

Component 8 (Coordination)

Area-capability Cycle on stock enhancement

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Component 8 has responsibility to create conceptual design of Area-Capability based on the achievements of all components and discussion of Area Capability Index seminars. So far, a total of 2 times of ACI seminars have been held in Japan until April to August in this year. We invited 3 presenter at this seminar and discussed about appropriate resource management system by the community and for the community. Professor Yamakawa, who was one of the presenter, talked about how important fisherman's mind for community based resource management by using numerical model. Professor Foshimi and Arimoto made a presentation about stock enhancement activity in the Hamana Lake Japan and Rayon province Thailand based on there long term collaborative activity with local people and government. In addition, we also made a presentations of Area-Capability concept at Japan society for the promotion of science (JSPS) Symposium at University of California, Berkeley, annual meeting of the Japanese Agricultural Systems Society, Sustainability week seminar at Hokkaido University Japan and The Japan Society for International Development, Doshisya University, Kyoto Japan. And a presentation at annual meeting of the Ecological society of Japan is planned at March 2015.

Based on the discussion at the ACI seminars and the presentations, "Area-Capability" is recognized as one set of social conditions and items of human empowerments which enable to local institutional natural resource governance and they should be improvement targets in the rural development plans. The "governance" in the Area-capability concept should involve both effective use of natural resources based on the scientific ecosystem health evaluations for improvement of quality of lives of the members of local institutions and care actions for ecosystem health with monitoring and scientific evaluations by local institutions. These effective use and care for ecosystem health should be done simultaneously. Any rural development actions should touch in both effective use and care of ecosystems.

We propose the Area-Capability Cycle as one filter for evaluation whether each rural development plan considers both effective use of natural resources and care of ecosystem health or not (Fig. 1). And we considered what kinds of conditions and items are required to complete the Area-Capability Cycle on sites based on the case studies of Stock enhancement in Hamana Lake in Japan and set-net installation in Rayong Thailand.

In both cases of Stock enhancement and Set-net fishery installation, core persons of each activity have many passions and they conducted continued efforts with appropriate technological improvements. In stock enhancement of Hamana Lake, Prof. Fushimi who was a researcher of stock enhancement center of Shizuoka prefecture, conducted environmental survey of whole Hamana Lake in order to decide aquaculture conditions and to find release points of shrimp larvae. And he improved aquaculture technology in feeding, water controls and handling of shrimps, etc. These technological improvements increased fishermen's shrimp catch in short period of time. The increased catch gave much impact on fishermen mind, and they realized the importance of stock enhancement for their lives. And the importance of environmental conditions for their lives was also recognized by local fishermen. In case of Set-net fishery in Rayong, Mr. Aussanee Mumprasit planned and obtained the permissions of Set-Net fishing in Rayong by himself. And he designed the fishing gear and he organized town seminar for establishment of fishermen community which manage the set-net fishery. In the first year, the set-net fishery did not get good results of fishing but Mr. Aussanee improved the design of fishing gear and fishing operation with consultation from Prof. Inoue, Prof. Arimoto and other professors and the fishermen of Himi City in Japan who have many experience of set-net fishery in Japan. After two years, the set-net fishery obtained big catch of fish including high value fish species which had not been caught by small-scale fishing. The community members of the set-net fishery realized

Our project are trying to clarify the conditions and essential elements for Area-Capability Cycle through the case studies.

