

# OPEN EDUCATIONAL RESOURCES FOR LEARNING WASTE MANAGEMENT IN RURAL COMMUNITIES

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**Abstract:** *Environmental protection is close related with environmental education. Environmental education is as necessary in the educational system as outside it. The present study, starting from the perception of the representatives of the local rural public administration and the citizens of the rural communities on environmental protection issues: (i) highlights the need for information and education in the field of environmental protection, especially with regard to environmental legislation and waste management; (ii) demonstrates the usefulness of environmental educational projects and the use of open educational resources, as resources that can be easily adapted to the real needs of education and information*

**Key words:** *environmental legislation, waste management, open educational resources, rural communities.*

## 1. Introduction

Since 2007, the EEA Financial Mechanisms developed and implemented by the donor states from the European Economic Area - EEA (Norway, Iceland and Lichtenstein) have included Romania, as a result of its accession to the European Union, among the 15 states that benefit of funding for collaborations based on projects. (EEA Agreement, 2007). During 2014-2021, the EEA Financial Mechanisms (Memorandum, 2009; Memorandum, 2014) granted projects within 12 financing programmes. Of interest for our study are the cooperation projects in higher education, granted by the Education, Scholarships, Apprenticeships and Youth Entrepreneurship Programme (ESAYEP), during 2018 – 2021. A short analysis of these projects, show 5 calls for application (two calls in 2018), with 86 applied projects, of which 32 were granted (<https://www.eea4edu.ro/>). In order to highlight the diversity of the project themes, the 32 projects granted during 2018-2021 were analyzed from the point of view if their domain of applicability, being

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identified eight groups of granted themes: business, education, energy, engineering, environment, intelligent technologies, medicine, sociology, while in the “others” group were included one project each from the following domains: agriculture, economy and governance, green chemistry and military (Figure 1).

In this context, the Environmental Education – OERs for Rural Citizens (EnvEdu-OERs) EEA project was applied and granted starting with 2019, covering needs from both education and environment.

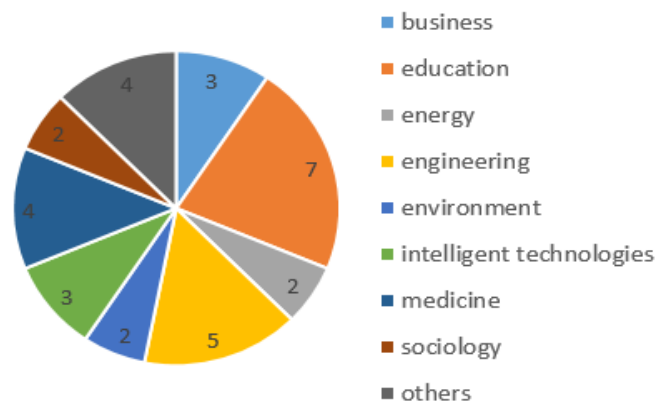


Fig. 1. The distribution of EEA granted projects by domains, during 2018-2021

*Transilvania* University of Brasov (Romania), together with three more higher educational institutions, Reykjavik University from Iceland, Bucharest University of Economic Studies and Gheorghe Asachi Technical University of Iasi, both from Romania (Figure 2) implemented the EnvEdu-OERs project, having as part of the objectives the development of intellectual outputs ([https://envedu.unitbv.ro/en\\_US/](https://envedu.unitbv.ro/en_US/)):

- 6 teaching modules (TMs) – developed as open educational resource (OERs);
- e-learning platform – where the OERs will be uploaded and available free of charge;
- a set of policy recommendations – for the local rural public administration.

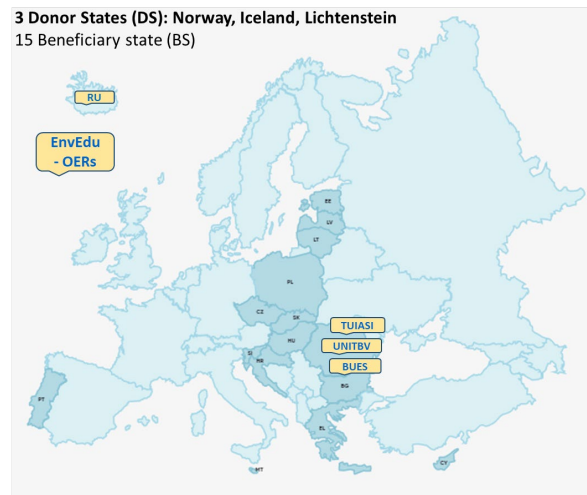


Fig. 2. *The EnvEdu-OERs project partnership, with Iceland as donor state (DS)*

The six proposed teaching modules are designed to cover subjects of interest about the environmental quality and protection:

- TM1: Sustainable communities and social communication
- TM2: Environmental Quality
- TM3: Environmental Management, Impact and Risk
- TM4: Waste Management in Rural Communities
- TM5: Water Resources and Water Balance for Sustainable Community
- TM6: Environmental Projects Management.

Environmental protection is a subject of great interest, both for EU states and non-EU ones, like EEA states are, both groups of states applying similar environmental regulations. A brief look at the waste management EU legislation, pointed out that the waste management is a general responsibility of the society, regardless the form of organization, especially of the following types of organizations:

- (i) any public or private organization that generates wastes – with specific regulations in the EU Directive 2008/98 (Directive, 2008);
- (ii) public administration (at national/ local level), responsible for the development and implementation of the public policies in domain – with specific regulations in the EU Decision 2019/61 (Directive, 2019);
- (iii) waste management companies (public/ private), organizations that have nomenclature of economic activities (NACE) codes in this field – with specific regulations in the EU Decision 2020/519 (Directive, 2020).

The two decisions were under the EU Regulation (EC) 1221/2009 “on the voluntary participation by organizations in a community eco-management and audit scheme (EMAS)” (Regulation, 2009).

In practice, the local public administration is under the applicability of the Decision 2019/61, but can also be involved in the waste management activities under the Decision 2020/519 perspective. To find out the perception of the rural local public administration representatives and of the rural citizens on the environmental protection issues, the Env-Edu-OERs project launched a survey.

The processed data pointed out both the need of education for environmental protection themes, and the large interest in waste management legislation and its applicability at local rural public administration level. Thus, this study aims to present the possibility to combine the need for environmental education for the rural citizens, with a better understanding and application of the waste management regulations by the rural local public administration representatives.

This was possible within the EnvEdu-OERs project, developing new and innovative teaching modules, and a set of policy recommendations, the novelty also consisting in the presentation of the TMs as OERs, uploaded on a learning platform, with free access for the beneficiaries/ learners.

## **2. Methodology**

A survey, exploratory research on the vision of local administration leaders was developed, in Romanian and English languages. The survey was distributed during April - June 2021 online (Google forms English, Google forms Romanian) to possible interested groups. The aim of the survey was to understand the perception of the public administration representatives from rural communities concerning the environmental opportunities and constraints related to the quality and the protection of the environment in their communities. The survey contains 19 open questions and 6 questions for socio-demographic data. The target groups were public administration representatives and rural citizens. For the actual study, only the answers to selected questions were used, those related to the perception on environmental legislation and waste management ones, from 37 respondents (of which 19 with HE degree), and only from Romanian respondents. The data were qualitatively processed by Excel Data Analysis (Microsoft Office), and the results are graphically presented.

## **3. Results and Discussions**

### **3.1. Results on knowledge of legislation**

One of the main aspects analyzed through the survey aimed to identify the respondents' opinion on the legislation applicable to environmental protection. Moreover, for the application of national legislation, local public authorities have the right to issue their own normative acts at the community level through which they solve environmental problems taking into account the specifics of the rural area of which the community is a part. Even so, the knowledge on the existence of these acts was the object of identifying the respondents' opinion on the legislation applicable to environmental protection. In this sense, the following questions were developed:

- Q11 What do you think about the current legislation on the quality and protection of the environment?
- Q12. Are there any decisions of the local council concerning environmental protection or its resource valorization?
- Q12.1. If yes, which are the most relevant such decisions?
- Q12.2. If not, which subject(s) would you consider for a future decision initiative of the local council?

