The Impact of the Bioeconomy on the Economic Development under the Global Crisis

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Abstract: The paper is focused on the idea that bioeconomy represents a real solution to the future sustainable development. The main objectives of the paper consist of an evaluation of the bioeconomy's impact on the global economy, followed by finding solutions for the Romanian economy. The bioeconomy is a new concept in Romania. As a result, there are just a few theoretical contributions to this topic area. This is why**,** we realised a pertinent analysis, in order to quantify the impact of the bioeconomy on the EU economy and to find pertinent solutions for the development of this approach in Romania. The main conclusion of the paper is that bioeconomy is a good solution for a sustainable development in Romania.

Keywords: bioeconomics; sustainable development; resources sustainably; knowledge transfer networks.

JEL Classification: Q1; Q2; Q3; Q4; Q5

1. General Approach

The present global economic development model is not able to ensure and to promote a sustainable development. It is based on high consumptions of rare materials and often low economic returns. Moreover, the limits of this kind of growth are much closed. The direct and indirect effects of the classical model of economic growth are almost all negative and cover the natural, social and cultural environment. The humanity has to discover and implement another model of economic development, a more sustainable one. The actual economic growth model is based on an unsustainable production, which uses extensively the natural and labour resources. This model is the main reason for the food and energy insecurity and the climate change across the world. Moreover, it affected the public health (see Figure 1).

As a result, a new economic challenge for the global economy becomes the need of another economic growth model, which to be able to preserve and to use the natural and labour resources under a sustainable way. This is why bioeconomy is considered to be a real alternative for the global economy. There are a lot of

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initiatives connected to this bioeconomy across the developed and emergent countries, in the last period.

