Biogas is a renewable gaseous energy source produced from waste materials such as agricultural residues and manure through the process of anaerobic fermentation conducted in devices like fermentation chambers or bioreactors. In recent years, biogas production has gained popularity as a sustainable method of waste management and renewable energy production. However, the biogas production process also generates large quantities (120 million tons annually in the EU) of by-products called digestate, which can be used in agriculture as fertilizer. Despite its fertilizing potential, the use of digestate as fertilizer is limited in many countries due to insufficient confidence in its quality and safety, primarily due to the presence of harmful chemical substances such as heavy metals, polycyclic aromatic hydrocarbons, and biological elements like antibiotic resistance genes. This project aims to determine the long-term concentrations of these contaminants in soil supplemented with digestate and to propose a solution that will minimize or even eliminate the problem of contaminants present in the digestate by using appropriately prepared nano-scale biochars. Biochars are carbonaceous materials obtained from biomass through a process known as pyrolysis, which involves the thermal decomposition of organic material under limited oxygen conditions. They are characterized by their porosity and ability to adsorb various substances, making them ideal for immobilizing contaminants while preserving the fertilizing potential. With these properties, biochars are used in agriculture as soil conditioners and nutrient carriers. The project includes the production and modification of advanced biochars, which will be optimized for contaminant immobilization while utilizing the fertilizing potential of the digestate in such a way that the nutrients present in the digestate are released in a controlled and gradual manner. This prevents the rapid release and loss of nutrients, ensuring rational resource management. Such a comprehensive approach will provide a deep understanding of the potential benefits and limitations associated with using digestates in agriculture, ensuring that the proposed method not only solves environmental issues but also supports sustainable food production. The project, through the use of waste materials, rational resource management, limiting the spread of contaminants, and carbon sequestration through the use of biochar, fulfills the European Commission's goals of protecting the environment and preserving biodiversity.