# Analyzing the Relationships between Disturbance, Landscape-level Change, Land-formation Mechanisms and Biota in Complex Socioecological Systems

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Socioecological systems are often described as ‘complex’ and ‘dynamic’ systems, but prevalent analytical frameworks have so far mainly explored biological and human parameters of the environment. The classical definition of ecosystem ecology by Odum (1953) mentions abiotic components of the environment as key to ecological dynamics, and more recent socioecological research focusing on periodic release and conservation of energy in ecosystems (Gunderson and Holling 2012) implies that landscape formation and change play vital roles in socioecological systems. However change in land-formation and landscaping processes over time and their interaction with the biotic components remain under-researched and generally poorly understood. This paper shows how such lack of understanding may be detrimental to the resilience of the landscape through a case study of the Shirakami Mountains World Heritage Property in Japan. The mountains provide one of the last natural forests of the Siebold’s Beech (*Fagus crenata*) in Asia, and are protected for their biological diversity. These forests have also provided vital ecosystem services to local communities through ages. The landscape dynamics though, have not been adequately addressed in the existing protection and management frameworks. As global climate change and anthropogenic impact on land-formation processes escalate to a new level, governance of such biologically diverse and change-prone systems require understanding based on questions such as: ‘what causes change in complex socioecological systems on what scales, and how it is related to the resilience of these systems?’ Key findings are: Disturbance is a fundamental component in landscapes and over time generates landscape heterogeneity, but at the same time, scale is critical. If disturbance ceases to be ‘local’ and transcends boundaries, fragmentation of socioecological systems occurs. Landscaping mechanisms are directly linked with land-formations processes that evolved over geologic time scale and these mechanisms ought to be taken into account for socioecological system governance.

Keywords: Landscape and landform level change, Resilience of complex systems , Shirakami Mountains

 

# The role of experts and their knowledge in managing world natural heritage: The case of Shiretoko in Japan

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The role and contribution of experts in fields ranging from ecology to economics have been recognized for natural area management in national parks and world heritage sites because the management process requires a specific set of technical knowledge. This research explores the case of the Shiretoko world heritage site. The management of the area has been executed with the help of a scientific advisory committee. Knowledge sharing and diversity are confirmed as key contributors to successful science-based management. Intentional diversification and open platforms for better management are also discussed.

Keywords: expert, knowledge, Shiretoko

 

# The relationship between honeybees and nature in the Japanese context

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Nectar is generally not seen as a principal resource. It is only with the involvement of honeybees that nectar becomes honey, which is a food resource. The plants that are used for honey cultivation are generally of 2 types: agricultural plants and natural plants. Each of these plant types has its own ecosystem, growth environment and social and cultural connections. In this presentation, I will discuss about the environmental factors behind each of these plant types, and their relationship with honey growers, as a system of natural resource management.

Keywords: Natural resource management, environmental factors, honeybees

 

# Declining bio-cultural diversity in the seas: The case of Satoumi -Socio-Ecological Production Seascapes of Japan.

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This paper explores the connection between declining bio-cultural diversity in the socio-ecological production seascapes in Kunisaki peninsula in Japan. Kunisaki peninsula is characterized by a complex mixture of different landscapes with rice agriculture involving the traditional 'tameike' irrigation system forming its backbone. Due to the peninsula's proximity to the Seto Inland Sea, the area can be studied as a coupled system. For centuries, the seas around the peninsula were rich with fish and other marine creatures that sustained local population. Kunisaki Peninsula was a vibrant bio-cultural landscape or 'Satoyma', managed by traditional forestry and farming methods. The people of the peninsula had a close relationship with agriculture, forestry and fisheries. However, in recent past this area also underwent land use change, which included the collapse of lower parts of the food web in coastal areas. This change is poorly understood and thus the main objective of the paper is to look at Satoyama-Satoumi as a coupled system and to provide an analysis of 'Satoumi' through the use of historical profile, and ecosystem service analysis of the area. The paper will also describe the background and methods for understanding changes in this system in order to help future rehabilitation and sustainable (ecosystem based) approaches for developments in the area.

Keywords: Satoyama-Satoumi ecosystems,, social-ecological systems, , coastal fisheries, , Japan.

 

# Conservation of geological sites based on the Law for the Protection of Cultural Properties

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The national government designates animals, plants and geological features and minerals that possess a high scientific value for this country as “natural monument”. Under the terms of the Law for the Protection of Cultural Properties, any alternation of the existing state of a natural monument, or any activities that will affect its preservation require authorization from the Commissioner for Cultural Affairs. The national government is required to indemnify owners and others for any loss to property rights which exceeds a specified limit that result from such restrictions. As a rule, however, it seeks to compensate owners by providing subsides from the national treasury for the purchase of such sites by the local government. To ensure that natural monuments are widely used, the national government also provides subsidies for their monitoring investigation, upkeep, and repair.
In this presentation, we will introduce the concept of the recent designation, the authorized status alternation of the existing state, and the municipality of conservation projects.

Keywords: Natural Monument, Law for the Protection of Cultural Properties

 

# Cemeteries construction and National Trust in the Sayama Hills

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The Sayama Hills area has been the stage for a National Trust activity by the Totoro Furusato Fund since the 1990s. The Sayama Hills area is an interesting example of rich natural landscapes at the outskirts of an urban area and this has attracted a lot of local support for the National trust. However plots are owned by individual owners, and this has led to issues like dumping of industrial waste. The area is under pressure from development and is undergoing fragmentation. One of the recent issues is the development of a cemetery. This is taking place in a valley where construction materials were dumped in the past due to the needs of an urban population. The cases of industrial waste dumping and cemetery development show landscapes are disturbed due to plans that have no immediate use, and such developments only damage natural landscapes that have good potential for natural diversity.

Keywords: conservation movement, value of nature, NIMBY

 