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EAS Congress 2009
SATO-UMI WORKSHOP

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

Workshop Report

International EMECS Center

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

CONTENTS

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

Suprapta 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., Pengsakun 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

Tetsuo YANAGI
Kyushu University, Kasuga 816-8580, Japan
tyanagi@riam.kyushu-u.ac.jp

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

Tetsuo YANAGI
Research Institute for Applied Mechanics
Kyushu University
tyanagi@riam.kyushu-u.ac.jp

We have suffered from Minamata desease, 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 leafs 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.



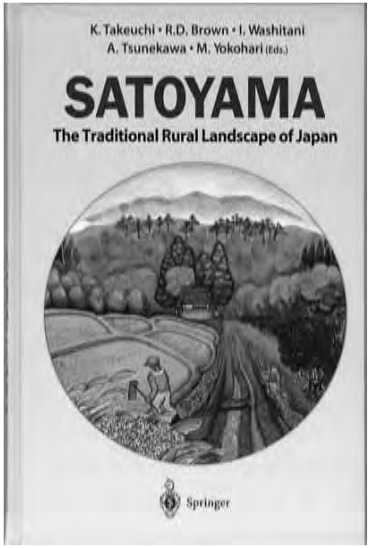
High-biodiversity






Rich flora and fauna

Sato-Yama published in (2001)



Sato-umi

Umi: the sea in Japanese

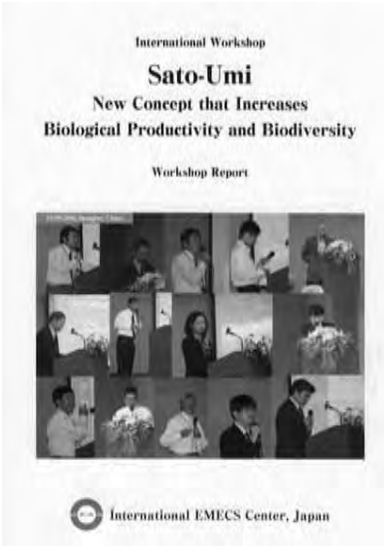
Sato-umi : the coastal sea with high productivity and high biodiversity under the human's interaction.

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

Report

Invited:7
Oral:6
Poster:12



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.Mosse (Pattimura University Ambon, Indonesia) "Sasi laut: History and its role of marine coastal resource management"

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)

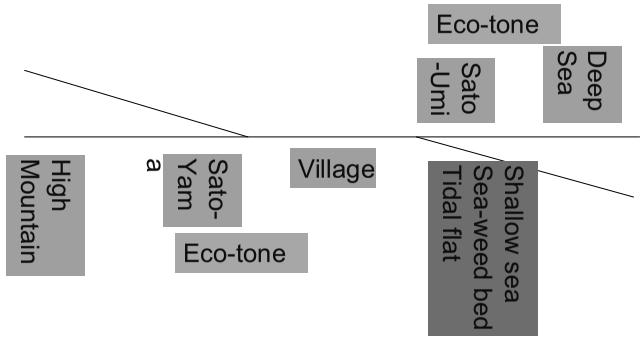
The Shanghai Declaration
October 30, 2008

…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, USA)

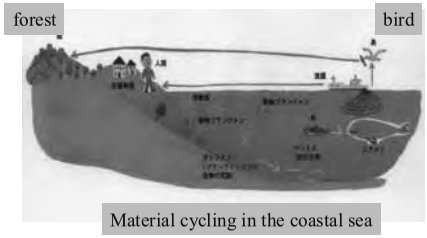
Sato-yama and Sato-umi

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



Material cycling in Sato-umi

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



Material cycling in the coastal sea

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

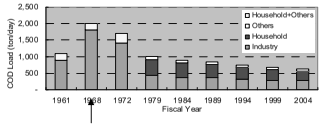
In the eutrophic coastal sea, we have to reduce the nutrient load from the land.

