ENHANCING CAPACITY OF GREEN ECONOMY BY EDUCATION

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Abstract: *The country's ability to pass to a green economy model depends on the volume of resources, competence and the knowledge it holds. In adopting "green" development practices, it is important to study the possibilities and the limits of the implementation of green business models, which can be achieved by establishing and calculating the performance indicators of the green economy in the main sectors of the economy. This article presented the theoretical analysis of the "green" economy concept and analyzed the performance indicators of the "green" economy in education. The research approach was inductive using traditional methods: bibliographic research, systemic observation, statistical and comparative analysis. The study is focused on education data from the Republic of Moldova. Period for calculating the indicators included study years 2013-2018. The results showed that education indicators in the Republic of Moldova are decreasing. In conclusion, the development of human capital must be a real priority for the Republic of Moldova, as this is one of the main factors that can positively influence the long-term development of the country. For this, increased efforts are needed, especially at the regulatory level.*

Key words: *green economy, education, green growth indicators.*
JEL Classification: *I 25, Q01.*

1. Introduction

The transition from the traditional economic development model to a "green economy" is a global trend that determines the sustainability of the development not only of national economies but also of the entire planet, and the promotion of a "green economy" is the only right way of development.

The development of the economy in a new environment-oriented dimension has become a goal of the international community at the end of the nineteenth century. Earlier, researchers have realized that the continuation of the technical way of producing and the maintaining of the post-war economic development course is damaging the right of future generations for a better live. On a normative level, the recognition of the problem came in 1972, when the first UN Development Conference was held in Stockholm. There was discussed the eco-development of the world. In the same year, the Club of Rome Report, entitled "Growth Limits", warned the world that economic growth depends on environmental pollution, resource depletion, explosive population growth, etc. The importance of this approach was enhanced by the Bhopal catastrophe (1984) and the Chernobyl accident (1986). As a result of these events, a new attitude towards eco-development issues was created and the World Commission on Environment and Development was established. Already in 1987, report of the Commission entitled "Our Common Future", set the objectives of sustainable development. The aim of the report was to find "a way of development that supports human progress ... for the whole planet and for a far future" (Pohoata, 2018, pp.21-22).

2. Literature review

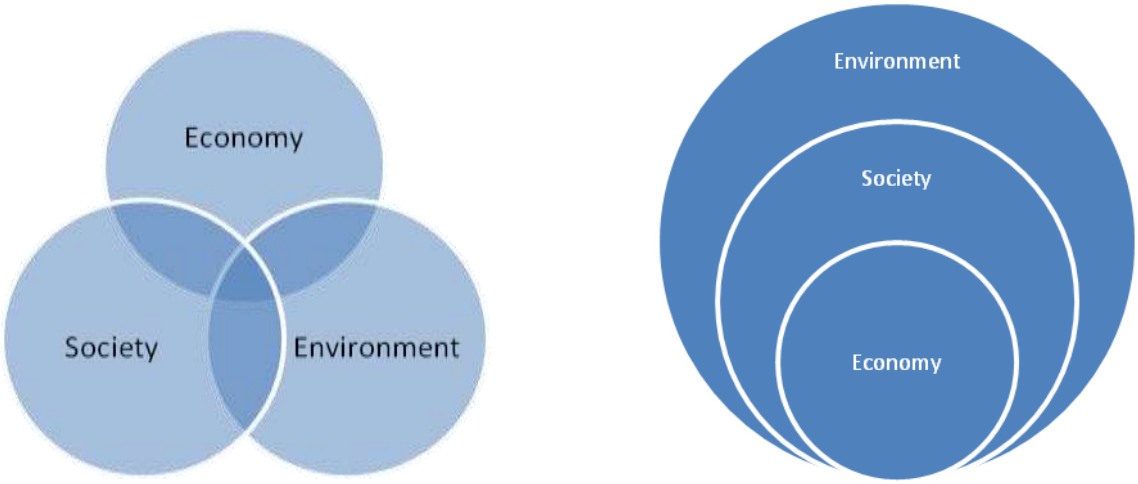
After the report of the World Commission on Environment and Development on the future of the planet in a sustainable development perspective, avalanche of research and publications has appeared on this subject. The term "green economy" was introduced in 1989 by David W. Pearce, Anil Markandya and Edward B. Barbier in Blueprint for a Green Economy (Barbier and Markandya, 2007).

