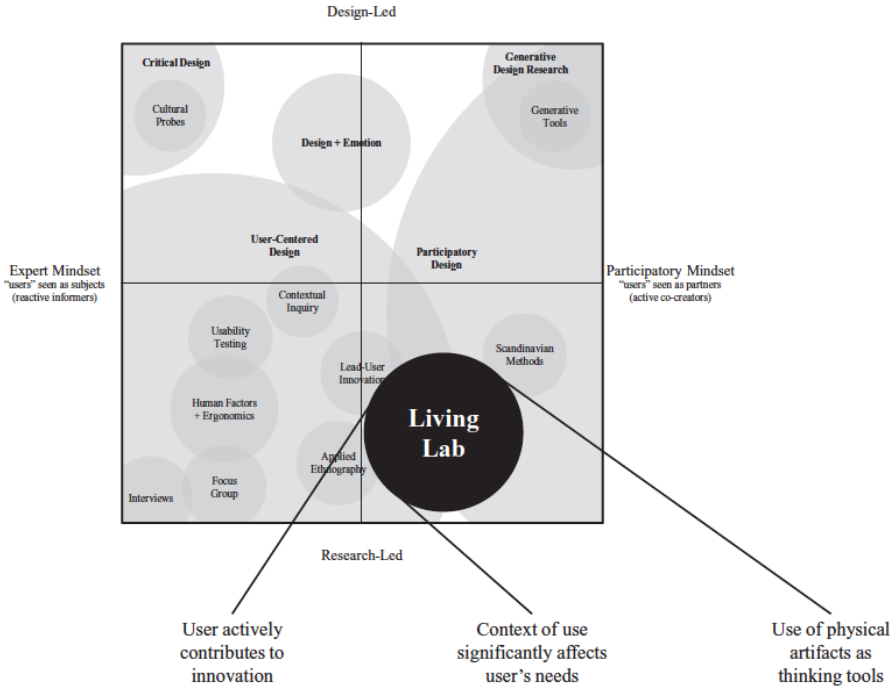

Figure 3. Positioning of the Living Lab Methodology in the Design Research Methodologies Described by Sanders (2006)

The figure represents the partial overlapping and differences of these three methodologies on the map. In particular, this positioning allows us to show that:

(i) The context of use in the Living Lab methodology significantly affects the user's needs, similar to applied ethnography;

(ii) Users in the Living Lab methodology actively contribute to the innovation process, like the users in the lead user methodology, and

(iii) The co-creating activity of the Living Lab methodology usually supported by physical artefacts is aligned with participatory design approaches, specifically the Scandinavian methods.

Nominal Group Technique

The Nominal Group Technique (NGT) is a technique of expert group management that tends to bring out the full potential of information presented in the group by avoiding or limiting possible distortions that occur during ordinary meetings.

The NGT is part of the Consensus Method, which takes as a measure of trust of reliability the homogeneity within the group using the paradigm.

If a group of experts describes a phenomenon evenly it is highly likely that the phenomenon is actually as described.

The use of NGT allows, in a limited time, to attribute to a set of elements a quantitative estimate shared in the expert group compared to certain criteria such as the relevance, feasibility, distribution, etc.

When to use NGT

The NGT is used in many different areas, and some of the goals can be summarized as follows:

- Attribute weighting factors shared by various stakeholders in decision-making systems in an evaluation or descriptive field

Example: locate a weighting factor to be given to the criteria for assessing the quality of a service or the evaluation of criteria for selecting projects to be financed.

- Identify the importance or the spread of attitudes or knowledge present in populations hardly audiences through traditional surveys

Example: evaluate the determinants of parents who choose not to vaccinate their children

- To realize predictions of phenomena for which there is no reliable information or you can plan a non-linear evolution

Example: predict the possible evolutionary scenarios of migratory pressure in a given area

- To predict the impact of the implementation of policies, projects or interventions

Example: To foresee how it will change the percentage of sedentary after the implementation of a policy of support to the movement

- To have an early indication on the progress of a phenomenon in situations of scarcity of resources to make a search with the characteristics of statistical representativeness

Es: investigating the use of leisure time among young people in a given area.

To check the degree of homogeneity with respect to certain elements within a working group

Es: to ensure the management of an organization will share the development lines

Basic principles

The main concepts underpinning the Delphi family techniques are:

- Divide the idea of creator, thus limiting the effects of leadership and alignment of signs not on shared ideas but on what it is referred to by leaders or persons who no longer are able to influence the group.