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

Eutrophicated coastal sea

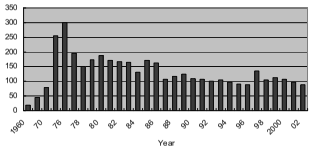
COD load and red tides in the Seto Inland Sea, Japan

COD load



1973: Law on Measures for the Environmental Preservation; COD load decrease to 1/2

Red tides

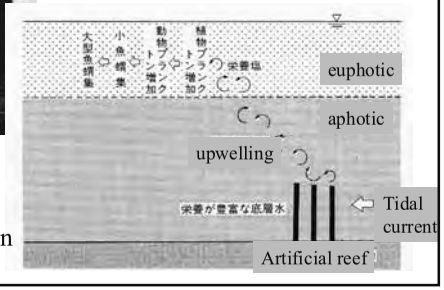


Change in COD load and the occurrence number of red tides in the Seto Inland Sea, Japan

Oligotrophic coastal sea

Artificial upwelling reef

H=10m, L=20m

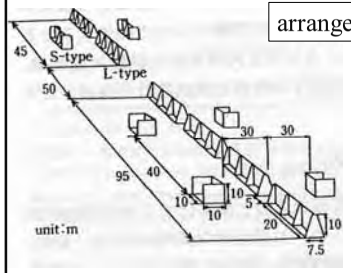


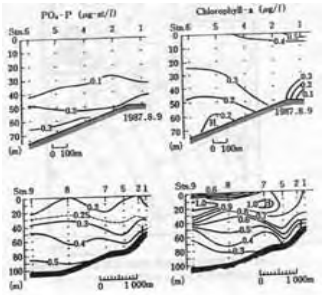
Field experiment was carried out in the Seto Inland Sea, Japan in 1987.

Seto Inland Sea

Effect of artificial upwelling reef

arrangement





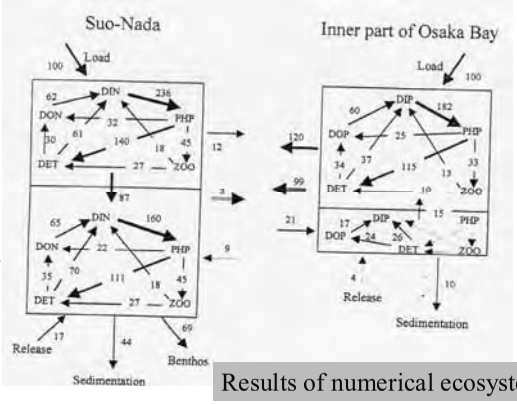
1987 before

1989 after

Yanagi and Nakajima (1991)

Importance of bio-chemical processes

Hayashi and Yanagi (2002)



Nitrogen flux

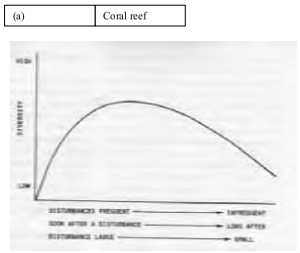
Phosphorus flux

Results of numerical ecosystem model.

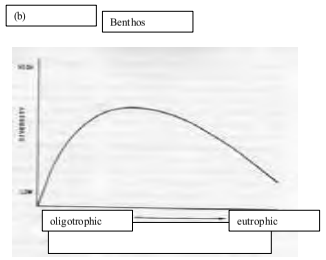
Coastal sea as a habitat

- 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

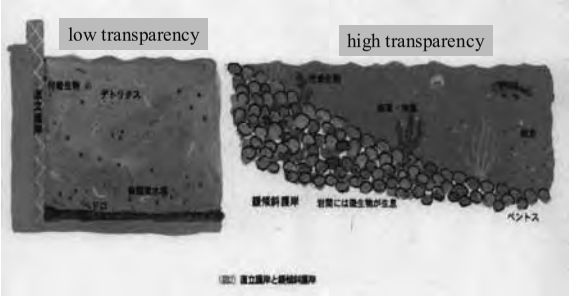


Connell (1978)



Kokubu et al. (2007)

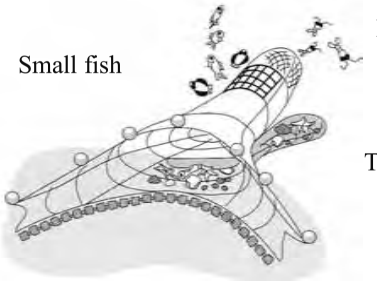
Strait-uplifted coast or gentle-sloped coast



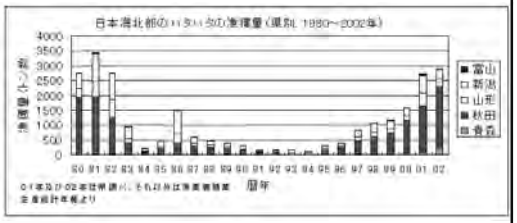
We have to provide good condition for marine life in Sato-Umi.