The theories on the subject of green economy have their roots in the post-war period, especially in the decades of second half. Economic growth based on labor, capital and their derivatives: technical progress, technical-scientific revolution, innovation have put a heavy burden on natural resources and the environment. The risk of over-exploitation of the planet's resources by economic operators and the awareness of the scarcity of these resources has brought the need for change in the pattern of economic growth. Romanian scientist Nicolae Georgescu-Roegen in his paper "Analytical Economics: Issues and Problems", published in 1966, has grounded the idea that economic growth has consequences for ecology and society and affects the future of humanity. In his work published in 1971, "The Entropy Law and Economic Process", he demonstrated how in the economic process also takes place a degradation of materia that can no longer be used in future economic activities (Dobrota, 2010).

Another theory related to development in the parameters of the green economy was formulated by Richard Douthwait in 1992 in his first book entitled "The Growth Illusion: How Economic Growth Enriched the Few, Impoverished the Many and Endangered the Planet" (Douthwait, 1992). He considered that economic growth is an illusion that has generated, besides benefits, a lot of negative consequences on the quality of life such as air pollution, human health affecting, decreasing skills, reducing wages and stress levels increasing, etc.

The fundamental research of Jonathon Porritt (Porrit, 2006) on sustainability has led to the formulation of a green economy paradigm that is illustrated in Figure 1:

Figure 1. Tricyclic model of formal economy vs green economy



Formal economy Green economy

Source: Cato, 2009, p. 37.

In formal vision, the economy, environment and society interact, but are not interdependent. They are represented as equal and identical dimensions of importance, although the economy has more influence in decision-making that affects society, while the environment has the most to pay for these decisions. Therefore, a new paradigm of a sustainable world has been built, which is also the reflection of the green economy. It demonstrates that economic activities influence people's lives and society together with production activities have a major impact on the environment. On the other hand, society fits into the environment, and the economy is a part of society. In this sense, both society and the economy depend on the environment.

The transition to a green economy requires policy-making to promote the new development direction. It also presupposes the formation of a green-oriented society that knows about saving natural resources and protecting the environment. In order to achieve these objectives, state authorities must have information on the current situation, perspectives and possible risks. This information can be obtained on the basis of specific indicators for each sector of interest.

The purpose of this paper is to analyze the possible indicators of the green economy, especially those related to education and communication. This will help us to demonstrate our research hypothesis that education and communication have an important role to play in promoting the green economy.

3. Methods and data sources used

Traditional research methods were used to achieve the aim of this study: bibliographic research, systemic observation, statistical and comparative analysis. The study is not just a simple reflection of reality; it is a product of the author's understanding based on epistemological stages. The obtained results were based on practical observation, determination of regularities and establishment of the research hypothesis and all of it reflects the inductive approach of research.

In this paper were used experts' studies from international organizations World Bank, OECD, UNEP, UNCTAD, International Chamber of Commerce, etc. Data analysis in the field of education was conducted in accordance with the International Standard Classification of Education (ISCED).

The calculations were based on the official statistical data from the Republic of Moldova. The period of analysis of indicators in the field of education referred to the last 5 years of study (2013-2019).

The usefulness of this study is emphasized by the fact that the methodological basis of the green economy has not yet been substantiate. Thus, the theoretical research and the analysis of the scientific theories related to this subject will contribute to the development of the new current in the economy, namely the "green economy".

4. Results

4.1. Conceptual analysis of green economy

Literature review has shown that currently, there is no widely accepted interpretation of the term "green economy". Experts from United Nations Environmental Protection (UNEP) provide the broadest definition of this concept, considering the green economy as "an economic activity that enhances people's welfare and ensures social equity, significantly reducing environmental risks and degradation of nature". This treatment is one of the most widely recognized (Tereshina, 2012).

Experts believe that the concept of green economy does not replace the concept of sustainable development (Yashalova, 2013) but is clearly aware that sustainability can only be ensured by greening the economy.

The priority directions for green economy development, according to UNEP, are:

- efficient use of natural resources;
- saving and enhancing natural capital;
- reducing natural gas consumption;
- reducing greenhouse gas emissions;
- preventing loss of ecosystem services and biodiversity;
- increasing income and employment of the population.

The new direction for economic development proposes to mobilize and restructure the world economy to increase investment in clean technologies and natural infrastructure,

stimulating the greening of the economy and avoiding the catastrophic effects of global climate change. Introducing the new eco-development course involves minimization of depletion of resources to produce electricity through renewable energy investments and energy-saving commitments (ISD, 2012).

