



Focusing on coral reef island systems located in the Ryukyu Arc as well as in the tropical and subtropical western Pacific, we are elucidating the connections between land and sea through the water cycle, the biocultural diversity and community capability, and the evolution and structure of organizations and institutions that govern the use and management of multiple resources.

By integrating and visualizing the above interconnected components, we aim to shed light on adaptive governance of multiple resources based on the water cycle.



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Please check our website for more details!
LINKAGE Project website:
www.chikyu.ac.jp/rihn_e/activities/project/detail/8/



Research Institute for Humanity and Nature (RIHN)

Adaptive Governance of Multiple Resources based on Land-Sea Linkages of the Water Cycle: Application to Coral Reef Island Systems

(LINKAGE Project)

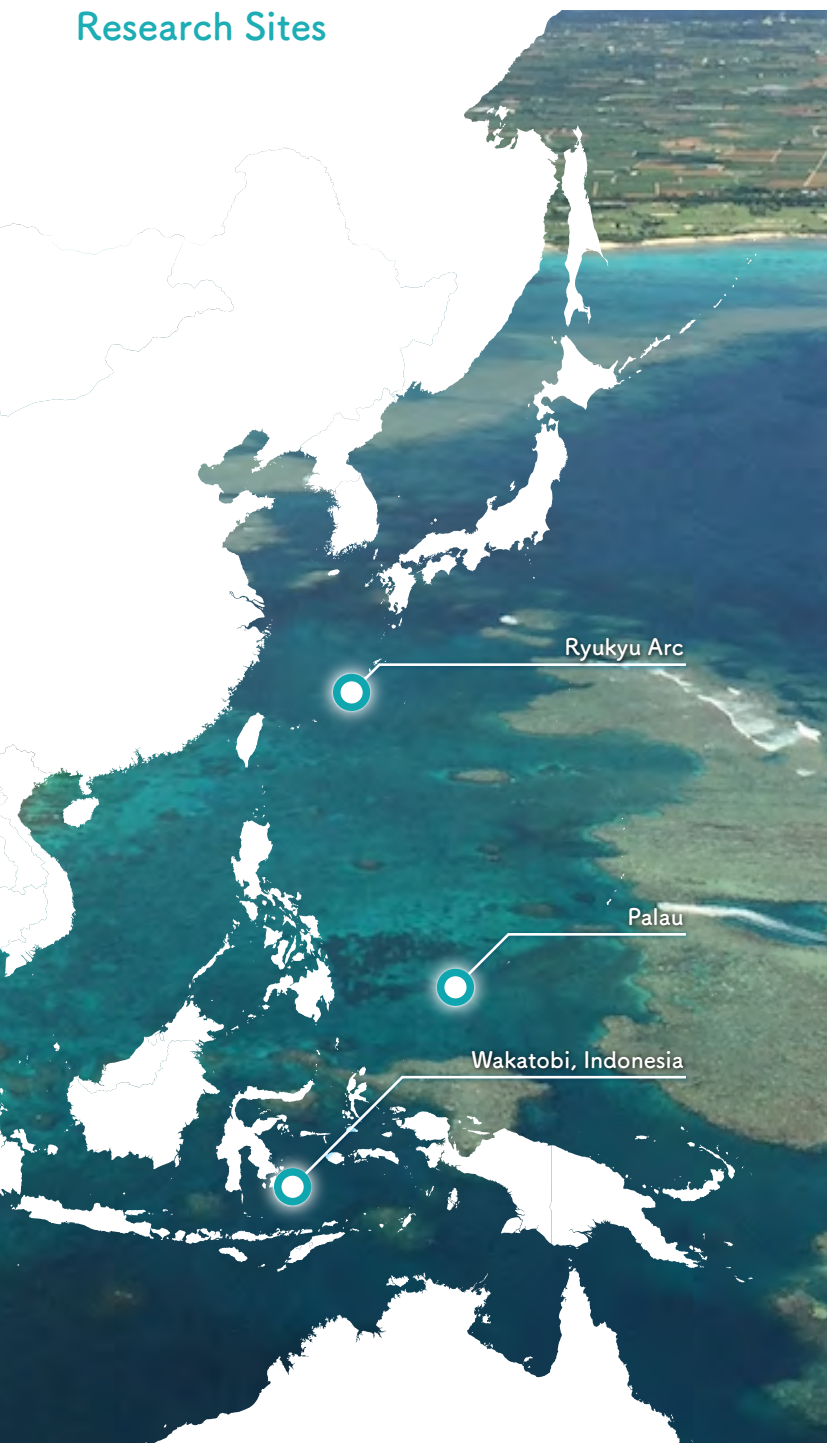


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Research Sites

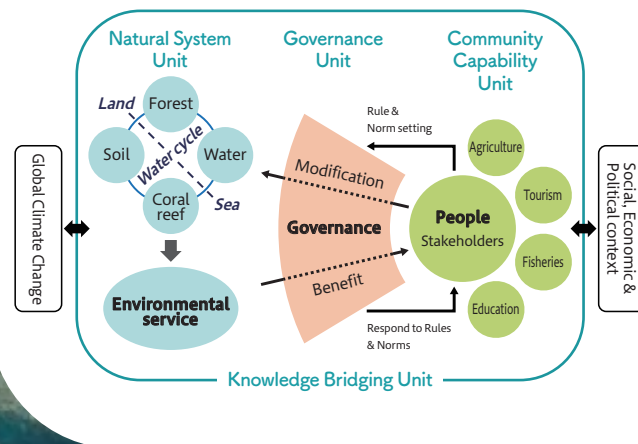


Why we conduct this research?

Islands with rich coral reefs are widely distributed in the tropics and subtropics. Water is very precious on coral reef islands, and inhabitants have used limited water resources (such as groundwater and spring water) carefully and creatively since ancient times. While water is essential for daily life, it also circulates while changing form and functions to connect the land and the sea. On islands, the scale of the water cycle connecting the land and sea is small, and the coral reef ecosystem that nurtures marine resources is closely connected to the land through this water cycle. Such coral reef island systems have nurtured a diversity of organisms and cultures unique to the region.

In recent years, however, land use and socioeconomic changes have led to the depletion of water resources and deterioration of water quality on the islands, resulting in the deterioration of coral reef ecosystems via the water cycle. Changes in precipitation patterns, sea levels, ocean acidification, and sea temperatures due to climate change have further contributed to this deterioration of conditions.