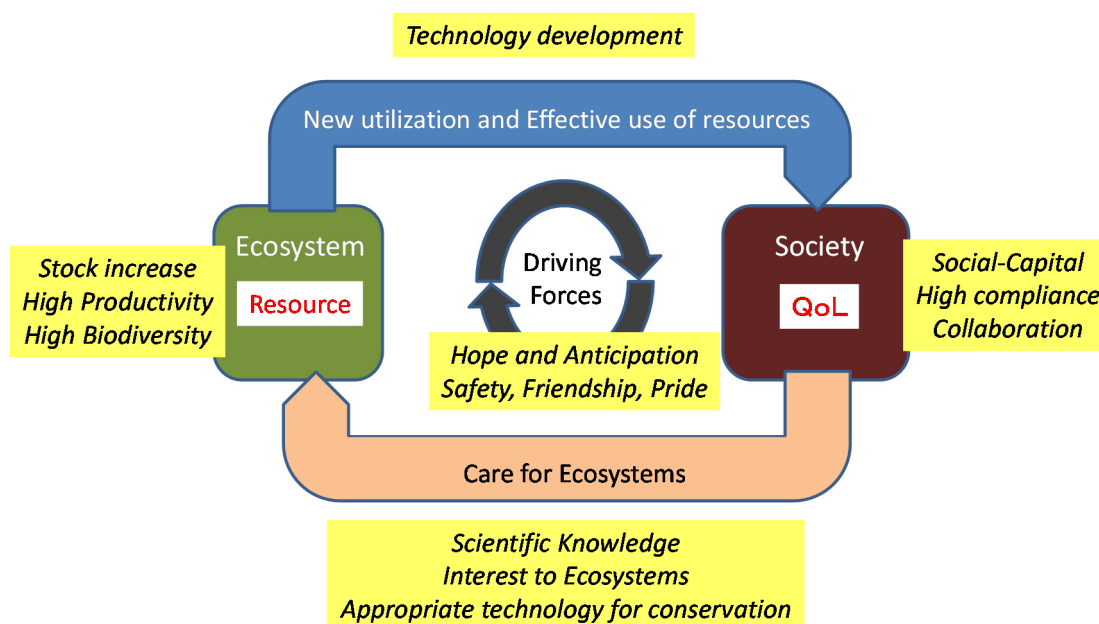


Fig 1. Area-Capability Cycle

and had much hope to this new fishing. The pooling system, in which all fish catch are sold in their own market by themselves, and half of fish income is pooled for management cost and rest half are shared by members according to their contribution. Through this system, all fish catch and incomes have been recorded very precisely. And improvement of management can be done based on the data analysis. So, these case studies indicate 1) continued efforts by skillful leader, 2) improvement appropriate technology, 3) existence of community which have some rights to decide their activity, 4) cultivating future hopes, 5) realization of ecosystem health importance for better life, 6) facilitate care on ecosystem health, are necessary for local institutional natural resource governance.

The two case studies are summarized as Figure 2 and 3 based on the Area-Capability Cycle. The stock enhancement of shrimp in Hamana Lake started the care of natural resources. Then, efficient utilization by fishermen community had started based on the collaboration among fishermen and researchers. The collaboration aquaculture fostered the social capital and high compliance of regulations. And local institutional stock enhancement stated after finish the national project. In this case, all conditions and items were completed. So this activity continued more than 30 years.

In case of set net fishery in Rayong, efficient utilization had been started as a first step using set-net fishing gear. Then, fishermen community had been established. And big catch and income cultivated the pride of fishermen. They started the eco-tourism using set-net fishery, it could be said they find new efficient utilization of ecosystem services. Good statistics data are provided from set net fishery. High monitoring and surveillance are also conducted by set-net fishery. However, the impact of set-net fishing on environment had not been examined. Therefore, to complete Area-Capability Cycle, the experiments on ecosystem impact evaluation should be done. The component 5, 6 and 4 have been conducted food web analysis based on the stable isotope analysis and biomass evaluation using acoustic survey. The results of these experiments can persuade all people to accept the set-net fishery as new tool for local institutional ecosystem governance.

Using the Area-Capability Cycle model, the important items and conditions can be considered by many stakeholders. And this cycle show the weak points of each activity for harmonization between utilization and care of ecosystem services. Therefore, the Area-Capability Cycle has high potential as a tool for evaluation of action plans in many cases of rural developments.

This concept design and Area-Capability Cycle were shown in CJS-JSPS Symposium 2014 “Long-term Sustainability through place-based small-scale economics, at UC Berkeley, September 26-28, 2014, Annual meeting of the Japanese Agricultural system Society in Kyoto University at 17 October 2014, Sustainability week symposium of Hokkaido University at 1st November 2014. And one presentation is expected at symposium named “Global and regional

integration of social-ecological study toward sustainable use of biodiversity and ecosystem services” in the 62th Ecological Study of Japan annual meeting in Kagoshima in March 2015.