At the conceptual level, there are two development-related terms in an ecological context: green economy and green growth. These concepts have been studied by international experts and international organizations such as World Bank, OECD, UNEP, UNCTAD, International Chamber of Commerce, etc. Thus, green economy is a system of economic activities that provides a better quality of life for all within the ecological limits of the planet. Green growth is a new development paradigm about making growth process resource-efficient, cleaner and more resilient without necessarily slowing them.

4.2. Education as an indicator of green economy

In order to ensure a transition to green economy it is necessary to provide special policies and mechanisms at the level of each state, but also at international level. These policies should include indicators to quantify the effects, risks and limits of this transition.

Strategies aimed at promoting green growth should be based on a deep understanding of the factors that shape this growth and the challenges associated with it. For their determination, relevant information and indicators capable of delivering clear signals at both regulatory and societal level are needed. Indicators should be integrated into a conceptual framework, selected according to clearly defined criteria and based on comparable international data.

The importance of education is also confirmed by the latest EBRD elaborations that calculate a country's new performance index, namely the knowledge-based economy (KE). The index is part of the EBRD's new approach to measuring countries' progress in terms of the six qualities of a sustainable market economy: competitive, strength, green, integrated, well-governed and inclusive. This approach contains a set of 38 indicators grouped into four pillars. It is considered that data on how countries evolve in skills, technology and infrastructure development provides important guidance for decision-makers as well as for investors.

In the present research we intend to analyze the performance indicators of the green economy, especially those related to education and communication. The selection of this field was determined by the importance of creating a society aware of the impact of human activity on the environment and of the need to change the development paradigm towards environmentally friendly economic sectors. At the same time, in order to promote "green" economic activities, is necessary qualified staff that is able to work in an ecologically oriented economic system. These can be achieved through educational programs and information channels that will help to strengthen human capital through education and skills development.

The development of human capital through education and training is particularly important. Young people who are enrolled in secondary education (UNESCO, 2011) have fewer difficulties in finding jobs and in engaging in environmental-oriented sectors. Thus, the educational level has an enormous impact on the employability and on the increase of the qualification of the personnel employed in the activities of green economy.

In the list of green growth indicators developed by the OECD, education is a part of the compartment entitled “Labor Market, Education and Incomes” and includes “learning outcomes: level and access to education”. In the National Report based on the OECD set of indicators of green growth, indicators on education are the “degree of involvement of pupils/students in the educational process”.

Level of education - is determined as a graduation rate for men and women in tertiary programs. Input rates estimate the proportion of people entering the tertiary program during their lifetime. It also indicates the accessibility of tertiary education and shows the extent to which population acquires high-level skills and knowledge on the labor market. The high level of graduation and participation in tertiary education involve the formation and maintenance of a highly skilled labor force, because tertiary programs are designed to provide sufficient qualifications to enter advanced research programs and highly skilled jobs.

Access to education is an indicator of a country's investment in human capital, measured by enrollment of students to university studies and the graduation rate of students in tertiary education programs. Developing human capital through education induces behavioral change and enhances skills, including adopting and adapting environment-friendly processes, products and technologies.

Degree of involvement in the educational process refers to the rate of enrollment of pupils/students in the educational process. This indicator shows the total number of children /students enrolled in all levels of education, regardless of age, as a percentage of the total population of all ages that corresponds to all levels of education (usually 3-23 years).

Gross enrollment rate at all levels of education

$$RBC^t = \frac{E_t}{P_{tv}} \times 100 \quad (1)$$

where:

RBC_t - the gross enrollment rate at all educational levels in a school year *t*;

E_t - the total number of pupils and students enrolled in all educational levels, regardless of age, in a school *t*;

P_{tv} - the total population of the age group *v*, corresponding to all educational levels (3-23 years), in a school year *t*.

Net enrollment rate at all levels of education

$$RNC^t = \frac{E_{tv}}{P_{tv}} \times 100 \quad (2)$$

where:

RNC_t - the net enrollment rate for all levels of education in the school year *t*;

E_{tv} - number of children / pupils / students of school age (3-23 years old) enrolled in all levels of education in the school year *t*;

P_{tv} – the total population of the age group *v* (3-23 years) in the school year *t*.

