

EAS Congress 2009

EAS Congress 2009

SATO-UMI WORKSHOP

*Indigenous Approaches to Habitat Protection and Restoration:
Experiences in Sato-umi and Other Community Initiatives*

Workshop Report



EAS Congress 2009
International Conference
 Habitat Protection, Restoration and Management (T3)

T3:2
SATO-UMI
WORKSHOP

Indigenous Approaches to Habitat Protection and Restoration:
 Experiences in Sato-umi and Other Community Initiatives

24 November, 2009
 Philippine International Convention Center, Manila, Philippines
 Summit Hall D

Convener:
 Partnerships in Environmental Management
 for the Seas of East Asia (PEMSEA)

Co-Convener:
 International EMECS Center, Japan

Oyster Beds (Hiroshima Pref., Japan)



Presentation in Part 1



Presentation in Part 2



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Preface

“Sato-umi” has often been recently referred in Japan. Although, a concept of “Sato-umi” is not officially defined, while the basic concept was initially proposed by Prof. Tetsuo Yanagi of Kyushu University in 1998; as “high productivity and high biodiversity in the coastal sea area with human interaction”. On the occasion of Sato-umi-spotlighted trend, then the concept of Sato-umi was described as Japan model for protecting and restoring enclosed coastal seas by the Japanese Government in the Strategy for an Environmental Nation in the 21st Century (2007) and the Basic Plan on Ocean Policy (2008). Under these policies, Ministry of Environment started a project to aid creation of Sato-umi in several local coastal areas in Japan.

International EMECS Center has been playing the role to spread the concept for the promotion of Sato-umi concept through convening international conferences such as EMECS 7 in 2006 in France and EMECS 8 in 2008 in China.

The co-hosting of this Sato-umi Workshop in The East Asian Seas Congress 2009 in Philippines with PEMSEA (Partnership in Environmental Management for the Seas of East Asia) was planned in order to encourage these activities.

The workshop was comprised of three parts from Part 1 to Part 3. In Part1, subtitled as “The Sato-umi concept and its application in Japan: lessons and application”, there were seven oral presentations from Japan. In Part 2, subtitled as “Indigenous knowledge and community based approaches in protecting, restoring and managing key habitats”, there were nine oral presentations from Thailand Indonesia, Vietnam, Malaysia, Korea and Philippines.

Part 3, subtitled as “Institutionalizing community-based efforts in habitat protection, restoration and management within an ICM framework”, was the panel discussion; Prof. Matsuda as coordinator, and Prof. Yanagi, Director McDonald and Prof. Ferrer as panelists. Panelists, presenters and participants all together exchanged their opinions actively and positively. Oral presentations and panel discussion brought fruitful results.

We wish to express our sincere gratitude to all who contributed to this workshop, especially to Professor Emeritus Osamu Matsuda of Hiroshima University, Professor Tetsuo Yanagi of Kyushu University, and Director Anne McDonald of United Nations University, Institute of Advanced Studies, Operating Unit Ishikawa/Kanazawa, who have developed this workshop as the members of its internal committee. And with special thanks to the staff of PEMSEA for managing laborious arrangement for this workshop.

Finally let us express our great appreciation to the Nippon Foundation for precious financial support for our workshop.

International EMECS Center

1. Outline

Theme

Indigenous Approaches to Habitat Protection and Restoration:
Experiences in Sato-Umi and Other Community Initiatives

Date

November 24, 2009

Venue

Philippine International Convention Center, Manila, Philippines,
Summit Hall D

Conveners

Partnerships in Environmental Management for the Seas
of East Asia (PEMSEA)



International EMECS Center, Japan



Sponsor

The Nippon Foundation



2. Background and Focus

Brief Introduction to “Sato-umi”

What is “Sato-umi”? Why much attention is paid to “Sato-umi” nowadays? Since in Japanese “Sato” means local village or community where people live their life and “Umi” means the sea, simple literal meaning of “Sato-umi” is the sea associated with village. In many seas of that kind, sustainable community-based management of the sea had long been made historically in Japan with traditional manner. However, during the phase of nation’s high economic growth after the World War II, this type of traditional coastal management was gradually deteriorated affected by changes of local community and life style of the people. During the same time, coastal environment, habitat and living resources were also seriously damaged by water pollution, eutrophication and land transformation based on urbanization and industrialization of coastal area. As a result, social demand to create and establish new type of “Sato-umi” defined as high biological productivity and high biological diversity in the coastal sea with human interaction has arisen and been strong. In other word, “Sato-umi Renaissance” is taking place to realize rich and healthy coastal sea. In Japan, community-based habitat restoration activities have been gaining ground in recent years partly because concept of “Sato-umi” was incorporated into official institutional systems of national policy.

The term and concept of “Sato-umi” is relatively new compared with “Sato-yama” in which “Yama” means forest and mountain in Japanese. “Sato-yama” is traditional land management system including local village, agricultural field and forest near by and therefore “Sato yama” is a term indicating such landscape including those components. So, although “Sato-yama” and “Sato-umi” have different historical and socioeconomic background, nowadays “Sato-yama” and “Sato-umi” is often used in pairs as a similar term indicating sustainable coastal and terrestrial management, respectively.

“Sato-umi” is originally one of the traditional Japanese practices of the coastal communities co-existing with nature at which people’s livelihood and their culture are deeply involved, productivity is sustained, biodiversity is protected and conserved while ecosystems are able to function and material cycling is maintained. These community efforts were undertaken through comprehensive and integrated management from land to coastal area. Combination of “Sato-yama” that focuses on forest and agricultural area with “Sato-umi” is expected to develop a Japanese model of integrated coastal management (ICM).

“Sato-umi” in the international society

New concept for coastal sea management called “Sato-umi” has been recently noticed

not only in its originated place of Japan but also in some international meetings held in both western and Asian countries. New concept of “Sato-umi” and some cases of its implementation had been presented in the 7th International EMECS conference held in Caen, France in 2006 and the new concept was highly evaluated in the reviewing session as “symbiosis among human communities and coastal/marine area - a more rational vision of co-existence”. As a next step, “Sato-umi Workshop” was held in the 8th International EMECS conference held in Shanghai, China in 2008 in order to deepen the concept collecting many similar cases of management and good practices from many countries. As a result of this workshop, it was made clear that there were many similar types of sustainable coastal management and community-based practices in the world. Indigenous knowledge, traditional culture and community actions have already contributed significantly in protecting and restoring several coastal, island environment and natural resources in several countries. And finally, outcome of the workshop was incorporated into the Shanghai Declaration adopted on the final day of the conference.

And then another “Sato-umi Workshop” was organized in the EAS Congress 2009 which was held in Manila in 2009 in order to discuss “Sato-umi” from the view point of indigenous knowledge in Asian countries for farther understandings of “Sato-umi” and related practices. This “Sato-umi Workshop” in the EAS Congress was cooperatively organized by both PEMSEA and International EMECS Center with financial support of Nippon Foundation. From the view point of organization system, it is noticeable that PEMSEA tied an official non-state partnership with International EMECS Center in 2008, after that official cooperation and collaboration between both organizations started in many ways. Since PEMSEA has long experience in the implementation of ICM and International EMECS Center has some experiences in “Sato-umi” related activities, cooperation by both was expected to provide a good opportunity to find new approaches towards sustainable coastal management.

Background of “Sato-umi Workshop” in the EAS Congress

It might be quite significant in the process of internationalization of “Sato-Umi” that “Sato-umi Workshop” titled “Indigenous Approaches to Habitat Protection and Restoration: Experiences in Sato-umi and other Community Initiatives” was held in EAS Congress 2009 in the theme of “Habitat Protection, Restoration and Management (Theme 3)”. Thinking about overall theme of the Congress “Partnership at Work: Local Implementation and Good Practice”, the standpoint of “Sato-umi Workshop” can be made more clear.

Communities living along coasts and small islands have acquired invaluable

indigenous knowledge on how to live in harmony with nature in Japan. With long lasted traditional knowledge, these communities are able to sustain the continuous supply of natural resources without deteriorating the habitat and ecosystem. However, unfortunately, rapid economic development and indiscriminate exploitation of primary products and unsustainable consumption over the last several decades have seriously damaged the functional integrity of ecosystem and specific habitat such as seaweed bed and tidal flat demonstrated by decreasing biodiversity and fish catch and degraded social well being of these communities. These experiences in Japan may be applicable to many countries although the time of drastic change is different. Under these circumstances, “Sato-umi Workshop” was designed as one of well-timed program of the EAS Congress 2009.

Major focuses of the workshop

Major objectives of this workshop is to deepen the understandings on indigenous approaches to habitat protection and restoration through experiences in “Sato-umi” and other related community-based initiatives in many countries. The workshop was divided into three parts. In Part 1 titled as “the Sato-umi Concept and its Application in Japan: Lessons and Application” were presented in Part 1 by 7 presenters. 7 presentations included concept, 4 case studies in Japan, supporting activities for the creation of Sato-umi in Japan by central government and Satoyama Sato-umi Sub-Global Assessment in Japan. In Part 2 titled as “Indigenous knowledge and community based approaches in protecting, restoring and managing key habitats”, 9 presentations were made from varieties of groups and countries. Part 3 was discussion and conclusive session titled as “Interactive session/wrap-up: Institutionalizing community-based efforts in habitat protection, restoration and management within an ICM framework”. This interactive session was chaired by Prof. Osamu Matsuda with 3 invited panelists of Prof. Tetsuo Yanagi, Director Anne McDonald and Prof. Elmer Ferrer including the discussion with floor participants. This session aimed to seek applicability of “Sato-umi” from the international viewpoint and to strengthen the effective implementation of “Sato-umi” and related community-based activities under the variety of natural and socioeconomic conditions.

Chair of the Workshop

Osamu MATSUDA, Ph. D

Professor Emeritus, Hiroshima University, Japan

3. Program

10:30-10:35 Opening Address by Int'l EMECS Center

Introduction by Workshop Chair

Chair: Matsuda O., *Hiroshima University (Professor Emeritus), Japan*

Co-Chair: Yanagi T., *Research Institute for Applied Mechanics, Kyushu University, Japan*

Co-Chair: McDonald A., *United Nations University, Institute of Advanced Studies, Operating Unit Ishikawa/Kanazawa, Japan*

10:35-13:00 Part 1: The Sato-umi concept and its application in Japan: lessons and application

Chair: Yanagi T., Co-Chair: Matsuda O.

10:35-10:55 Concept and practices of Sato-umi in Japan and lessons learned

Yanagi T., *Research Institute for Applied Mechanics, Kyushu University, Japan*

10:55-11:15 Concept and practices of Satoyama Sato-umi Sub-Global Assessment in Japan

McDonald A., *United Nations University, Institute of Advanced Studies, Operating Unit Ishikawa/Kanazawa, Japan*

11: 15-11:35 Case of Fushino River Estuary Initiatives in Japan

Ukita M.* , Sekine M.* , Yamamoto H. ,** *Yamaguchi University, **Yamaguchi Prefecture, Japan*

11:35-11:55 The Ago Bay Management Initiatives in Japan

Maegawa M.* , Uranaka H.,* *Mie University, Japan*

11:55-12:15 Potential of urban wetland as a target of habitat restoration and management

Furukawa K., *National Institute for Land and Infrastructure Management, Japan*

12: 15-12:35 Community-based sea grass bed restoration and management in Seto Inland Sea: Case of Akou Coast in Japan

Matsuda O., *Hiroshima University (Professor Emeritus), Japan*

12: 35-12:55 Supporting activities for the creation of Sato-umi in Japan

Muroishi Y., Yamada T., Ogawa N., *Office of Environmental Management of Enclosed Coastal Seas, Ministry of the Environment, Japan*

13:00-14:00 Lunch

14:00-16:20 Part 2: Indigenous knowledge and community based approaches in protecting, restoring and managing key habitats

Chair: McDonald A., Co-Chair: Yanagi T.