For inhabitants of coral reef islands to sustainably use the limited natural resources, including highly vulnerable water resources, fishery resources, and forest resources, it is necessary to strengthen adaptive governance and the response to both climate change and socio-economic changes.



Research Organization and Planning

We would like to implement the followings to study how people can sustainably use islands' limited multi-resources such as water resources, fisheries resources, and forest resources in the tropical and subtropical western Pacific, Ryukyu Arc, Indonesia and Palau.

- 1) We will first clarify the actual state of the water cycle and multiple resources by analyzing groundwater and coral reef ecosystems, and understand and predict the responses of multiple resources to socio-economic changes and climate change.

► Natural System Unit

- 2) Through the approach of historical ecology, we will focus on the diverse values and linkages between humanity and nature living in coral reef Islands, and clarify the mechanisms of Island Community Capability with the limited natural resources.

► Community Capability Unit

- 3) Through behavioral science and institutional analysis, we will clarify the transition and multilayered nature of the system, organization, and awareness of adaptive governance.

► Governance Unit

- 4) We will act as a bridge to create new value by visualizing and integrating the relationships between scientific knowledge, indigenous knowledge, policy knowledge, and other knowledge necessary for adaptive governance.

► Knowledge Bridging Unit

Through these results, we hope to shed light on the connections between land and sea through water cycle as well as on the adaptive governance of multiple resources, in order to contribute to the realization of a resilient nature-symbiotic society in coral reef island systems.