- Divide the creative moment from the evaluation one so as to bring out any ideas and directions of the group, even those that may be considered unimportant initially but that could just be original and later important elements.

- Give a chance to the experts to change their judgment. In fact, the iteration of the collection of information on individual items and the discussion on diversity of opinions allows experts to revise their views on the basis of enrichment the analysis carried by other experts.

- Measure the trustworthiness of judgment on consent, the measure of the reliability of numerical values allocated to the evaluation criteria adopted (e.g. dissemination, importance, impact, ...) will be directly linked to the degree of homogeneity in the group.

How does it work?

A NGT session normally consists of several phases of NGT work that can be summarized as indicated below.

Preliminary Stage

The first step is to define the objects that the experts will be asked to evaluate.

This is a very important step because it is the moment of the construction of meanings: through the comparison experts share a language and can make their original contribution to deciding what to evaluate. This stage may also be achieved before assessing what was managed through NGT, i.e. during another meeting, or at a distance, often using different methods and/or enhancing the products of previous phases of work.

The outcome of this concept phase takes the form of a list of items that will be subsequently assessed by experts.

Evaluation Phase: the realization of the NGT

NGT sessions are managed by a conductor who earlier defines the objectives of the work, presents the rules that guide the evaluation stage of ideas, decides the execution times of the session and presents the result of the conceptual work done previously on the creative material (list of items produced in phase A).

The conductor's task is to enhance the meaning of participation, to dispel the doubts about this method, to increase the motivation of the experts and to share the work done previously.

Then the true and proper NGT session begins through the following steps:

1. **The definition of criteria and rating scale**

At this stage they fix the "rules of the game": the criteria against which the experts involved should express their opinions are defined (i.e. the importance of a given element, the feasibility of a given intervention, the broadcast of a particular issue) as well as the numerical scales that will be used will be used to evaluate them (i.e. from 1-5 or 0-100).

2. **Formulation of the opinions from the experts**

At this point each expert involved uses a computer on a wireless network with other experts to express his or her opinions using the rating scale previously agreed on. The opinions expressed by individuals remain anonymous and are not disclosed to third parties.

3. **Discussion**

The scores are processed in real time by the software and projections of central tendency and dispersion

- The items on which there is homogeneity of judgment are not further explored or discussed
- Items that are characterized by a higher variability of the opinions expressed are addressed individually through a comparison of participants to investigate the reasons for this difference in evaluation. The debate is focused on the item being discussed and not on persons: in the course of the confrontation, you are not interested in knowing the judgment that the individual person gave or how the items may justify a particular judgment (whether the individual assessments may have expressed). The aim is to make an effort to consider the different points of view and then possibly to reconsider one’s own.

4. **The iteration of the evaluative stage**

The items that were discussed are reintroduced to the experts for a second vote to determine whether the comparison has led to greater sharing. The evaluation process stops when the experts

are homogeneous in judging all items considered, or when it appears that there is a consensus on the assessment of some item (an indicator of dispersion). Other stabilized inhomogeneous judgment may not be significantly modifiable by that specific group of experts ("stability").

5. The definition of results

NGT session results can easily be printed and distributed to participants at the end of the session that can then directly "take home" a collaborative work with other experts on the matter.

The computerized version

To streamline the process of comparison between experts, the company Sinodè, which was selected by UCV to develop the activity foreseen during the LL, has developed a specialized software that allows the management of a structured N.G.T. meeting through a computer database and real-time statistical analysis. Every expert must have a PC/smartphone connected to a wireless local area network, and the entire meeting is handled via computerized means. This maintains adequate and balanced spaces of individual assessment and comparison between participants and makes it possible to conclude the meeting with tangible results in a short time and, above all, with an estimation and assessments shared among experts.

The latest specialized software developed by Sinodè uses the theoretical N.G.T. methodology exploiting technology opportunities available today. It has in fact implemented a version that relies on the web during all stages of collection and processing of data elements (voting experts) and that can be achieved through any type of terminal (PC, tablet, smartphone) without the experts needing an especially designated PC or any specific software.

This opens up interesting perspectives that offer the chance to also organize N.G.T. meetings under non-traditional conditions, with a much larger number of experts, and to remotely connect the experts in synchronous or asynchronous moments.