- 14:00-14:15 Implementing an ecosystem approach to coastal management through community based organizations: An example from the Andaman coast of Thailand
Soonthornnawaphat S., Silva J., IUCN, Thailand Programme, Thailand
- 14:15-14:30 Implementation of *Tri Hita Karana*, a local wisdom of Bali to maintain agricultural resources
Suprpta D. N., Director School of Postgraduate Udayana University, Indonesia
- 14:30-14:45 Developing a mechanism of mobilization of various human and material resources in planting, taking care and protecting urban green trees in Danang city
Hai T. C., Danang Department of Natural Resource and Environment, Vietnam
- 14:45-15:00 Community Involvement in Coral Reef Restoration Projects in the Gulf of Thailand
Yeemin T., Saenghaisuk C., Pongsakun S., Sutthacheep M., Marine Biodiversity Research Group, Department of Biology, Faculty of Science Ramkhamhaeng University, Thailand
- 15:00-15:15 Evaluation of Artificial Reefs in West Coast, Peninsular Malaysia
Ismail I., Noh K. M., Arshad F. M., Noh A. F. M., Institute of Agricultural and Food Policy Studies Universiti Putra Malaysia, Malaysia
- 15:15-15:30 Community-based management approach at work in the Muan Wetland Protection Area: Changing perception, changing practice and changing policy
Jang J. Y., Choi Y. R., Eco-Horizon Institute, Korea
- 15:30-15:45 When the cradle falls: A case of management failure in a community marine reserve in southern Philippines
Guzman A. B., Mindanao State University at Naawan, Philippines
- 15:45-16:00 Conceptual framework of organizing communities for effective mangrove management
Savaris J. P., Joven R., Rodney Golbeque and Edison Advincula Zoological Society of London, Philippines

16:00-16:15 Indigenous approaches to access, control and protection of coastal resources: A review of some Philippine Experiences
Ferrer E., *University of the Philippines, College of Social Work and Community Development, Philippines*

16:20-16:40 Coffee Break

16:40-18:10 Part 3: Discussion panel:

Interactive session/wrap-up: Institutionalizing community-based efforts in habitat protection, restoration and management within an ICM framework

Chair: Matsuda O.

Panelists: Yanagi T., McDonald A., Ferrer E.

Part 1: The Sato-umi concept and its application in Japan: lessons and application

4. Part 1 Summary

The title of part 1 is “The Sato-umi concept and its application in Japan: lessons and application”.

At first, T.Yanagi introduced the new concept of Sato-umi which is “the coastal sea with high bio-diversity and bio-production under the moderate human interaction”. He stressed the importance to arrange adequately the man-made habitat for marine biota in the coastal sea area in order to increase the bio-diversity on the basis of scientific knowledge and local wisdom. High bio-production (high fish catch) is the result of high bio-diversity. A question is raised from the floor; “Is there any experience of co-operation between scientists and local fishermen for the creation of Sato-umi in Japan?”. He introduced the examples of man-made tidal flats in the central part of Japan and rehabilitation of sea-grass beds in the central part of the Seto-Inland Sea based on the cooperation between scientists and local fishermen. Fish catch has increased in both areas.

A. McDonald introduced the trial of integrated environmental management from the forests to the coastal seas in the Noto Peninsula, the central northern part of Japan. She stressed the importance of the cultural background for the successful management. M. Ukita also introduced the successful experience of the integrated environmental management of the forests, rivers and estuaries in the watershed of Fushino river, the western part of Japan. He stressed the importance of the establishment of central committee for the management. M. Maegawa introduced the recovery of fishing ground in Ago Bay, the southern central part of Japan, where the self pollution by pearl oyster culture is very severe. He pointed out the importance of governmental guidance for the local management. K.Furukawa introduced an interesting trial of man-made small scale tidal flats in the urban area of Tokyo Bay. He claimed that such small scale tidal flats are very useful for the environmental education for the urban young students. O. Matsuda introduced a trial of creation of Sato-umi in the central part of the Seto Inland Sea by co-operation of some NPOs there. He stressed the importance to communicate well for many people there in order to negotiate the different stakeholders. Y. Muroishi introduced the main concept and budget system of the Ministry of Environment, Japan for the support of Sato-umi activities in Japan.

Part 1 could succeed to introduce the concept and importance of Sato-umi and some successful activities related to Sato-umi in Japan to the participants of this workshop. The main contribution of this part 1 for this workshop is to clarify the importance of the support of the environmental friendly primary industries, that is, the forest industry in the mountain, the agriculture in the field and the fisheries in the coastal sea. The

creation of the habitat for the marine biota is only possible under the good water quality and the good water quality in the coastal sea is a result of good management in forest and land by the environmental friendly forest industry and agriculture.

Chair of Part 1

Tetsuo YANAGI, Ph. D

Professor, Kyushu University, Japan

5. Part 1 Oral Presentation

- Concept and practices of Sato-umi in Japan and lessons learned -----15
Yanagi T., *Research Institute for Applied Mechanics, Kyushu University, Japan*
- Concept and practices of Satoyama Sato-umi Sub-Global Assessment in Japan ---29
McDonald A., *United Nations University, Institute of Advanced Studies, Operating Unit Ishikawa/Kanazawa, Japan*
- Case of Fushino River Estuary Initiatives in Japan -----37
Ukita M.*, **Sekine M.***, **Yamamoto H.****, **Yamaguchi University, **Yamaguchi Prefecture, Japan*
- The Ago Bay Management Initiatives in Japan -----42
Maegawa M.*, **Uranaka H.**, **Mie University, Japan*
- Potential of urban wetland as a target of habitat restoration and management -----48
Furukawa K., *National Institute for Land and Infrastructure Management, Japan*
- Community-based sea grass bed restoration and management in Seto Inland Sea:
Case of Akou Coast in Japan -----54
Matsuda O., *Hiroshima University (Professor Emeritus), Japan*
- Supporting activities for the creation of Sato-umi in Japan -----63
Muroishi Y., **Yamada T.**, **Ogawa N.**, *Office of Environmental Management of Enclosed Coastal Seas, Ministry of the Environment, Japan*

CONCEPT AND PRACTICES OF SATO-UMI IN JAPAN AND LESSONS LEARNED



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A new concept for coastal sea management called “Sato-Umi”, defined as “High productivity and biodiversity in the coastal sea area with human interaction”, is proposed. To establish the Sato-Umi, it is necessary to realize comprehensive material cycling and appropriate fish resource management in coastal sea areas.

It is said that “Nature takes its best state without mankind”. Would it be true that no environmental problems would exist if mankind was not present on Earth? However, there would be no meaning to a discussion regarding environmental problems without the presence of mankind.

Nature does exist that takes its best state under mankind’s interaction. In Japan, it is called “Sato-Yama”. In Japanese, “Sato” means the area where people live and “Yama” means the forest. Sato-Yama is thus the forest near where people live. In 1987, the area of Sato-Yama in Japan was about 4,500,000 ha making up about 20% of Japan’s total area of forest of 25,000,000 ha.

In this paper we discuss a new concept for coastal sea management that is based on the ideas of Sato-Yama. Is it possible to create a “Sato-Umi” similar to Sato-Yama? In Japanese, “Umi” means the sea, so “Sato-Umi” is defined as “High productivity and biodiversity in the coastal sea area with human interaction” (Yanagi, 1998, 2007).

To establish the Sato-Umi, we first need to understand quantitatively material cycling in the coastal sea area. That is, we need to know the quantity of nutrients that are loaded from the coast, and what are the primary, secondary and tertiary productions in the area. We need to clarify what kinds of actions by mankind are permissible or prohibited in the coastal sea area from the viewpoint of increasing production and biodiversity. The important focus is to establish comprehensive material cycling in Sato-Umi.

Yanagi, T. (1998) To create “Sato-Umi” in the coastal sea area. *Journal of the Water Environmental Society*, 21, 703 (in Japanese).

Yanagi, T. (2007) *Sato-Umi: A new concept for coastal sea management*. Terra Scientific Publishing Company, Tokyo, 96pp.

Sato-umi:

A new concept for coastal sea management

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We have suffered from Minamata disease, red tide, hypoxia, fish catch reduction and so on in the coastal seas all over the world

The basic reason is that human beings, who live on land, do not understand the sea.

We have to more deeply understand the coastal sea.
How can we associate with the coastal sea?

Human and Nature

Some people say “Nature is at best without Human”.

Is this true?

There exists the nature which is at best under the interaction with human.

It is the “Sato-Yama”. (the forest near the village)

Sato: village in Japanese

Yama: forest in Japanese

Sato-Yama in Japan
4,500,000 ha and 20 % of the total forest area in 1987

Definition of “Sato-Yama”

Sato-Yama is the forest with high productivity and high bio-diversity under the interaction with human activities.

People plant oak at Sato-Yama and cut them every 20-30 years for charcoal and mushroom cultivation. Dropped leaves are used for the fertilizer. high-productivity

Flora is rich at Sato-Yama due to its brightness. Insects gather for honey of flower and oak. Small animals come for acorn of oak. Periodical human disturbances are good for biodiversity. high-biodiversity

Sato-Yama



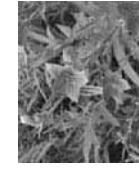
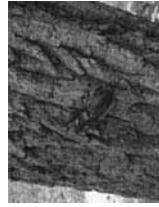
Deciduous broadleaf trees.



People work there. High productivity.

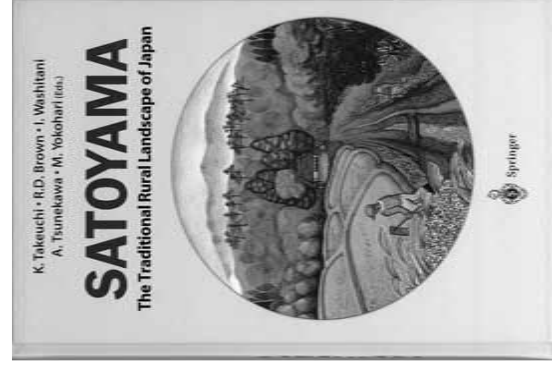


High-biodiversity



Rich flora and fauna

Sato-Yama
published in
(2001)



Sato-umi

Umi: the sea in Japanese

Sato-umi : the coastal sea with high productivity and high biodiversity under the human's interaction.

In order to realize "Sato-Umi", we first have to understand quantitatively the material cycling in the coastal sea.

8th EMECS (Environmental Management in Enclosed Coastal Seas) at Shanghai on 29 October, 2008

- Special Session on "Sato-Umi" in the 8th EMECS at Shanghai, China
- T. Yanagi (Kyushu University, Japan) "Definition of Sato-Umi"
- J. Greer (Maryland Sea Grant College, University System of Maryland, USA)
"Resolving Oyster Conflicts in the Chesapeake Bay: The Concept of Sato-Umi"
- J.P. Decrotoy (University of Hull, U.K.) "Managing eutrophication in megatidal estuaries in North-Western Europe through Integrated Coastal Zone Management"
- W.K. Chang (Korea Maritime Institute, Korea) "National Initiative on Environment Management in Coastal area of Korea"
- J.Fang (Yellow Sea Fisheries Research Institute, Chinese Academy of Fisheries Science, China)
"Development of integrated multi-trophic aquaculture in China"
- P. Songsangjinda (Coastal Aquaculture Research Institute, Department of Fisheries, Thailand)
"Silvo-aquaculture: an ecosystem based management for sustainable coastal aquaculture in Thailand"
- B.Messe (Pattimura University Ambon, Indonesia) "Sasi laut: History and its role of marine coastal resource management"

International Workshop

Sato-Umi

New Concept that Increases
Biological Productivity and Biodiversity

Workshop Report



International EMECS Center, Japan

8th EMECS
(Environmental
Management in Enclosed
Coastal Seas)
at Shanghai
on 29 October, 2008

Report

Invited: 7

Oral: 6

Poster: 12

The Shanghai Declaration October 30, 2008

... At EMECS 8 we learned an informative new concept, sato-umi, which signifies "high productivity and biodiversity of a coastal sea as result of, and in harmony with, human activity".....Sato-umi places increased emphasis on promoting positive interaction between humankind and our coastal enclosed seas..... It may be realized through concerned, continuous environmental conservation programs. Sustainable economic return through ecosystem-based resource management and agricultural practices are other aspects of sato-umi.....Finally, sato-umi places a high premium on an education that connects young people with the natural world and provides them opportunity to learn through hands-on experiences how their sincere concern for the natural world relates to the well-being of their community, family, and themselves.

