

NATURAL RESOURCE TAX AS AN INSTRUMENT FOR SUSTAINABLE ENVIRONMENTAL GOVERNANCE

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Abstract. To contribute to a more efficient use of resources and the transition to a circular economy by reducing the amount of landfill waste, environmental tax policies need to be well thought out. The research aims to assess the use of environmental taxes for fostering the circular economy. All EU Member States use taxes to solve environmental governance problems; however, the tax revenues as a percentage of GDP tend to decrease, which indicates that GDP growth outpaces an increase in taxes. Environmental taxes mainly consist of energy and transport taxes, while the proportion of pollution and resource taxes is relatively lower. To achieve environmental governance goals, both tax collection and tax relief are simultaneously used to contribute to waste and packaging management and reduce environmental impacts. Increasing tax rates alone is not enough to reduce the amount of landfill waste, and more attention should be paid to educating the population and increasing the role of local governments in sustainable environmental governance.

Key words: environmental governance, environmental taxes, natural resource tax, household waste.

JEL code: Q58, Q53

Introduction

Natural resources on the Earth are constrained, and because of economic activity, they tend to slowly deplete. In contrast, the number of people and the amount of waste in the world tend to increase. In recent years, the circular economy has received increasing attention worldwide, as it represents a way to overcome the current production and consumption pattern based on the ever-increasing use of resources and an increase in the amount of waste. The circular economy aims to increase the efficiency of resource use, with a special focus on urban and industrial waste to achieve a balance between the economy, the environment and society (Ghisellini et al., 2016).

Based on the research problem, the authors put forward a hypothesis that natural resource tax is one of the instruments in sustainable nature governance, yet it is not a sufficient one. The research aims to assess the use of environmental taxes for fostering the circular economy. Accordingly, the following specific research tasks were set: 1) to examine trends in environmental as well as pollution and resource tax revenues in Latvia and other EU Member States; 2) to analyse the distribution of environmental tax revenues and the changes therein in Latvia; 3) to analyse the impacts of natural resource tax on a decrease in the amount of landfill household waste in Latvia. The research employed the monographic method – a review of scientific literature – and a quantitative method – statistical analysis. The research covered a period from 2016 to 2021, while an analysis of household waste involved a period from 2006 to more accurately identify the trends.

Research results and discussion

Natural resources are consumed 1.7 times faster than nature can generate the resources. This is also evidenced by the "Earth Overshoot Day" – it is the day when the global population have used up all the resources intended for the year and borrowed the resources from the coming years; in 2020 it was 22 August, in 2022 – 28 July (Lin et al., 2021). This is one of the reasons why it is necessary to abandon the linear economic model and shift to the circular economy model. The basic elements of the circular economy are the reduction of the overall use of materials and the reuse of products by extending their life cycles through repairing, refurbishing, remanufacturing, recycling, and recovering the materials in the

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production and use processes. In addition, the circular economy is operationalised at several levels: at the micro level they are products, companies and customers, at the meso level – eco-industrial parks and economic sectors, while at the macro level – the region, the country and beyond (Milios, 2021).

The transition to a circular economy is a complex process that requires extensive multi-level and multi-stakeholder engagement and could be facilitated by appropriate policy interventions. Given the role of a well-balanced set of policies that includes a variety of complementary policy instruments, the EU Circular Economy Action Plan (COM (2020) 98 final) includes a section about “getting the economics right” that encourages the broader application of economic instruments. This contributes to a comprehensive taxation system applied throughout the life cycle of a product, which includes a tax on raw materials and resources, reuse or repair tax relief and a tax at the end of the life cycle of a product (Milios, 2021).

