



# ASSESSING THE STATE OF BULGARIAN BIOECONOMY- TBL

Mihaela MIHAILOVA\*, Vassil STOYCHEV\*, Daniela DIMITROVA\*\*

\*Institute of agricultural Economics - Sofia, Agricultural Academy, Bulgaria

\*\*Institute of Viticulture and Enology – Pleven, Agricultural Academy, Bulgaria

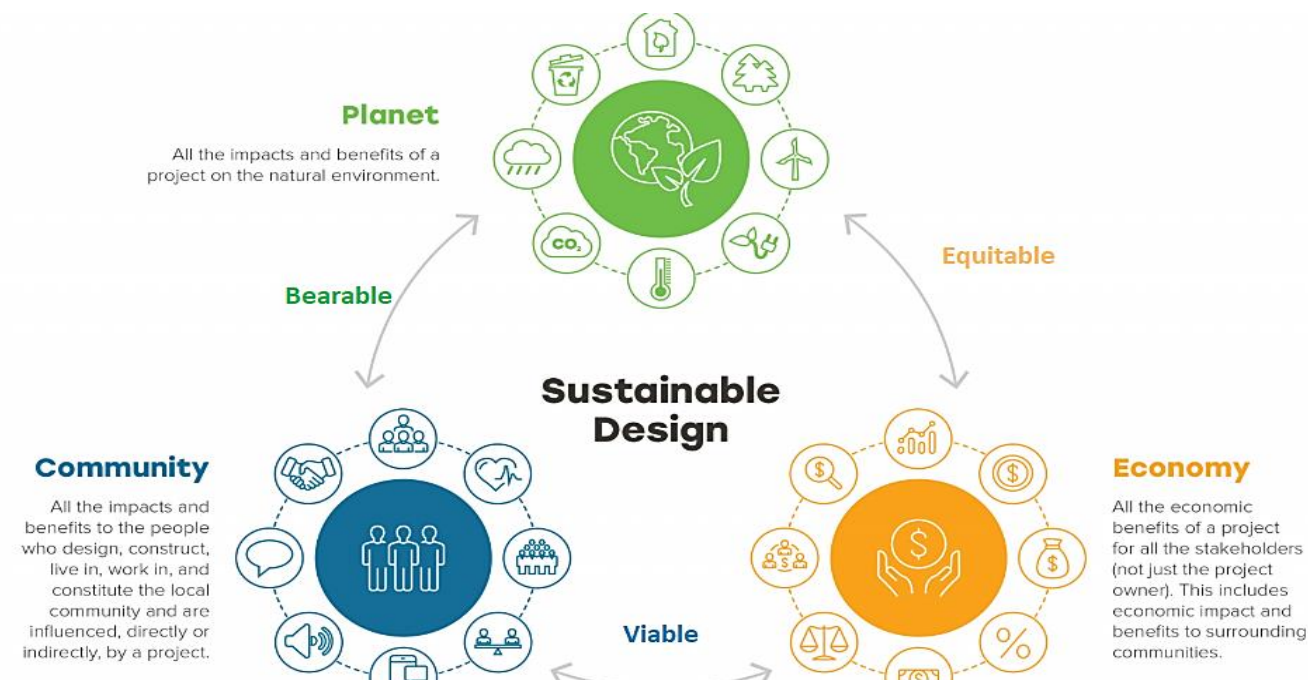
## INTRODUCTION

The integration of industrial crops into the bioeconomy presents a sustainable pathway for agricultural development, offering alternatives to fossil-based resources and contributing to environmental conservation. This review examines the role of industrial crops within the bioeconomy, their applications, and the implications for the agricultural sector. Emphasis is placed on the industrial crops in line with dealing with social and economic problems and the potential socio-economic benefits. Challenges such as land-use competition, environmental impacts, and the need for supportive policies are also discussed. The bioeconomy encompasses the production of renewable biological resources and their conversion into food, feed, bio-based products, and bioenergy (European Commission, 2018).

## MATERIAL AND METHOD

In this research article a critical review of literature sources was performed to better understand the role of industrial crop in bioeconomy and agricultural sector. Desk Research, logical, expert method, etc. combined with graphic method of representation is utilized for describing and examining the current situation of the problem and its social, economic and ecological aspects.

