

Introduction

- The bioeconomy development is an important strategy for increasing sustainability and achieving the European Green deal. Environmental taxes are one of the most important tools for the development of the bioeconomy. The research aim is to compare the role of environmental taxes in countries with different levels of economic development: Lithuania and Georgia.
- The authors explore the following question: whether the policy of environmental taxes can contribute to the development of the bioeconomy.
- The authors assume that the impact of environmental taxes on bioeconomy development is very different in these countries.

Methodology

Background of methodology are aims of Bioeconomy and Environmental tax:

Bioeconomy aims to contribute to solving several societal challenges:

- ensuring food security,
- management of natural resources in a sustainable manner,
- reduction of dependence on non-renewable resources,
- mitigation of and adaptation to climate change,
- creation of jobs and maintenance competitiveness (Venkatramanan et al., 2021; Asada et al., 2020; Böcher et al., 2020; Liobikiene et al., 2021).

Environmental taxes aims are:

- internalization of the negative externalities;
- promotion of energy saving and the use of renewable sources;
- discouragement of anti-ecological behaviour;
- motivation of the companies to innovate in sustainability;
- generation of revenue for governments, allowing other taxes to be lowered or environmental projects to be carried out;
- environmental protection (Khan et al., 2021; Miceikiene et al., 2021; Miceikiene, Butvilaitė, 2018).

The following theoretical methods were used in order to substantiate the problem relevance: scientific literature analysis, comparative analysis, systemic analysis, document analysis, generalisation analysis, and other common research methods. The bibliometric method was used in the analysis of the relations between the environmental taxes and bioeconomy from the theoretical perspective. Research conducted by Lithuanian and foreign researchers, published in peer-reviewed and international databases with an impact factor, such as Web of Science, Scopus, EBSCO, and Spranzlyzedere analysed. Statistical methods were used for the purpose of the empirical study.

The research presented in the article analysed and compared the possibilities (indicators) of two countries with different levels of economic development (Lithuania and Georgia) to develop bioeconomy. Environmental taxes were used as the factor. The results were compared with the mean indicators of the OECD countries.

In Lithuania, 4 types of environmental taxes are used: energy, transport, pollution, and resources taxes, in Georgia – transport taxes only.

The research consisted of several stages. In the first stage, the analysis of bioeconomy development and environmental tax situation in Lithuania and Georgia was performed in order to identify the role of bioeconomy in the economies of both countries.

As part of the assessment of the effect of environmental taxes on the bioeconomy development, the indicators identifying the environmental taxes in Lithuania and the mean indicators of the OECD countries were calculated. The following groups of indicators were selected for the analysis:

1. Share of environmental taxes revenue in GDP;
2. Air pollution-related taxes revenue;
3. Revenue from taxes targeting biodiversity;
4. Climate change-related taxes revenue;
5. Revenue from energy taxes;
6. Revenue from transport taxes;
7. Revenue from pollution taxes;
8. Revenue from resource taxes.

- Due to the scarce information of the low volume of the environmental taxes, the environmental tax indicators of Georgia were not calculated.

- In the second stage of the research, the key indicators characterizing the bioeconomy were calculated and analysed:

1. Agriculture, forestry, and fishery, value added (% of GDP);
2. Total production of renewables (PJ);
3. Share of renewables in total energy production (%);
4. Share of renewables in TES (%);
5. Share of solid biofuels in renewables production (%);

- Mean indicators of Lithuania, Georgia, and OECD were calculated. The conclusions were developed on the basis of the empirical study.

- This research starts with data collection, gathering and systematisation. The study used statistics from 2000 to 2019. The data for the research was gathered from the OECD database.

Main conclusions

The aims of bioeconomy and environmental taxes are the same and contribute to solving several societal challenges: ensuring food security, management of natural resources in a sustainable manner, reduction of dependence on non-renewable resources, mitigation of and adaptation to climate change, creation of jobs, and maintenance of competitiveness. Bioeconomy serves the goals of resource-saving and reduction of environmental pollution and is, therefore, in accordance with principles of sustainable development.

Certain European countries have implemented environmental tax reforms. No reforms have been implemented in Lithuania and Georgia. The aim of this kind of reform is to shift the tax burden in favour of environmentally targeted taxation.

The situation in Lithuania is better on average than in the OECD countries in terms of the share of the revenues from environmental taxes in GDP, and revenue from the air pollution-related taxes. The revenues from transport, and taxes in Lithuania are low. Almost all environmental taxes (90%) are excise duties on oil and oil products, with the taxes on pollution and natural resource use accounting for the remaining share.

Lithuania does not yet levy a carbon tax, although it participates in the EU emissions trading system. Having started to implement the Green Deal, Lithuania will have to apply carbon taxes and other environmental taxes.

The environmental tax burden in Georgia is very low, but this country has the potential to develop a bioeconomy. At present, the excise tax plays the role of an environmental tax in Georgia. Since 1 January 2017, it was increased significantly for petroleum products, oil distillates, and natural gas. The reason behind the tax increase was to avoid the expected reduction of budget revenues as a result of the profit tax reform, rather than an environmental policy.