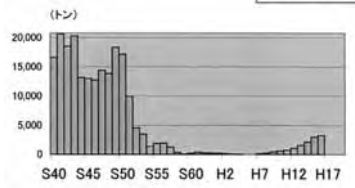
Fish resources management is also very important for the establishment of Sato-Umi.

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-manage 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.

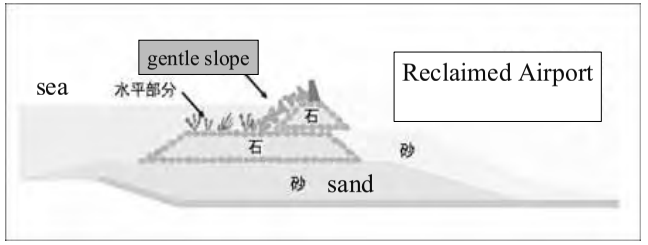
Humanized nature

- Many examples such as gentle-sloped coast of Kansai International Airport

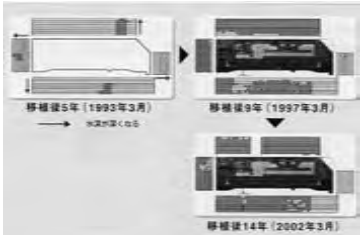
Mud ecosystem has changed to algae-bed ecosystem there by human activity.

Kansai International Airport

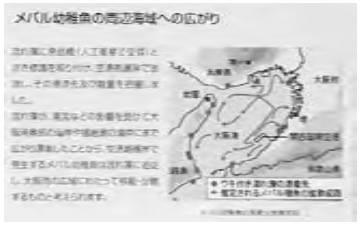
Artificial gentle-sloped coast.



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

表7-1 items of rule

	年度	条項数	道具制限	防火消火	炭焼き	山林巡回	林区の明確化	罰則規定	刈り場所・芝草刈りの範囲・期限	保護掛設置	左記の職務等	制度改正要件	村会議決事項	伐採年齢	伐採方法	伐期規定	枝打間伐技術	土石採取制限	植樹義務	苗圃木育成設置
1877	明治10年規約書	全5ヵ条	○	○	○	○														
1882	明治15年盟約	全5ヵ条	○	○	○	○														
1884	明治17年議案	全17ヵ条	○	○		○	○	○	○	○	○	○	○						○	
1896	明治19年規約	全36ヵ条	○	○		○	○	○	○	○	○	○	○	○	○	○			○	○
1907	明治31年規約	全28ヵ条	○	○		○	○	○	○	○	○	○	○	○	○	○	○	○	○	
	明治42年規約	全33ヵ条	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○

（備考）『大正七年発行　滋賀縣大原村村有林経営方法および成績書』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.

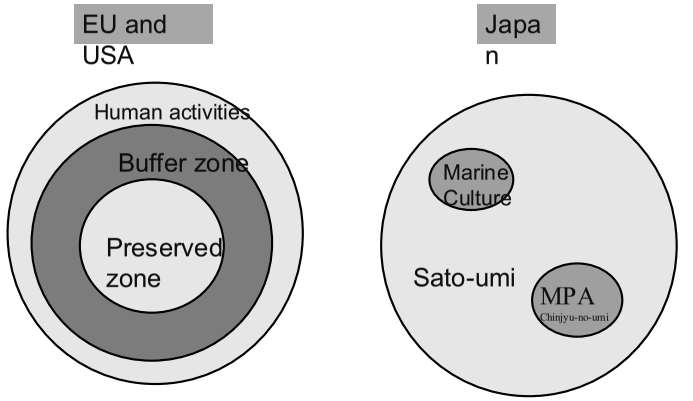
"Sasi" is rules for the natural resources management in the Southeast Asia.

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 huma n and Nature

Appropriate zoning

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

Nutrients cycling

Nutirents (N:P:Si=16:1:16)

Tidal flat
Sea-grass bed
Benthic diatom
phytoplankton
fish

past

Multiple paths
Thick material cycling

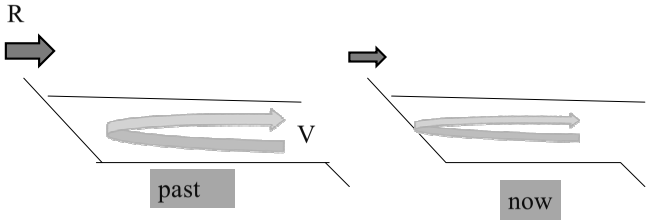
Nutirents (N,P>Si)