For further analysis of the state of the regional development of bioeconomy production using industrial crops we have adapted the Triple bottom line approach (or otherwise noted as TBL or 3BL) that is an accounting framework with three parts: social, environmental (or environmental) and financial. Business writer John Elkington claims to have coined the phrase in 1994. Some organizations adopt the TBL framework to assess their performance in a broader perspective to create greater business value, for the purpose of this research we will look at the bioeconomy through this framework.



Source: altered by the author base on (Dalibozhko & Krakovetskaya, 2018) and (Cody, 2024)

Graphic 1. TBL representation

The Triple Bottom Line (TBL) methodology is a comprehensive framework that integrates three dimensions of performance: social, environmental, and financial.

### 1. People (Social axis)

This dimension pertains to fair and beneficial business practices toward labor, the community, and the region in which a corporation conducts its business. It addresses issues such as employee well-being, community engagement, diversity and inclusion, and human rights (Patel et al., 2020).

### 2. Environmental (Planet)

This dimension pertains to sustainable environmental practices. It seeks to reduce the ecological footprint of a company by focusing on resource use, emissions, waste management, and sustainability (Thabrew et al., 2018).

### 3. Profits (Economic)

The economic dimension traditionally associated with the bottom line in business – the profit and loss. However, in the TBL methodology, the economic value also includes the economic impact the organization has on its surrounding community, such as economic growth, value creation, risk management, and investment (Nogueira et al., 2022).

## CONCLUSION

The integration of industrial crops into the Bulgarian bioeconomy presents a sustainable pathway for economic growth, environmental conservation, and social development. From an economic perspective, industrial crop production contributes to GDP growth and employment, yet resource efficiency remains a concern due to high input costs and fluctuating energy prices. Ultimately, the future of Bulgaria's bioeconomy depends on balanced policy measures that address economic viability, social equity, and environmental sustainability.

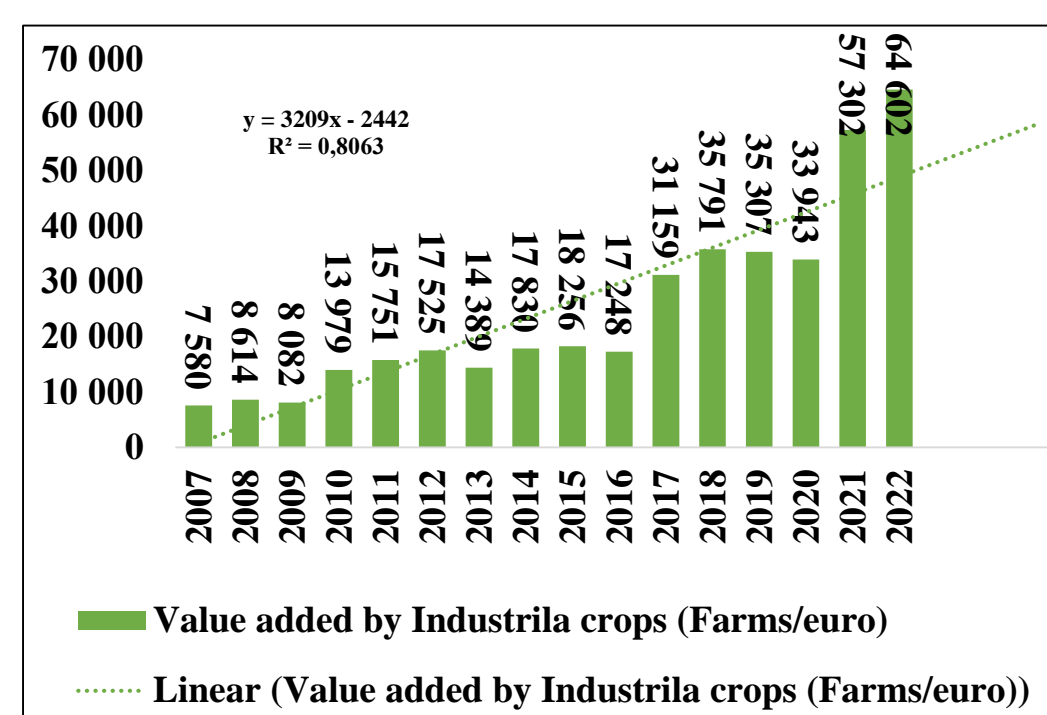
Strengthening support mechanisms, fostering innovation, and promoting sustainable agricultural practices will be key to ensuring the sector's long-term resilience and contribution to a greener economy.