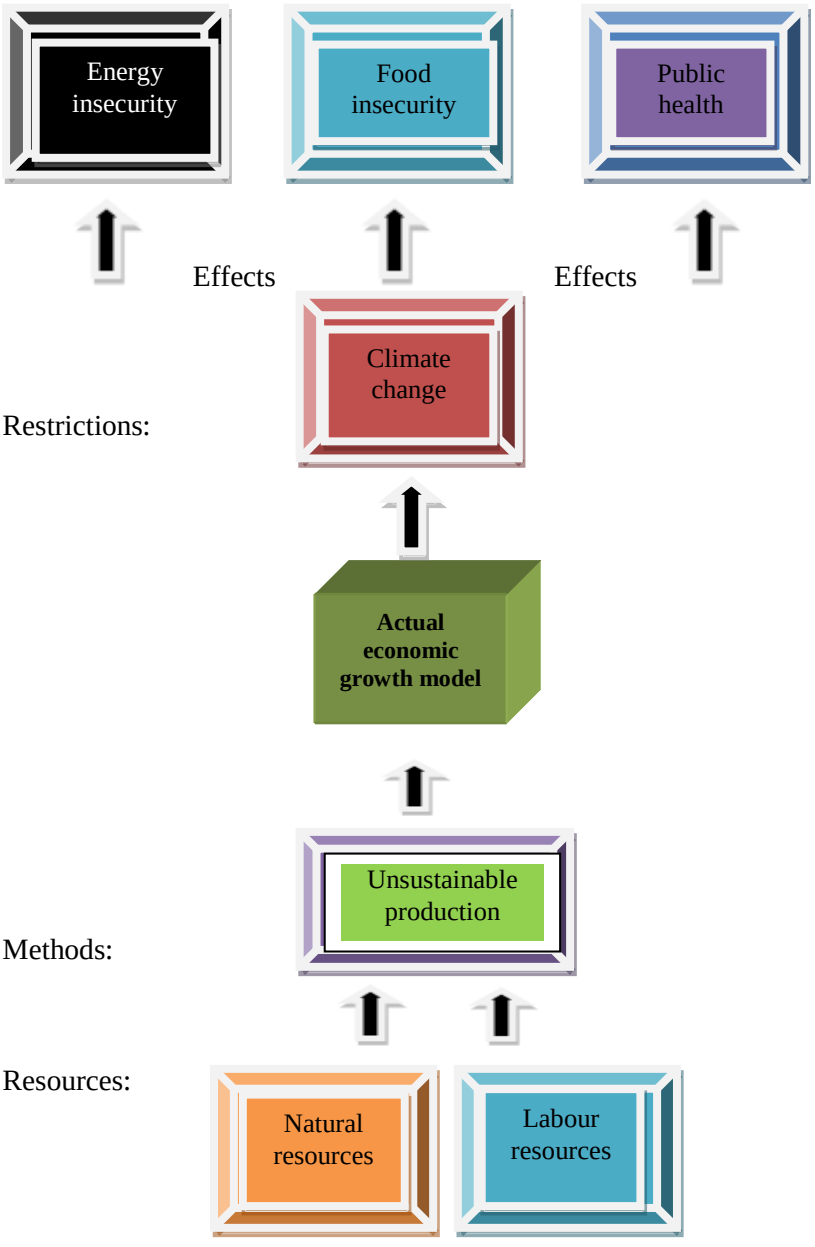

Figure 1. Actual economic growth model

Source: Personal contribution

2. Other Research in this Topic Area

The research in bioeconomy developed quickly in the last decade and they were focused on finding solutions to the global crisis challenges. The international approach connected to bioeconomy is more developed than the Romanian one. An interesting book of bioeconomy is a classical research which received the PROSE Award for Best Engineering and Technology Book from the Association of American Publishers. (Carlson, 2011). The book covers 14 chapters and starts with the concept of biology and its implications in the real economic life. A distinct part of the book deals with the foundations for a bioeconomy and the need of a revolution in the present economic approach.

OECD recognises the importance of the bioeconomy in a special policy agenda (OECD, 2012). This is an International Futures Programme (IFP) of the OECD which will be supported by other interested OECD directorates, OECD Government Ministries, and outside partners. The main idea of this paper is that "the application of biotechnology to primary production, health and industry could result in an emerging "bioeconomy" where biotechnology contributes to a significant share of economic output". The research tries to find those external elements which will drive the bioeconomy to 2030, starting to the state of this bioeconomy today. The analysis is divided into two time periods: 2012-2015 and 2016-2030. An interesting idea is that of the policy options for the bioeconomy. Another interesting approach is that which realises a connection between the bioeconomy and the need of a revolution in the global economy (Mayes R.E., 2012). The basic idea of this book is that the 21st century is a century of biology, connected to the potential of genomics. The evolution of the bioeconomy will be based on anticipated revolutions. The Romanian research in bioeconomy is minimally, excepting a research collective from the Romanian Academy. An interesting research is that connected to the food security and the need of a bioeconomic approach (Bogdan, 2012). The proposed solution for this problem is the biodiversity of the farm animals. Another approach is that connected with Romania as an agrifood green power (Bogdan & Ipate, 2012). The authors consider that Romania is able to become an important economic power using its green development resources. Last, but not the least, the global food crisis can be eliminated under a strategic and integrated management focused on bioeconomy and ecoeconomy (Bogdan, 2012).

3. The Bioeconomy as a Platform to a Sustainable Development

We noticed above that the actual global economic model implies an unsustainable use of the biological and non-biological resources. This model is not able to support the use of the food, water and energy on long term. Moreover, the pollution made by the actual economic system is higher and the developed countries do not

support an important decrease of the pollution level. The bioeconomy is based on the idea that any biological material can be used to support food, health, fibre and industrial products and energy. This implies a sustainable production and the conversion of biomass. The main result of the bioeconomy is the possibility to move from fossil biomass to current biomass. On the other hand, the importance of agriculture, natural resources and sustainable energy production will increase.

