Japan Geoscience Union Meeting 2015
(May 24th - 28th at Makuhari, Chiba, Japan)

MIS01-01 Room:101B Time:May 25 09:00-09:30

How can we conserve geology?: a classification of geoconservation methods

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Geoconservation is carried out by a variety of methods, but these have never been systematically classified or compiled into an organised system. This presentation will seek to do this by proposing a classification involving site management, curation, licencing, supervision, benevolent ownership, restoration, legislation, policy and education. Examples and applications of the methods will be presented.

Keywords: Geconservation, Legislation, Policy, Planning, Education, Site management

Japan Geoscience Union Meeting 2015
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MIS01-02 Room:101B Time:May 25 09:30-09:50

Geoconservation in Japan

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A term, geodiversity, was first introduced in Japan in 2004, and then some scientists have gathered to discuss geodiversity including geoconservation since 2011. Meanwhile, the first academic paper on geoparks was published in 2005, and a notion of geoparks was widespread then. Discussion among the community of geoparks in Japan seems to be somehow weak, mainly because the community has a variety of tasks to commit. A special issue on geodiversity in an English journal published in Tokyo in 2005 carries s few papers dealing with geoconservation, and another special issue on geodiversity of Hokkaido, northern Japan published in Sapporo in 2009 contains a few papers on geoconservation issues in Hokkaido. Besides these efforts, actual in-depth research on geoconservation is likely to be minimal in Japan so far. Balancing research on geoconservation and research on geoparks would be one of the issues found in Japan. Japanese academic arena should pay more attentions to emphasize the necessity in lectures at a university level. At the same time, a responsible ministry (most probably, the Ministry of the Environment) should be convinced of the merits of developing a notion of geodiversity conservation in Japan, as they have been addressing biodiversity conservation as a national strategy.

Keywords: geodiversity, geoconservation, geopark

Japan Geoscience Union Meeting 2015
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MIS01-03 Room:101B Time:May 25 09:50-10:10

Geoconservation's Dilemma: How to Value Diversity Itself for Conservation Benefits

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This paper critically analyzes two fundamental questions: why is geoconservation important and how to ground this concept in practice. Geoconservation differs from other conservation frameworks because it focuses on the diversity of the abiotic environment. Most conservation discourses focus on the biotic environment and on specific flagship species. Geoconservation in this sense is more holistic as a conservation framework, it holds that the abiotic diversity in itself is important for the well-being of the planet. However this concept is weakly integrated in praxis. Furthermore as the case studies reveal; geoconservation in practice tends to focus disproportionately on specific landforms (volcanic or natural hazard related) that are considered uniquely valuable, and less commonly values diversity itself. This is a natural result of stakeholder dynamics and institutionalism in nature governance, but it also poses a fundamental problem for geoconservation. This paper discusses case studies of the Izu Peninsula, Minami Alps, Hakusan Reserve, and Kamikochi National Park, and argues through these case studies how an alternative framework of diversity evaluation can provide better conservation benefits.

Keywords: Geoconservation, holistic conservation, diversity, case study

Japan Geoscience Union Meeting 2015
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MIS01-04 Room:101B Time:May 25 10:10-10:25

Conservation of geoheritage in tectonically active and intensely denuded region

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The Japanese islands is one of the most tectonically active and intensely denuded regions on the planet, and therefore is a region with a very high natural hazard frequency. Many of the land features and soil strata are proofs of disturbances in the natural environment due to the tectonic and denudation related mechanisms. Naturally these land features are related to natural hazards that either occurred in the past or are likely to occur in the future. Engineering solutions that seek to prevent natural disasters are a natural response of the society, but many of such disaster prevention schemes cause significant damage to the land formation or landscape change mechanisms that are fundamental to the geological heritage of geologically active regions. Geoconservation in such tectonically active and aggressively denuded areas therefore needs to have a different approach from geoconservation in tectonically stable continental locations.

