How shall we rebuild them?

• Devastated societies are heavily dependent on ecosystem services.
• Without restoration of ecosystems, rebuilding of society and livelihoods will not proceed.
• Caring for ecosystems is the key to sustainable rebuilding.
• Rebuilding by caring for the surrounding ecosystem will lead to restoration of ecosystems and development of a sustainable society.
The Tohoku Green Renaissance Project

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

The massive earthquake and tsunami 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.

22nd May 2011
(World Biodiversity Day)

We appeal that ecosystem services, through the connectivity between ocean, forest, rice paddies and human well-being, are essential for rebuilding.
The Tohoku Green Renaissance Projects

Affiliated Bodies

- Tohoku University, Ecosystem Adaptability GCOE
- Tambo (Rice Paddies Network Japan)
- Moriwa-Umino-Koibito
- Tohoku Chamber of Environment
- Sustainable Solutions

Supporters

- Institute for Global Environmental Strategies (IGES)
- Ramsar Network Japan
- Environment Outreach Centre (GEOC)
- MUDEF
- United Nations University Institute for Sustainability and Peace (UNU-ISP)
- United Nations University Institute of Advanced Studies Operating Unit Ishikawa/Kanazawa (UNU-IAS/OUIK)
- Think the Earth
- CEPA JAPAN
- Earth Day Everyday

- Japan Business Initiative for Biodiversity (JBIB) Tohoku Taskforce
- Nikkei BP Eco Management Forum Tohoku Taskforce
- EarthWatch Institute Japan
- Regional Environmental Planning Inc.
- Geoecological Conservation Network
- Eagao-Tsunagete
- United Nations University Institute of Advanced Studies Secretariat for the International Partnership for Satoyama Initiative (UNU-IAS/IPSI)
Goals of the Green Renaissance

1. Land use that mitigates disaster risk through ecosystem services
   - Restore coastal rice paddies. Land capability will be rejuvenated by the functions of wetlands. Other usage, including as a tidal flat or coastal wetland, would be considered for areas that are difficult to be restored (e.g., areas below sea level).
   - Mitigate disaster risk with floodplain, retarding basin, or coastal belt zone for wetland (‘Sato’-wetland).
   - Financial support mechanism for land use that mitigates disaster, including offset, tax benefit (e.g., conservation easement), and insurance.

2. Careful disaster prevention that does not reduce ecosystem services
   - Recovery of ecosystem with local vegetation.
   - Land development with appropriate forest management and reduced sediment discharge, for conservation of marine ecosystems and securement of water quality.
   - Construction with care for marine biological resources and passages of animals. Mitigates tsunami or flood by smart construction including move ability of constructions and buildings that parry water flow.

3. Sustainable activities with ecosystem services and their resilience
   - When designing local industrial plans (agriculture, fishery, forestry, tourism, education), local culture and ecological resilience will be integrated into activities and shared with residents for consensus formation.
   - The values of beauty of ecological landscapes and local cultures.
   - Small-scale natural energy including biomass and small-scale hydroelectric power would be used to achieve energy self-sufficiency. Use of geothermal power will also be promoted.
   - Financial support mechanisms will be developed. This includes long-term pre-order or investment supporting both rebuilding and biodiversity via rich food cultures and local resources in Tohoku.
## Ecosystem Monitoring at Kesennuma, Miyagi

### Table 2: Species Found in Wetland at Kesennuma

<table>
<thead>
<tr>
<th>Insect Order</th>
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<th>Apr 26</th>
<th>May 16</th>
<th>Jun 21</th>
<th>Jun 29</th>
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<td>Sigara. substriata</td>
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<td>Oulema oryzae</td>
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<td>Lissorhoptrus oryzophilus</td>
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<td>Berosus punctipennis</td>
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<td>Aquarium paludum</td>
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<td>Gerris latiabdominis</td>
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<td>Ranatra chinensis</td>
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<td>Appasus japonicus</td>
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<td>Sympecma paedisca</td>
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<td>Ephemeroptera sp.</td>
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<td>Ephyridae sp.</td>
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<td>Sarcophagidae sp.</td>
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<td>Tipula (Yamatotipula) aino</td>
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<tr>
<td>Chironominae sp.</td>
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</table>

**Total Number of Species Found**: 3, 8, 11, 15
Ecosystem Monitoring in Sabusawa Island

**Motoyashikihama, Sabusawa Island**

- Gammaridea sp.
- Ephydridae sp.
- Rhantus suturalis
- Lycosidae sp.
- Cipangopaludina chinensis
- Ceratopogonidae sp.
- Micronecta sp.
- Enochrus subsignatus
- Physa acuta
- Podocopa sp.
- Ischnura sp.
- Syrphidae sp.
- Coenagrionidae sp.
- Sphaeridae sp.
- Cladocera sp.
- Tipulidae sp.
- Culicidae sp.
- Brachycera sp.
- Cloeon sp.
- Procambarus clarkii
- Sphaeromatidae sp.
- Physidae sp.
- Chironominae sp.
- Mesovelia sp.
- Nephila clavata
- Larinioides cornutus
- Araneus sp.
- Cladopelma sp.
- Mugil cephalus (mullet)
- Stratiomys sp.
- Tetragnathidae sp.
- Argiope bruennichii
- Enchopoda japonica
- Helice tridens
- Brachycera sp.
- Cloeon sp.
- Procambarus clarkii
- Sphaeridae sp.
- Chironominae sp.
- Mesovelia sp.
- Nephila clavata
- Larinioides cornutus
- Araneus sp.
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- Brachycera sp.
- Cloeon sp.
- Procambarus clarkii
- Sphaeridae sp.
- Chironominae sp.
Over 1 trillion bacteria are found in 1 gram of soil.

Microbial diversity is indirectly evaluated by scoring how many of 95 organic substances are decomposed.

Analysis with 15 min intervals for 48 hrs makes it possible to estimate the soil’s vitality value.
Biologically poor soil (Replant failure)

Biologically rich soil
Microbial Diversity of the Soil from the Damaged Rice Paddies

http://www.drc.co.jp/biodiversity.htm

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調査地点の土壌の様子

- a層：津波によって運ばれた土壌
- b層：作土層
- c層：作土層

No2-1, No2-2, No2-3, No2-4, No2-5, No2-6
Economic Support

“Renaissance Rice” (Fukkoh Mai)

Green-Tourism
Summary

• Winter-flooded rice paddy, which nurtures biodiversity, was indeed effective for rebuilding from the disaster.

• Many volunteers are eager to participate.

• Citizen-involved ecosystem monitoring seems to be effective in...
  ➢ Assessing the influence of the disaster and dynamics of ecosystems since then.
  ➢ Promoting environmental literacy.

• Rebuilding with full respect for independence of local communities

• Need to involve other stakeholders and be more involved in developing rebuilding designs