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EXPENDITURE ON RESOURCE MANAGEMENT IN EU COUNTRIES

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ABSTRACT: The article presents an analysis of statistical data on expenditure on resource management in the European Union countries over the period of 2006-2017. In analysis, only the countries for which the full range of information was obtained were taken into account. The trend of changes in the amount of expenditure was analyzed and the amount of expenditure in individual countries was compared. Attention was also drawn to the structure of expenditure by areas of natural resources management.

KEY WORDS: resource management accounts, resource management expenditures

Introduction

The concept of resource management expenditure accounts in Eurostat's work first appeared in 1994 as part of the European System for the collection of economic information on the environment (SERIEE). The accounts were to cover the recording of activities related to the management of natural resources (SERIEE, 1994, p. 24), mainly the management of water and other resources (forests, soil, energy, etc.) and recycling and recovery which are not covered by the APEA environmental protection expenditure account. At that time, the accounting framework was very broadly defined and it was assumed that the methodological work would be carried out in the future. The result is the initial version of the methodology for compiling the resource management expenditure accounts developed in 2014 (ReMEA, 2014).

Work on the concept of ReMEA accounts has been temporarily suspended by Eurostat, which is why the member states have not carried out statistical surveys in this area. However, the results of a study of the Environmental Goods and Services Sector (EGSS) have been used to examine how this expenditure is developing in the era of a resource-efficient European economy.

The article presents an analysis of statistical data concerning the EGSS sector of the European Union Statistical Office Eurostat. The analysis covers the member states of the European Union and concerns the years 2007-2014.

The concept of ReMEA accounts

The ReMEA resource management expenditure accounts cover all activities related to natural resources management and are classified as (CEA, 2011):

- CReMA 10 – Management of waters
- CReMA 11 – Management of forest resources
- CReMA 12 – Management of wild flora and fauna
- CReMA 13 – Management of energy resources
- CReMA 13A – Production of energy from renewable sources
- CReMA 13B – Heat/energy saving and management
- CReMA 13C – Minimisation of the use of fossil energy as raw materials
- CReMA 14 – Management of minerals
- CReMA 15 – Research and development activities for resource management
- CReMA 16 – Other resource management activities

The activities included in the ReMEA accounts must fulfill a primary purpose criterion, i.e. the primary purpose is resource management. Any activity that has a beneficial effect on natural resources but is undertaken for other reasons is not eligible for ReMEA.

In ReMEA accounts are included:

1. Specific resource management activities:
 - actions to reduce resource consumption such as recovery, re-use, recycling, rational use, and the replacement of natural resources,
 - complementary actions: increasing renewable natural resources (water, forests, and wild flora and fauna),
 - natural resources management and regulatory activities carried out by the government;
 - monitoring, control, and surveillance,
 - teaching, training, information and communication activities,
 - research and development activities in the field of natural resources management.
2. Products related to the management of natural resources:
 - specific products – used directly and exclusively for the protection of natural resources, for example, renewable energy and advice on water and energy saving,
 - related products – non-characteristic products which only serve the protection of natural resources, but their production does not affect resource management, for example, wind turbines, rainwater storage tanks, and specific measuring instruments,
 - resource-efficient products – non-characteristic products that may be present in a resource-efficient version, for example, energy and water saving washing machines, energy-saving candles, etc.; only additional costs are taken into account if resource-efficient products are more expensive than their alternative counterparts.

The sector of EGSS environmental products and services

Due to the fact that ReMEA accounts are still in the sphere of concept and theoretical considerations, no information on the amount of expenditure on resource management is available. For this reason, it was decided to use the results of research on the environmental products and services sector, which covers both environmental and resource management areas.

Environmental goods and services fall into the following categories:

- environmental services – typical of environmental protection and resource management, e.g. wastewater treatment, waste management,

- organic farming, energy production from renewable resources, environmental monitoring and measurement, and environmental education,
- products with a purely environmental purpose (related products) – products that serve directly and exclusively for environmental protection and resource management or other services,
 - adapted goods – alternatives to traditional ones, more environmentally friendly, less polluting and more resource-efficient,
 - environmental technologies – broken down into “end-of-pipe” and integrated technologies.

The data on these elements is to be compiled according to the CEPA environmental classification and CReMA resource management (CEA, 2011). The breakdown by domains is analogous to that used in the APEA and ReMEA satellite accounts. As in these accounts, the main purpose criterion also applies here.

