Sustainable and resilient social system for healthy nature

R&D Project Title（Registered）： Construction of energy and food circulation system by integrating urban metabolic system and coastal ecosystem

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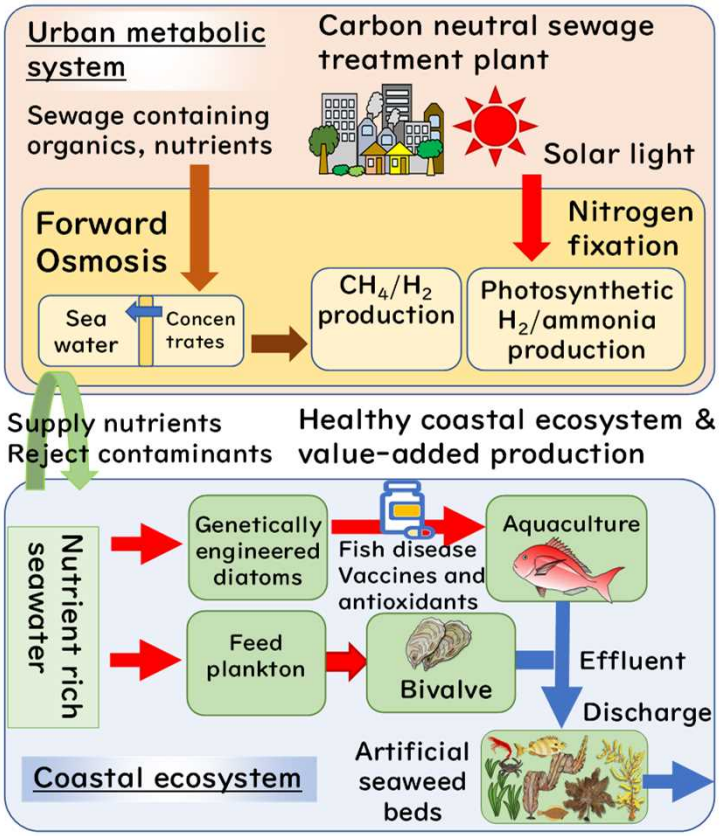
Summary：

Aiming to solve social issues such as greenhouse gas emissions from sewerage systems and a decrease in fishery production due to nutrient depletion and fish disease damage in coastal areas, we will construct a future circular system that creates multiple values such as energy, high value-added materials, edible marine products, carbon offsets, and biodiversity by using organic matter and nutrients contained in sewage in a cascading manner. A carbon neutral sewage treatment system will be achieved through forward osmosis, methane/hydrogen production, and photosynthetic hydrogen/ammonia production. Furthermore, We will establish a technology for cultivating genetically engineered diatoms that produce fish disease vaccines and antioxidants using effluent from the forward osmosis system. The effluent will be also utilized to establish a bivalve aquaculture systems and construct artificial seaweed beds. Social acceptance of sewage-derived aquatic products is one of the bottlenecks of the proposed system. We challenge to propose a methodology to achieve social acceptance of the system.

https://water.env.kyoto-u.ac.jp/



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