## RESULTS AND DISCUSSIONS

The integration of industrial crops into the bioeconomy presents a sustainable pathway for agricultural development, offering alternatives to fossil-based resources and contributing to environmental conservation. This review examines the role of industrial crops within the bioeconomy, their applications, and the implications for the agricultural sector. Challenges such as land-use competition, environmental impacts, and the need for supportive policies are also discussed.

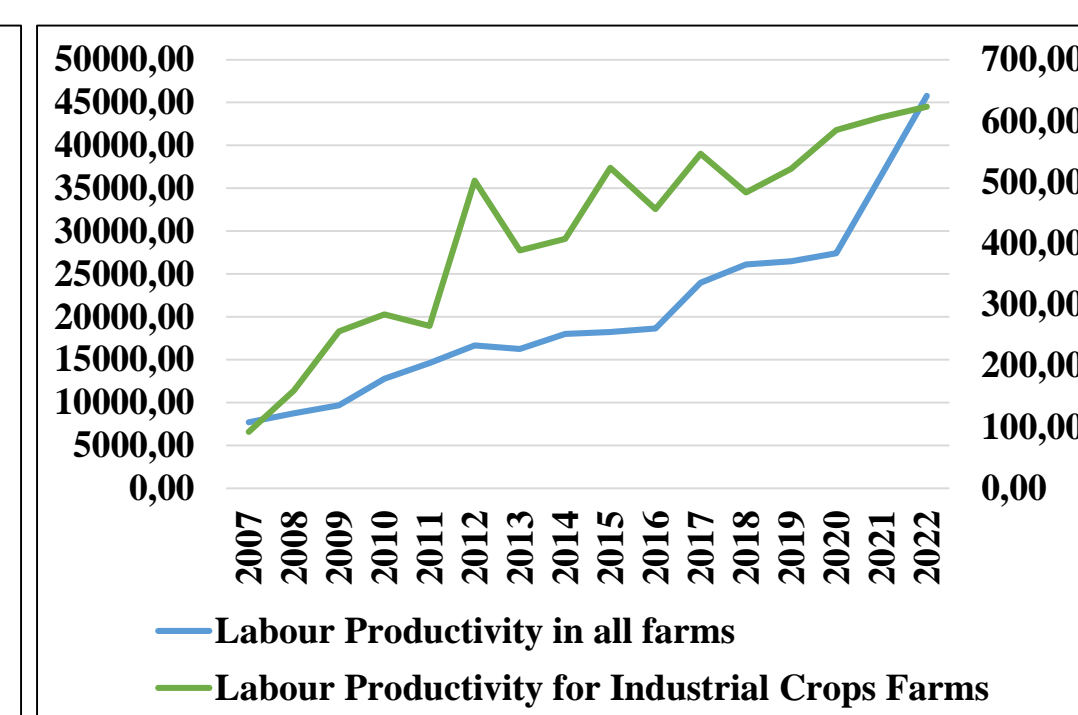
### Profits (Economic)

The economic dimension focuses on growth, value creation, risk management, and investments in Bulgaria's bioeconomy. The bioeconomy's contribution to GDP has grown due to increases in land efficiency and labor productivity.



