



Tohoku Green Renaissance Projects and Ecosystem-Based Disaster Risk Reduction (Eco-DRR)

東北グリーン復興と生態系を基盤とした防災・減災 (Eco-DRR)

The Tohoku Green Renaissance Project, Ecosystem Adaptability Center, Graduate School of Life Science, Tohoku University
東北大学大学院生命科学研究所生態適応センター「海と田んぼからのグリーン復興プロジェクト」

1. Tohoku Green Renaissance Project 海と田んぼからのグリーン復興プロジェクト

The Tohoku Green Renaissance Project

The massive earthquake and tsunamis of 11th March 2011 caused catastrophic damage to our homes in the Tohoku region. Rebuilding society and the economy of this region is a priority for the whole of Japan and of pressing interest to the international community. The area devastated was a harmonious natural mixture of riparian land, forest and ocean, and historically the population of the area has optimized its ecosystem services for their livelihoods. Rapid re-development of this area, without conducting an environmental impact assessment and giving adequate thought to the biodiversity of its rivers, rice paddies and ocean, may not only fail to repair the natural damage, but compound the losses already suffered. For this reason we believe a renaissance, or rebirth, of the area is necessary via "Green Rebuilding" to enrich the ecosystems and nurture biodiversity. We affirm as citizens of the region that green rebuilding is necessary to regain and secure regional well being and to strengthen our harmonious relationship with nature.

We believe ecosystem services – connecting the ocean, forests and rice paddies with human well-being – are essential to rebuilding the Tohoku region.

Affiliated Bodies:
Tohoku University Ecosystem Adaptability Center
Tambo Rice Paddies Network JAPAN
Morian Umiko Kobo
Tohoku Chamber of Environment Sustainable Solutions

Supporters:
Institute for Global Environmental Strategies (IGES), Ramсар Network Japan, Environment Outreach Centre (EGOC), General Incorporated Foundation MAJUSE, United Nations University Institute for Sustainability and Peace (UNU-ISP), United Nations University Institute of Advanced Studies Operating Unit Sukirama/Nanase (UNU-ASOJIK), Think the Earth, CEPF JAPAN, Earth Day Everyday, Japan Science Initiative for Biodiversity (JSIB) Tohoku Subcenter, Nikkei BP Eco Management Forum Tohoku Taskforce, Earth Watch Japan, Regional Environmental Planning Inc., Geoecological Conservation Network, Ego Tsunagari (Supporters and case projects are now invited)

Contact:
Tohoku University Graduate School of Life Sciences, Ecosystem Adaptability Center
5-1-3 Aoba Aramaki-Aza-Aoba, Sendai, Japan, TEL: +81-22-795-3637 FAX: +81-22-795-3638 E-mail: ena@post.tohoku.ac.jp

Action Goals

- Intelligent land use that mitigates disaster via deployment of ecosystem services**
生態系機能を活用した災害のリスクを初らした土地利用
■ Restore coastal rice paddies: land capability will be rejuvenated by the diverse functions of wetlands. Other uses, including tidal flats or coastal wetlands, should be considered for areas that are difficult to restore (e.g. those below sea level).
■ Mitigate risk with flood plain basins (Sato Shoko).
■ Encourage financial support for intelligent land use that mitigates disaster, including offset, tax benefits (e.g. conservation easement) and insurance.
- Careful disaster prevention that does not reduce ecosystem services**
流域全体の生態系からの恵みを低下させない防災・減災の配慮
■ Recovery of ecosystem using local vegetation.
■ Land development with appropriate forest management and reduced sediment discharge, for conservation of marine ecosystems and assurance of water quality.
■ Construction that takes into account marine biological resources and animal transit routes. Mitigate tsunami or floods by smart construction that carries water flow.
- Activities compatible with ecosystem services and their natural resilience**
生態系とその回復力を活かした、持続可能な創出
■ When re-designing local industry (agriculture, fisheries, forestry, tourism and education), local culture and ecological resilience should be integrated. And local residents should share in the process. The beauty and ecology of the landscape is of importance.
■ Small natural energy sources including biomass and hydroelectric power should be used to promote self-sufficiency in energy.
■ Use of geothermal power should also be promoted. Financial investment should support both rebuilding and biodiversity via a rich food culture and local resources.