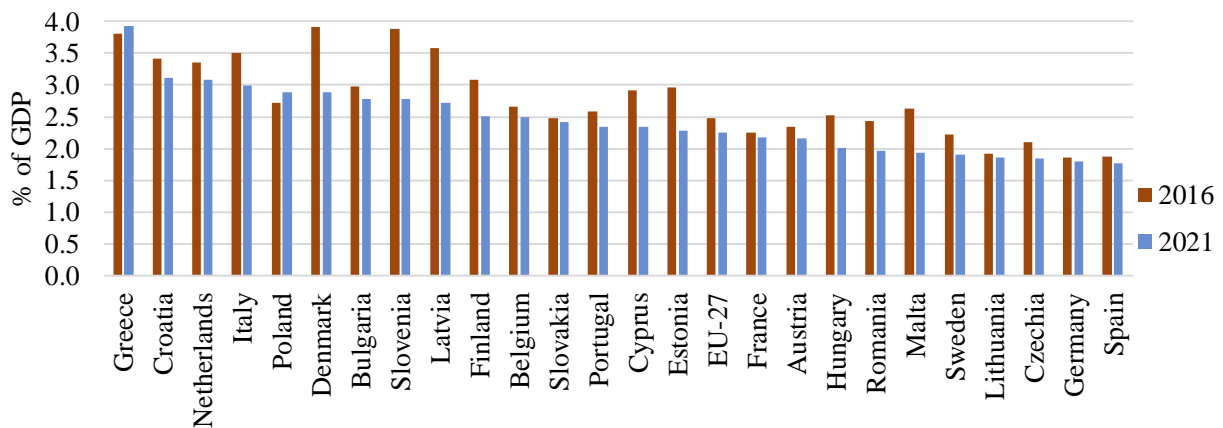
When designing policy measures, natural resource tax is an important factor in supporting the implementation of circular economy measures, as the tax can provide a financial incentive for companies to adopt more sustainable business practices (Hondroyiannis et al., 2024). Most of the natural resource taxes imposed on damaging activities were not initially intended for this purpose but to increase the revenues for the government budget (Freire-Gonzalez et al., 2022). However, in recent decades, the application of natural resource tax has been aimed at correcting negative externalities, which force polluters to pay for creating negative impacts on the environment as damage to the public good (Vence, Lopez Perez, 2021). Environmental taxation is one of the most important instruments among many policy measures, as it acts as a “compulsory” tax on significant pollution such as sewage, waste, noise and waste to preserve the ecological environment. If the intensity of environmental tax collection is too low, it is not enough to realize the protection of the ecological environment; however, if the intensity is too high, it might have a distortion effect on the development of related industries (Hua, 2024). The authors agree with this conclusion because too high taxes can hinder the development of resource-intensive industries, as well as increase illegal activities in the use of resources, environmental pollution and waste disposal.

A circular economy taxation system is a comprehensive fiscal policy approach that targets each stage of the life cycle of a product through various policy interventions. It involves three life cycle stages: production, product use and waste management. Each stage uses a different taxation approach to more accurately reflect the desired resource efficiency outcome (Milios, 2021). Several economic instruments are used to implement the principles of the circular economy: taxes, tax relief and subsidies. The environmental taxation system consists of raw material resource tax, reuse or repair tax relief and waste tax at the end of the life cycle of a product. Milios suggests imposing a raw material resource tax at the production stage, which could be applied at the raw material extraction stage, as well as at the first industrial process and also at the final consumption stage. Taxing raw materials can increase demand for secondary materials if they are as easily available as primary materials. It is also important to set a proper tax rate to balance the price difference between unprocessed materials and secondary materials. At the second or product use stage, according to Milios, tax relief is needed for reuse or repair services, e.g. a reduced value-added tax rate for repairs could increase consumer desire to buy repair and maintenance services. The purpose of tax relief is to encourage reuse, thereby increasing the life cycle of products, which results in significant material and energy savings. At the final stage, the author proposes a waste hierarchy tax, which is progressive, i.e. it gradually decreases as landfilling decreases (Milios, 2021).

Landfill tax is widely used in EU Member States, which is of great importance in improving waste management practices in the Member States. This allows significant amounts of waste to be diverted from landfills to waste management following the principles of the waste management hierarchy, which is the

main principle of EU waste management (Milios, 2021). The waste management hierarchy defines the prioritization of waste management options according to environmental and resource efficiency aspects: waste production prevention, preparations for reuse, recycling and other kinds of regeneration and disposal (Directive 2008/98/EC of the European Parliament ..., 2008).

