



IDENTIFYING THE POTENTIAL OF RENEWABLE ENERGY IN RURAL AREAS THROUGH DIGITALIZATION

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Abstract: The article presents the identification of renewable energy potential in rural areas of Romania through the use of digital technologies, with the aim of supporting the sustainable development of these regions. The study uses modern technologies, such as Geographic Information Systems (GIS), to assess the energy potential of different renewable sources – solar, wind, hydropower and bioenergy – depending on geographical factors and local conditions. The research includes detailed case studies that use open-source data and information from public institutions to assess opportunities for rural energy development. The results show that approximately 8% of the country's surface has high potential for hydropower, and 14% for wind resources, while solar energy has the highest potential, being viable on 42% of the country's surface. The conclusions emphasize that digitization is essential in the energy transition and that the exploitation of renewable energy can support the economic and sustainable development of rural areas.

• Introduction

The European picture is currently defined by an increased interest in everything that means sustainability, an aspect captured in as many events and sustainable development objectives of the European Union [12].

An increased use of energy from renewable sources is essential to reduce both the European Union's greenhouse gas emissions and the Union's dependence on fossil fuels and energy imports, thus contributing to the security of its energy supply [11]. Moreover, energy from renewable sources can play an important role as a vector of sustainable development in rural areas [7]. Specific funding available for rural development could play an important role in achieving European Union and national renewable energy targets, but Member States have not always prioritized renewable energy projects that could contribute to sustainable development of rural areas [4]. There are numerous legal and financial frameworks that offer a multitude of opportunities for Romania, from the perspective of developing renewable energy sources. [8].

• Material and method

In order to carry out scientific work, I have carried out several case studies that involve a detailed research of information about the identification of the potential of renewable energy in rural areas through digitization. Research includes study data, data analysis and presentation.

• Conclusions

Identifying and harnessing the potential of renewable energy in rural areas in Romania is essential for the transition to a sustainable economy and for improving the quality of life in rural communities. The study demonstrated that the use of digital technologies, such as Geographic Information Systems (GIS), plays a crucial role in the process of analysis and identification of renewable resources, allowing a correct and detailed assessment of the energy potential. The digitization of data collection and analysis processes facilitates a precise identification of the areas with the greatest energy potential, thus maximizing the efficiency of investments and reducing the impact on the environment.

Therefore, identifying and using the potential of renewable energy in rural areas in Romania, with the help of digitalization and modern technologies, represents an essential step towards the sustainable and equitable development of these regions. The implementation of an appropriate legislative framework and collaboration strategies between authorities, investors and local communities can transform Romania into an example of success in the energy transition. The efficient exploitation of renewable resources will not only support economic development and poverty reduction in rural areas, but will also contribute to environmental protection, ensuring a sustainable future for future generations.

