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## **MONITORING TRANSFORMATION OF BIOECONOMY ENTREPRENEURSHIP IN ROMANIA**

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### **Abstract**

In the context of shift towards bioeconomy, ensuring the food security under limited territorial resources is a challenge for any national economy. The policies in the field of innovation, small and medium-sized enterprises and entrepreneurship can play a major role in stimulating business and innovation, thus increasing the productivity which in turn leads to well-being and job creation. Entrepreneurship directly influences innovation, competitiveness and economic growth is recognized.

At the same time, in order to make a significant contribution to the revitalization of the national economy, the concept of multifunctional and diversified agriculture, as a key sector of bioeconomy, will have to be included in the future business models.

This paper constitutes an overview of the Romanian enterprise ecosystem with a focus on bioeconomy field. The companies with activity in the field of bioeconomy were identified quantitatively, for an estimation of the proportion of the bioeconomy in the national economy. With a proper awareness raising from the policy makers and effective collaboration between research organizations and business environment, the entrepreneurship in bioeconomy sector can only bring benefits for both society and economy.

### **Keywords**

Bioeconomy, Romania, entrepreneurship, bio-resources.

### **JEL Classification**

Q1, Q2

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### **Introduction**

The transition to the bioeconomy has now become a center of interest for the strategic program of governments around the world. The bioeconomy includes the basic sectors of the national economies, sectors that provide materials and products that come from renewable raw materials, based on the sustainable exploitation of bioresources. Bioeconomy is based on "the use of research and innovation in the biological sciences to create economic activity and public benefit" (White House, 2012).

The crisis generated by the appearance of COVID 19 and the declaration of the pandemic state, brought into question the limitation of the free movement of persons and implicitly the difficulty of the movement of goods, the stopping of the economic activity of some companies in the manufacturing and processing industry. Currently, strategic working groups focus on identifying locally available resources to reduce import dependency and ensure food security. More than ever, ensuring immediate food needs means profound reorganization in national economies.

The restarting of the national economies will have to be based on a transformation of all paradigms, through the transition to higher added value activities, more efficient from the point of view of the use of resources, with an accentuated specialization in the direction of the use of existing resources at territorial level. Such a reorientation, however, needs an objective evaluation of the determining factors, by drawing a map of the existing innovation system, realized by identifying the potential enterprises with the role of catalysts in restarting the engines of the economy, firstly in basic sectors of production.

To support the development of entrepreneurial ecosystems, this paper constitutes an x-ray of the Romanian enterprise ecosystem within bioeconomy field. The companies with activity in the field of bioeconomy were identified quantitatively, for an estimation of the proportion of the bioeconomy in the economy of Romania.

### **Review of the scientific literature**

There are different definitions of bioeconomy, and all of these definitions can be described as enrolling in one of the following three basic directions (Bugge, 2016):

1. **Biotechnology**: this direction underlines the central role of research in the field of biotechnology and the application of the results in all sectors of activity.
2. The use of **bioresources** is centered on the efficient processing of the existing natural resources, including the principles of the circular economy and the creation of new value chains.
3. **Bioecology** is an approach based on the concept of sustainability, encouraging ecological processes by optimizing the use of nutrients in agriculture, avoiding soil degradation, oppressing the use of energy sources.

The bioeconomy brings new economic opportunities, by enhancing the emergence of business and encouraging entrepreneurship. It is characterized by increased resource efficiency, the diversification of the supply of energy sources, and investments in knowledge-based sectors such as biotechnology and genomics, plant breeding, and plant-based processing. Therefore, it is considered that bioeconomy is both associated sustainability goals and with innovation and the valorization of scientific knowledge (Hermans, 2018).

Bioeconomy is seen as a challenge and a strategic sector for Romania as well, being considered that an efficient, innovative and sustainable use of biological resources will be a job generator and will bring a new range of improved bioproducts on market.

### **Research methodology**

Entrepreneurship as a factor of economic growth, social progress and employment is enjoying a special attention and support lately, special funding programs being launched to encourage

initiatives. The entrepreneurship indicators used in this paper are the traditional indicators reported in the literature, such as the number of companies, occupation and turnover by sector. Regarding the bioeconomy, a special set of indicators has not yet been defined to measure the performance or efficiency of this field.

The indicators used for measuring the bioeconomy, are at present the number of companies, the degree of employment, and turnover, taking into consideration the data reported for the different fields that are included in this sector of activity, as follows:

- agriculture, forestry and fishing,
- food industry (including beverages and tobacco)
- biobased products (textile, wood products)

Therefore, we have tried to identify these indicators at the level of our country based on official data extracted from National Institute of Statistics.