Across EU Member States, environmental tax revenues as a percentage of GDP vary significantly (Figure 1). In 2021, the lowest revenues were collected in Spain (1.8%), while the highest in Greece (3.9%), followed by Croatia and the Netherlands (3.1%). Among the Baltic States, the highest revenues were collected in Latvia (2.7%), followed by Estonia (2.3%), which was higher than the EU average (2.2%). In Lithuania, the revenues from environmental taxes were lower (1.9%). However, overall, the revenues from environmental taxes as a percentage of GDP tended to decrease in EU Member States from, on average, 2.5% in 2016 to 2.2% in 2021, as well as in the Baltic States: in Latvia (3.6% and 2.7%, respectively) and Estonia (3.0% and 2.3%), and only in Lithuania they were relatively constant (approximately 1.9%) (Eurostat, 2023). Overall, this trend shows that in most EU Member States, GDP growth outpaced an increase in the revenues from environmental taxes.



Source: authors' construction based on European Commission data

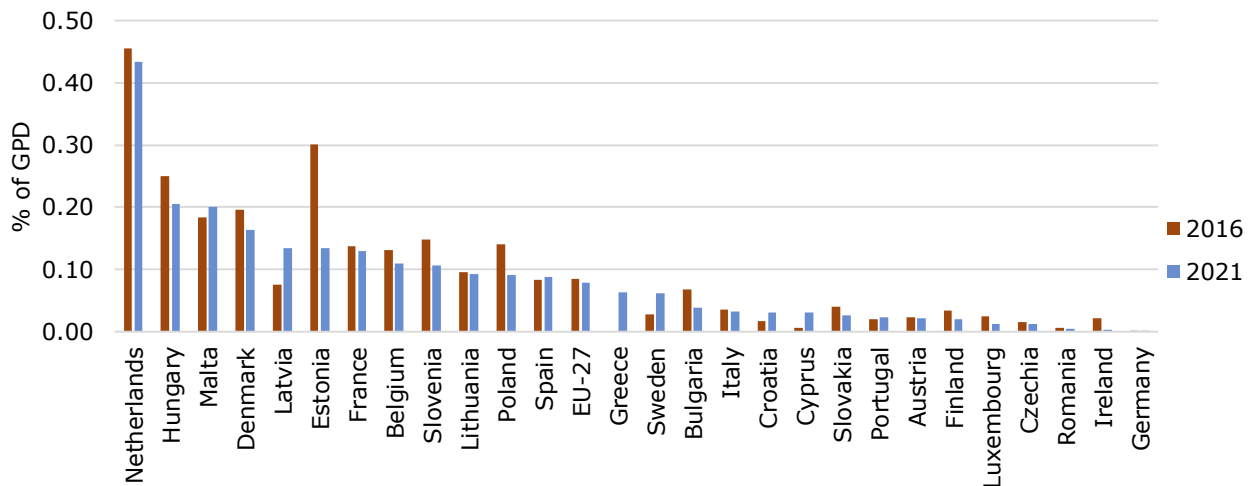
Fig. 1 Environmental tax revenues in EU Member States in 2016 and 2021, as a % of GDP

The proportion of environmental tax revenue in total tax revenue also varied widely across EU Member States. On average in the EU, the proportion decreased from 6.2% in 2016 to 5.5% in 2021, while in four Member States (Greece, Bulgaria, Croatia and Latvia) the environmental tax revenues made up more than 8% of the total tax revenue. However, the role of environmental taxes is less significant in economically advanced countries with higher GDP per capita. The lowest proportion of environmental taxes was reported in Luxembourg, Germany, Sweden, Spain and France, i.e. less than 5% of the total tax revenue (Eurostat, 2023).