Written by Wayne Bell (Maryland,
USA)

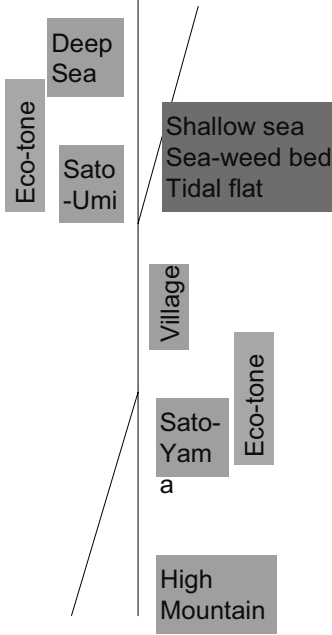
The Shanghai Declaration October 30, 2008

... At EMECS 8 we learned an informative new concept, sato-umi, which signifies "high productivity and biodiversity of a coastal sea as result of, and in harmony with, human activity"Sato-umi places increased emphasis on promoting positive interaction between humankind and our coastal enclosed seas.It may be realized through concerned, continuous environmental conservation programs. Sustainable economic return through ecosystem-based resource management and agricultural practices are other aspects of sato-umi.Finally, sato-umi places a high premium on an education that connects young people with the natural world and provides them opportunity to learn through hands-on experiences how their sincere concern for the natural world relates to the well-being of their community, family, and themselves.

Written by Wayne Bell (Maryland,
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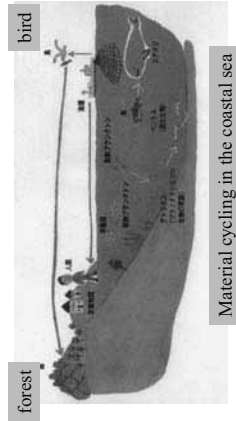
Sato-yama and Sato-umi

(high productivity and high bio-diversity under the interaction with human activities)



Material cycling in Sato-umi

Thick, long and smooth material cycling
(Comprehensive material cycling)
must be established in Sato-umi
for high productivity and high bio-diversity.



Red tides

Red tides mean the thick material flow but the short and no-smooth material flow because the big biomass of dead phytoplankton consumes the dissolved oxygen in the bottom layer and results in hypoxia and fish mortality.

They are not good for Sato-Umi.

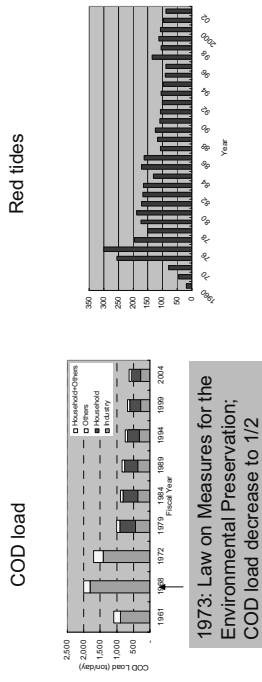
Eutrophic or oligotrophic coastal seas

In the eutrophic coastal sea, we have to reduce the nutrient load from the land.

In the oligotrophic coastal sea, we have to increase the nutrient supply from the aphotic layer by the artificial upwelling reef.

Eutrophicated coastal sea

COD load and red tides in the Seto Inland Sea, Japan



Change in COD load and the occurrence number of red tides in the Seto Inland Sea, Japan

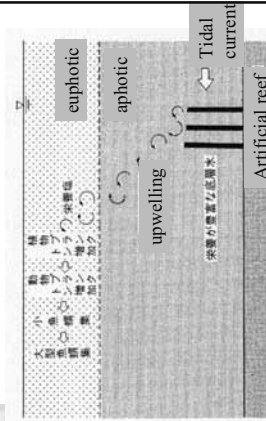
Oligotrophic coastal sea

Artificial upwelling reef

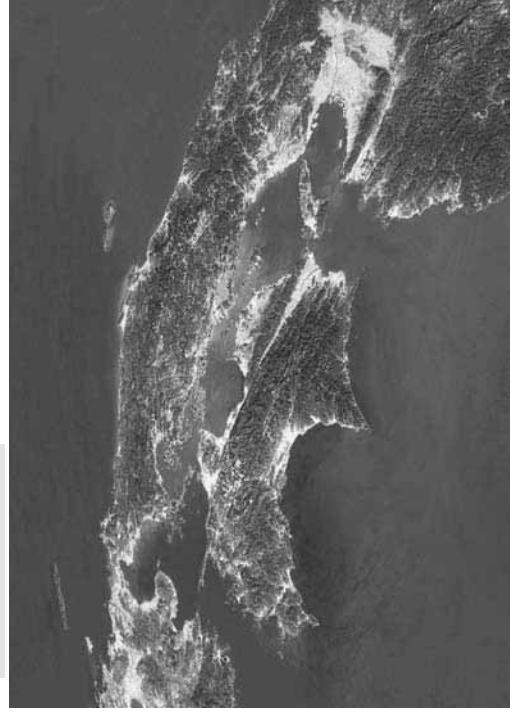


H=10m, L=20m

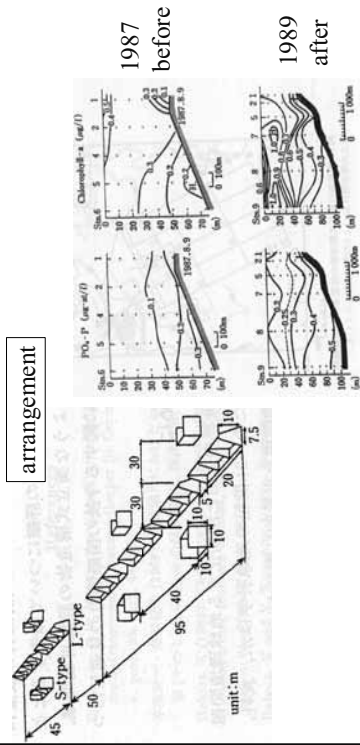
Field experiment was carried out in the Seto Inland Sea, Japan in 1987.



Seto Inland Sea



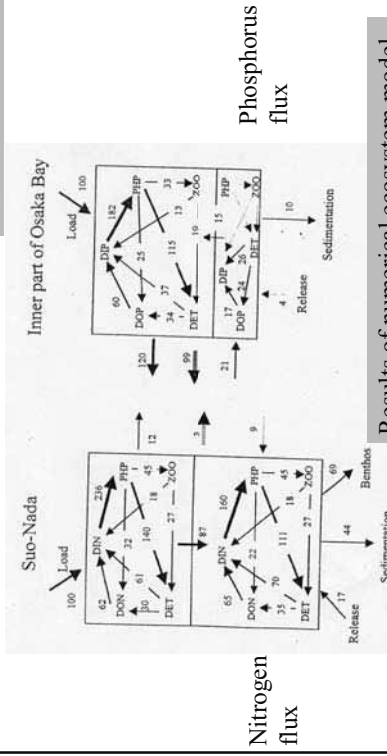
Effect of artificial upwelling reef



Yanagi and Nakajima (1991)

Importance of bio-chemical processes

Hayashi and Yanagi (2002)

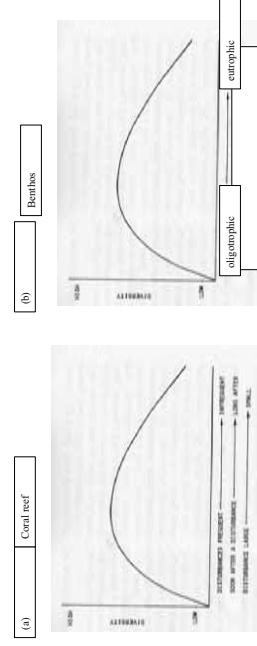


Results of numerical ecosystem model.

Coastal sea as a habitat

- It is very important for the coastal sea as a habitat for marine biota in order to establish the comprehensive material cycling there.
- Because the bio-chemical material flux is very large in the coastal sea.

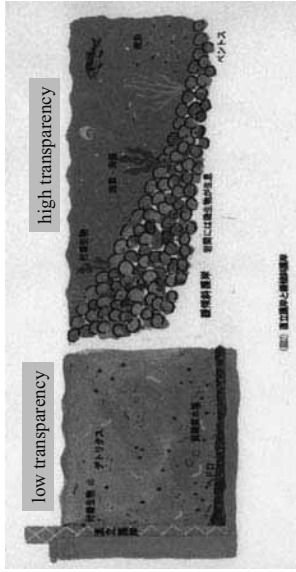
Biodiversity and Human interaction



Connell (1978)

Kokubu et al. (2007)

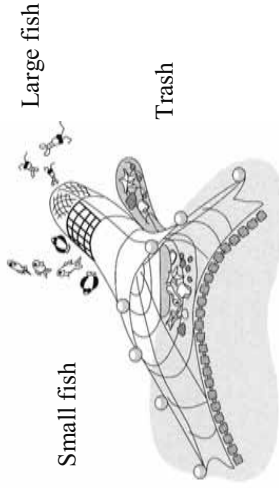
Strait-uplifted coast or gentle-sloped coast



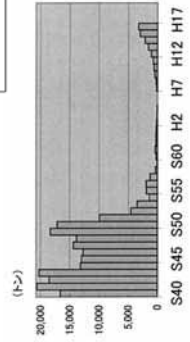
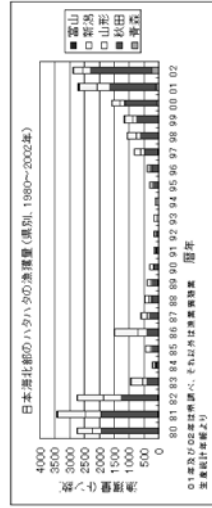
We have to provide good condition for marine life in Sato-Umi.

Fish resources management is also very important for the establishment of Sato-Umi.

New technology is developed: Fishing gear to avoid small fish catch



Fish resources management



Year-to-year variation in fish catch of Hata-hata in Akita Prefecture
Prohibit of fishing in 1992-1995,
After that
Application of TAC(Total Allowable Catch)

Sato-Umi = Commons

Commons ; system for co-use and co-management of resources or resources themselves (land or plants)

It is situated between nature and human.

Nature is humanized in Commons and Human must be naturalized in Commons.

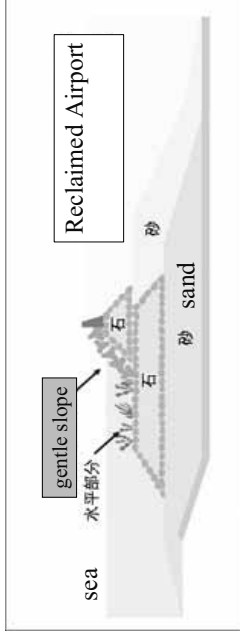
Then human's and nature's sustainable developments are possible in Commons.

Humanized nature

- Many examples such as gentle-sloped coast of Kansai International Airport
- Mud ecosystem has changed to algae-bed ecosystem there by human activity.

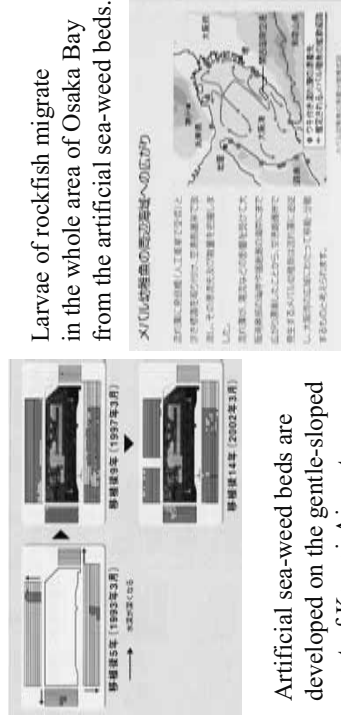
Kansai International Airport

Artificial gentle-sloped coast.



Artificial sea-weed beds

Larvae of rockfish migrate in the whole area of Osaka Bay from the artificial sea-weed beds.



Artificial sea-weed beds are developed on the gentle-sloped coast of Kansai-Airport

Human naturalization

Human naturalization is to follow the natural rhythm by pressing down the human's desire.

We have to understand the natural rhythm at first.

Marine science is important for understanding the natural rhythm.

Fishermen in Japan have many rules for preservation of fish resources in order to follow the natural rhythm.

Many rules are necessary for sustainable development of Sato-Yama

年度	条項数	表7-1 items of rule																
		運防具	山火焼	山林区	林野	野山	区野	野山	区野	野山	区野	野山	区野	野山	区野	野山	区野	野山
明治10年規約	全5カ条	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
明治15年規約	全5カ条	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
明治17年議案	全17カ条	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
明治19年規約	全36カ条	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
明治31年規約	全28カ条	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
明治42年規約	全33カ条	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○

(備考) 『大正七年森林 滋賀縣大原村村有林經營方法および成規書』より筆者作成

This is naturalization of human in Sato-Yama.