### Results and discussion

The concept of bioeconomy was born following the technological advances registered in the life sciences in the last decades. The bioeconomy includes all the main sectors of primary production (agriculture, horticulture, fishing and aquaculture, plant and animal husbandry forestry, fisheries and aquaculture), food industry and those of the transformation of biological resources, such as the textile industry, wood processing and biorefining.

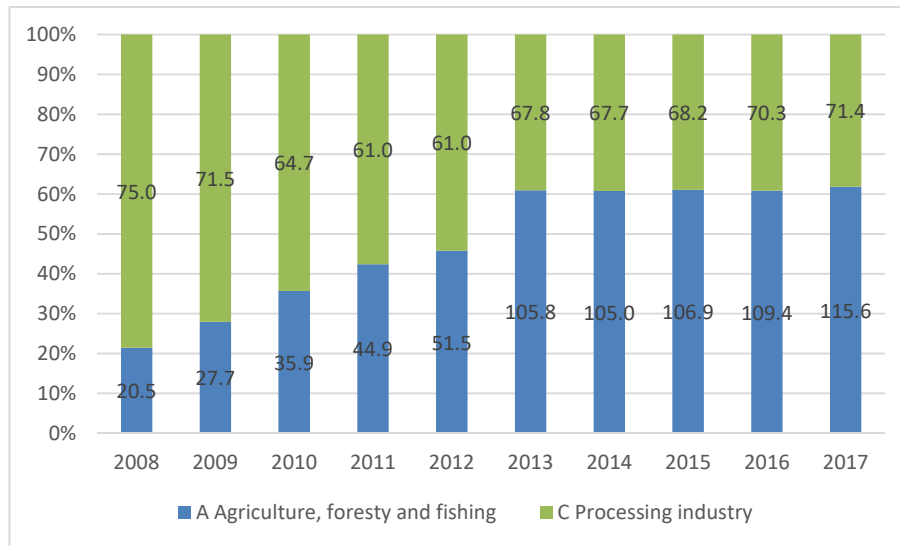
For translating the bioeconomy sector development into numbers and figures, it is considered that the bioeconomy sector is based on the following commercial production areas (Table 1), and their corresponding NACE 2 (Nomenclature statistique des activités économiques dans la Communauté européenne) codes:

**Table no. 1 Category of production areas in Bioeconomy, by NACE 2 CODE**

Category	Domain	NACE code
Primary production from bioresources	agriculture, forestry, fisheries and aquaculture	A 01, A02, A03
Processing and transformation industry	food, beverages, tobacco and feed; leather, wood, and straw based products	C10, C11, C12 C15, C16, C17
Chemical and bioenergetic industry based on alternative renewable resources	paper, textiles, chemicals and pharmaceuticals for the energy industry	C13, C14, C20, C21 D35

The bioeconomy focuses on the methods of converting raw materials into value-added products, with the aim of reaching an innovative economy, based on advanced knowledge, with low emissions. Thus, the bioeconomy includes innovative actions taken to produce food, feed, biological materials and bioenergy resources. Given the specific data available for our country we shall further on concentrate on the analysis of entrepreneurial ecosystem existent in the traditional sectors of bioeconomy, namely primary production and food and feed industry.

We started from the analysis of the distribution of the number of companies existing in Romania in the field of agriculture and processing industry. According to NIS data, the evolution of the number of companies tends to be unfavorable for the processing industry. After 2013, more than 50% of the total number of companies in the field of bioeconomy, are involved in the primary production of agriculture.



**Fig. no. 1 Number of enterprises in 2018 (label data are expressed as thousand enterprises)**

*\*Data source: NIS, INT110B*

It is already known that Romania has the most fragmented structure of the agricultural sector in Europe. According to official statistics, a high percentage of the agricultural holdings in Romania (over 70%) belong to the group of up to 2 ha. This translates into a low capacity to enter the market, the land being used and exploited for the purpose of obtaining goods for own consumption, without being a market-oriented economic activity.

The problem of the poor position of the farmers in the value chain derives directly from the structural imbalance affecting the agricultural sector in Romania, characterized by an excessive fragmentation of production.

The supply in this segment is difficult to adapt to the demand, as the agricultural producers tend to expand less in the sense of vertical integration (in the downstream sectors: processing or direct sales), thus limiting the opportunities to increase the value added of the production and to strengthen their market position.