Keywords: geoconservation, natural hazard, landform, mass movement, sustainable development, soil and water conservation

Japan Geoscience Union Meeting 2015
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MIS01-05 Room:101B Time:May 25 10:25-10:45

Japanese Geopark activity: its history and role in sustainable development of local community.

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Promotion of geopark concept by Japanese scientists began in 2004. Through the symposiums and workshops held by them, strong movement to establish geopaks in Japan gradually activated from 2007 by local people in several areas where they had been making an effort to conserve and promote geological heritages for years. Responding the movement of these people, Japan Geopark Committee (JGC) was established in 2008 to evaluate aspiring geoparks in Japan.

JGC decided first three candidate areas to apply for Global Geoparks Network (GGN) from Japan in October 2008 and endorsed first seven national (domestic) geoparks including above mentioned three candidates for GGN in December 2008. The JGC played an crucial role to expand the concept of geopark that includes the idea of geoconservation and to launch geopark projects in Japan. It was top-down movement from the academic side. On the other hand the bottom-up network activity of the Japanese Geoparks Network (JGN), which was established in February 2009 by the seven first national geoparks in Japan, have been becoming active recent few years. Now evaluation of geoparks are conducted both JGC and JGN members. JGC and member geoparks of JGN have been playing an important role in conserving geodiversity, promoting geoheritages, dissemination of knowledge for disaster prevention, and also sustainable economic development through geotourism. Both top-down academic movement and bottom-up local movement now work together to establish sustainable local society.

Keywords: Geoconservation, sustainable development, Geopark, local community

Japan Geoscience Union Meeting 2015
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MIS01-06 Room:101B Time:May 25 11:00-11:20

Geoconservation and Sustainable Development in Langkawi: Opportunities and Obstacles for Geopark Rangers

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This paper analyses the opportunities and obstacles for Geopark Rangers at Langkawi, Malaysia. Since the Langkawi archipelago became a duty-free destination in 1987, the number of annual visitors has increased rapidly and now numbers over three million. The certification of Langkawi as the first Global Geopark in Southeast Asia in 2006 was thus part of a broader strategy implemented by the Langkawi Development Authority (LADA) to reposition the island's rapid development along a more sustainable trajectory. A new geopark ranger system was introduced to encourage sustainable tourism via three service missions: enforcement of regulations, conservation and maintenance. This research examines the role of the rangers, investigating the set-up, current state and challenges faced by the ranger system. A mixed method approach combined primary data from interviews with the rangers' monthly report and log books (January to July 2013) at three geoforest areas that represent the geopark core zones. Findings detail the set-up process of the ranger system, from design in 2011 under the Tourism Blueprint through to implementation in 2012. Currently there are twelve rangers within the LADA Geopark Division, but the age range (19-27) reveals most to be high school graduates with little specialist knowledge of nature parks or visitor management. Analysis of primary data shows damage reports and maintenance issues to be most frequent, with little evidence of conservation and emergency reports. Challenges were identified as job conditions and organizational capacity of ranger personnel along with inter-organizational collaboration. The Langkawi case provides insight into the new ranger system as a means of regulating visitor flows within geopark core zones toward sustainable development.

Keywords: Geoconservation, Sustainable Development, Langkawi Global Geopark, Geopark Ranger, Regulation, Visitor Management

Japan Geoscience Union Meeting 2015
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MIS01-07 Room:101B Time:May 25 11:20-11:35

Conservation and Interpretation of Natural Forests from Global Geopark Program

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Muroto Geopark became a Global Geoparks Network Member in 2011. This recognition actually paved the way to explore different aspects of nature through media coverage. Not only limited to geology these include natural aspects that were not adequately focused upon earlier. A notable case is the natural colony of giant Japanese Cedar (Cryptomeria japonica) trees located in Dannotaniyama . This colony was protected as a part of a national forest area but increased media coverage coupled with strong citizen advocacy led to the designation of 'protected forest' in October 2012 (by MAFF and Muroto City). In 2014, local residents formed a guiding group called DANSUGIKAI. This group is conducting various activities like educating people about the geological origin of Muroto cape, conservation of the mountains and of course, preservation of this natural forest. All of this actually became possible after Muroto became recognized as a geopark, so geopark activities became directly related to conservation in this case. Especially the 'Global' geopark recognition acted as a stimulant in local residents, who successfully sought expression in different types of nature related activities, such as this example of forest conservation.