Major Actions

- Ecosystem monitoring**
■ Monitor the magnitude of the damage and the status of remaining ecosystems, including coastal areas, rivers, rice paddies, forests, and islands. The data will be used to design "green re-building." Surveys have already been conducted in many tidal flats and rice paddies. A survey of butterflies on islands has also been carried out. In addition to surveys by specialists, we have a ten-year monitoring plan that involves volunteer citizens. Stationary cameras have been placed to observe changes in rice paddies and their surrounding environments.
- Restoration of rice paddies damaged by the tsunami**
■ Removal of artificial materials
With the help of volunteers we have removed waste materials by hand from a number of rice paddies. Although field restructuring is needed after removal by heavy machinery, hand removal does not disturb the soil layers.
■ Removal of salt
We remove salt with fresh water instead of chemicals. Flooding rice paddies with fresh water reduces the saline level and makes it possible to harvest rice as quickly as possible.
- Support for industry**
■ Sales of "Fukkou-Mai" (Tohoku Saikou Bank Project)
Sales of rice from winter-flooded paddies as "Fukkou-Mai." Forty percent of the value is donated towards agricultural restitution.
■ Tohoku Green Renaissance Project Partnership
It aims to prompt regional economy to be independent, with people who live in the region preserving biodiversity and utilizing resources sustainably. The partnership hosted workshops for business matching to create new business opportunities. It also started model projects, ecotourism and product development, basing on a concept "Shoku-Ho-Gaku-Shu (protect environment and resources of the region by eating local food and walking around and learning the region)"
- Environmental education and Education for sustainable development (ESD)**
■ "Kodomo Koizumigaku"
A ESD program is conducted for students in Kesennuma, where a great tsunami attacked after the Great East Japan Earthquake. The students learn nature, geography and history of their home town through fieldwork and from specialists, and consider about rebuilding after the tsunami.

2. Green Renaissance and Eco-DRR グリーン復興プロジェクトとEco-DRR

Eco-DRR

Well-managed ecosystems act as natural infrastructure, reducing physical exposure to many hazards and increasing socio-economic resilience of people and communities by sustaining local livelihoods and providing essential natural resources such as food, water and building materials (Morawetz and Nehren, 2005¹; Sudmeier-Rieux and Ash, 2009²). 生態系には災害を緩和する機能がある

Hazard mitigation functions of ecosystems. From Ewald and Salomon, 2013

Function	How it works
Disaster prevention	<ul style="list-style-type: none"> Vegetation (especially mangroves) against erosion and increases dry stability by binding and trapping sediments. Coastal protection against tsunamis and tsunamis waves reducing the risk of inundation. Coastal forests, especially pioneer forest, reduce risk of floods by increasing retention of rainfall, and absorbing peak floodwater flows, except when such an extreme event occurs. Terrestrial wetlands are important for water recharge and purification, drought mitigation and safeguarding drinking water supply for some of the world's most vulnerable.
Disaster relief	<ul style="list-style-type: none"> Wetlands and floodplain wetlands in coastal areas, flood plain basins, and riparian areas subject to flood risk (including wetlands) provide critical services to coastal and inland areas, including the control of erosion and sedimentation. Wetlands, flood plain basins, flood and riparian wetlands, and riparian areas provide critical services to coastal and inland areas, including the control of erosion and sedimentation.
Disaster recovery	<ul style="list-style-type: none"> Coastal ecosystems function as a reservoir of natural buffer systems protecting agricultural areas, tourism, fishing and other coastal livelihoods. A well-managed coastal ecosystem can help restore fish and shellfish stocks and support coastal livelihoods. However, the highlighted areas where coastal areas protected by healthy ecosystems have suffered less from extreme weather events than those exposed communities. Coastal and riparian wetlands such as mangroves and saltwater marshes provide natural coastal protection, reduce wave height and reduce erosion from landward. Coastal wetlands buffer against salt water intrusion and adapt to global sea level rise by trapping sediment and organic matter. Coastal and riparian wetlands such as mangroves and saltwater marshes provide natural coastal protection, reduce wave height and reduce erosion from landward. Coastal and riparian wetlands such as mangroves and saltwater marshes provide natural coastal protection, reduce wave height and reduce erosion from landward.
Disaster risk reduction	<ul style="list-style-type: none"> Coastal and riparian wetlands such as mangroves and saltwater marshes provide natural coastal protection, reduce wave height and reduce erosion from landward. Coastal and riparian wetlands such as mangroves and saltwater marshes provide natural coastal protection, reduce wave height and reduce erosion from landward. Coastal and riparian wetlands such as mangroves and saltwater marshes provide natural coastal protection, reduce wave height and reduce erosion from landward.

