Ecological literacy of one of the competencies of a 21 century citizen

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Abstract. The current environmental situation requires a certain amount of knowledge of ecology in an individual regardless of their professional sphere as this information becomes an integral part of both professional and personal day-to-day life. The state of ecology requires help and support from humanity. Therefore, ecological literacy becomes one of the most demanded competencies for a person living in the 21 century. This concept is closely connected to ecological culture and ecological awareness and utilizes the psychological willingness of a modern person to behave according to concepts of ecological literacy. The knowledge of ecology positively affects waste management and reduces risks for nature posed by waste pollution and human activities. Therefore, the conducted research aims to examine the ecological literacy rate in the population of Russia overall and particularly concerning the issues of separate waste collection. The authors identify the reasons for reluctance to perform separate waste collection and suggest measures to stimulate it in the Russian Federation.

1. Introduction

The mindset of modern people is affected by radical transformations in the biosphere. Massive natural disasters require urgent measures both from governments and the business sphere in different countries. However, the developed global culture places the responsibility for environmental safety upon every living individual.

The green economy is one of the relevant development paths available for the economic sphere in the current conditions. Therefore, one of the crucial competencies in the modern digitalized world is ecological literacy.

To date, there is a great variety of definitions for the notion of ecological literacy. The authors will consider the following definition by the professional education dictionary: “... a capacity for competent participation if activities aimed to prevent and remedy the environmental damage done by production and business activities. The following components comprise it: nature as the living environment of an individual; scientific...”
Ecological literacy is closely connected to the ecological culture and environmental awareness of an individual. There is room for discussion on which component is primordial and which is a foundation for the formation and development of interconnected qualities. Knowledge in the ecological sphere can either facilitate the formation of ecological culture or reverse the situation. However, the majority of researchers hold the belief that ecological literacy is the fundamental aspect that contributes to the establishment of ecological culture through environmentally friendly upbringing.

The notion of ecological culture has been gaining popularity since the last half of the 20th century. It can be defined as a system of internal limitations put by a person on themselves and aimed to preserve the optimal condition of the environment. The creation of this phenomenon is attributed to the poor state of natural resources that has been deteriorating during the entire history of humanity, which led to environmental crises. The following measures were suggested to overcome this issue:

- Use of alternative resources;
- New rules of behavior towards the environment;
- Governmental and legal regulation.

The ecological culture of a person is shaped by the influence of society and their personal beliefs. However, the unique nature of every human leads to different mindsets stemming from similar upbringing conditions. The process of socialization is affected by a family, school community, and society as a whole. While imitating adult behavior, children often adopt the moral values, traditions, and knowledge that they witness in their living environment.

The governmental system is majorly responsible for the formation of ecological values as the transfer of knowledge is one of the educational functions delegated to it. Additionally, the government is required to ensure the safety of its population against negative effects of any nature. At the same time, however, the educational and upbringing process remains predominantly family-centered. Jointed actions of the governmental structures and an immediate family can systematically alter an individual's perception of the world and ensure the formation of a truly environmentally cultured personality.

The issue of waste has become one of the key problems faced by modern society. Human activity produces millions of tons of waste yearly, including household waste that accumulates in landfill plants.

The issue of solid waste collection and disposal has received extensive attention over the past years. Although the population of Russia is becoming increasingly familiar with separate waste collection, ecological literacy, culture, and environmental awareness still require time and a clear operating system to become a part of the routine for every family.

2 Materials and methods
Russian Federation were personally interviewed) [1] (Fig. 1 - 4)

Fig. 1. The proportion of answers for the question about which of the listed activities the respondents have participated in during the last 12 months (in % of all the respondents).

Source: [4].

Fig. 2. The proportion of answers for the question about the utilization of separate waste collection containers close to the place of residence (in % of all the respondents that admitted not knowing of any separate waste collectors near their place of residence (57%).

Source: [4].

Fig. 3. The answer to the option: “I sort household waste (collect at least one type of waste separately: glass/paper/plastic etc.).” Source [4].
The answer to the option: “I donate hazardous waste (electronics, batteries, mercury lamps) to specialized collection centers.” Source: [4].

The obtained data indicate (Fig. 1-2) that only 14% of the Russian population practice separate waste collection, 12% donate hazardous waste (batteries, rechargeable batteries, energy-efficient lamps). However, more than half of the respondents (57% of the total number and 57% of those who do not know about separate waste collection containers) voiced willingness to sort waste given the availability of containers and their proximity to their houses. The authors note that individuals with higher income occupying executive positions demonstrate ecological behavior more often [4].

However, the results of the survey taken earlier (Fig. 3-4) demonstrate that 27% of the Russian population sort household waste, 33% donate hazardous waste to specialized collection centers, and 47% of the respondents stated that they would like to start separate household waste collection given the opportunity [8, 9].

The results of the third poll on the readiness to sort waste conducted in 2020 demonstrate that during that period, 34% of the respondents reported regularly sorting waste, 25% stated that they did it occasionally, 12% admitted doing it rarely, and 30% said that they never did it. Furthermore, 73% of the respondents are ready to sort waste at home if provided with accessible waste collection containers [1].

The survey participants also gave reasons for their reluctance to sort waste at home (Fig. 5). Despite some discrepancies, the data provided by the polls show that, despite an increase in the number of people practicing separate waste collection, it remains minor. The majority of the Russian population does not sort waste regularly. The survey by the Levada Center determined the reasons for refusing separate waste collection and identified the following main concerns: it is pointless to sort household waste (29%); lack of free time to sort waste (27%).