Environmental taxes include not only resource and pollution taxes but also energy resource and vehicle taxes. The distribution of tax revenues also varies significantly across EU Member States. In 2021, the energy tax revenues as a % of GDP were the highest in Greece (3.1%), Poland (2.6%) and Bulgaria (2.5%). A relatively high proportion was reported also in Latvia (2.2%), which was higher than the EU average (1.8%). However, the proportion of vehicle taxes was higher in Slovenia (1.9%), Poland (1.8%) and also in Latvia (1.7%), which exceeded the EU average (1.1%).

The proportion of resource and pollution taxes was relatively low in all EU Member States, yet the differences between the Member States were significant (Figure 2). The highest revenues from the taxes as a % of GDP were reported in the Netherlands (0.434%), Malta (0.205%) and Hungary (0.201%). Latvia

(0.134%) was in fifth place, Estonia (0.133%) was in sixth place and Lithuania (0.093%) was in 10th place; however, in all the Baltic States it was higher than the EU average (0.079%). Environmental and pollution tax revenues as a % of GDP have been decreasing in the last few years in most Member States and also on average in the EU. Moreover, according to Eurostat data, the most significant decrease was reported in Estonia (from 0.301% in 2016 to 0.133% in 2021), and Latvia has surpassed its neighbouring countries because in Latvia, the proportion has increased (from 0.075% to 0.134%, respectively). The most significant increase in resource and pollution tax revenues as a % of GDP in 2021 compared with 2016 was reported in Greece, Latvia, Sweden and Cyprus, i.e. the increase outpaced GDP growth.



Source: authors' construction based on European Commission data

Fig. 2 Taxes on pollution and resources in EU Member States in 2016 and 2021, as a % of GDP

In absolute terms in Latvia, the total environmental tax revenue increased until 2018 (Table 1), while in 2019 it decreased by 8.4% or EUR 82.4 million, but then it gradually increased again. However, in 2021 it had not reached the 2017 and 2018 levels. The change in the proportion of tax revenues was more significant in recent years, i.e. the proportion of energy resource tax revenues tended to decrease (from 85.2% in 2016 to 81.9% in 2021); however, the proportion of pollution and resource tax revenues tended to increase (from 2.1% to 4.8%, respectively). Besides, the proportion of pollution and resource tax revenues in the total tax revenue also tended to increase (from 0.24% to 0.43%, respectively), even though the proportion of environmental tax revenues tended to decrease overall (from 11.7% to 9.0%, respectively). This means that labour and consumption tax revenues increased faster than environmental tax revenues in Latvia.

