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2.2. Clam (*Sinonovacula constricta*) culturing system (CCS)

2.3. Fishpond system (FCS)

3. Methods

3.1. Conceptual framework of ecosystem services evaluation



Table 1

3.2. Calculation of emergy

Table 2

Table 3

3.2.1. Emergy of material sedimentation

3.2.2. Emergy of biodiversity

3.2.3. Emergy of habitat availability for waterfowls

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3.2.5. Emergy of CO₂ fixation and O₂ release

3.2.6. Emergy of the market products and ecosystem services

3.2.7. Emergy of pollution impacts of the three systems

3.3. Data collection

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4. Results



Comparisons of ecosystem services among three conversion systems in Yancheng National Nature Reserve

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<http://dx.doi.org/10.1016/j.ecoleng.2008.09.007>, [How to Cite or Link Using DOI](#)

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Abstract

A conceptual framework of internal and external emergy was addressed to integrate ecosystem services evaluation and emergy analysis. Internal emergy yields support the material, structure, and information of the ecosystem, and external emergy is those goods and services related to the outside of the ecosystem. An accounting system was determined from the conceptual framework and applied to the evaluation of ecosystem services of conversion activities in Yancheng National Nature Reserve (YNNR), an international important coastal wetland in Jiangsu Province of China. Three typical conversion systems were selected as study cases: (1) a ragworm culturing system (RCS, located in the core zone of YNNR), (2) a clam culturing system (CCS, located in the buffer zone), and (3) a fishpond system (FCS, located in an experimental zone). Our results showed that the ragworm culturing system was more sustainable than the other two systems; indices of base emergy yield ratio (Beyr), net emergy yield ratio (EYR), eco-services benefits (Bs), emergy sustainable indices (ESI) were more sensitive in the new accounting system; the function of the ragworm culturing system relied more on renewable resources and the other two relied mainly on the economic management; and environmental impact, and external services played a crucial role in the ecological engineering evaluation.

Keywords

Ecosystem services; Emergy analysis; Ecological engineering evaluation; Sustainability