Source: FADN data

Graph 1. Value added



Source: FADN data

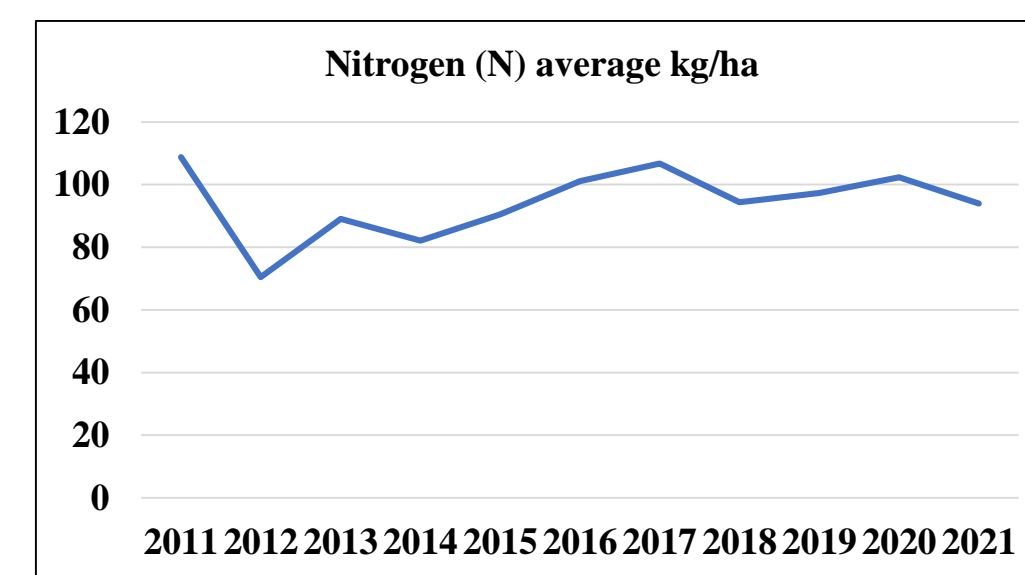
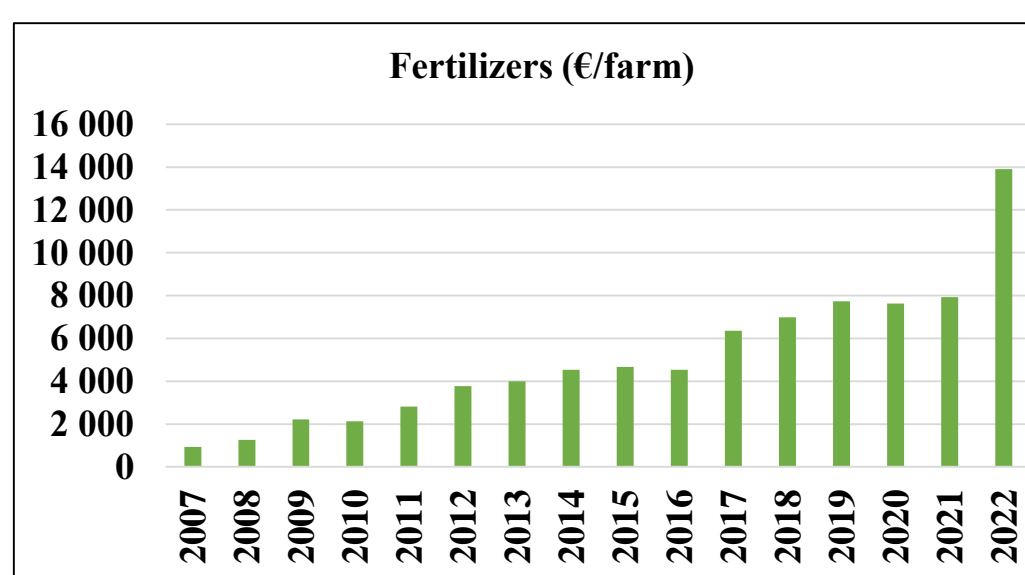
Graph 2. Labour productivity in Bulgaria

Labour productivity in Bulgarian agriculture has shown a steady upward trend, with significant acceleration after 2015 due to modernization, resource efficiency, and EU CAP support and market demands. Specialized industrial crop farms maintain higher productivity levels but exhibit greater volatility due to market and climatic factors.

### People (Social axis)

Creating skill oriented towards bio economy is crucial for knowledge transfer and value chain optimization. The bioeconomy sector, particularly agriculture, plays a vital role in rural communities. Increased rural development payments and environmental subsidies could enhance the quality of life for rural residents, contributing to long-term social stability and economic resilience. Even with the steady increase thru the years, the level is much lower than other payments.

### Environmental (Planet)



Source: FADN data

Graph 3. Fertilizers (euro/farm), Nitrogen (N) average kg/ha

The data indicates moderate fertilizer and energy consumption in agriculture. While these inputs are essential for productivity, excessive use leads to environmental concerns. Increasing precision in fertilizer application and adopting renewable energy sources could mitigate these impacts.

The steady increase in crop protection spending per farm from 2007 to 2022 reflects growing challenges and costs associated protecting crops. For the bioeconomy sector and industrial crop producers, managing these costs while ensuring effective crop protection will be essential for maintaining productivity and profitability in the face of changing agricultural and environmental conditions. Environmental subsidies are relatively low, which may limit the adoption of sustainable practices.