There are two approaches to compiling the accounts, both in the national accounts and in the EGSS accounts, i.e. a supply-side approach to production and a demand-side approach to use (Broniewicz, Domańska, 2016). The demand-side approach focuses on the use of statistics on environmental protection expenditure and resource management. As for the expenditure, the following categories are calculated: domestic demand, which is the sum of total consumption (individual and collective consumption) and gross accumulation (gross expenditure on fixed assets, the growth in tangible current assets, and the growth in valuables) and the external trade balance (export and import of goods and services).

A combination of both approaches, the production approach, and the used approach is used, depending on the variables presented. Therefore, with a certain error, it can be assumed that the production volume of the environmental goods and services sector is equal to the amount of expenditure on environmental protection and resource management.

The production of environmental goods and services sector in the European Union in the years 2007-2015 ranged from EUR 528,800 million in 2007 to EUR 735,700 million in 2015. As can be seen in figure 1, production in the sphere of environmental protection was higher than in the sphere of resource management. However, the growth rate of production volume was faster (figure 2). Eventually, in 2015 the production of the environmental protection sector increased by 16.7% compared to 2007, and the resource management sector by 75.7%.

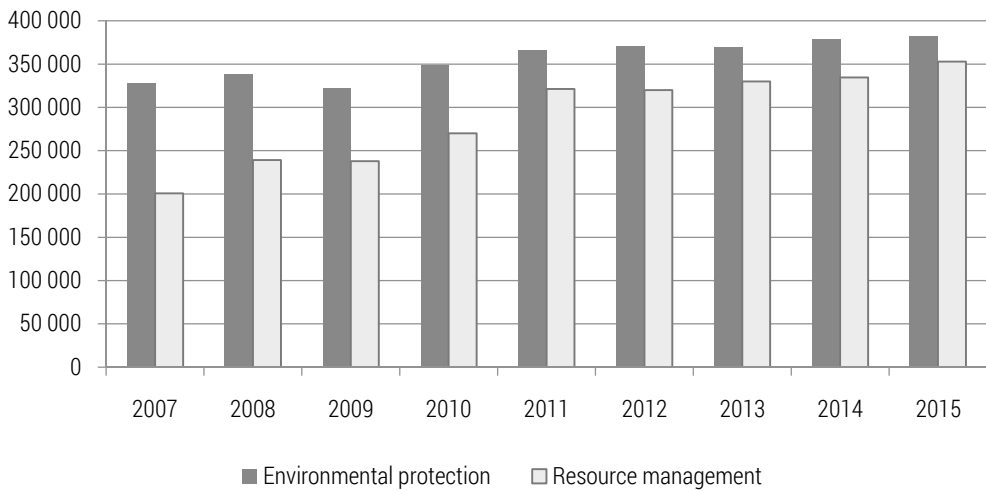


Figure 1. EGSS production volume in the European Union [million euro]

Source: author's own work based on Database-Eurostat.

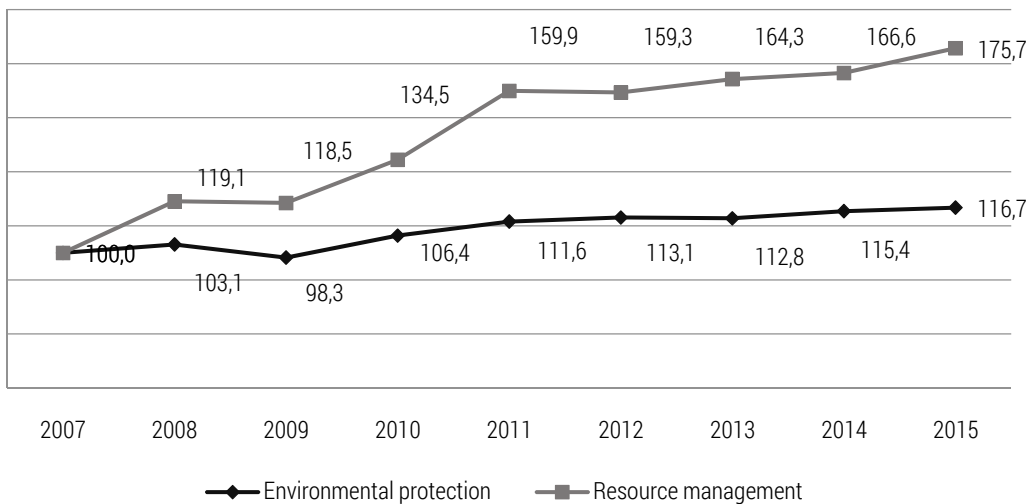


Figure 2. The growth rate of EGSS production in the EU [2007=100%]

Source: author's own work based on Database-Eurostat.