Sasi

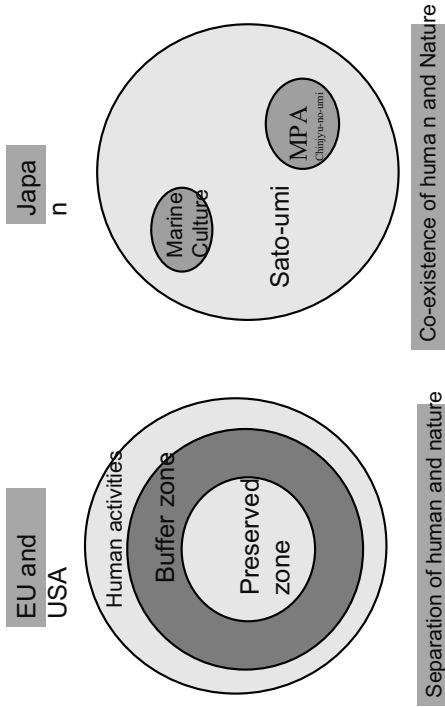
- The strict rules in Satoyama is similar to “Sasi” in the Southeast Asia countries.
- “Sasi” is rules for the natural resources management in the Southeast Asia.

Conservation or Preservation

Sato-Umi does not preserve the coastal sea but conserve the coastal sea.

It is a way of “Wise Use” of the coastal sea.

Human and Nature



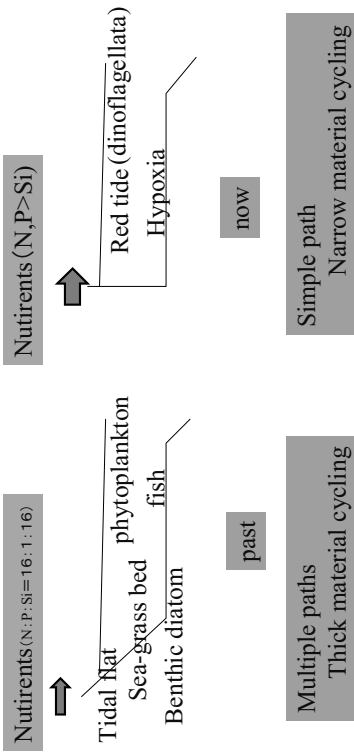
Separation of human and nature

Co-existence of human and Nature

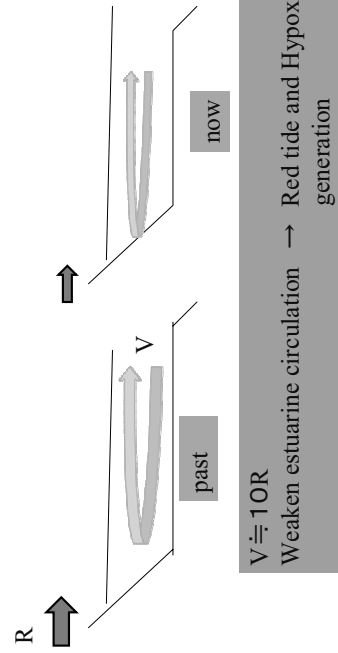
Appropriate zoning

Forest	Sea
1) Needle-leaf forest Japanese cedar, Japanese cypress	1) Aqua-Culture sea weed, oyster, yellow tails
2) Sato-yama	2) Sato-umi
3) Chiriyu-no-mori Ever-green-leaf trees	3) MPA (Marine Protected Area)

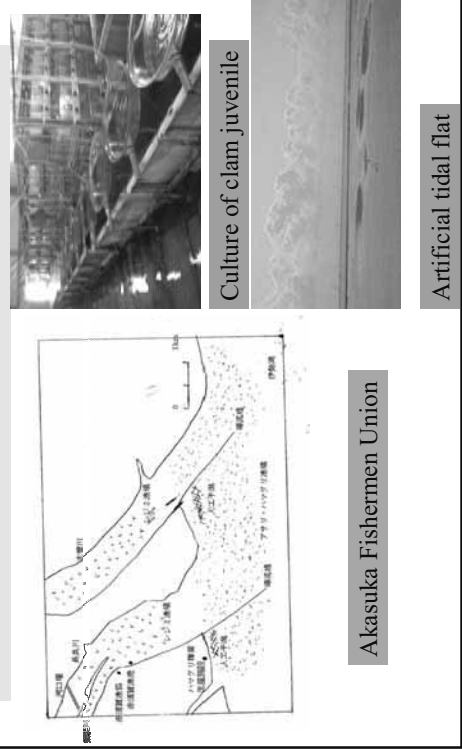
Nutrients cycling



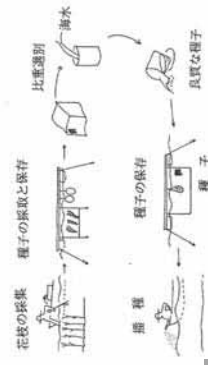
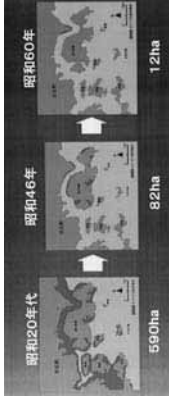
Decrease of river discharge due to dam construction



Artificial Tidal Flat and Clam



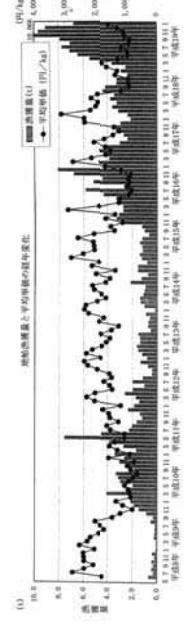
Decrease of sea-grass bed area



Reproduction of sea-grass bed

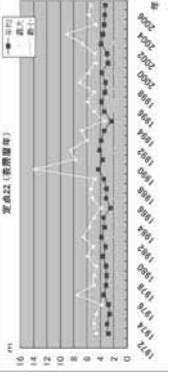
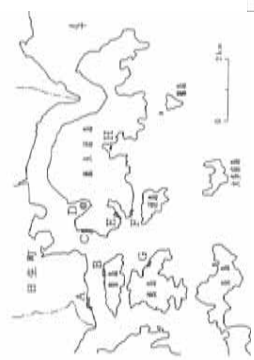
Hinasecho Fishermen Union

Harvest variation

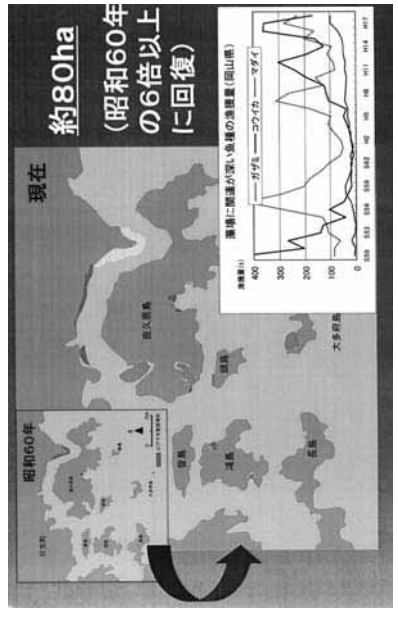


Year-to-year variations in clam harvest and price

Sea-grass bed reproduction areas



Expanding sea-grass bed



Holistic governance from the top of the mountain to the sea

- Material cycling
- Resource management
- Social system innovation (production + consumption)
- Change of value
- Technology innovation

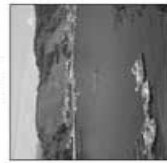


Fisheries law
Navigation law → unified
Water pollution law

Fishermen and Citizen

- Fishermen are the main players for the creation of Sato-umi
- However the population of fishermen is only 0.1 % of total population in Japan
- The close collaboration of fishermen and citizen (99.9%) is necessary for the creation of Sato-umi.
- How ? Under study.

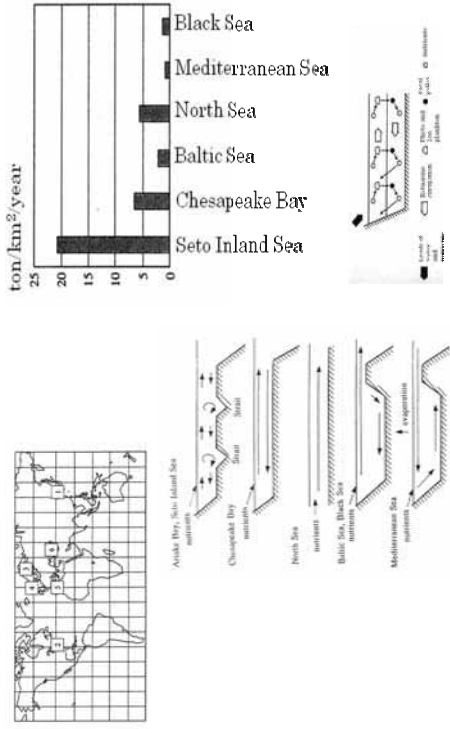
Sato-Umi
 A New Concept
 Coastal Sea Management



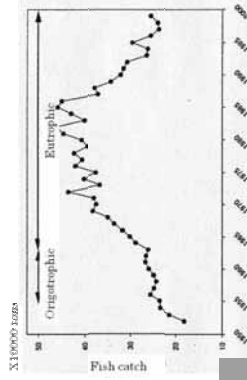
Terra Scientific Publishing
 Company
 2007, 96p.

- Sato-Umi**
 → A new concept for coastal sea management — introduction
1. Mankind and coastal sea
 - 2.1 Richness of the coastal sea
 - 2.2 Crisis of the coastal sea
 3. Mankind and the forest
 - 3.1 Sato-Yama
 4. Sato-Umi
 - 4.1 Concept of Sato-Umi
 - 4.2 Harvest of sea-glass bed
 - 4.3 New technology
 - 4.4 Stock enhancement and fish culture
 - 4.5 Sea farming
 - 4.6 Fish resources management
 5. Environmental ethics
 - 5.1 Environmental ethics and Commons
 - 5.2 Preservation and Conservation
 - 5.3 Environmental education
 6. Concluding remarks

Fish Productivity in the Seto Inland Sea



Reduce of fish catch in the Seto Inland Sea



Its causes

- 1) Regime shift
- 2) Variability of oceanic condition
- 3) Overfishing
- 4) Destruction of shallow sea
- 5) Marine pollution, eutrophication

8th EMECS (Environmental Management in Enclosed Coastal Seas) at Shanghai on 29 October, 2008

- Special Session on "Sato-Umi" in the 8th EMECS at Shanghai, China
- T. Yanagi (Kyushu University, Japan) "Definition of Sato-Umi"
- J. Greer (Maryland Sea Grant College, University System of Maryland, USA)
"Resolving Oyster Conflicts in the Chesapeake Bay: The Concept of Sato-Umi"
- J.P. Decrooy (University of Hull, U.K.) "Managing eutrophication in megatidal estuaries in North-Western Europe through Integrated Coastal Zone Management"
- W.K. Chang (Korea Maritime Institute, Korea) "National Initiative on Environment Management in Coastal area of Korea"
- J.Fang (Yellow Sea Fisheries Research Institute, Chinese Academy of Fisheries Science, China)
"Development of integrated multi-trophic aquaculture in China"
- P. Songsanginda (Coastal Aquaculture Research Institute, Department of Fisheries, Thailand)
"Silo-aquaculture: an ecosystem based management for sustainable coastal aquaculture in Thailand"
- B.Mosse (Pattimura University Ambon, Indonesia) "Sasi laut: History and its role of marine coastal resource management"

CONCEPT AND PRACTICES OF *SATOYAMA SATO-UMI* SUB-GLOBAL ASSESSMENT IN JAPAN



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In 2000, then United Nations Secretary-General Kofi Annan called for a scientific-based assessment of the state of the world's ecosystems. The following year, the Millennium Ecosystem Assessment (MA) was initiated and for the next 4 years over 1,300 experts across the globe were asked to assess the changes in ecosystems and the consequences of those changes to human well-being. Published in 2006, the MA framework has since been applied to continued ecosystem assessment analyses as follow-up work to the MA.

