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Concept of ecosystem intrinsic value and application in marine environment

So far, the most popular methods for ecosystem valuation are ecosystem service valuation (ESV), which is based on the utility of ecosystem to human beings rather than on the objective value of the ecosystem. After more than 10 years' application, it has been found that all losses of ESV were about 10% of the benefits of human activities. The ecosystem intrinsic value (EIV) is defined as an objective value of ecosystem in the earlier studies that emerges from the existence, substance, energy, information, structures, functions and processes of ecosystem, but independent with man, man's will and preferences. The valuating approach and methods for EIV were developed by using the methods of emergy analysis and eco-exergy analysis from the ecosystem properties, which represents the existent value and the externally working capacity (creative value) of ecosystem, respectively. The evaluating approach and methods of EIV were applied into Xiamen Bay and Pearl River Estuary, China. The results showed that the EIVs of both ecosystems were around USD 54 million km⁻² that were irrespective with their socio-economical levels. It demonstrates that the EIVs are the objective value of the ecosystem and independent of human consciousness, will and preference. The total marine EIV in Xiamen Bay was nearly 30 times of ESV and 8.5 times of the GDP of Xiamen marine industry in 2010. EIV in unit area is more than 10 times of the average global ESV in estuaries, the highest marine ESV. It implies a potential undervaluation to ecosystem value by ESV concept and approach. Due to its under-valuation ecosystem, as a result, ESV may mislead decision-making process and results in that ecological degradation continues to accelerate. All of these show that EIV is an objective value of ecosystem, a more rational value can just conserve ecosystem by using it and support decision-making towards sustainability.

Biography

Luo Ping Zhang has his expertise in marine environmental monitoring and integrated environmental quality assessment, strategic environmental assessment and environmental risk assessment, coastal and regional environmental planning and management.

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