The link between environmental taxation, the bioeconomy and sustainability

Environmental tax system

Bioeconomy development goals

Sustainability goals

Results

Table 1. Bioeconomy indicators in Lithuania and Georgia

Indicators	Lithuania		Georgia	
	1990	2019	1990	2019
Total production of renewables (PJ)	13.42	70.06	46.84	40.94
Share of renewables in total energy production (%)	6	85	55	93
Share of renewables in TES (%)	2	22	9	20
Share of solid biofuels in renewables production (%)	89	76	42	24

Table 2. The main factors of bioeconomy in Lithuania and Georgia

Indicators	Lithuania		Georgia		OECD	
	1990	2019	1990	2019	1990	2019
Agriculture, forestry and fishery, value added (% of GDP)	9.88	3.24	30	7.3	2.33	1.39
Food and beverage industry, value added (% of GDP)	6.5	3.7	35	9.1	x	x

Bioeconomy development and environmental taxes in Georgia

The opportunities for bioeconomy development under the conditions regulated by entrepreneurial activities by the means of green taxes have been not explored in Georgia sufficiently. The expected outcome has not been estimated in contrast to the outcome of environmental pollution and depletion of natural resources in parallel with economic growth, endangering the prospects of further economic development. Thus, the tax system is not being reformed gradually, taking into consideration the environmental interests of the country. Therefore, the green taxes cannot perform their environmental function yet. The future of sustainable development of the country directly depends on the promotion of environmentally healthy production methods and restriction of environmentally undesirable activities.

Bioeconomy development and environmental taxes in Lithuania

The bioeconomy has an important role in the overall economy of Lithuania. The total turnover of the Lithuanian bioeconomy sectors is about EUR 15 bln (Y2020) and accounts for about 14% of the total turnover of non-financial companies. Over a third of the turnover is generated by the food processing industry and other bio-based manufacturing sectors. A smaller share is generated by agriculture, forestry and logging, fishery, and aquaculture. More than a sixth of the employed population in Lithuania are occupied in the bioeconomy and almost half of them are occupied in agriculture, forestry, and fishery. The food industry accumulates almost a fifth of the occupied population. The bioeconomy accounts for about 15% of the national GDP, with more than half of this share generated by the food system, i.e., the food industry and agriculture. The export value of the Lithuanian bioeconomy sector was almost EUR 12 bln, i.e., 45% of the total Lithuanian product export. The Lithuanian bioeconomy sectors employ about 18% of the total employed population.

In Lithuania, environmental taxes are applied in all sectors, including the bioeconomy. Almost all the environmental taxes (90%) are excise duties on oil and oil products, with pollution and natural resource use taxes accounting for the remaining share. Recently, the government has taken action to increase pollution taxes.

Table 3. Main indicators of environmental taxes in Lithuania and OECD

Indicators	Unit of measure	Lithuania		OECD	
		2000	2019	2000	2019
Environmental taxes	% of GDP	2.76	1.94	1.83	1.52
Revenue from air pollution-related taxes	% of environmental tax revenue	65.1	92.34	85.1	80.02
Revenue from taxes directed at biodiversity	% of environmental tax revenue	7.1	2.77	1.18	0.92
Revenue from climate change-related taxes	% of environmental tax revenue	66.24	91.1	90.32	90.61
Revenue from energy taxes	% of GDP	1.74	1.72	1.31	1.08
Revenue from transport taxes	% of GDP	0.67	0.08	0.46	0.4
Revenue from pollution taxes	% of GDP	0.05	0.04	0.05	0.04
Revenue from resource taxes	% of GDP	0.3	0.11	0.01	0.01

Table 4. Revenue from climate change-related taxes in Lithuania and OECD

Indicators	Unit of measure	Lithuania		OECD	
		2000	2019	2000	2019
Climate change-related tax revenue: energy tax bases	% of environmental tax revenue	63.1	88.31	70.96	70.52
Climate change-related tax revenue: transport tax bases	% of environmental tax revenue	0	0	18.95	19.75
Climate change-related tax revenue: resource tax bases	% of environmental tax revenue	0	0	0.38	0.4
Climate change-related tax revenue: pollution tax bases	% of environmental tax revenue	0	0	0.38	0.4

Table 5. Revenue from air pollution-related taxes in Lithuania and OECD

Indicators	Unit of measure	Lithuania		OECD	
		2000	2019	2000	2019
Air pollution-related tax revenue: energy tax bases	% of environmental tax revenue	63.1	88.31	68.45	63.82
Air pollution-related tax revenue: transport tax bases	% of environmental tax revenue	0.24	1.91	15.96	16.2
Air pollution-related tax revenue: resource tax bases	% of environmental tax revenue	0	0	0.62	0.48
Air pollution-related tax revenue: pollution tax bases	% of environmental tax revenue	1.73	2.12	0.01	0.01

Table 6. Revenue from biodiversity-related taxes in Lithuania and OECD

Indicators	Unit of measure	Lithuania		OECD	
		2000	2019	2000	2019
Biodiversity-related tax revenue: energy tax bases	% of environmental tax revenue	0	0	0.003	0.009
Biodiversity-related tax revenue: transport tax bases	% of environmental tax revenue	0	0	0.194	0.225
Biodiversity-related tax revenue: resource tax bases	% of environmental tax revenue	0	0	0.663	0.574
Biodiversity-related tax revenue: pollution tax bases	% of environmental tax revenue	7.1	2.77	0.322	0.423