The analysis of expenditure on resource management in the European Union countries

In the European Union, the distribution of expenditure on resource management in 2016 was almost equal to that on environmental protection (52% to 48%). However, the situation in individual countries was different. The group of countries (e.g. in Western Europe), in which most of them are expenditures on resource management, cannot be clearly identified (figure 3).

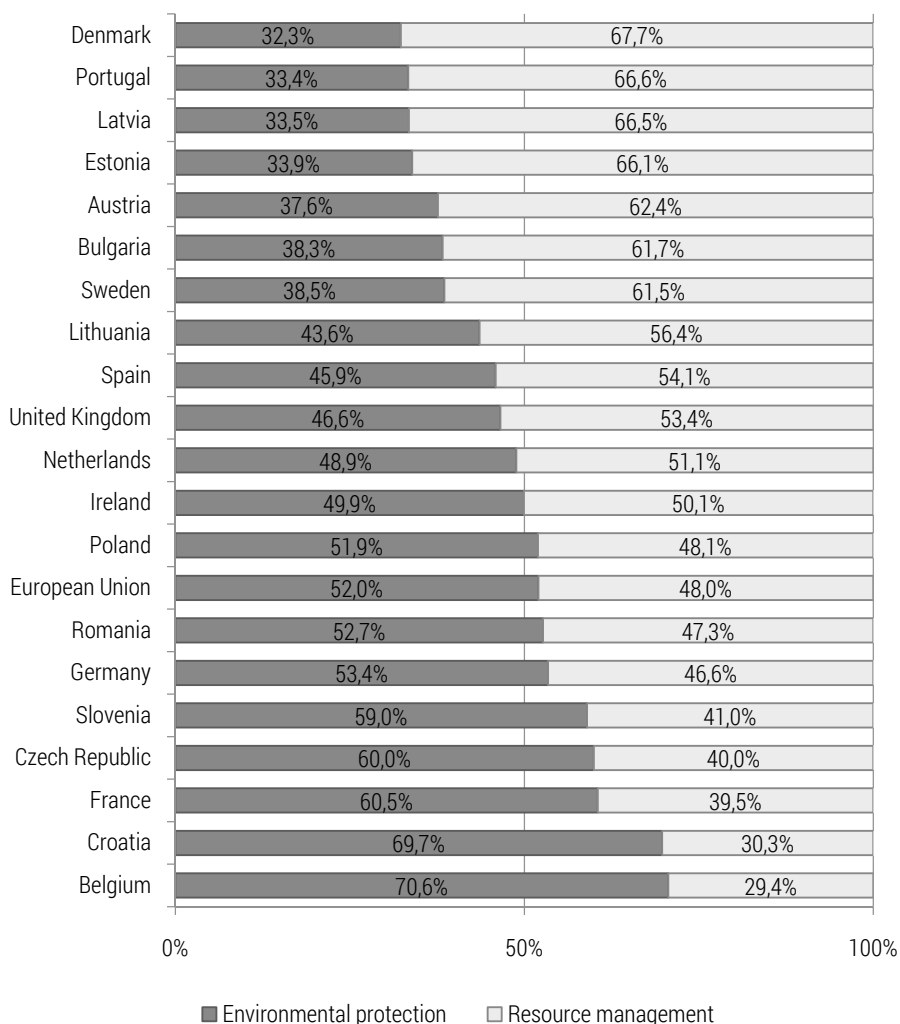


Figure 3. The structure of expenditure of the EGSS sector in EU countries in 2016

Note: only the countries for which the full range of information was obtained were taken into account.

Source: author's own work based on Database-Eurostat.

However, when comparing absolute values (in million EUR), it can be seen that it is mainly Western European countries that bear the burden of resource management in Europe (figure 4).

It is interesting to present the amount of spending on resource management in individual EU countries per capita. In 2016, Denmark (3311 euro/per capita) and Austria (2302 euro/per capita) were the leaders. Among the new EU member states, Estonia had the highest spending on resource management – EUR 1247 per capita. The lowest expenditure, 76 euro/per capita was in Croatia.