Japan Geoscience Union Meeting 2015
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MIS01-P01 Room:Convention Hall Time:May 25 18:15-19:30

Destruction of geomorphological environment caused by large-scale development in Japan islands.

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[1]Pro Natura Foundation Japan

Japan has a large population in its limited area. Therefore, there are many destruction of nature. Especially, geomorphological environments such as mountain, river and shore area are not appreciated in Japanese society. I analysing the development progressing at present in Japan by angle of geomorphology and sustainable development.

Keywords: Linear Chuo Shinkansen, coral reef, landfill, dam construction, mining development

Japan Geoscience Union Meeting 2015
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MIS01-P02 Room:Convention Hall Time:May 25 18:15-19:30

Issues among conservation on local level -Through the case of Hakusan-

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Conservation of local natural environment including geological or geographical features is essential to sustainable local development using local resources. In Japan, international programs such as biosphere reserves (for ecosystem conservation) or geoparks (for geoconservation) are carried out in the local (municipalities') level. It seems that promotion for conservation at local level is prepared, but in actual fact the efforts has not always succeeded. In this presentation, an attempt will be made to arrange the issues among conservation on local levels through the case of Hakusan from two points: the social situation and natural environment in Japan.

1. Social situation

Biosphere reserves focuses on the three functions; conservation, development, and logistic support, while geoparks focuses on conservation, education, and sustainable local development through geotourism. Conservation is a common element among these two.

But in Japan, even biosphere reserves or geoparks don't carry out so much conservation activities. In contrast with education or development activities, conservation activity tends to be passive which restricts someone to do something. To restrict someone, you need a legal framework. In Japan, most of the legal frameworks related to conservation are under the control of national or prefectural governments.

For example, there are some natural parks in Hakusan such as Hakusan National Park or Hakusan Ichirino Prefectural Natural Park. Moreover, there are some protected forests such as Hakusan Forest Ecosystem Reserve in the national forests. But these are managed by the national or prefectural governments, so municipalities' governments could not set up or manage them on their own.

In addition, some of the locals are not sure what to do as conservation activities. In many cases, conservation activity tends to be thought as an activity to spread the idea of conservation. But in these cases, it is hard to distinguish conservation activities from educational or public awareness activities.

2. Natural environment

Japan locates on a mobile belt, where four plates bump each other, volcanoes are active, and earthquakes occur frequently. Moreover, there is high risk of land disasters or snowslides because of the high precipitation, especially heavy snowfall on the Japan Sea side. For example, in Hakusan, a settlement was buried under the ground due to the land disaster which occurred in 1934.

Concerning on conservation at such a changing earth, a doubt comes up: what should be preserved? In Hakusan, because of the volcano and snowfall, sediment discharge is constantly occurring. Considering the huge land disasters occurred in the past, the construction of erosion control dams (*sabo*) has been carried out to protect the residents' lives. This construction should be against the concept of conservation, since human is stopping the sediment discharge. On the other hand, concerning on the safety of residents' lives, it is difficult to deny sabo. Besides, it may be said that *sabo* is keeping the stability of the earth in the point of erosion control.

There is a dilemma in ecosystem conservation too. In Hakusan, lowland plants are invading the alpine zone by their seeds carried by the climbers' shoes. They breed and encroach on the niche of alpine plants. In Hakusan, removal of these lowland plants is carried out currently. This removal is in accordance with the concept of conservation from the position of alpine plants. But from the position of lowland plants, it could be said that a newly acquired niche was taken away by human, resulting some residents to be negative with this removal.