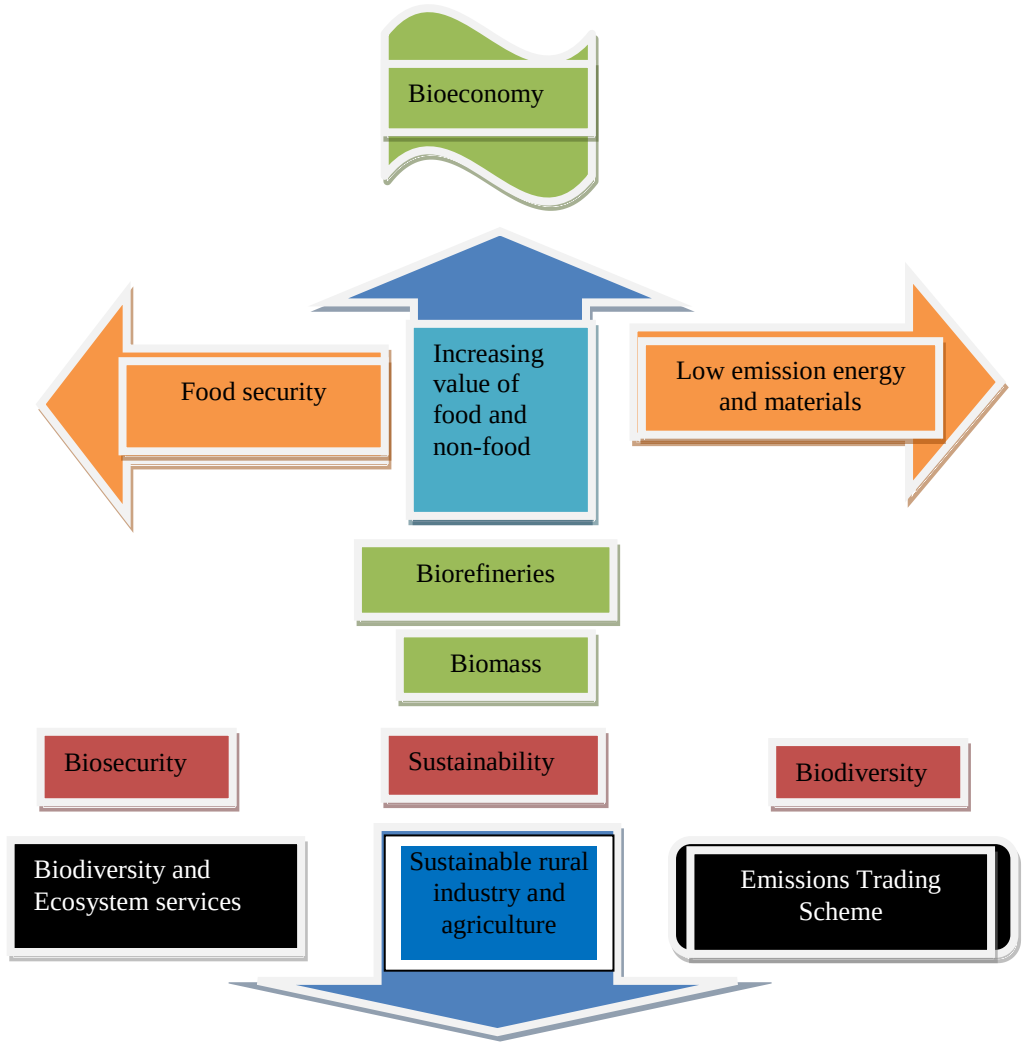

Figure 2. Bioeconomic model

Source: (Begley & Hirsch, 2008)

Like the classical economic system, the bioeconomy is based on efficiency. This is supported by higher biomass productivity, adequate prices and an incentive law framework. On the other hand, bioeconomy needs a new proactive management focused on sustainable development.

According to Figure 2, the bioeconomy is able to increase the value of food and non-food outputs using a sustainable rural industry and agriculture. As a result, there are at least two opportunities. The food opportunities consist of the change of the demand to the high value goods and processed foods, developing sustainable biomass production systems and improving biosecurity systems.

On the other hand, the non-food opportunities are connected to the possibility to transform resources and offals into biobased products, to protect the environment and to decrease the dependence on imported oil, as well.

4. The Bioeconomy across the EU

The European economy understood the importance of the bioeconomy. It tried to implement this new approach in order to maximise the socio-economic positive effects.

Nowadays, the bioeconomy covers 17% from the EU27's GDP and 9% from the European total employment (see Figure 3).

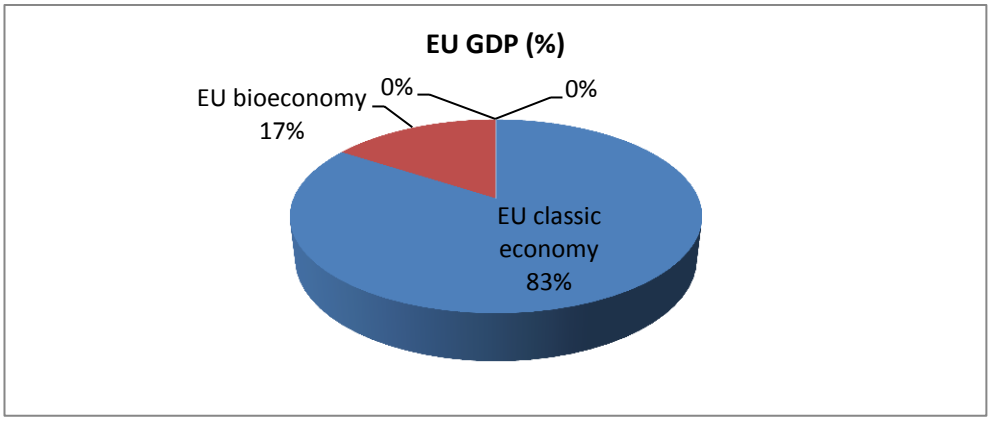

Figure 3. The contribution of the bioeconomy

Source: Personal contribution using European Commission, 2012

The largest share of annual turnover of the European bioeconomy is covered by food. It is followed by agriculture and paper/pulp (see Figure 4).