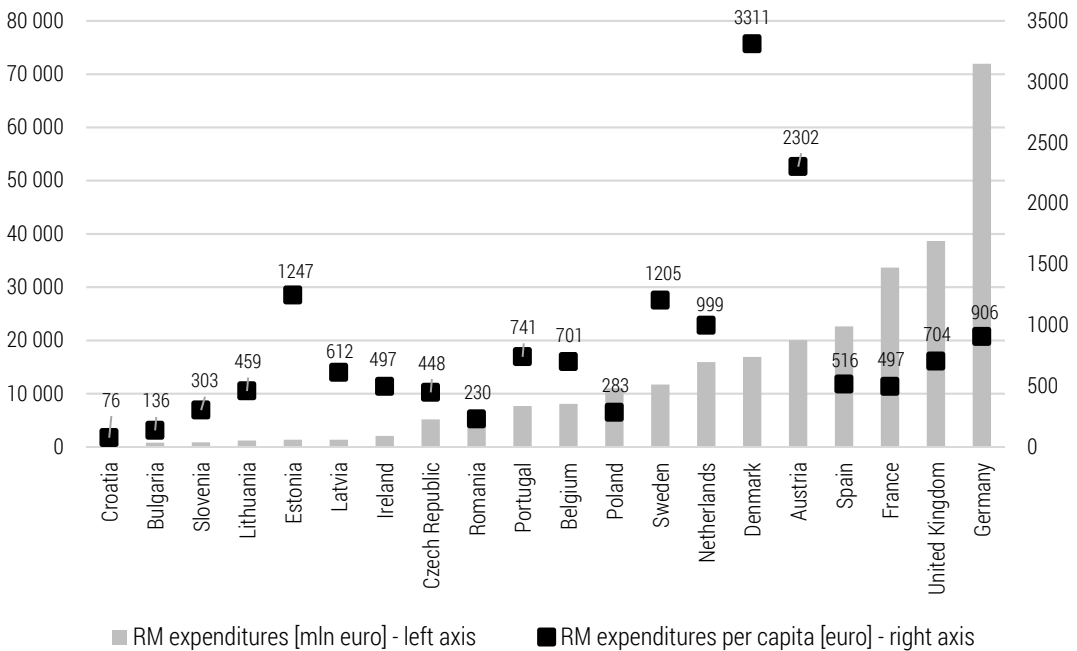


Figure 4. The expenditure on resource management in EU countries in 2016

Source: author's own work based on Database-Eurostat.

In establishing the reason for such a large difference between the level of expenditure on resource management in the European Union countries, a correlation was sought (for the years 2007-2015) between the expenditure on resource management and:

- the amount of GDP per capita,
- resource productivity understood as the level of GDP per a unit of consumption of natural resources in the national economy,
- environmental protection expenditure.

Only in the case of the relationship between resource management expenditure and environmental protection expenditure, the Pearson correlation coefficient was quite high at 0.74 (figure 5). In other cases, no correlation between variables was found. The above-presented expenditure on natural resources management is certainly influenced by non-economic variables, such as administrative and legal conditions, the level of environmental awareness of the society and the like.

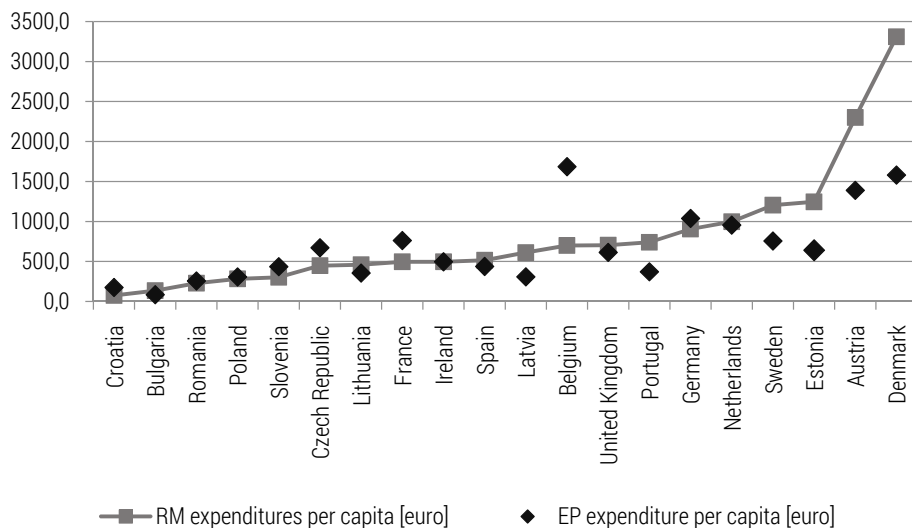


Figure 5. Expenditures on resource management vs. environmental protection expenditures in EU countries [euro/person] in 2016

Source: author’s own work based on Database-Eurostat.

