

surface showed uneven distribution of bacteria on the surface. The craters (pores) of beads seem to be the most appropriate sites for bacteria attachment. Conversely, ceramic beads made from quaternary deposits of Prometejs clay (800–1150 °C) inhibited bacterial growth.

Besides, peat and humic-rich peat extract, sapropel, biochar, clay powder, straw etc. were evaluated as potential amendments to soil for optimizing interrelations between autochthonous and introduced microorganisms, higher plants, contaminants, etc.

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### Composite clay sorbents for immobilisation of biomolecules and cells



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An efficient tool for new application possibilities in biotechnology is the modification of natural materials. A good approach in this respect is clay modification or synthesis of composite/hybrid sorbents with high sorption capacity. We have developed an approach of clay modification with reactive organic functional groups (NH<sub>2</sub>, SH, COOH, epoxypropyl) and the obtained composite sorbents have high sorption capacity in respect to enzymes (superoxide dismutase, catalase) or biomolecules (sterols, FMN, etc.). The immobilisation yields are high and the chemical bonds are stable. Another approach is based on synthesis of clay–mineral phase sorbent synthesis. As the most prospective in this respect can be considered clay modification with iron oxohydroxides or oxyapatite. The obtained sorbents thus have a combination of basic clay properties (high surface area, ion exchange capacity) with properties of the mineral phases immobilised onto clay surface. The obtained composite clay sorbents were characterised by means of determination of their sorption capacity, in respect to phenolic substances, metal ions, BET surface, SEM and other methods. The versatile application potential of the obtained sorbents in several fields for immobilisation of biomolecules and cells has been demonstrated.

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### Study regarding the current situation of farms in Romania



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Agriculture is a sector with great potential, occupying, by tradition an important place in the structure of the Romanian economy. This is an important factor in maintaining social stability and eco-

logical balance; it is the branch that provides food for population and important quantities of raw materials for non-food industries and other industries. This paper aims to analyze the evolution of farms in Romania, as a basic element of economic development. The excessive fragmentation of agricultural property and lack of association leads to a permanent duality, represented on the one side by the semi-subsistence and subsistence farms, and on the other hand by commercial holdings. In the case of commercial holdings there is still an imbalance, in terms of utilized agricultural area by family farms and agricultural companies with legal personality, the last ones largely managed to adapt to the needs of a competitive agriculture. From the investigations made that number of farms with utilized agricultural area of less than 1 ha decreased in 2013 compared to 2010, with about 76,000 farms or 3.8%, them holding still, a large share, 54.5% from the total, used agricultural surface which returned on average in 2013, on a farm was 3.60 ha, compared with 3.45 ha in 2010.

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### Cost/Benefits analysis – A sufficient process in choosing investment



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The article deals with a comparative study of investment options regarding a standard water – treatment plant vs. a biological water – treatment plant. The analysis is made by ERR and ENPV reported to a financial discount rate for projects financed by public funding. The method of valuation used within the study was a Cost–Benefit Analysis. Research was made during a training program regarding financial resources for projects during the programming period from 2014 to 2020. Training aimed members of staff involved in the management of the Environment Operational Program.

As far as a standard water – treatment plant is concerned, investment rises to 652,000 Euros, while for a biological water – treatment plant is of 403,400 Euros. For both plants the considered operating period is of 25 years. The result of the carried – on analysis is a recommendation made by the authors of the study regarding the fact that a biological water – treatment plant is better suited in terms of costs for the equivalent of a 3000 – inhabitant community taking into account the following reasons: ERR is of +7.33%, ENPV is of +72,000 euros reported to a financial discount rate of 4.00%, thus the cost of water – treatment is bearable even by low-income inhabitants of rural areas.

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