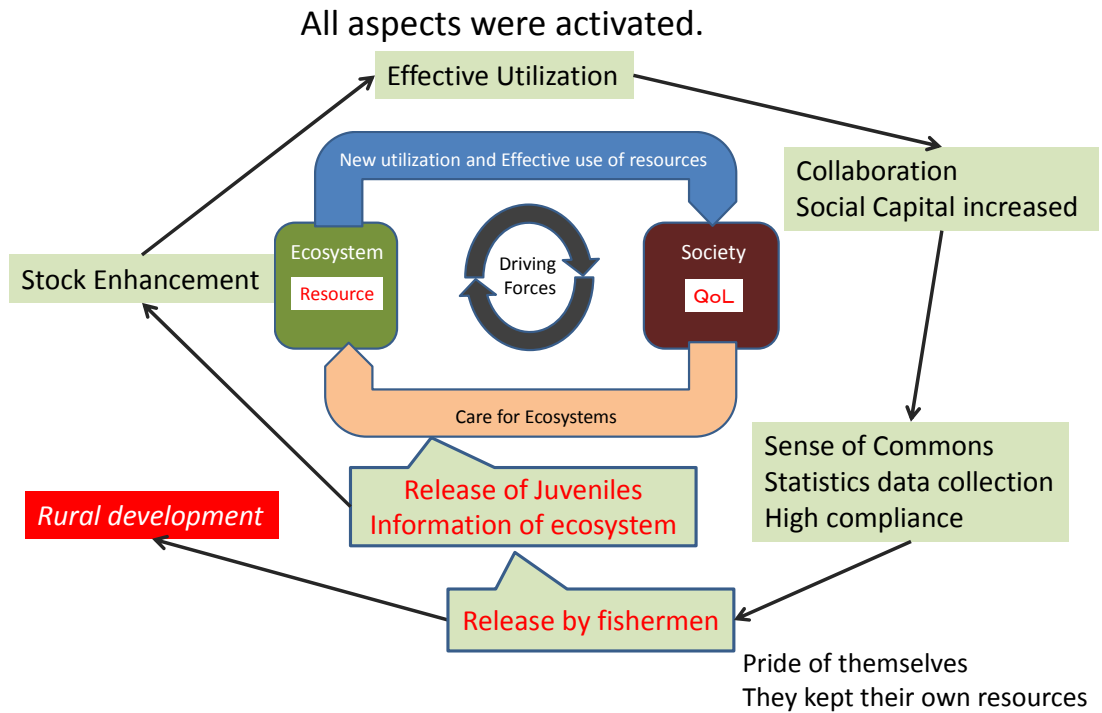
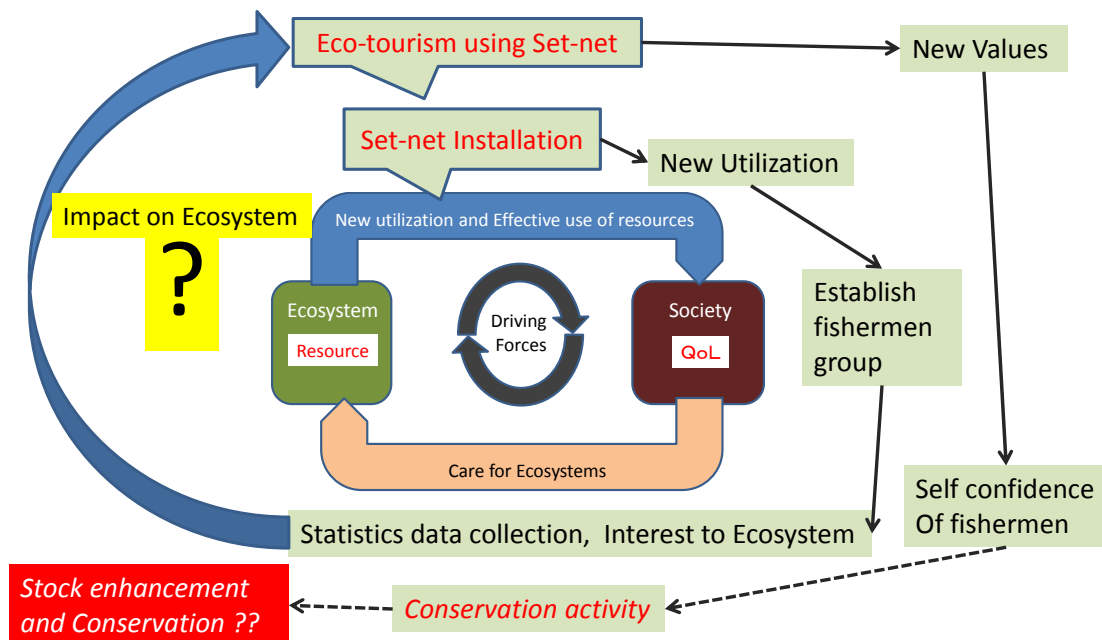


Fig. 2 AC cycle of Hamana Lake



Ecosystem Friendly activity give high value of fish and pride of fishermen. These self-confidence will act as driving force of AC cycle.

Fig. 3 AC cycle of Set-net Fishery