When analyzing the structure of spending on resource management by area, a similar correlation can be observed in all EU countries – the largest spending is on energy resources management. The lowest, but still a high share of this type of expenditure in 2016 constituted 50% of the total expenditure on resource management (Great Britain), while the highest – as much as 97% (Slovenia) – figure 6.

This phenomenon confirms the pan-European trend to reduce the consumption of non-renewable resources, to invest in renewable energy sources, and to save heat and energy. On the other hand, however, the Author, having experience in compiling data from the environmental goods and services sector in Poland, can state that the variables related to CReMA 13 – Management of energy resources are the easiest to identify and estimate. Therefore, it is possible to underestimate expenditure in other areas. For example, in Poland,

where CReMA 10 – Management of waters expenditure research is conducted in the form of direct research, the share of expenditure in this area of resource management is the highest among the countries analyzed (figure 6).

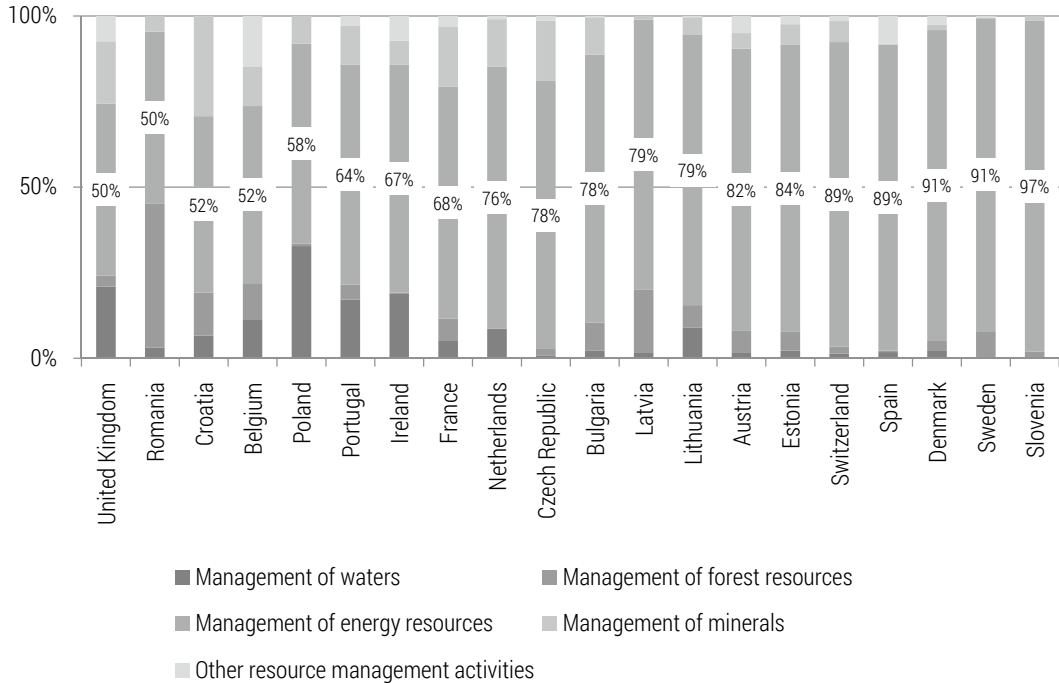


Figure 6. The structure of expenditure on resource management in EU countries in 2016 [%]

Source: author's own work based on Database-Eurostat.

Conclusions

When analyzing the volume of production (expenditure) on resource management, it can be stated that the desired trend towards the resource-efficient economy in Europe is being implemented. Not to the same extent in all countries as highly developed countries allocate more funds for natural resources management. The main direction of spending funds in all analyzed countries is energy resources management.

Due to the lack of data from the ReMeA account, the article uses the results of research on the sector of environmental goods and services, in which one of the two parts covers the management of natural resources. In both accounts, the division into areas of resource management is the same, but the approach to estimating economic quantities is slightly different. It is

therefore desirable to 'return' to the development of the concept and starts compiling the ReMeA satellite account, which is the twin 'half' of the EPEA environmental expenditure account.

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