The authors can conclude that the major factors preventing the population from sorting waste are the insufficiently efficient management of the separate waste collection system and lack of understanding in society.

The surveys carried out by the Russian Public Opinion Research Center [RPOR] in 2018–2020 also demonstrate interesting results. They aimed to study public opinion on the state of the environment in Russia. According to the poll of 2019, only 16% of the Russian population consider landfills as the most pressing ecological issue [8], thus showing results almost identical to the poll of 2018 that revealed 15% of the Russian residents to point out this problem [7].

During the survey in 2020, the majority of the respondents (67%) reported their dissatisfaction with the management of waste collection and transportation in their place of residence [10].
Fig. 5. The reasons given by the respondents for their reluctance to sort waste at home (in % from the number of those with no collection containers available and % of those who are not ready to sort waste with accessible containers). Source: [1].

Fig. 6. The proportion of answers to the question: “In Russia, 2017 was the Ecology Year. Have you heard of any events or measures taken in connection to the Ecology Year? If you have, what are the results of these activities?” (a closed-ended question, one answer option, in % of all the respondents). Source: [7].
Fig. 7. The proportion of answers to the question about the population's satisfaction with transportation and disposal of household waste in their local city (a closed-ended question, one answer option, in % of all the respondents).

Source: [7].

Fig. 8. The proportion of answers to the question about the population's attitude towards waste collection and transportation in their place of residence (a closed-ended question, one answer option, in % of all the respondents).

Source: [10].

The research carried out by the Romir research holding in the post-COVID-19 period in March 2021 revealed a positive change in the attitude of the Russian citizens towards ecological matters. According to it, 88% of the Russian population voiced support for the idea of separate waste collection (within this proportion, 45% expressed total support and 43% voiced partial support). For comparison, during a survey conducted by the same organization in 2019, only 73% of the respondents demonstrated support for this kind of activity (Fig. 9) [5]. However, the support itself does not necessarily imply actions taken (waste separate collection activities).
Fig. 9. The proportion of answers to the question about the attitude towards separate waste collection. Source [5].

Fig. 10. The proportion of answers to the question concerning the Russians’ activities in the sphere of separate waste collection and protection of the environment (a multiple-choice question, in % of all the respondents). Source [5].

During the interviews within the scope of the surveys, the majority of respondents who did not sort waste stated that they did not have enough space in their flats and had not acquired a habit of sorting waste in their childhood.

3 Results

The comparative analysis of a variety of social surveys on the attitude towards separate waste collection in the Russian population demonstrates a mixed picture. Among the most popular reasons for refusal to perform separate waste collection are as follows: lack of correct sorting skills and psychological conviction to do it; unwillingness to sort waste caused by lacking/inaccessible waste collection containers (undeveloped environmental awareness); unwillingness to sort waste caused by the high effort intensity of the process (lack of ecological literacy and ecological culture).
4 Discussion

Although it is desirable to start the formation of ecological literacy from childhood, some measures can be taken to prompt the parents to sort waste by eliminating the obstacles preventing them from doing it. Thus, waste sorting can be stimulated in the adult population right now [2, 3].

One of the possible solutions is to organize a massive event for separate waste collection where volunteer ecologists could provide masterclasses on the correct ways to sort and dispose of waste. For example, a person should unscrew plastic bottles and crush them before throwing them out, rinse off milk packets and fold them neatly; rinse off cans, etc.

Another measure includes close cooperation with manufacturers, particularly production of labels for glass bottles that are easy to take off with water, or replacement of labels with QR-codes at stores containing all the necessary information about the goods.

To train the waste sorting at home, bags of baskets of different colors can be used to store different kinds of waste.

Educational and awareness-raising events can be held at different types of educational facilities, including talks with pupils, school and university students, panel discussions aimed to share the experience of solid waste sorting and identify difficulties and factors hindering the adoption of environmentally-aware behavior, demonstration of environmentally-aware behavior by public figures and authorities, public service announcements in mass media, educational posters near the collection containers.

The discussed field is open for suggestions and solutions, and every citizen is encouraged to say what stimulates or is likely to stimulate them to adopt solid waste sorting.

5 Conclusion

In this research, the authors dedicate attention to the component of waste sorting within ecological literacy. The measures suggested to stimulate the population of Russia to adopt separate waste collection are not novel; however, they have proven to be efficient. Diligent and continuous work towards this goal is the key to success.

Shortly, the authors expect ecological education to become a part of the lifelong learning system. Regular awareness-raising work with the citizens is equally necessary to develop environmentally-friendly behavior according to the values of the 21st century.

References


2. O. A. Kovyrshina, Humanitarian studies of Central Russia 1 (26), 68-74 (2023) DOI: 10.24412/2541-9056-2023-126-68-74


531, 05012 (2024) UESF-2024
5. Russians began to care more about the environment (2021) https://romir.ru/studies/rossiyane-


8. WC IOM. Caring about the environment: We want to, but we can’t? (2019) https://wciom.ru/analytical-reviews/analiticheskii-obzor/zabota-ob-okruzhayusheskej-srede-khotim-no-ne-mozhem

9. WC IOM. Ecological situation in Russia: Monitoring (2019)