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Earth Observation Societal and Economic Applications, Challenges and Benefits (5)

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ASSESSING AND PREDICTING RENEWABLE ENERGY POTENTIAL IN AZERBAIJAN USING
HIGH-RESOLUTION AEROSPACE DATA

Abstract

The world is disturbed about the effects of climate change, and as a consequence, strategies and initiatives are being adopted at the international and national levels. In Azerbaijan, the pollution of the environment with the formation of greenhouse gases are mainly due to energy, which emissions per capita are 6-7 tons. Renewable energy sources are the only solution for avoiding future environmental issues and energy crises. The application of space technology such as aerospace data to address these issues and carry out scientific study in this field is expanding quickly both worldwide and in Azerbaijan. According to the strategic plan "Azerbaijan 2030: National Priorities for Socio-Economic Development," the mission is to improve the proportion of alternative and renewable energy sources in primary usage in all sectors of the economy. This will minimize the impact of climate change, attract development to underused land in the nation, and achieve effective use of water resources. This study is dedicated to the use of high-resolution aerospace data to generate innovative ways for assessing and predicting the potential for renewable energy with environmental factors, such as soil, water basins, air pollution, and changes. Aerospace data from various locations in Azerbaijan, including stationary and mobile stations, have been used to calculate the number of solar hours, direct, diffuse, total, and albedo solar radiation, as well as wind speed and direction, river potential, wave potential, and biomass potential. As a result of the study, practical proposals for the use of the high, medium, and low potential areas will be provided by developing digital suitability maps for the study area. Depending on the economic region's energy needs and natural climatic potential, the precise coordinates of the areas for the development of high, medium, and low power plants are provided in stages. The potential of each renewable energy source for each economic region of Azerbaijan has been evaluated independently based on the research's experiments and highly aerospace data, and in the future phases of the research a prediction for the next 20 years will be presented. Innovation by using aerospace data based on the green economy may support the settlement of the population and the establishment of sustainable economic activities for study areas. The experimental findings gathered from this research may be applied in order to develop a model for an area of interest.