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Bioeconomy mapping indicators and methodology. Case study about forest sector in Latvia

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Abstract

Researches have been performed, and indicators developed to evaluate separate economy sector sustainability or impact of a separate factor that includes bioeconomy context. However, the indicators used till this moment did not answer the question – where and which bioeconomy sectors are better to develop. Therefore within this research a method for complex analysis performance was developed to define regions in national level for certain bioeconomy sector development, which based on certain exploitation of bioresources. Developed method is composed of indicator analysis, correlation and regression analysis and mapping. In the result, a visual answer is given to the researched question. For the method approbation Latvia is taken as an example to evaluate the establishment of new wood processing enterprise in the context of bioeconomy with the most appropriate location and taking into account resource and labour availability and existing competition.

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1. Introduction

Mapping and indicator analysis methods are being used for various type of sector research; it also includes combination of these methods and is done with an aim for the broad scope and volume data to become more

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comprehensive and easier to analyse. Within the last years research in connection with mapping in the context of bioeconomy are continuing to grow in importance [1–5]. It can be explained with the European Union bioeconomy strategy making [6] and efforts to integrate this concept in the further development of the EU member states. Accordingly, indicator tools for evaluating and monitoring the EU bioeconomy were developed [7], criteria established and indicators to describe the regional bioeconomy [8].

Majority of research and studies about indicators for separate bioeconomy sector assessment that have been carried out are related directly with forestry and specifically are about sustainable forest management [1, 9]. Even though Ministerial Conference on the Protection of Forests in Europe (MCPFE) developed 34 pan-European indicators for sustainable forest management [10] and indicators about forest biodiversity [11], scientists and representatives of forestry sector have understood that to use these indicators for sustainable forestry analysis is incomplete [1, 12, 13]. One of the reasons are that not all the necessary data is available and it is not always credible enough [14].

In the bioeconomy context authors of this paper see main non-conformities for the existing sustainable forestry indicators. It is their general character, because mainly these indicators describe statistical data information, not its dependence or impact to other factors or mutual influence of the indicators. For this reason it has been suggested for indicator analysis instead of using rough and unverified statistical data, use indicator ratios against these data where correlation exists.

This paper proposes a combined method by using mapping and indicator analysis methods to assess bioeconomy development trends and determine the most suitable regions. As an example for method approbation the case of Latvia will be used, which is relatively small but wood resource rich country. This case study will find an answer to the question – where and with what kind of forestry resources wood processing oriented industry could be established in Latvia to match all bioeconomy principles.

2. Methodology

Based on Pan-European Indicators for Sustainable Forest Management forestry sector development assessment was made for Latvia [15], however, this evaluation cannot be used to determine in which region and using which bioresources bioeconomy should be developed. Therefore this research developed combined method for regional bioeconomy development perspective trend analysis (Fig. 1) that consists of 8 modules. This method was combined of factors, indicators, correlation and regression analysis methods and mapping. In that way acquiring visually easily comprehensive result for the researched question – on the national level in which region certain bioeconomy trends should be developed also focusing on certain bioresources.

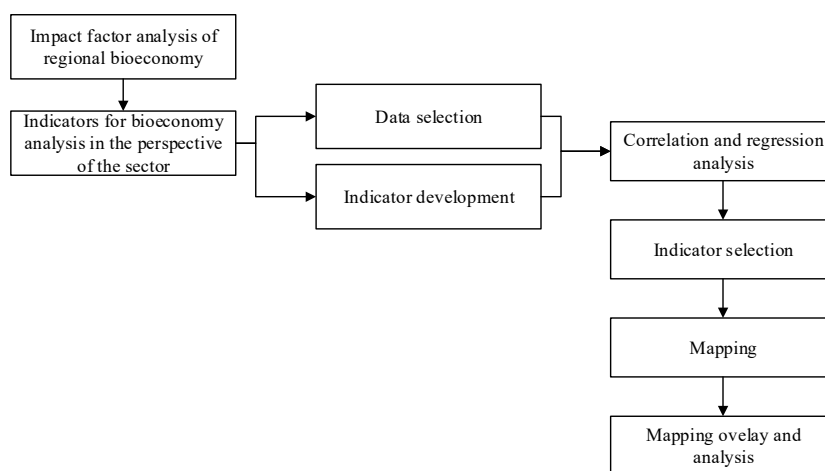


Fig. 1. Method algorithm.

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