Degree of school enrollment by age is the total number of pupils regardless of the level of education they are enrolled as a percentage of the total population of the same age.

$$GC_{tv} = \frac{E_{tv}}{P_{tv}} \times 100 \quad (3)$$

where:

GC_{tv} – the degree of enrollment for an age *v* in the school year *t*;

Etv – population of age *v* enrolled in the education system, regardless of the level of education, in the school year *t*;

Ptv – the total population of age *v*, in the school year *t*.

Analyzing the indicators which describe the level and capacity of education, we conclude that the most recommended indicator of "green" growth in education is the rate of school enrollment or degree of involvement in the educational process.

4.3. Fostering green economy in the Republic of Moldova

A development priority for the Republic of Moldova is the promotion of an economy that is resource-efficient, socially inclusive and minimally offensive for environment and health. An economic and social development in a sustainable system will bring growth, welfare and continuity for next generations.

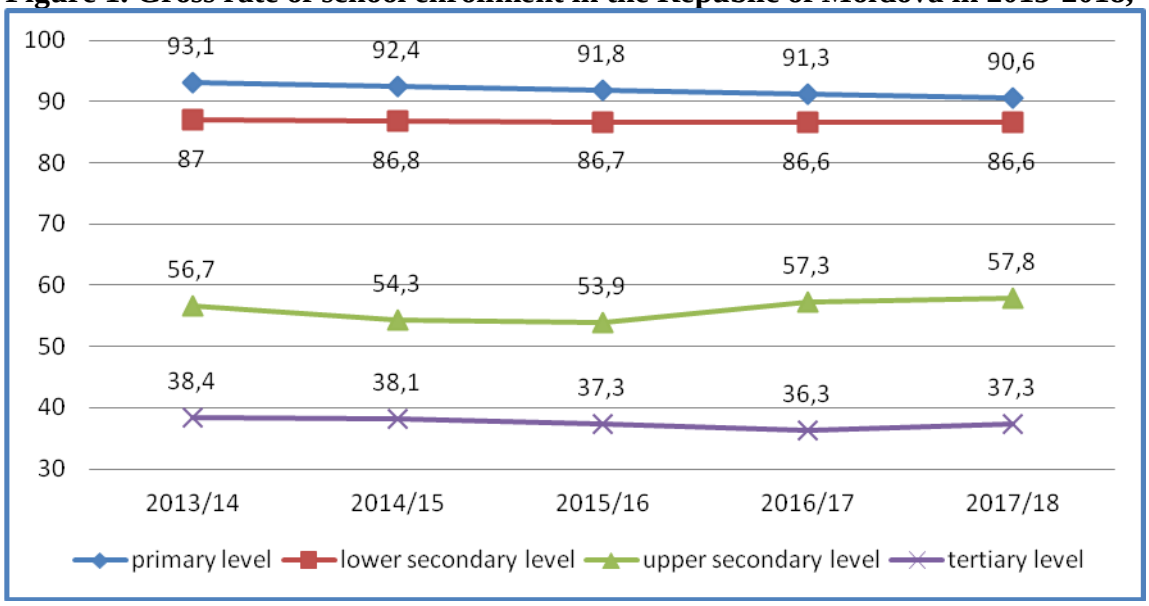
The importance of fostering green economy was recognized by the Moldovan authorities. As evidence of this, the main principles of sustainable economic development are included in the main policy documents of the Government. At the same time, the signing of the Association Agreement of the Republic of Moldova with the European Union, as well as other agreements signed with the external partners, foresee the promotion of environmental protection, rational use of resources and energy efficiency in all sectors of national economy and social life.

On the wave of promoting the green economy, the Republic of Moldova has joined international green programs and platforms such as the "Greening the Economy in the Eastern Neighborhood" Program, Green EaP Green Program, Green Industry Platform and others. These programs include, among other, green growth indicators at national level. These indicators are intended to serve as the basis for policy development and monitoring of the country's performance in green economic development.

4.4. Indicators of education in the Republic of Moldova

Using the set of indicators described in section 4.2. of this paper, we present in Figure 1 the results obtained from the calculation of the gross enrollment rate in education in the Republic of Moldova.

Figure 1. Gross rate of school enrollment in the Republic of Moldova in 2013-2018, %



Source: developed by author based on data from National Bureau of Statistics of the Republic of Moldova

The enrollment rate in education is the highest in the primary cycle, about 90%, moderately decreasing over the last 5 years. The lowest rate is recorded in tertiary education, reaching 37.3% in the 2017/18 study year.

