

PREREQUISITES FOR ECOSYSTEM SERVICES ASSESSMENT IN UKRAINE

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Ecosystem services defined as the benefits to humans that result from ecosystem functions and processes such as: major biogeochemical and nutrient cycles (e.g., of water, carbon, nitrogen, phosphorus etc.); natural pest control by predators in food chains; pollination by insects, bats and birds; decomposition of biomass, wastes, and pollutions; soil formation, retention, erosion prevention, and maintenance of soil fertility; and climate regulation [4]. There were described 4 categories of ecosystem services: provisioning (food, fuel, genetic resources, etc.); regulating (water purification, disease control etc.); supporting (soil formation, nutrient cycling, etc.); and cultural (spiritual enrichment, recreation, and nonmaterial benefits, etc.). Ecosystem services assessment was determined as a powerful analytical tool for comparison of different alternative scenarios to choose the most optimal solution of nature management development [1].

In early 1980s the scientists of the Institute of Hydrobiology of NAAS of Ukraine (Kyiv) began their pioneering work on ecological economy and ecosystem services [6]. The value of ecosystem services provided by Ukraine's rivers and wetlands were estimated. They defined the monetary value of services provided by aquatic ecosystem, or their replacement cost if the natural services were destroyed by human activities, especially such as construction of dams.

Current case study of ecosystem services assessment was carried out in the framework of the WWF Danube-Carpathian Programme "Promoting Payments for Ecosystem Services and Related Sustainable Financing Schemes in the Danube Basin". Ukrainian scientists determined that a serious barrier to the introduction of payments for ecosystem services was fiscal and budgetary legislation of Ukraine. According to the willingness to pay analysis, consumers have low willingness to pay irrespective of economic conditions [6].

In Ukraine, the most popular and effective agroforestry practice is establishment and maintenance of shelterbelts, which generate a number of ecological goods and services to society, such as protection of watercourses, biological diversity, landscape embellishment, and carbon retention [2]. For example, they increase crop yields from 3 to 25% due to protection of crops against winds. However, these data correlate with such important factors as soil type, climate zone and weather conditions during the year, quantity of fertilizers, etc. [4]. A cost-benefit analysis of the windbreaks installed along the livestock barns was carried out in Canada [2]. This case study demonstrated that the windbreaks were highly profitable and offered important benefits for farmers. They provided such ecosystem services as protection of watercourses and problematic road segments, reduction of snow clearing cost, increase of crop yield, minimization of odours from livestock barns, etc. Results related to the monetary value of ecosystem services evaluated for over 40 year period demonstrated that their maximum total value was 30000-40000\$ for a farm. It was found that the value of ecosystem services emanated from the agroforestry practices was significantly higher for the public than for farmers (excluding the aesthetic benefit, etc.).

Assessment of ecosystem services is important tool for biodiversity protection in Ukraine. In Russia, that studies were conducted to assess the values of endangered Siberian crane (*Grus leucogeranus*) and bison (*Bison bonasus*) through the reconstruction cost method. The value was approximately 27000\$ for one crane and 50300\$ for a bison. Both case-studies were performed in the framework of reintroduction projects. This valuation is available for assessing wild fauna in hypothetical reconstruction projects [7].

Taking into account the prognoses of global biodiversity loss as well as decline of ecosystem services, it is extremely important to develop measures on support and management of ecosystems, and to implement the best management and political tools for their protection and sustainable use.

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