**Fig. no. 2 Active enterprises, NACE Rev.2, size classes of number of employees, by counties**

*\*Data source: NIS, INT1010*

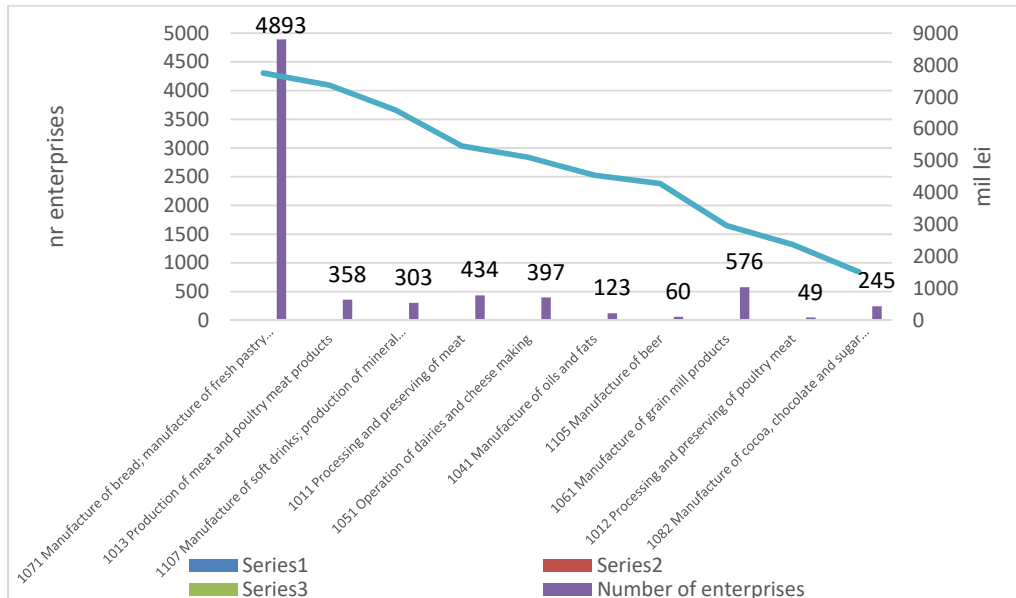
The number of people employed in agriculture reached 20.000 persons in 2018, with the highest concentration in Timis (1105), Constanta (970), Bihor (890) and Arad (774) (figure no. 2).



**Fig. no. 3 Active local units, by NACE, by number of employees, by counties**  
 \*Data source: NIS, INT101S

The number of people employed in Processing and transformation industry reached the highest concentration (Figure 3) in Bucharest Municipality (118,110) Cluj (34,875), Timis (26,250), Constanta (23,255).

Obviously, the entrepreneurial opportunities in Romania will come in the near future in the food field, rather than in other emerging sectors. The most important sub sectors within food and feed industry, by turnover and by number are represented in figure 4.



**Fig. no. 4 Top ten Enterprises from Food, feed and tobacco sector by turnover**  
 \*Data source: NIS, INT101S

Under the recent transformations suffered by the demand and consumption trends in food market, namely the high demand for safe, high quality, healthy, nutritious and pesticide free products, it is a given fact that innovation as well as technological advances will play a key role in the success of entrepreneurs, on increased sectorial competition.

Functional foods (foods rich in protein, microplants, fortified milk alternatives, etc.), the use of enzymes in production processes, the use of innovative environmentally friendly packaging, are just a few examples of good practices in the field of bioeconomy, which have been successful in the EU.



**Fig. no. 5 Five-step-conceptualization of the food value chain inspired by Kuckertz 2019**

Thus, it is necessary to pay particular attention to the stimulation of entrepreneurship in the direction of setting up some companies involved downstream on the value chains, diversifying the revenues by involving in the processing of the raw material from agriculture and processing of the resulting waste. The most active sub sectors of the value chain in agri-food value chains are transformation and converting and packaging (Figure 5)

Over the time, the economic units involved in bioeconomy related sector, did not necessarily need to focus on marketing strategies, innovation pathways and up to date technology, as they were profitable per se, owing traditional distribution channels and regulated markets (Lindgreen et al., 2012). Lately, the tendency towards creating value chains in agriculture, and its management, has emerged as a business survival strategy (Salvia, 2020).

### Conclusions

To meet the current expectations of consumers, a key factor in an entrepreneurial strategy means offering high quality and differentiated products that reflect emergent agri food market. This will lead to a resumption of business in the future, in harmony with the new social trends and with the future profile of the consumer.

Long-term winners will be those who will have the vision and power to move the perspective beyond 2020 and will reposition themselves stronger and more confidently.

Applying the discoveries in the field of biotechnology can act as a catalyst for the leap of knowledge and the strengthening of the bioeconomy. The evolution of industrial and agricultural processes, towards the digitization of production, the use of genetic engineering and biotechnology, will lead to the emergence of a new type of new industrial entrepreneur, as well as agro-entrepreneurs.

Support to bioeconomy sector should be coupled with research and innovation funding. The EU allocated almost 4 billion Euro under Horizon 2020 programme and a budget of 10 billion Euro is planned under the next programming period that will start in 2021. With a proper awareness raising from the policy makers and effective collaboration between research

organizations and business environment, the entrepreneurship in bioeconomy sector can only bring benefits for both society and economy.

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