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## CONNECTING RURAL AREAS IN BALTIC SEA REGION TO BOOST SMART AND SUSTAINABLE BIOECONOMY

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**ABSTRACT:** The background and objective for the project was to boost bioeconomy and innovations in rural areas in selected Baltic Sea Regions. The cooperative network includes Finnish, Norwegian, Polish, Latvian and Estonian partners from authorities, academia and research, and business development oriented organizations. The focus was on regions' smart specialization and networking in many levels to increase the innovation potential. Regional bioeconomy profiles and strategies are created or updated, joint actions have been recognized for concrete regional and international cooperation and open virtual innovation hub with operating model has been created for piloting. Along the model, digital platform called Biobord, has been introduced to tackle the mentioned challenges of rural area actors. The platform enables entrepreneurs, inventors, researchers and developers in these areas to expand their networks, teams and societies. The platform also supplies different bioeconomy product development environments and innovation services to be applied by the network.

**Keywords:** Bioeconomy, rural area, Baltic Sea Region, sustainability, innovation, digital platform

### 1 BACKGROUND AND OBJECTIVES

#### 1.1 Need to boost bioeconomy and services in rural areas

As stated in the EUSBSR Policy Area Bioeconomy [1], the Baltic Sea Region (BSR) has the potential to become one of the world's leading regions in green growth and sustainable development. BSR countries possess a well-developed infrastructure, strong knowhow and skilled workforce and a vast resources of biomass. Bioeconomy can create development in rural area by providing especially primary industries to grow. This creates new business opportunities and knowledge based jobs for rural areas of the BSR.

Smart specialization (RIS3), as part of EU Cohesion Policy, has a focus on increasing the innovation potential for all regions. The focus in RIS3 is on investment and creating synergies, improving the innovation process and improving governance and stakeholders increased participation. RIS3 supports the creation of knowledge-based jobs and growth in research and innovation beyond the expertise concentrated centers, aiming also in developing and rural regions. [2]

Basic challenges of innovation activity outside big cities in rural areas include low number and long distances between actors. Rural regions lack creative connections between people from different fields of expertise, which decreases the innovation potential of these areas significantly. Furthermore, the rural small and middle-sized enterprises need to build their ability to learn and innovate in the transforming markets. Thus, regions suffer from their inability to reach their full potential due to limited human capital and lack of agglomeration economies. This is especially true when discussing bioeconomy.

#### 1.2 RDI2CluB

Rural RDI milieus in transition towards smart bioeconomy clusters and innovation ecosystems, RDI2CluB-project (10/2017-9/2020), is an on-going Flagship project of EU Strategy for the Baltic Sea Region (EUSBSR), Policy Area Bioeconomy. The project includes four bioeconomy hubs representing following regions: Central Finland, Hedmark (Norway), Vidzeme

(Latvia) and Świętokrzyskie Voivodeship (Poland). In addition, Estonia has participated in the project by building their bioeconomy strategy and being active as network partner area. The project recognizes the smart specialization of these bioeconomy centered regions, focusing in cooperation and both national and transnational innovation initiatives in bioeconomy development interfaces.

Three-year cooperation project has ambitious objectives to

- 1) discover new information for more effective realization of the smart specialization of the five target areas,
- 2) discover and update regional bioeconomy profiles and bioeconomy strategies,
- 3) establish network strategy for hubs,
- 4) introduce regional and international joint action plans for development actions, and
- 5) create and pilot functioning international online platform for innovation management.

Furthermore, platform will serve new hubs and networks in the future. This paper focuses on the project outline, selected results from regional strategy development work, network strategy and operation model for joint platform from the coordinator, Central Finland, perspective.