The answers obtained to Q11, designed as an open-ended question, formulated to not influence the respondents' opinion, can be grouped into 4 large categories:

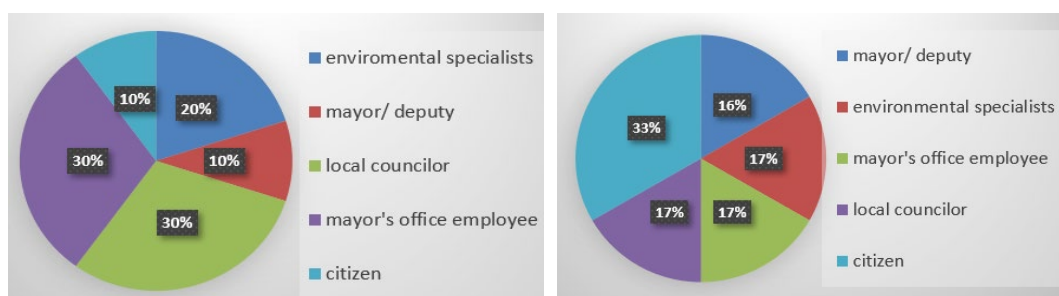
- 10% of respondents indicated that environmental legislation is complicated;
- 14% of respondents shown that the obligations of the environmental legislation are connected with the obligations of the public administration;
- 31% of respondents claimed that the legislation is insufficient or that it needs improvement;
- 45% of respondents said that it is good or very good.

Analyzing the categories of respondents related to the two large groups of answers good/ very good (Figure 3.a) and insufficient/ need improvement (Figure 3.b), the results show that:

- respondents who come into direct contact with the application of environmental legislation (mayor's office employee and environmental specialists) as well as those who are responsible for drafting local regulations (local councilor) are the ones who stated in high proportion (20% - 30%) that the legislation of the environment is good or very good (Figure 3.a); the low percentage (17%) of the same categories of respondents who state that the legislation is insufficient or requires improvements (Figure 3.b) supports the previous statement;

- although the category of mayor/ deputy respondents who stated that the legislation is very good/ good (Figure 3.a) is in a low percentage (10%), we noticed that also in a low percentage (16%) they state that the legislation is insufficient or requires improvements (Figure 3.b); this aspect is relevant from the perspective of the mayor/ deputy's real knowledge of environmental legislation;

- it is confirmed the existence of the low percentage (10%) of respondents (citizen) who stated that the legislation is very good/ good (Figure 3.a) with the high percentage (33%) of the same category who stated that the legislation is insufficient or requires improvement (Figure 3.b).



a. very good/ good

b. insufficient/ needs improvement

Fig. 3. *Opinions regarding the current legislation on the quality and protection of the environment*

Regarding the involvement of the local community in the development of its own normative acts for a better application of environmental legislation, through Q12 (Figure 4) we find that 56% of the respondents stated that such regulations exist, among them 50% mayor/ deputy and 37% environmental specialists.

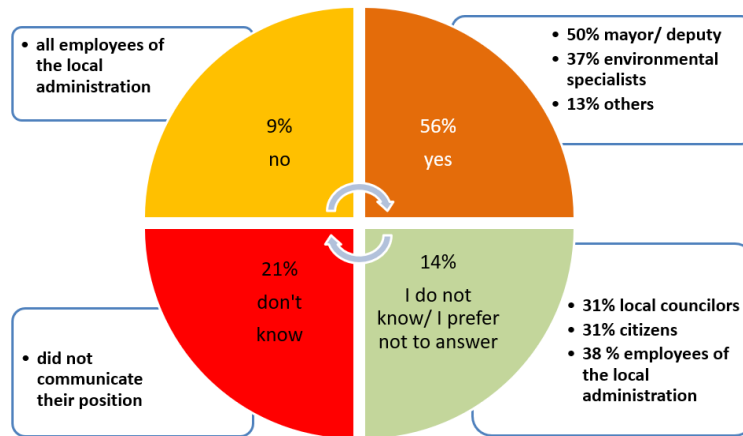


Fig. 4. *Community involvement and categories of respondents*

Worrying are the percentages of respondents who do not know and/ or do not want to answer, they accumulate a total of 35%, especially the high proportions of local councilors (31%) and employees of the local administration (38%) among them.