Table 1

Environmental tax revenues and their proportion in total tax revenue in Latvia

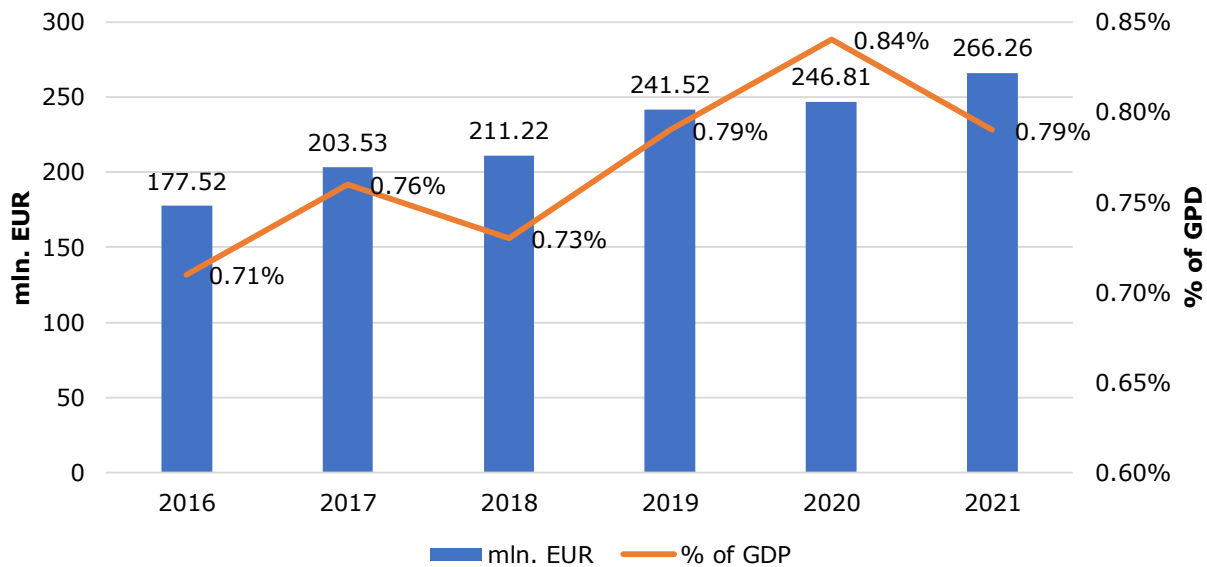
Indicator	2016	2017	2018	2019	2020	2021
Energy resource tax revenues, million EUR	773.2	801.8	835.5	752.1	759.5	750.9
Transport tax revenues, million EUR	115.7	112.9	115.8	116.4	119.2	122.5
Pollution and resource tax revenues, million EUR	19.0	26.9	31.4	31.8	35.5	44.0
<i>Changes in pollution and resource tax revenues compared with the previous year, %</i>	x	41.6	16.7	1.2	11.8	23.8
Total environmental tax revenue, million EUR	907.9	941.5	982.7	900.3	914.2	917.4
<i>Changes in total environmental tax revenues compared with the previous year, %</i>	x	3.7	4.4	-8.4	1.5	0.3
<i>Proportion of energy resource tax revenues, %</i>	85.2	85.2	85.0	83.5	83.1	81.9
<i>Proportion of transport tax revenues, %</i>	12.7	12.0	11.8	12.9	13.0	13.4
<i>Proportion of pollution and resource tax revenues, %</i>	2.1	2.9	3.2	3.5	3.9	4.8
<i>Proportion of environmental tax revenues in total tax revenue, %</i>	11.7	11.2	10.9	9.6	9.8	9.0
<i>Proportion of pollution and resource tax revenues in total tax revenue, %</i>	0.24	0.32	0.35	0.34	0.38	0.43

Source: authors' calculations based on Official statistics of Latvia data (2024a)

A faster increase in pollution and resource tax revenues is also expected in the future in Latvia. Amendments to the Natural Resources Tax Law stipulate an increase of tax rates and make new items taxable from 1 July 2024: tobacco product filters, textile products, wet wipes, balloons and other plastic-containing products (Amendments to the Natural Resources Tax..., 2023). As regards the extraction of natural resources, natural resource tax (NRT) rates were increased in 2024 and an increase is planned for 2026 as well.

In Latvia, the purpose of the NRT Law is to promote an economically efficient use of natural resources, limit environmental pollution, reduce the production and sale of environment-polluting products, contribute to the introduction of new, environment-friendly technologies, support the sustainable development of the national economy, as well as fund environmental protection measures (Natural Resources Tax..., 2005). Importantly, the transition to a circular economy could be facilitated by instruments that can interact, which requires a comprehensive policy framework. In Latvia, significant NRT relief is also granted to achieve environmental governance goals. This relief is an important instrument for the development and implementation of environmental policy goals, thereby providing a considerable incentive for introducing a waste and packaging management system for environmentally harmful goods and preserving a cleaner environment in the long term. The NRT relief system was created with a specific goal - to meet the obligations of Latvia regarding meeting the requirements of EU directives in the field of waste management and to implement the principle of extended producer responsibility (Ministry of Finance, 2022). The producer extended responsibility scheme is an aggregate of measures upon implementation of which a producer of goods bears financial or financial and organisational responsibility for efficient management of the waste of its goods and packaging placed on the market (Natural Resources Tax..., 2005).

In Latvia, the size of NRT relief increased every year, reaching EUR 266.26 million in 2021, which was EUR 229.9 million or six times more than the total NRT revenue in that year (Figure 3). The size of NRT relief also increased if expressed as a % of GDP (from 0.71% in 2016 to 0.79% in 2021).