Efforts in Japan to join other sub-global ecosystem assessment work gained momentum in 2006 and scoping for a Japan Sub-Global Assessment (Japan SGA) was initiated by the Ecosystem Assessment programme at the United Nations University-Institute of Advanced Studies (UNU-IAS). In the fall of 2007, geographically delineated assessment teams referred to as clusters were formed and the Satoyama Satoumi Sub-Global Assessment (Japan SGA) began. The findings are to be published in the months leading up to the Tenth Conference of the Parties to the Conventional on Biological Diversity (COP10) in Nagoya, Japan in October 2010 in an effort to contribute to global discussions of biodiversity and sustainability.

This paper will introduce the governance structure of the Japan SGA along with the conceptual framework of the MA. This will be followed by exploration of the scoping process, specifically why satoyama and satoumi were selected as the focus for the Japan SGA, examining evolving working definitions of the concepts. Satoyama satoumi concept examination will be followed by a look at assessment efforts of the Hoku-Shinetsu Cluster. Working closely with non-academic stakeholders to collect data of satoyama satoumi over the last 50 years, this cluster applies a bottom-up approach. The strengths, limitations and potentials of multi-stakeholder bottom-up assessments will be identified in hopes to provide insight into future potentials of bottom-up

approaches to ecosystem assessment in areas where financial and human capacity may be limited.

One of the overarching aims of the Japan SGA is to link the findings to effective comprehensive policy making both at the local, regional and national levels in Japan. Further, the Japan SGA aims to link their findings to other SGA efforts around the globe, contributing to global discussions of sustainable resource use and conservation based on culturally diverse approaches which effectively combine traditional ecological knowledge with environmentally sound science and technologies. Whether or not the Japan SGA achieves these aims cannot be answered until the report is completed in 2010, however for the purposes of this paper, the potentials of satoyama satoumi assessments in Japan will be explored in hopes to identify common challenges and solutions of sustainable marine resource use, management and conservation that integrate locally-specific and universally applicable approaches.

MA Conceptual Framework

(modified from Millennium Ecosystem Assessment 2005)



ecosystem services next slide:
supporting, provisioning, regulating & cultural
services

Concepts and practices of SATOYAMA SATO-UMI Sub-Global Assessment in Japan

Habitat Protection, Restoration and Management (T3)
T3.2
Indigenous Approaches to Habitat Protection and Restoration:
Experiences in Sato-Umi and Other Community Initiatives

SATO-UMI WORKSHOP
Anne McDonald, Director
United Nations University-Institute of Advanced Studies Operating Unit
Ishikawa/Kanazawa

ECOSYSTEM SERVICES & constituents of wellbeing

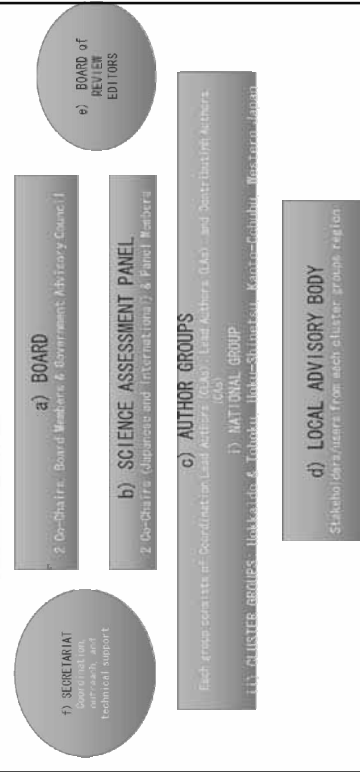
(modified from Millennium Ecosystem Assessment 2005)



constituents of wellbeing: security, basic materials for a good life, good social relations
freedoms and choices

JSGA Governance

(modified from UNU-IAS Japan SGA Secretariat governance structure 2008)



JSGA scoping process:

why the interest in satoyama satoumi today?
why satoyama satoumi?

nostalgia driven attempts to recapture fading past traditional rural landscapes? or attempts to look to past traditions of resource management and human societies relations with nature as potential keys to unlocking the challenges of the future?

i) interest in *satoyama satoumi landscapes* and recognition of their potential as a prototype for a sustainable system has grown beyond conservation ecology circles to include policy makers and citizens concerned with the socio-cultural and environmental impacts of contemporary lifestyles in Japan.

ii) this growing interest in *satoyama satoumi landscapes* is in a sense reflective of the gradual shift in focus of the nature conservation movement; specifically that from conserving designated protected zones and/or remote areas separate from human settlements to conservation wherein human intervention in nature is recognized as an integral element. This has led to analysis of habitat modification and environmental degradation patterns observed through *satoyama satoumi landscapes*. Of particular interest to researchers is human intervention within *satoyama satoumi* environments and its impacts on species diversity, sustainable resource extraction, use and management.

defining SATOYAMA



里地里山の保全・再生モデル事業イメージ

source: ministry of the environment, japan

satoyama

historical background: from feudal era to contemporary japan

sato 里 (田+土 rice paddy+soil) = village

yama 山 = mountain

i) first written reference to *satoyama* was in *Miscellaneous Stories of Kiso Mountain*, a book published in 1759 by forest manager Hyoemon Terauchi during the feudal Tokugawa Era (1603-1867). The book recorded the livelihoods of rural mountain woodland communities and used the term *satoyama* to describe the human managed mountainous landscapes surrounding those rural communities.

ii) the term *satoyama*, along with the nature views, lifestyles, cultural values, traditional knowledge and resource management practices embodied in the term, were reintroduced by forest ecologist Tsumahide Shide in the 1960s as agricultural woodlands. Shide's revival of the *satoyama* concept was in part a counter reaction to the fuel and chemical fertilizer revolutions of the 1960s and the impacts rapid economic development was having on the social, cultural and natural landscapes of Japan.

iii) *satoyama* has since evolved and is used in differing contexts. Among neo-traditional conservationists, *satoyama* often broadly refers to traditional rural landscapes and has become for many a symbol of human-managed landscapes where humans and nature coexist in a harmonious symbiotic relationship. As ecologists explore habitat modification and humans use of natural landscapes, the *satoyama* concept has evolved to include what is described as *satoyama landscapes* comprising of *satoyama*, cultivated lands (farmlands), and reservoirs (traditional man-made irrigation ponds referred to as *tameike* and natural wetlands inclusive); all elements linked together as part of the traditional agricultural land use system of Japan.



defining SATOUMI

satoumi background
 sato 里 = village + umi 海 = sea

i) *satoumi* concept was first proposed by Dr. Tetsuo Yanagi of Kyushu University in 1998. Dr. Yanagi defined *satoumi* as a coastal areas where human interaction has resulted in a high degree of productivity and biodiversity, and where a deep relationship between human life and traditional culture has led to the coexistence of humans and nature.

ii) original focus of *satoumi* was the Seto Inland Sea area: communities' working together with researchers and policy makers to assess human impacts on the coastal marine environments and ecosystems.

iii) growing recognition of *satoumi* as a comparable term to *satoyama* by policy makers in Japan as a potential model for sustainable marine and coastal resource utilization and management. Term/concept incorporated in the 3rd National Strategy for Biodiversity (2007). Although *satoumi* not mentioned in 3 crisis, of note: Third National Biodiversity Strategy of Japan (November 2007) identify three crises: crisis 1: species and habitat degradation due to excessive human activities; **crisis 2: degradation of satoyama due to insufficient level of management**; crisis 3: ecosystem disturbances caused by the introduced alien species and chemical contaminations.

iv) *Satoumi* Creation Project initiated by the Japanese Ministry of the Environment (MOE) in July 2008. Currently 6 pilot projects in Japan, collected data from pilot projects to be used as the basis for a national *Satoumi* Manual.

JSGA efforts: defining satoyama satoumi for global discourse:

satoyama satoumi ecosystem assessment report (Japan sub-global assessment report, JSGA) working definition of satoyama and satoumi (24 July 2009)

satoyama and *satoumi* can be defined as dynamic social-ecological coupled production systems comprising of a mosaic of different ecosystem types producing synergy of a bundle of ecosystem services for human wellbeing.

OR simply defined as: multi-functional socio-ecological production landscape

satoyama is rural landscape for agricultural and forestry production and livelihood comprising of communities, farmland, secondary forest, plantations, grassland, ponds, and irrigation and drainage systems.

satoumi is coastal landscape for fishery production and livelihood comprising of seashore, tidal flats, seaweed beds and grounds

characteristics of *satoyama* and *satoumi*: diverse mix of ecosystem types producing a bundle of ecosystem services, depending on specific depending on social, economic, and ecological parameters. In short, they are context and/or place specific.

unu-ias led satoyama satoumi ecosystem assessment efforts

linking the past to the present & to the future
 integrating traditional ecological knowledge/local wisdom with science and linking these findings to effective integrated policy design

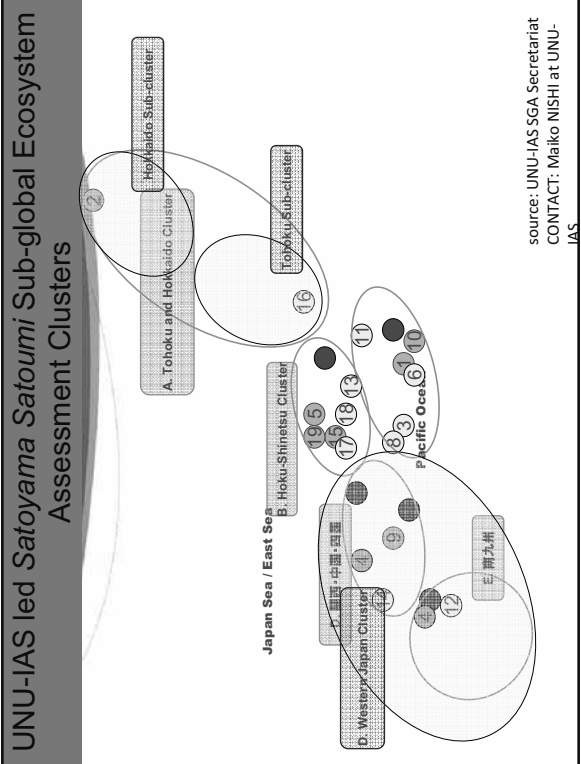
SOME QUESTIONS asked of JSGA contributors:

i) what is the historical context of *satoyama* & *satoumi*?

ii) what is the current state of *satoyama* & *satoumi* today?

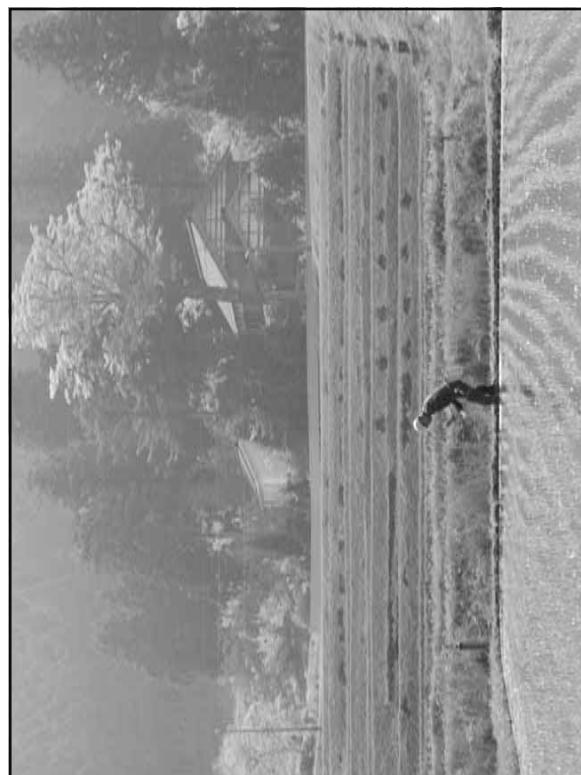
iii) over the last 50 years, what are the drivers of degradation? (abandonment + overgrowth, overutilization and land-use change-driven degradation included)