The analysis of the gross enrollment rate in education in the Republic of Moldova denotes the fact that children aged 7-15 years old are the most involvement in educational

system. This leads us to the conclusion that the primary focus in the education of a society with new visions, aimed at saving natural resources, preserving ecosystems and reducing environmentally-polluting activities, should be put on primary and secondary education programs.

In the Republic of Moldova the number of pupils/students is decreasing. The school age population (7-23 years) gradually decreased during the period 2006-2017. On 01.01.2017 this population amounts 704.7 thousand persons, about 30% lowest compared to 2006 (MECR, 2018). This was caused by low birth rates and rising numbers of family emigration.

In higher education in the Republic of Moldova, which is the main segment of human capital formation and qualified labor force formation, inclusively in the field of green economy, there is no university programs fully focused on the green economy. There are related specialties such as ecology, environmental protection, engineering and energy.

Statistical data on graduates of higher education institutions indicates that out of 13421 graduates of the first cycle of university studies, 105 obtained a specialty in environmental sciences and 1099 in engineering and engineering activities. In the top of the most demanded specialties in the Republic of Moldova remain the economic sciences with 3686 graduates, law with 2205 graduates and the education science with 2097 graduates. This trend is not only valid for the year 2017/2018, but it remains the same in the last 5-10 years.

4.5. Problems and solutions

Educational indicators relate to quantitative aspects and do not fully reflect the qualitative changes in the sector. Namely in the quality of education in the Republic of Moldova there are large reserves. Among the main challenges and problems we have identified in this study are:

1) population migration which reduces the number of potential students;
2) the education system is not adapted to market needs;
3) the inflexibility of study programs in relation to the economic and social evolution and progress;
4) lack of attractiveness of study programs leads some of the students to leave the education system before graduation;
5) disequilibrium between demand and supply of qualified labor.

This disequilibrium generates significant problems for the local labor market because higher education graduates are employed in jobs which require much lower qualifications. By this way they hold the jobs of tertiary segment graduates. At the same time, the population who does not have a qualification or whose skills are no longer required on the labor market works on unskilled jobs and can not contribute to increasing productivity. According to NBS data, the proportion of the population that has the highest qualifications is 19.2% of the total occupied population in 2016. The share of people with lower qualifications than is required at their workplace is 21.6%.

Performance in education can be achieved by implementation of national policies. One of the steps taken in this direction was the endorsement of the Strategy for Education Development 2014-2020 “Education-2020”. The strategy contains a new funding policy for educational institutions, but also opts for a stronger correlation between the labor market and the education system. By implementing these policies, a greater impact on economic growth can be achieved. The updating of educational supply and correlating them with the principles of environmental protection and resource conservation will contribute to developing the green economy.

Another important policy document is the Environmental Strategy for 2014-2023 setting out national and sectoral priorities for promoting the green economy and defining the framework for further integration of the green economy in agriculture, transport, energy, industry, construction, development regional, education and procurement.

5. Conclusions

The concept of green economy is still underdeveloped, because it appeared just a few decades ago. However, the importance of the green economy has generated avalanche of research in this area and became clearly that is necessary to elaborate a theoretical and methodological fundament that will be recognized by all scientists. The main research efforts were aimed at determining the set of indicators that would scale the limits and outline the perspectives of the main economic sectors in transition to a green economy. These studies were important to start fostering a "green" economy at the policy level.

Green transformation is not a question of money. The rich countries squander a lot of money on subsidising life-destroying industries year by year. It is a question of political vision and people's education.

The development of human capital should remain a priority for the Republic of Moldova, as this is one of the factors that can influence the country's development in a sustainable way. Policies geared to human capital development should not only be limited to developing strategies but should contain concrete actions. In order to achieve this, it would be appropriate to take the following measures:

1) Remodeling study programs and orienting them to current global and regional trends
2) Introduction in the primary and secondary education programs the disciplines related to environmental protection and greening of economic processes
3) Enhancing the quality of specialized education and encouraging adult education
4) Increasing budget allocations to support and develop education
5) Elaboration of special study programs in the field of ecological education and sustainable development for tertiary and university education
6) Organization of environmental education training for employees in any field. Elaboration of digital textbooks on ecological education and sustainable development
7) Organization of information and promotion events for ecological education and for green economy
8) Supporting and expanding research and innovation activities in the green economy

These actions will allow people to adapt to the new labor market conditions and to apply green jobs. Partnerships between the education system and the labor market will lead to the generation of educational offers that will meet the quantitative, qualitative and structural requirements for the labor force for the needs of the green economy.

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