Relationship Between Renewable Emergy Inflow and Ecosystem Service Provision of Tidal Flat Ecosystems in Korea

Naryeong Kim, Jongseong Ryu, Daeseok Kang

ABSTRACT

Annual emergy inflow from environmental sources were evaluated, annual fishery production and gross primary production were estimated, and correlation analyses between emergy input from environmental sources and selected ecosystem services (fishery production and gross primary production) were carried out to test the possibility of using emergy inflow to tidal flats of Korea in rapid assessment for decision-making regarding their ecosystem services. Thirteen tidal flats were selected based on the availability of environmental and ecological parameters, physical characteristics (degree of openness and tidal heights), and freshwater inflow from rivers and streams. Annual renewable emergy inflow per unit area to the tidal flats decreased from southern Kangwha tidal flat in the mid-west coast to Nakdong River estuary tidal flat in the southeastern coast. Even though it was difficult to find any clear trend in the distribution of fishery production per unit area among the tidal flats due to the limitations inherent in the estimation of fishery production, tidal flats in the west coast showed higher fishery production on average than those in the south coast. Annual gross primary production per unit area showed an increasing trend along the Korean coast from the mid-west to the southeast coast. There was a positive correlation between annual renewable emergy inflow per unit area and annual fishery production per unit area, while a negative correlation was observed between annual renewable emergy inflow per unit area and annual gross primary production per unit area. These suggest a possibility for using emergy inflow as an indirect measure of the potential for ecosystem service provision of tidal flat ecosystems in Korea.

Citation