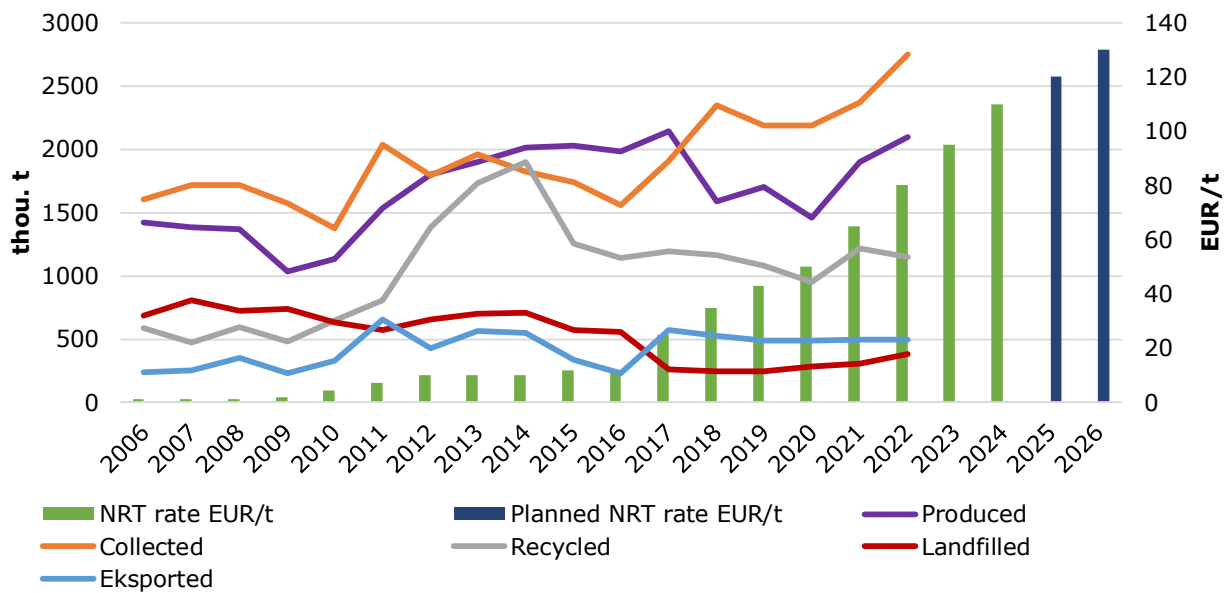


Source: authors' construction based on Ministry of Finance data, 2023.

Fig. 3. Size of natural resource tax relief in Latvia in 2016-2021, mln. EUR, % of GDP

The Ministry of Finance of the Republic of Latvia states that NRT relief is effective because, in the last five years, more than 90% of the total amount of packaging or environmentally harmful product waste was managed through the extended producer responsibility system (Ministry of Finance, 2022). Thus, the goals of recycling and regeneration of waste packaging or environmentally harmful goods set in the relevant regulatory acts and the European Union directive stipulating that the regeneration level should be at least 60% were achieved, while Latvia already reached a rate of 65.2% in 2021 (Eurostat, 2023).

However, achieving the long-term goals of environmental governance also requires a continuous increase in taxes on environmentally harmful activities. To reduce the amount of landfill household waste, the NRT rate for waste disposal in Latvia has been increased every year throughout the period of analysis since 2016 and an increase is planned for the future as well. To assess the progress that has been made in this area, Figure 4 shows Official statistics of Latvia data for a longer period, i.e. from 2006. The data clearly indicate that the amount of waste produced tended to increase. It should be positively viewed that the amount of collected waste tended to increase. Moreover, since 2017 it has been larger than the amount of waste produced, which means that previously produced waste was also collected. Waste recycling, even though unbalanced, still shows an increasing trend, which allows the amount of landfill waste to be reduced as well. However, the amount of landfill household waste significantly decreased only in 2017, possibly owing to the doubling of the NRT rate from 12 EUR/t in 2016 to 25 EUR/t in 2017, as well as other measures, which involved increased waste sorting, education of the population and promotion of collective consciousness. In 2017, amendments to the Waste Management Law entered into force, which established stricter prerequisites for sorting household waste. In addition, the export of waste also increased from 229 thou. t in 2016 to 574 thou. t in 2017 or 2.5 times. The shutdown of the Liepaja metallurgical plant in 2016 had a significant impact on an increase in waste exports, as scrap metal was no longer processed in Latvia, but was sorted and exported to Turkey, Southeast Asian countries and China. All these measures together made it possible to significantly reduce the amount of landfill household waste from 558 thou. t in 2016 to 262 thou. t in 2017 or by 53%.