1. Rain forest management and ecotourism. – St. H. Ganga, F. Kruze & M. K. K. Sustainability in Rural and Urban Environments, S. 53-74, Wageningen, 2006.
2. Disaster Risk Reduction: Ecosystems for Resilient Communities. Second Edition. Global Sustainable Solutions, 2011, 34 pp. ISBN: 978-2-8137-1344-7.
3. Ecosystem-based Disaster Risk Reduction (Eco-DRR) An Overview, by Renaud, C., Sudmeier-Rieux, K. and M. Echeverri (eds). The role of ecosystem management in disaster risk reduction. Tokyo: UNU Press.

Sendai Eco-DRR Declaration following the Great East Japan Earthquake

The Great East Japan Earthquake caused huge damage to the coastal area of northeastern Japan, where the lives, culture and industry of the local people have long been dependent on biodiversity and coastal ecosystems. We believe efforts to recover from this disaster should be done with conservation of both biodiversity and ecosystem services. The building of large sea walls as protective measures is often counter to the environment and the area's natural beauty.

Recently, Ecosystem-based Disaster Risk Reduction (Eco-DRR) and Ecosystem-based Adaptation for Climatic Change (EBA) have drawn attention worldwide. The aim is to use nature's own ecosystem defenses to protect against future disasters. Eco DRR and EBA are in general more cost effective and resilient when compared to man-made defenses. They also ensure rich biodiversity and ecosystem services supportive of human life.

In our discussions we reviewed the ecological impact of the Great East Japan Earthquake and the recovery of both natural resources and human society. And we recognize the effectiveness of Eco-DRR to the recovery of both. We urge all stakeholders with an interest in reducing damage caused by natural disasters to consider Eco-DRR as a secure means of protecting both the beauty of the local environment and its natural ability to protect against future disasters.

March 15, 2015
The 3rd UN World Conference on Disaster Risk Reduction Public Forum
"Use of Coastal Ecosystems for Disaster Risk Reduction: Mainstreaming and Promoting" Participants

Proposal of Rebuilding Options

生態系や生物多様性から考える復興オプション

- Options other than uniformed constructions
ハードに頼った画一的な防災に限らない選択が必要
- Land use according to disaster risk
災害リスクに応じた土地利用
- Make tidal flats or sea grass beds to enhance marine production in ground subsidence area
地盤沈下した場所を無難にもとに戻さずに、干潟や藻場を拡大し、水産資源の涵養能力を高める
- Agriculture that is resilient against disaster and harmonizing with nature
伝統的水管理など、災害に強く、自然と共生する農業
- Restore small catchments to improve production of aquatic products and to make seeds of ecotourism
小流域を自然性の高い流域に自然再生させ、養殖水産物の生産を上げるとともに、エコツーリズムのシードを作る