Analyzing cumulatively, the answers obtained to Q12 with Q12.1 and Q12.2, from the perspective of the respondents' involvement in the proposal of new regulations at the local level, we find that:

- among the 56% of respondents who are aware of local regulations, 75% believed that no new regulations are necessary, and 12.5% that an update of the legislation would be necessary (all respondents in this case being environmental specialists);
- all respondents who stated that they do not know the regulations issued at the local level, nor do they want to get involved;
- 54% of the respondents who do not know/ prefer not to answer say that they will not get involved in proposing new regulations at the local level, but a percentage of 23% shows that they will want to get involved, mainly in terms of developing new normative acts regarding the selective collection of waste;
- 50% of the respondents who affirm that there are no decisions of the local council concerning environmental protection or its resource valorization also want to be involved in the development of new normative acts regarding the selective collection of waste.

### 3.2. Results indicating training needs

Although the set of questions Q12, Q12.1 and Q12.2 did not aim at, or refer to, the need for the community to be trained in environmental law, from the cumulative analysis of these questions, this need emerges. The following invoke this necessity:

- 12.5% of those who know the regulations issued at the local level,
- 7% of those who do not know/ do not prefer to answer and
- 50% of those who state that there are no decisions of the local council concerning environmental protection or its resource valorization.

The answers obtained for Q17 (What are the topics for which it would be necessary to

organize informative sessions led by specialists, in your community) indicated both the need for community training regarding the legislation, especially the legislation aimed at waste management (Figure 5.a). In the order of the obtained percentages, as “The first necessary intervention for improving the environmental quality (status) in community” (Q16), the most of the formulated answers supporting the novelty options expressed in the answers to question set Q12, Q12.1 and Q12.2 (Figure 5.b):

- improving waste management (36%);
- awareness and information (24 %).

#### 4. Conclusions

This paper presents the opportunity of valorization of EEA grants for a subject of great interest nowadays, environmental education.

The EnvEdu-OERs project started with a survey distributed to the public administration representatives and citizens from rural communities, aiming to understand their perception on the environmental quality and protection.

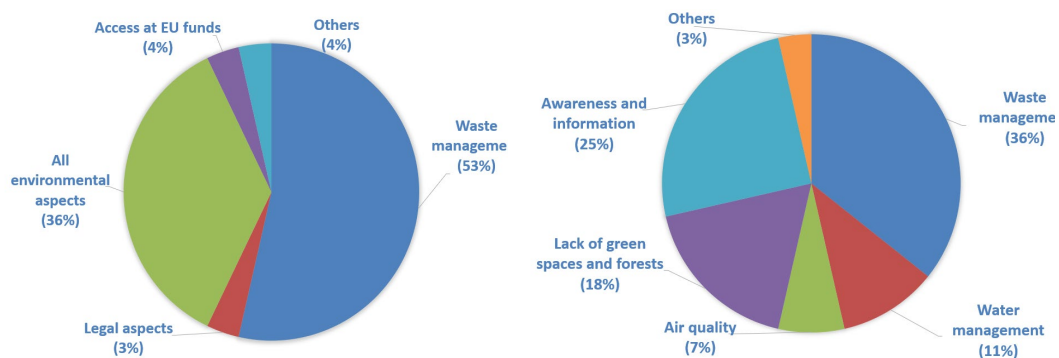


Fig. 5. Training needs for environmental legislation

a. topics for informative sessions led by specialists

b. first intervention for improving the environmental quality

As a result of the answers received to the questionnaire, part of the intellectual outputs were reconsidered, as follows:

a. the teaching module TM4, Waste Management in Rural Communities, that initially was designed to present three topics as teaching module units (4.1-4.3) was completed with a new TM unit (4.4), dedicated to the waste management regulations, thus the contents of the TM4 is now the following:

- 4.1 Waste Management in Rural Communities;
- 4.2 Biomass Waste. Household Waste;
- 4.3 Waste Collection, Treatment and Valorization;
- 4.4 Waste Legislative Framework.

b. one of the policy recommendations was proposed to present „sustainable practices in waste management for rural communities”, and finally was developed as a bilingual document, which includes environmental regulations aspects, entitled „Waste Management in Rural Communities. Legal Approach and Recommendations” (Romanian

and English). We consider that EnvEdu-OERs project, with its novel approach, will contribute to a better understanding of the environmental quality and protection among the citizens from rural communities, with a consistent presentation of the waste management regulation.

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