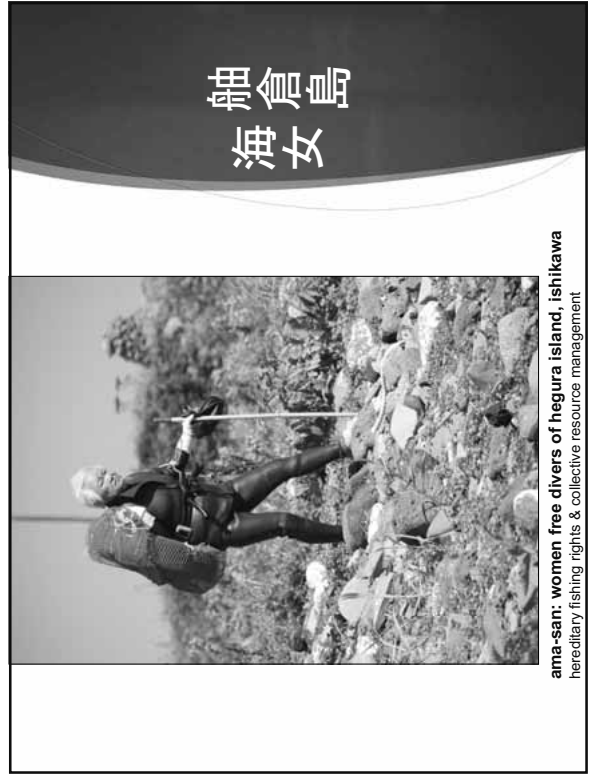
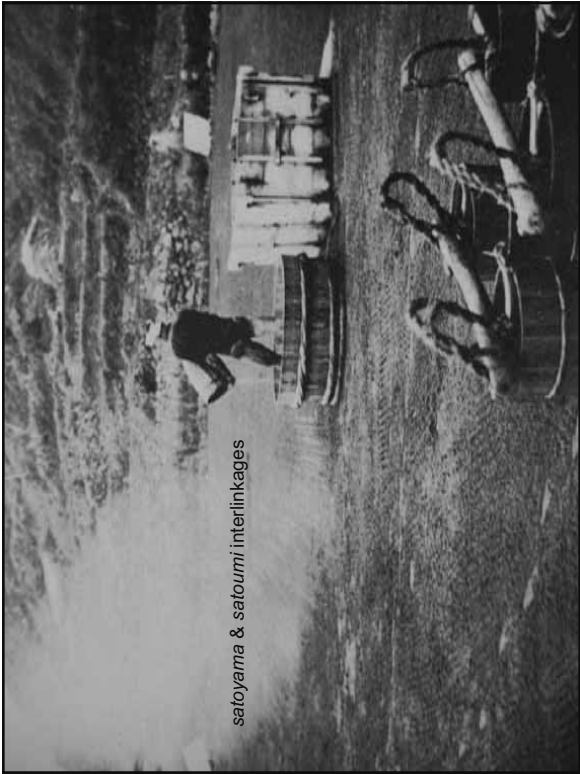
iv) how does/can *satoyama* & *satoumi* contribute to sustainable resource management and biodiversity?

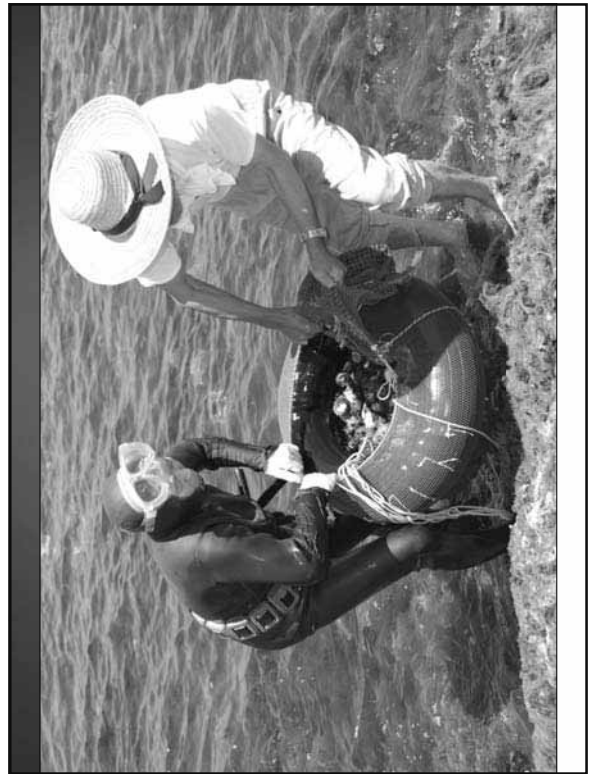
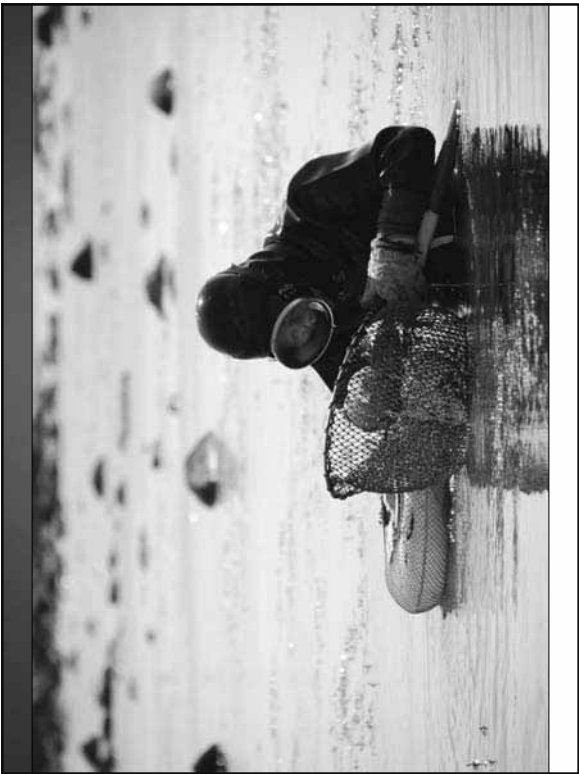
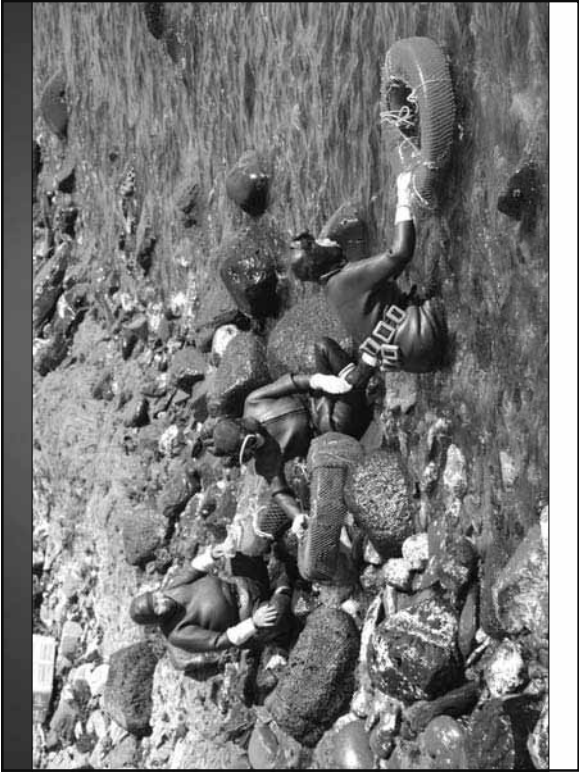


potentials and limitations

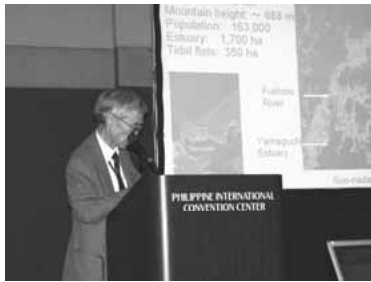
- integrative approach:** involving stakeholders from the beginning; addressing strengths and weaknesses of MA, specifically end-user involvement
- policy maker involvement in data gathering:** i) realistic expectations of results/report findings; ii) potential strengths = assess policy making capacities of government bodies, breaking down the walls of sectionalism; link report writing to satoyama satoumi biodiversity strategy writing for Ishikawa prefecture
- limited human capacity leads to exploring partnerships with parallel initiatives:** i) MOE Satoumi Creation Project in Nanao Bay, Ishikawa Prefecture—establishing research members and fisheries research stations; prefectural and municipal government, river network-related NPO, fishermen cooperative, diver organization; ii) partner with education for sustainable development programme development in Nanao Bay; iii) partnering with other research initiatives = UNU-IAS (Japan), Ume no Umi (Japan), Environment Department (Ishikawa prefecture), designed research project on transmission of traditions from satoyama and satoumi in Noto Peninsula; UNU-IAS Operating Unit based JSPS – UNU post-doctoral fellow Dr. Espalina Soc-Mon research project in Nanao Bay, environmentally-sound agriculture research study agricultural impacts on marine ecosystems;
- outreach activities = working with media:** i) video production; ii) social media; iii) partnership with UNU Media Studio <http://ourworld.unu.edu/en/>; recent titles include Harvest time in satoyama, Where the sea whistle echoes; ii) partnering with other research initiatives = Kanazawa University and Hokkoku Newspaper 50 year research project Natural Science International symposium study of Ama-san of Hegura and Nahaitsu Island







CASE OF FUSHINO RIVER ESTUARY INITIATIVES IN JAPAN



Masao UKITA^{*}, Masahiko SEKINE^{*} and
Hajime YAMANO^{**}

^{*}Yamaguchi University, Japan, ^{**}Yamaguchi
Prefecture, Japan

The studied area is located near the west end of Honshu Island and faced to Suo-nada, the west part of Seto Inland Sea. Tributary area of Fushino River is 322 km², the length is 30km. Population in the basin is 108 thousands. The area of Yamaguchi estuary is about 1700 ha. There exists tidal flats totally ca.350 ha.

Prior to focus on the river mouth area, we made the plan in 2003 for integrated management of the river basin, from forest to sea. The important keywords were, 'local production and local consumption', 'think of the source when drink water'. Then, we followed the Nature Restoration Program of the Ministry of Env. The basic concepts are, 'cooperation of local stake-holders', 'based on scientific knowledge', and 'adaptive implementation'. In 2004, we established the Conference for Tidal Flats Restoration of Fushino River Estuary consisting of citizens, academics, organization representatives, local governments totally 60. The environmental section of Yamaguchi Pref. mainly fulfills the office works.

The present important issues of the estuary are the decrease of fishery production especially short necked clam, the decay of sea grass fields, and the protection of endangered species like horse shoe crab. These problems are caused by the change of people's activities such as forestry, agriculture, life style, waste treatment, construction works, land reclamation, nearby industries, global warming, fishery itself and so forth, during this half century.

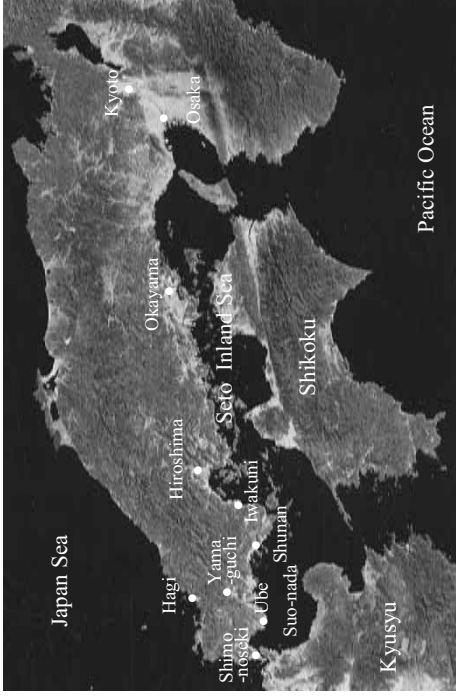
Main works for restoration program are, trying to restore short necked clam by various ways, planting sea grass, surveying horse shoe crab distribution. Cleaning beach, cleaning river upstream and planting tree are also conducted by the cooperation of local people upstream and downstream. We issues local money 'Fushino' to stimulate those activities. As the results, the area of sea grass field has been gradually recovering. The net-covering on the tidal flat soil of plowed area was effective for the clam shell production to prevent the damage by eagle ray or gilthead.

Ongoing tasks are, further scientific study on the cause of the changes, study on the traditional Satoyama and Satoumi systems in the past, increase of participants and administrative support, promoting environmental friendly fishery, forestry and agriculture, and slow life with more free time in people's mind.