Keywords: conservation, Japan, local, management, natural parks, sabo

Japan Geoscience Union Meeting 2015
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What are the Drivers of Environmental Degradation? A River Basin Scale Investigation at Takatsu River Basin Shimane

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This poster presentation discusses a peculiar and challenging case of degradation of the natural environment in a river basin that is generally considered to have excellent ecological paramters. The 81 Km long Takatsu River in Shimane is a rare large river without a dam. It had topped the water quality surveys in the past. However, in recent years the river has shown clear trends of degradation, decline of fish species, lack of flow volume, and rise in turbidity in the pools. Our survey found that despite the general perception of a healthy and clean river, Takatsu River is subjected to a number of stress factors, which are distributed very diffusely on the spatial scale. These are, qualitative change in the upland forest cover, increase in pollution in tributaries, presence of numerous check weirs that inhibit nutrient and material flow to the rivermouth and disturbance of the pool riffle sequence due to the combined effect of all the above factors, as well as changes of land use pattern around the stream. A local NPO Andante 21 is conducting surveys on a key species, the Hamaguri clam, that almost disappeared from the rivermouth. Currently citizen efforts are somewhat successful in prohibiting catch of clams, and the population has rebounded to a degree. As this key species shows, poorly understood mechanisms of nutrient flow from upstream to downstream can have swift effects on key species, thereby reducing the ecosystem diversity. The research suggests that it is imperative to understand the manifold ways of landscape connectivity, and how species depend on these connections, in order to address problems like degradations in a large spatial scale such as a river basin.

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Use art to raise awareness of landslide hazard

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The role of art as means of conveying complex scientific concepts has largely been neglected probably due to that scientists do not have art skills and also few artists are knowledgeable in science. By working together, researcher and artist are trying to bridge the gap between both sides and are in an attempt to raise general public awareness of landslide hazard. We conducted field geological and geomorphological investigation to study basic causes of the 2009 Typhoon Morakot induced the most catastrophic landslide at the Shiaolin Village, southern Taiwan and by which to enhance communication and understanding. We used traditional Chinese painting with selected important graphical elements such as rainstorm, dip slope, precursory topography, and dissected paleosurface to convey the idea that landslide hazards and risks are exposed in our community but people can reduce the risk by avoiding hazardous areas. We also plan to accumulate more landslide cases and include modern art as another form of graphic element of visual performance as a prospective study in the future.

Keywords: landslide, art, Chinese painting, graphical element

Japan Geoscience Union Meeting 2015
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Geoeducation on Conservation in a case of San'in Kaigan Geopark

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There are one national park, two quasi national parks, the downstream area of the Maruyama River and nearby paddies registered as wetlands under the Ramsar Convention, cultural properties designated by the Act on the Protection of Cultural Properties and wild fauna and flora prohibited under the Law for the Conservation of Endangered Spiecies of Wild Fauna and Flora in the territory of the Sanin Kaigan Global Geopark. The Ordinance to Protect and Nurture the Tottori Sand Dunes, the Greatest Sand Dunes in Japan is one of unique regulations in Japan. Geosite inspections and surveys are carried out by municipal governments and those who are staff members of the Preservation and Conservation Group and the Academic Group. In addition to weeding the Tottori sand dunes, the Tottori Sand dunes Reclamation Conference monitors sand dune drift and compiles reports on survey result. Geoeducation plays the important role to conserve geoheritage. For a long time, the importance of geodeucation has been ignored here. After becoming a member of GGN, however, people provide various geoeducational programmes for the improvement of awareness. Therefore, the aim of this presentation is to report on geoeducation for conservation of environment in a case of Sanin Kaigan Global Geopark.

Keywords: San'in Kaigan Geopark, geoeducation, conservation