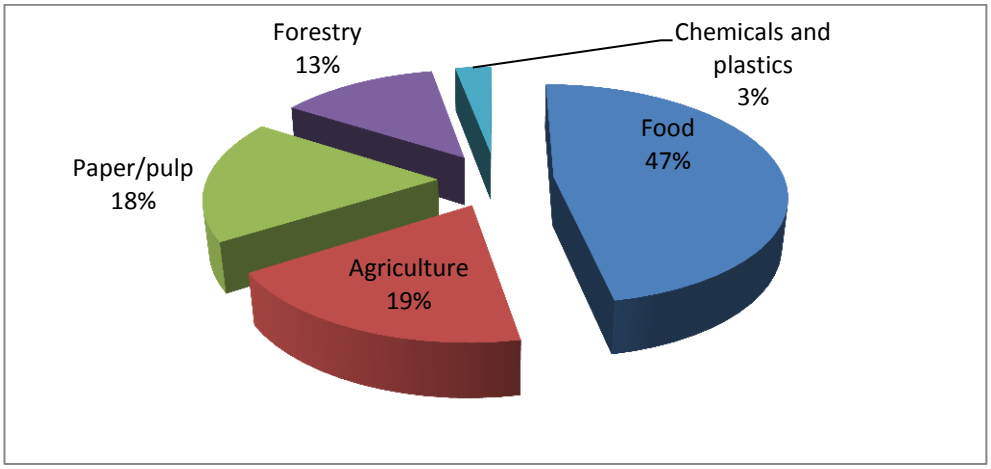

Figure 4. The distribution of the EU bioeconomy turnover

Source: Personal contribution using European Commission, 2012

9% from the European employment operates in bioeconomy, most of them in agriculture and food. There are other industries connected to the bioeconomy: paper/pulp, forestry, wood products, biofuels, chemicals and plastics (see Figure 5).

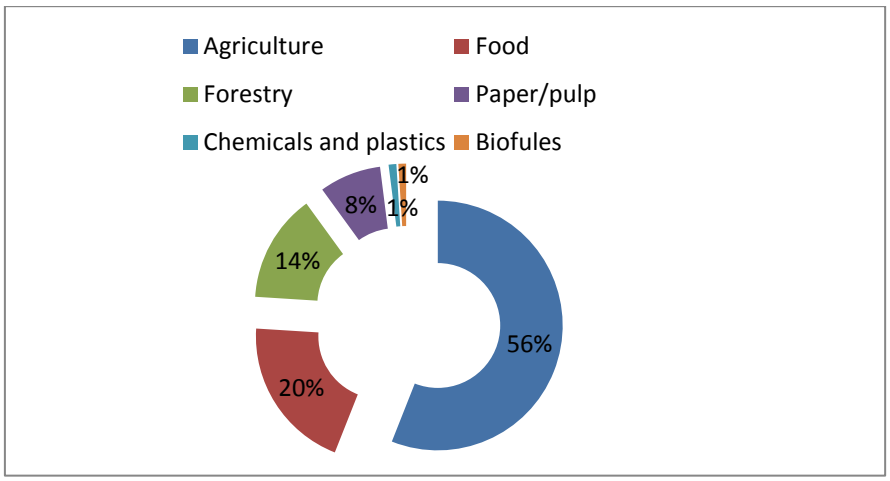

Figure 5. Employment within the EU bioeconomy

Source: Personal contribution using European Commission, 2012

European Commission realised a White Paper connected to the future of the bioeconomy. This document describes six major challenges: sustainable management of natural resources, sustainable production, improving public health, mitigating climate change, integrating and balancing social developments and

global sustainable development. All these challenges are described and are followed by solutions under a sustainable management.

This is why the document makes a set of recommendations which are focused on: research, innovation, education and training and governance and public dialogue.

Moreover, the European Commission realised a communication, to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions, connected to the sustainable growth in Europe under the bioeconomy (European Commission, 13.02.2012).

Bioeconomy represents a way of fighting against the main challenges of the present global economy: ensuring food security, managing natural resources sustainably, reducing dependence on non-renewable resources, mitigating and adapting to climate change, creating jobs and maintaining European competitiveness. The target of the European Bioeconomy Strategy is to generate 130000 jobs and 45 billion Euros in value added by 2025.

5. Conclusions

The above presentation leads to the idea that the bioeconomy is very important as a solution to the sustainable development. This approach is difficult to apply in Romania, where is not a theoretical support for it, yet. As a result, we propose some solutions for the Romanian economy. These solutions have to be used both at national and regional level. An interesting solution covers the need of a coherent policy connected to the environment policy. This means more informed dialogues, encourage private investment and implementing of a dedicated information system. The bioeconomy strategy in Romania has to align of EU research and innovation funding about the priorities of bioeconomy-related policies.

Another solution is the investment in knowledge, innovation and skills. This asks for a good public-private partnership in order to support bioeconomy research programmes.

A distinct solution is that connected to participative governance and informed dialogue with society. As a result, the science and technology have to be seen as a opportunity for the future generations. Last but not the least, Romania needs new infrastructures and instruments connected to bioeconomy. The infrastructure has to cover more research, rural, marine and industrial components. This infrastructure will be support by better knowledge transfer networks. As a final conclusion, bioeconomy is a good solution for a sustainable development in Romania.

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