Case of Fushino River Estuary Initiatives in Japan

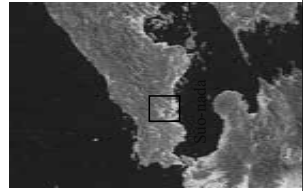
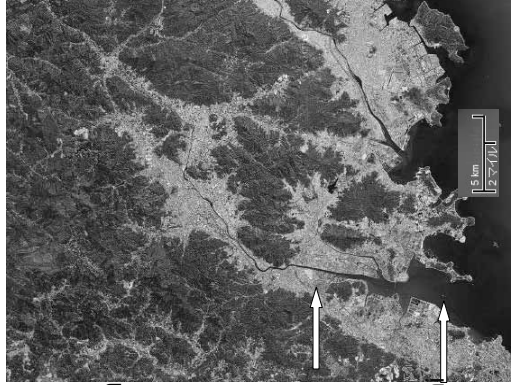
Masao Ukita*, Masahiko Sekine*, and Hajime Yamano**

*Yamaguchi University, **Yamaguchi Prefecture



Yamaguchi Prefecture is located in the west end of Honshu Island and faced to Suo-nada, Seto Inland Sea

Fushino River
 Area : 322 km²
 Length : 30.3 km
 Mountain height: ~ 688 m
 Population: 163,000
 Estuary: 1,700 ha
 Tidal flats: 350 ha



Fushino River
 Yamaguchi Estuary

Suo-nada Google

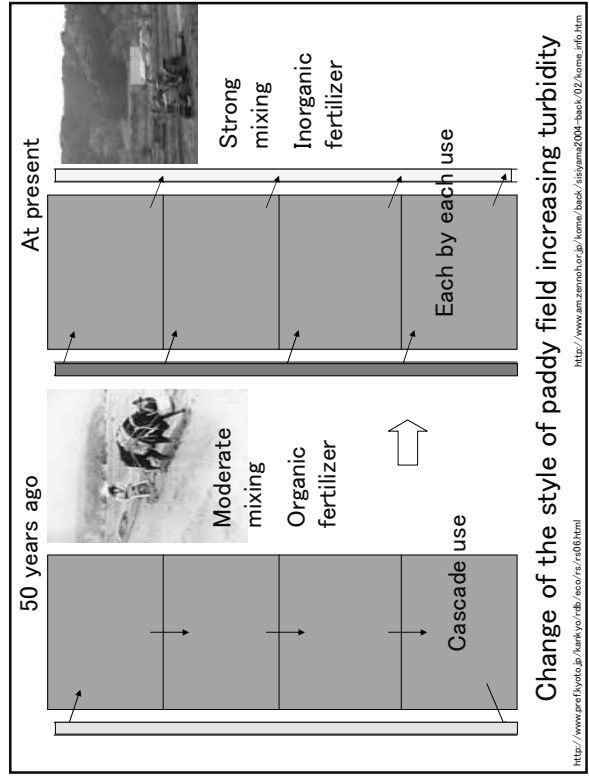
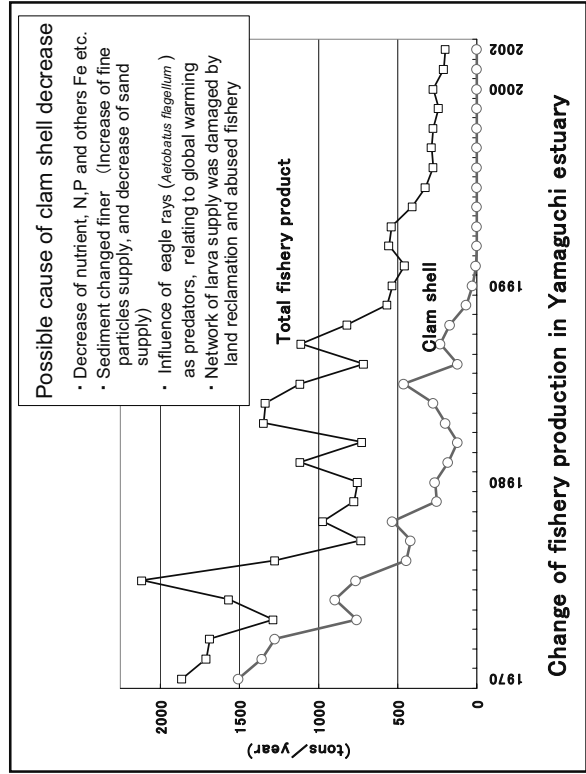
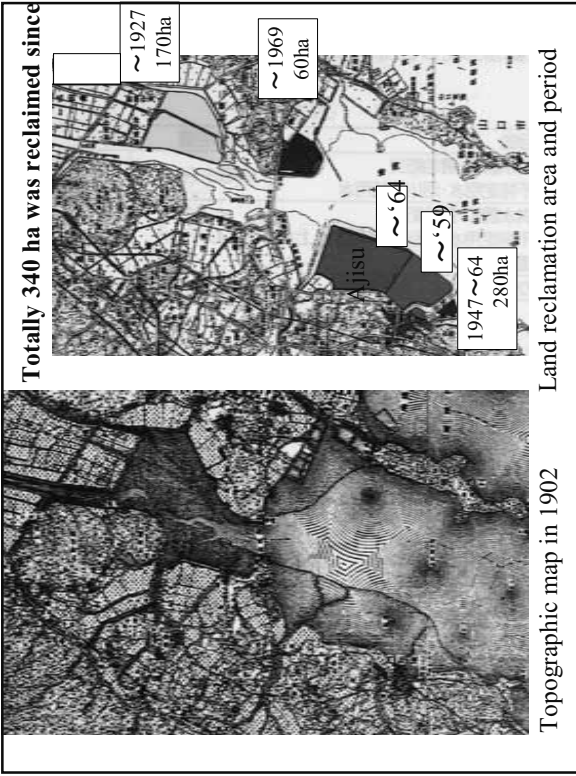


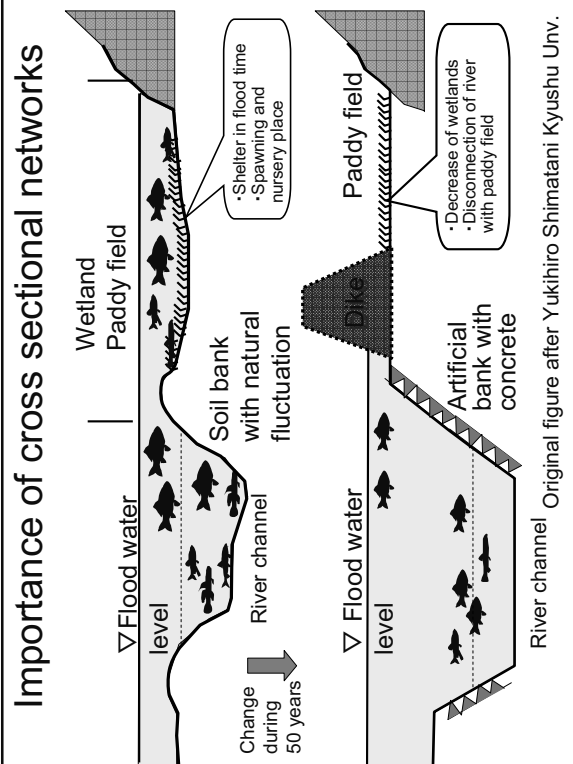
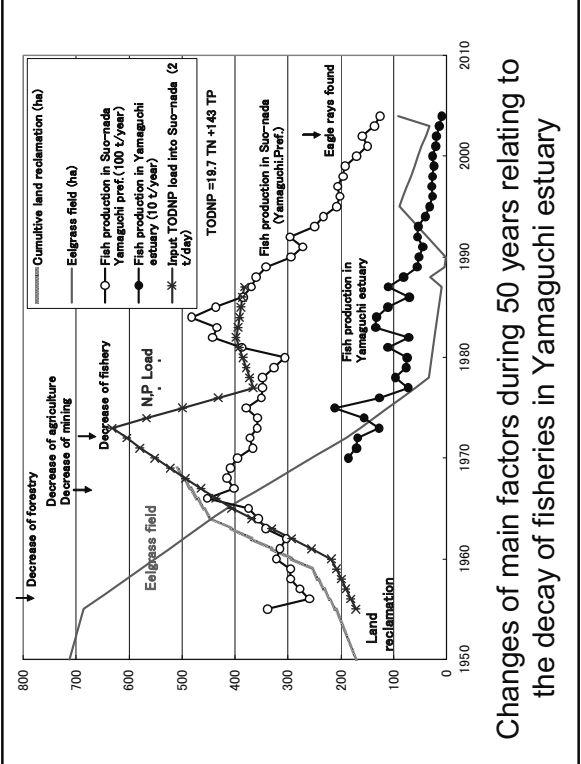
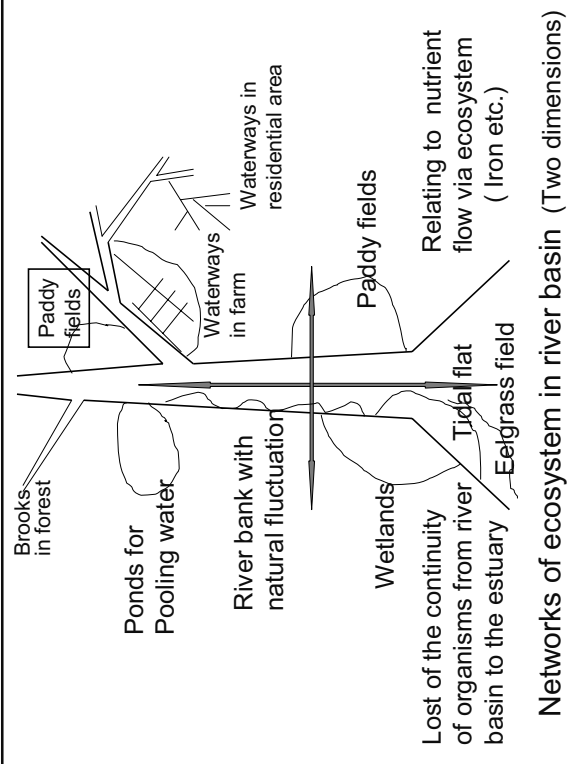
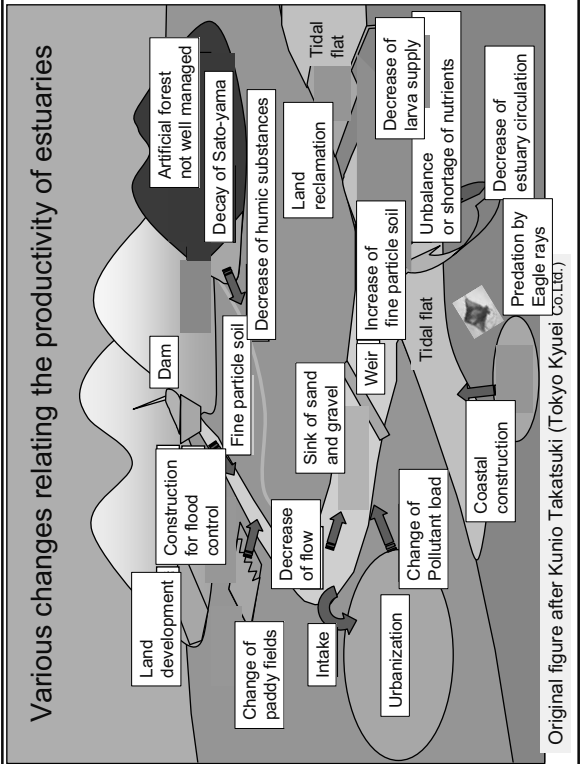
Over view from Yamaguchi estuary to Fushino river basin

There are wide tidal flats Naka-gata, Shinchi-gata and Minami-gata etc, totally 350 ha. We can find many kinds of bird, and endangered species horseshoe crabs are still alive.

Changes of the river basin

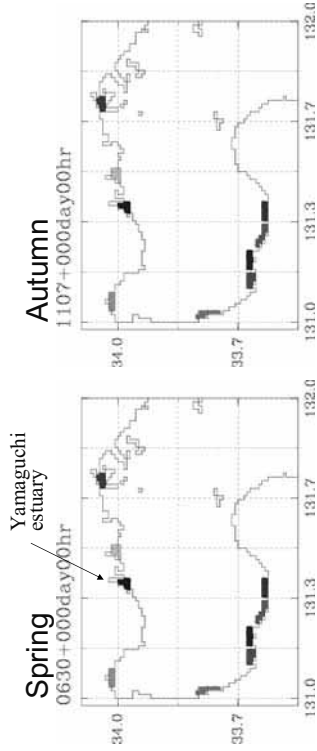
- Population increase 117,000('60) → 163,300('00), mainly causing to the 3rd industries. While population working in the 1st industries decreased.
- Farmland decreased with urbanization.
- Paddy field 70 km² (1965) → 30 km² (2000)
- Agriculture: modernized (irrigation system, machinery use)
- Sewage treatment proceeded. 18% ('85) → 67 ('01) → 75% ('05)
- Construction works: Shinkansen('75), Highway('83), two dams ('88) (tributary area <5% of the basin), other river constructions to prevent disaster.
- Land reclamation 340 ha since 1947 to 1969.
- Gravel mining in mountain areas and previous sand mining in the river mouth area.





