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Biotechonomy innovations development barriers in Latvia

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Abstract

The matter of providing people with the resources available is becoming more and more important in the world. The conception of biotechonomy contains the solution of this problem, because the resources are being used in the long term creating innovative products with high value added. However, this system does not always work. So it is essential to find out what are the causes for this problem in order to find solutions and strengthen the development of innovations of biotechonomy. The aim of this research is to identify the main barriers of the development of biotechonomy in Latvia. An analysis of literature (involving similar studies already carried out) was used as the basis of the research and the current situation of the development of biotechnical innovations in Latvia was taken into account as well. The main barrier types identified were: financial, policy-related, market-related, behavioural, organisational, technological, resource-driven, as well as environmental and climate-related.

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Keywords: bioeconomy; biotehonomy; innovations; barriers

1. Introduction

In previously carried out studies, authors have offered a deeper understanding of bioeconomy. That is why there was a new term invented – biotechonomy. In addition to bioeconomy it involves the technological problems of the usage of bioresources, not only the rational and effective usage of innovative products [1, 2]. Biotechonomy combine

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technologies of resource extraction together with the usage of biotechnologies in their processing and recycling by using innovative and modern technologies in order to gain new products with high added value [1].

Innovation is something that divides products produced from biomass according to biotechonomy from other biomass products [3, 4]. With a new innovative product with high added value, the authors of this text mean a product that is produced according to the eco-design principle [1]. The concept of innovation is defined differently in different countries and documents. However, no matter the difference, when we are speaking about innovation, it has always something to do with process. For instance, in Latvia innovation is a process, where new scientifically, technical, social, cultural and other ideas and technologies are carried out to create competitive products or services [5]. As already mentioned in the definition, there are barriers that affect innovations. That way the development of biotechonomy is also affected.

Scientists have carried out many studies about barriers, among those – some involving development of bioeconomy innovations [3, 6]. However, there are no studies, where attention is paid to the technological aspects of bioeconomy. This is why the aim of the research is to identify the barriers of biotechonomy innovation development, taking into account the actual situation in Latvia. A case of a particular country is used as a basis, because the theoretical assumptions about innovation development does not always resemble the actual situation.

2. Materials and methods

In order to evaluate the barriers affecting biotechnical innovation development in Latvia, there was an analysis of literature carried out about barriers identified in different fields. The method used in this particular research is carried out by taking inspiration from studies made about barriers in energy efficiency [7–9] and industrial symbiosis [9–11].

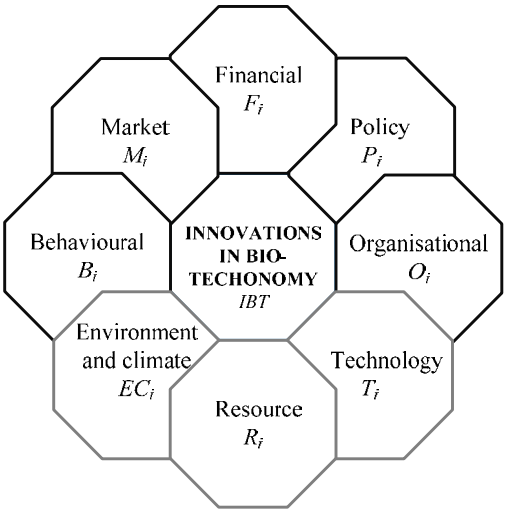

Fig. 1. Biotechonomy innovation barrier types.

Based on current situation in Latvia, there is a combined method carried out. There are eight main biotechonomy innovation affecting types of barriers in this method: financial, policy-related, market-driven, behavioural, organisational, technological, resource-driven, as well as and environmental and climate-related (Fig. 1). All of these barriers affect not only biotechonomy but also one another. According to the authors of this article, such types of barriers as resources, technologies, environment and climate (Fig. 1) play a major role in biotechonomy. Other barriers are more common in studies carried out in most of the other fields. The overall impact of barriers to biotechonomy innovation development can be expressed through such equation:

$$\sum IBT = \int \left(F_i; P_i; O_i; M_i; B_i; EC_i; R_i; T_i\right) \tag{1}$$