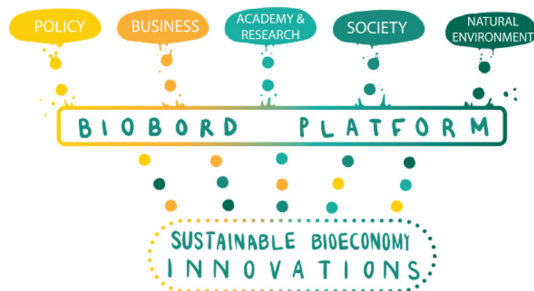
### 2 SMART SPECIALIZATION AND COOPERATION IN MANY LEVELS

#### 2.1 Regional innovation ecosystems

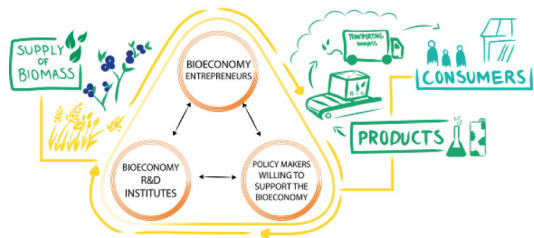
All hubs and regions in the project have their smart specialization areas in bioeconomy, depending on the natural resources, business structure and traditions in the regions. Central Finland Vision 2040 [3] highlights the importance of bioeconomy. In regional S3 strategy [4], the stress is on interaction between the strategic strengths (bioeconomy, digital economy, knowledge-based economy, wellbeing industry and tourism) that create innovations. Regional strongholds for bioeconomy development include forest resources and sustainable forestry; traditional, strong forest industry and knowledge

as well as high-level research and development. Regional bioeconomy includes also food sector development and circular economy approach.

A core concept for boosting innovation in bioeconomy was the development of an open virtual innovation hub for the rural regions in the Baltic Sea Region with smart specialization strategies focusing in bioeconomy. Innovation hubs are social communities, workspaces or research centers that provide subject-matter expertise on technology trends, knowledge and strategic innovation management, and industry-specific insights. [5, 6] These hubs enable active knowledge transfer between researchers and business experts, as well as industry, government and representatives of academia. Figure 1 presents the approach of quintuple helix, triple helix supplemented with society and environment perspectives. Therefore, quadruple helix refers to civil society, and the fifth helix to the environmental settings of a specific region [7]. Civil society members link the strategies and innovations, since they are the final consumers of bioeconomy products and services (Figure 2).



**Figure 1** Sustainable bioeconomy innovations boosted by different actors and organizations.



**Figure 2.** Regional bioeconomy cluster or innovation ecosystem.

Innovation hubs deliberately stimulate collaborative innovation activities in a variety of ways. The innovation hub is a meeting place that brings together the needed talent for generating ideas and for developing them further. In the innovation hub, bioeconomy start-ups can build their business plans with the help of the hub's services and expertise. Along the innovation path, the entrepreneurs get tools and support for product development and commercialization.

The testbeds, laboratories and pilots provide an opportunity to test and validate the products. New business ideas spark from creative encounters between people of diverse knowhow.

## 2.2 Demand for digital networking tool

Developing an innovation hub in a rural context is

challenging due to the limited number of actors, lack of diverse expertise and distances. RD12Club approach in building innovation was via capitalization of regional and inter-regional networks as well as digitalization. The idea for the digitalization in the project was the ability to connect local hubs together to provide a larger pool of expertise, talent and resources for bioeconomy innovation around the Baltic Sea. However, the connection of the active hubs together is not enough, but the hubs need also to build their regional networks for capitalizing on the urban-rural connections and the bioeconomy innovation ecosystem surrounding them.

Before establishing a networking tool, digital platform, mapping of the potential of hubs for networking was carried out in the project (Figure 3). The innovation ecosystem was mapped in all target areas by conducting analyses of bioeconomy actors from all regional, national and international level actors, categorizing them to innovation services of support, talent, capital, expertise and networks. Different user cases from the mapping were identified to be used for piloting the joint platform and innovation model. The idea of the planned innovation management system for the network was to be used to generate or capture new business ideas, share them in the network when relevant, select the most promising ideas and support their development to innovations and new sustainable products and services.



**Figure 3.** Idea of mapping and categorizing the innovation hub.

In the course of the service design process, the network of hubs identified the needs they had for digital service paths. In addition to analyzing the existing networks, they also analyzed platforms to identify gaps in the current platform services as well as best practices and preferred features in platform models. This definition phase involved co-creation of user profiles and service paths to establish a platform that would help the bioeconomy hubs in rural areas in boosting their innovation impact by achieving critical mass in RDI.