• Results and discussions

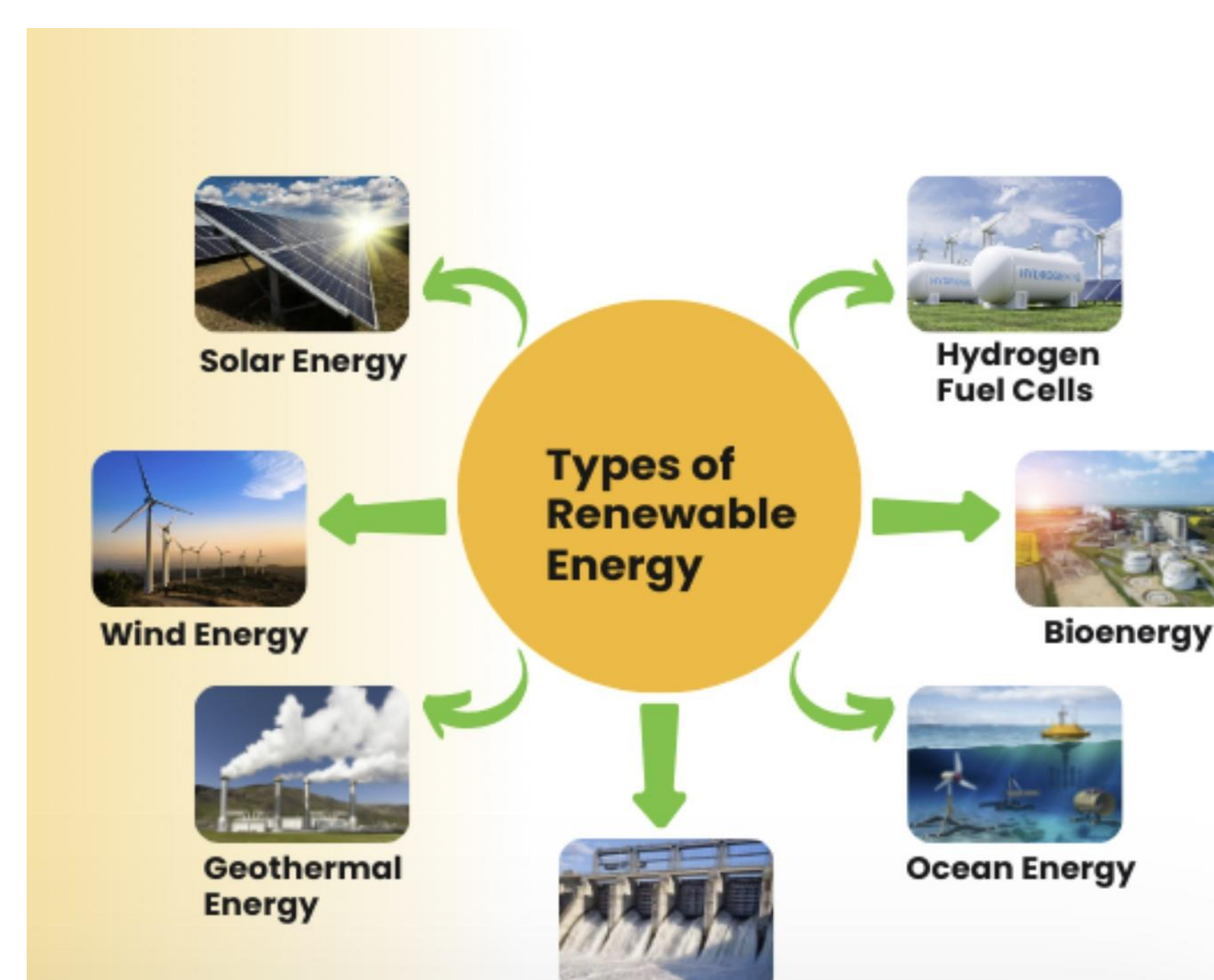


Figure 1.
Renewable
energy
sources,
technologies
and
applications

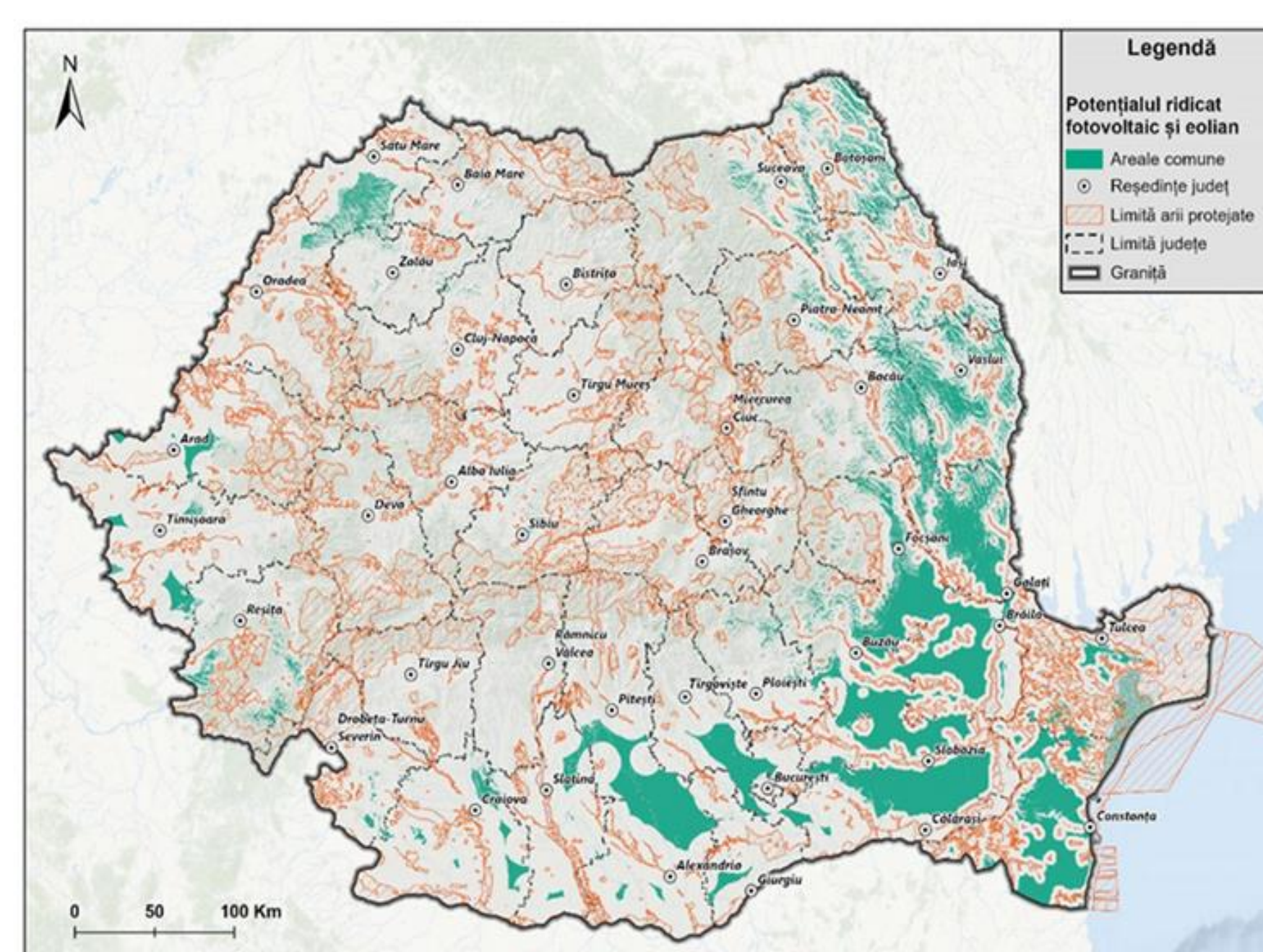


Figure 2.
Map of the
mixed wind
photovoltaic
potential in
Romania