Source: authors' construction based on Official statistics of Latvia data (2024b) and Natural Resources Tax Law

Fig. 4 Amounts of household waste (thou. t) and tax rates for waste disposal in Latvia (EUR/t)

However, a slight decrease in landfill waste continued in Latvia for only 3 years and, since 2020, it has increased again, despite the annual increase in the tax rate. This was also partially affected by a decrease in waste exports caused by the restrictions imposed during the COVID-19 pandemic.

The NRT rate for household waste disposal was significantly increased from 1.06 EUR/t in 2006 to 110 EUR/t in 2024, and an increase in the rate by 10 EUR/t per year is also planned for the following years. As the NRT rate increases, the waste management tariff also increases and, consequently, the interest of households and companies is increased both in reducing the amount of waste produced, in sorting waste and reducing environmental pollution, as well as in introducing new environment-friendly technologies into the companies, and most importantly, in reducing the amount of landfill waste. Increasing tax rates on natural resources contributes to circular economy policies that observe the principles of reuse, reduction and recycling; as a result, natural resources and energy are consumed less, and waste recycling is increased.

However, increasing the NRT rate alone does not give a sufficient result, and more attention should be paid to the education of the population, especially the young generation, as well as increased fines for not sorting waste. Besides, as shown in Figure 4, the amounts of both produced and collected waste tended to increase, whereas the amount of recycled waste did not increase as fast.

For better environmental governance in Latvia, changes are also being planned in the current distribution of NRT revenues related to natural resource extraction and environmental pollution, including waste disposal, between the national and local government basic budgets. Of the total tax revenue related to household waste disposal, 60% goes to the national basic budget and 40% to the budgets of local governments in whose territory the waste is landfilled. In 2025, however, the above-mentioned distribution of budgets is going to change, and 50% will go to the national government, 30% to local governments and 20% to municipalities included in the respective waste management region (Natural Resources Tax..., 2005). Besides, with the latest amendments to the NRT law, local governments have more responsibility for waste management, as well as the law clarifies the purposes on which the local governments can spend NRT revenue, thereby increasing the role of municipalities in sustainable environmental governance.

Conclusions

- 1) According to the scientific literature, environmental taxes are one of the instruments that promote sustainable environmental governance and the transition to a circular economy.
- 2) All EU Member States use tax revenues to solve their environmental governance problems. In 2021, the total tax revenue spent on this purpose was on average 2.2% of GDP in the EU and 2.7% of GDP in Latvia; however, the proportion tended to decrease, which indicated that GDP growth outpaced an increase in tax revenue.
- 3) Environmental taxes mainly consist of energy resource and transport taxes, and the proportion of pollution and resource taxes is relatively lower – in 2021, the EU average was 0.079%. However, the proportion of the taxes increases every year. Significantly higher pollution and resource taxes were in the Netherlands (0.434%), Latvia (0.134%) was in fifth place among EU Member States and in first place among the Baltic States.
- 4) In 2021 compared with 2016 in Latvia, pollution and resource tax rates have been increased several times, the revenue from the taxes has increased more than 2.3 times, and their proportion in total tax revenue has also increased.
- 5) To achieve the environmental governance goals, both NRT collection and NRT relief are simultaneously used to contribute to waste and packaging management and reduce environmental impacts.
- 6) Increasing the NRT rate alone is not enough to reduce the amount of landfill waste, and more attention should be paid to educating the population and increasing the role of local governments in sustainable environmental governance.

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