## 3 RESULTS AND CONCLUSIONS

### 3.1 Regions' profiles and networks

The first step in the project was to create bioeconomy state-of-the-art analysis for all participating regions. For this purpose, NUTS 3 (FI, NO, EE, LV) and NUTS2 (PL) level bioeconomy statistical parameters were collected.

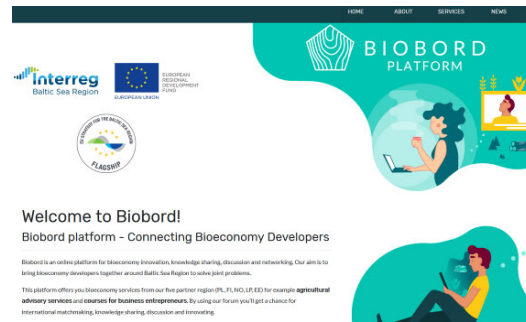
The focus was on economic activity and labour in different bioeconomy subsectors. This work revealed the urgent need to develop such statistical databases; currently data is not available or is outdated. Based on these results, regions created their individual Joint Action Plans (JAP), regional or hub level strategic plans to further develop the bioeconomy and bioeconomy related innovations. JAPs' also included transregional actions, the joint actions that are common for participating regions and that should be developed together. A good example of such activity is building sector, where Norwegian, Latvian and Finnish partners have started a joint learning process to increase the use of wood in construction sector.

Since networks are of great importance in this kind of joint innovation activities, the project partner hubs revealed their networks by visualizing them in joint exercise. The results from the mapping indicated that the total ecosystem comprises of 484 organizations connected via the four hubs. Hubs vary in their connections with the Finnish and Norwegian hubs having a more academy and research focus to the policy-oriented Polish hub and business-oriented Latvian hub. Also, organization leading the hub and hub targets have a central role in the composition of the hub core members. The orientation is reflected in the share of innovation service types (classified as talent, expertise, network, capital and support) found in the network connections of the different hubs. Furthermore, some hubs have stronger connectivity in regional level, others are more connected international level. Internationalization level varied between 4-38 per cent by region.

### 3.2 Cooperation platform piloting

New open virtual innovation hub for connecting bioeconomy developers, Biobord ([www.biobord.eu](http://www.biobord.eu)), has been built and shared in the project. Biobord Operating Model [6], published Aug 28<sup>th</sup> 2019, describes the potential of RDI2CluB network, the functionalities of the platform as well as the user profiles and service paths.

For each hub, Biobord (Figure 4) offers a platform to connect the regional innovation ecosystem as well as the national and international networks. In course of the piloting, all the connected hubs activate their relevant networks to use Biobord for network activities, management of joint projects or other co-working. As a result, an international community of bioeconomy developers emerge with a potential to spin-off new RDI initiatives, projects and business ideas. The innovation potential and the speed of learning is enhanced for all regions by the widening pool of talent, expertise, best practices and tested applications of technologies and business models. All in all, the joint platform will work as a tool for all the hubs to increase their international connectivity.



**Figure 4.** Landing page of the Biobord platform in June 2020.

During the piloting phase, from Aug 2019 to Sep 2020, project tests Biobord with different user groups and service cases, including managing the project lifecycle, network building and management, innovation calls and matchmaking, interactive capacity building as well as connecting product and business development services. Piloting has also included testing of the platform for educational purposes. Altogether, development actions utilize user-oriented service design process, and the partner network have influenced the iterative platform creation process along the piloting. With the information and experiences collected from regional and international pilot cases, the platform and operational model are developed further.

In June 2020, RDI2CluB partnership has connected 250 registered bioeconomy experts to the virtual platform via integrated activities of the regional hubs. This open platform for innovation management strives to boost rural bioeconomy development in Baltic Sea Region. In addition to connected authorities, researcher and developer institutions and business networks, stakeholders and partners of the network are also invited to join the piloting to build the community of the innovation hub. The platform is expected to act as a viable tool for communication and co-working forum in e.g. projects, courses, services and events.

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