Importance of the network for seed or larva supply

Dispersion of clamshell larva in Suo-nada using the model by CMES Ehime University



For 2 weeks

After N. Tezuka (National Research Institute of Fisheries and Environment of Inland Sea)
Similar situations were experienced in restoring eelgrass field though of smaller scale.

Adaptive cooperative management

It becomes difficult to get budget. We need more time to recover from the decay of 50 years.

Citizens and governments started counter measures they could.

Sand covering



Researchers

Study on the causes and the effectiveness of countermeasures

Our project is going almost successfully during five years. But, we are feeling restrictions, because the problem is so hard to be solved by voluntary base.

Conclusion

- To restore 'Sato-yama' and 'Sato-umi', we need the reconstruction of social system of environmental friendly fishery, forestry and agriculture. Self supply rate of these primary industries should be enhanced.
- We should recognize the importance of ecological networks from forest to sea. We are all connected including human beings, e.g. through micro-nutrients flow.
- We'd better establish new philosophy of environmental ethics relating to biodiversity.

THE AGO BAY MANAGEMENT INITIATIVES IN JAPAN



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Ago bay is semi-closed small inner sea located in Shima city, central Japan. This bay is famous for pearl oyster culture during one hundred years or more. All areas of Shima city including Ago bay are specified as national park. In recent years, organic loads of pearl oyster culture and drainages from coastal area increased gradually. So, frequent red tide and oxygen deficient waters occurred, and seriously damaged to pearl oyster culture and other fisheries.

From 2002 to 2007, Ago bay restoration project was carried out as “Environmental Restoration Project on Enclosed Coastal Sea”. The aim of this project was making better life through wise and sustainable use of coastal environment. In this project, we could develop important conservation techniques and systems for environmental restoration, such as construction of artificial tidal flats, recovering seagrass beds, continuous monitoring system and environmental simulation model of the bay. Many efforts were pay to corroboration with local populace, such as fishermen and regional public office. Outcomes of the project were pronounced to various academies, and applied to the many other regional and national projects. Also, report associations in region were held every year, and many populaces were participated in the association. In 2006 Shima city office announced the integrated plans for total conservation programs in Ago bay, such as effectively use of the results of the project, promoting pearl oyster culture and sightseeing industry, and applying to the environmental studies in the region.

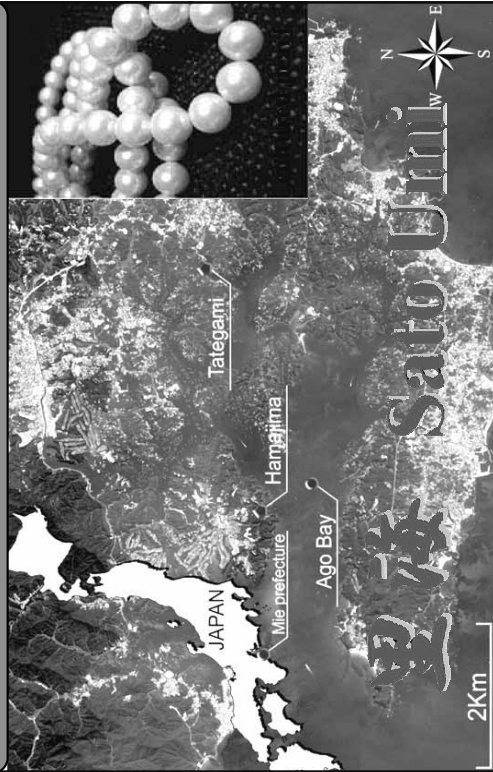
After the project, environmental research center for closed sea was opened in fisheries research station of Mie prefecture, and worked as total managements and developing of the results of this project as an aspect of the administrative measure of Mie prefectural office. In addition, committee for the promotion of environmental restoration in Ago bay was started. This committee was established for reproduce the symbiosis relations between Ago bay and the regional citizens through an environmental restoration and maintenance of biological diversity and beautiful bay area, as an aspect of regional movements. In this committee, many participants were joined, such as Shima city office, fisherman union, several groups of NPO, representatives around Ago Bay area, researchers of Mie prefectural research station,

Mie and Yokkaichi University, Mie fisheries high school and others.

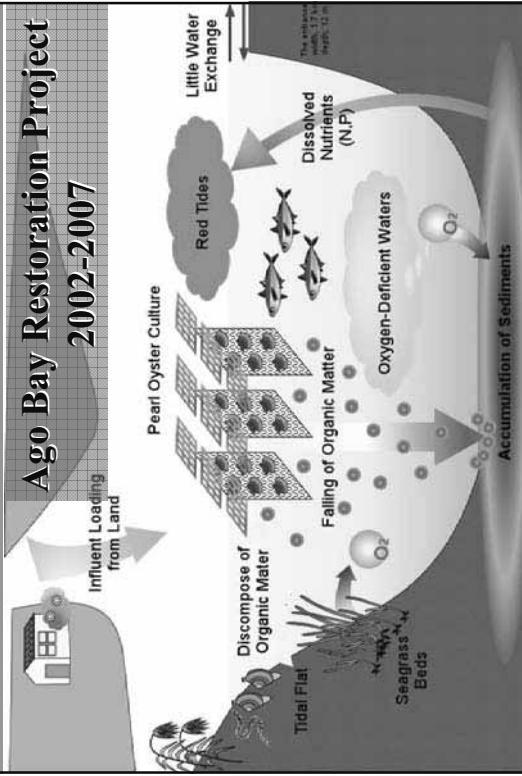
Around Ago bay area, social and economical circumstances changed drastically in recent years. Then, biological circulations and purification cycles were damaged by the excessive organic loads accumulating in the bay. Nowadays, we must have actions for symbiosis between natural environment and industry in region, as a new concept of the coastal sea management named “Sato Umi”, as the coastal sea with high productivity and high biodiversity under the mankind's interaction.

The Ago Bay Management Initiatives in Japan

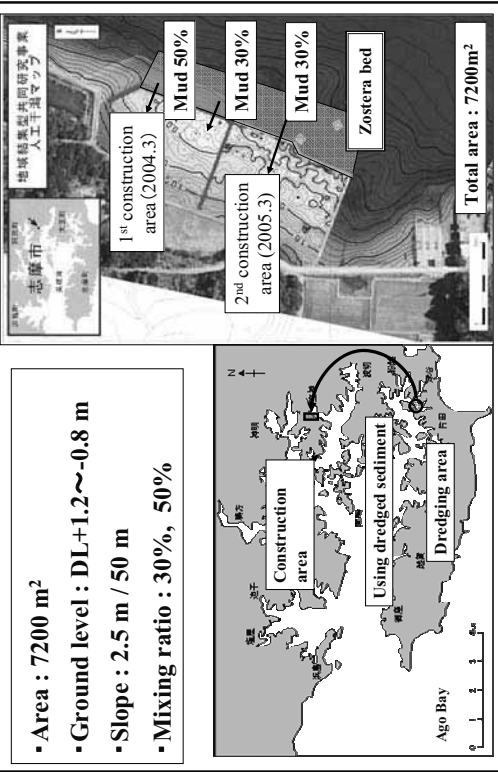
Miyuki Maegawa, Hideto Uranaka



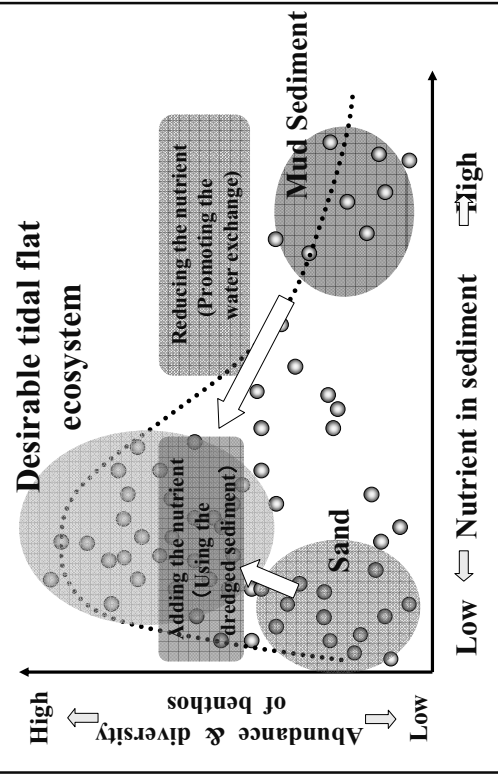
Current state and problems of Ago Bay



Construct Large Scale Artificial Tidal Flat



Restoration Concept of Shallow Area in Ago Bay



Development of a new method for recovering *Zostera* bed in collaboration with fishermen



Collecting mature fronds



Selection



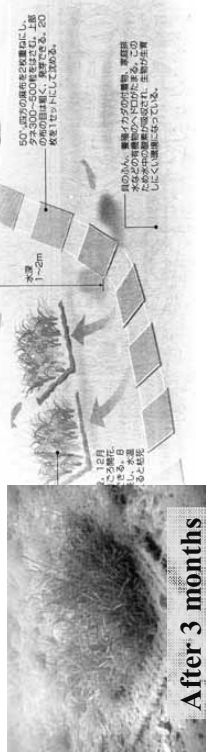
400,000 seeds!



Encase seeds in *Zostera* mat

Advantages of *Zostera* mat

1. All parts are made by natural materials (iron, jute and cotton) Environment-friendly technique.
2. The mats can successively be set from the boat on the sea bottom by connecting with cotton ropes. Low labor costs and no diving efforts.
3. Fisherman can do all procedures of the routine works.

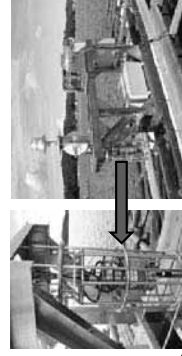


After 3 months

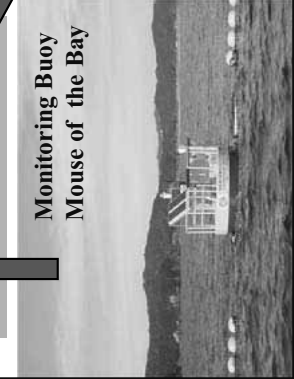
Ago Bay Environmental Monitoring System



Monitoring Buoy Mouse of the Bay



Raft system Inner Bay



<http://www.agobay.jp/agoweb/index.jsp>

Real time service

Internet System

Cellular Phone

Ago Bay Environmental Dynamic Model

Training seminar of using monitoring system for fishermen and residents around Ago Bay



(C) Mie Pref.



(C) Mie Pref.

Committee for the Promotion of Nature Restoration in Ago Bay

Members

- Three groups of NPO around Ago Bay
- Fisherman Unions in Ago Bay (Fisheries, Pearl Oyster Culture)
- Representatives around Ago Bay region
- Staffs of Shima City Office
- Staffs of Mie Prefectural Research Center
- Scientist of Mie University and Yokkaichi University

Total 25 groups and 8 members

Committee for the Promotion of Nature Restoration in Ago Bay from 2008



Aim

This committee was established for reproduce symbiosis relation between Ago-Bay and the citizen through a natural restoration of biologically abundant beautiful bay, which was famous for the cultured pearl and was the center of Ise-Shima National Marine Park.

Committee for the Promotion of Nature Restoration in Ago Bay from 2008



Current works from 2009

1. Support project of establishing Sato Umi by Ministry of Environment of Japan.
2. Health check programs of inner sea by Ocean Policy Research Foundation.
3. Restoration of tidal flat and algal bed in Ago Bay by JST

For the future of Ago Bay

1. Decrease the organic loads from land area .
2. Not to accumulate the organic matter on the bay bottom.
3. Abundance of biological diversity and progress of natural purification capability.
4. Transport organic matter to land ecological cycle from bay area.
5. Take good care of Ago Bay.



Thank you and please come to Ago Bay