Red tide (dinoflagellata)
Hypoxia

now

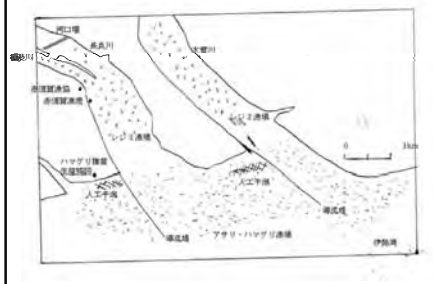
Simple path
Narrow material cycling

Decrease of river discharge due to dam construction



V≒1 OR
Weaken estuarine circulation → Red tide and Hypoxia generation

Artificial Tidal Flat and Clam

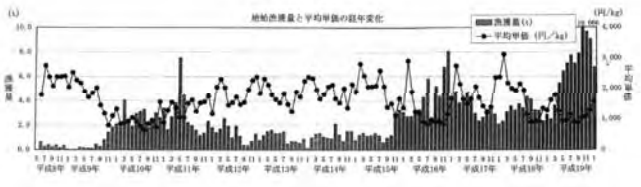


Akasuka Fishermen Union

Culture of clam juvenile

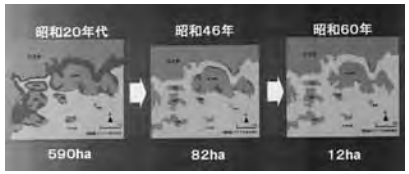
Artificial tidal flat

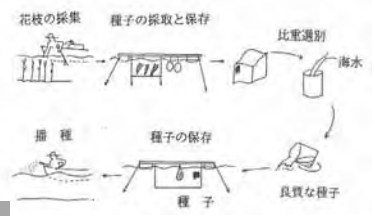
Harvest variation



Year-to-year variations in clam harvest and price

Decrease of sea-grass bed area

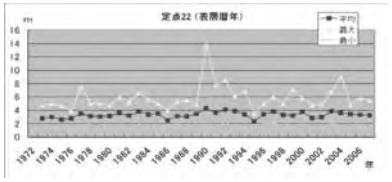




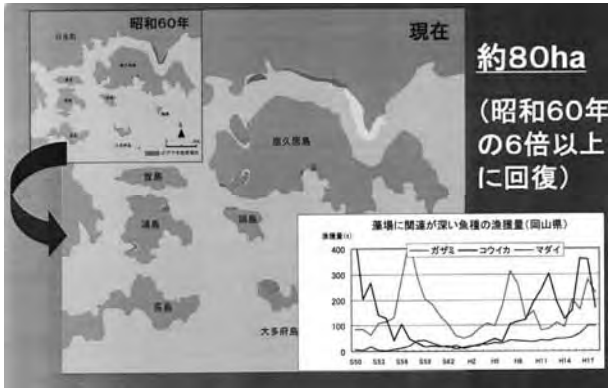
Hinasecho Fihsermen Union

Reproduction of sea-grass bed

Sea-grass bed reproduction areas



Expanding sea-grass bed



Holistic governance from the top of the mountain to the sea

Material cycling

Resource management

Socia system innnovation
(production・consumption)

Change of value

Technology innovation

Fisheries law
Navigation law →unified
Water pollution law

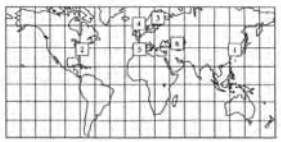
Fishermen and Citizen

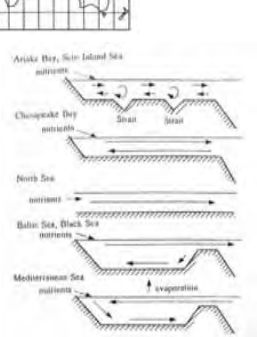
- Fishermen are the main players for the creation of Sato-umi
- However the population of fishermen is only 0.1 % of total population in Japan .
- The close collaboration of fishermen and citizen (99.9%) is necessary for the creation of Sato-umi.
- How ? Under study.

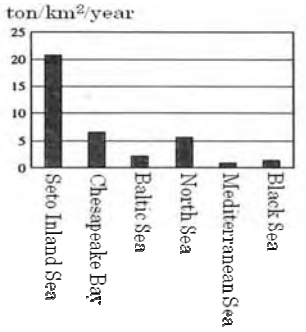
Terra Scientific Publishing Company
2007, 96p.

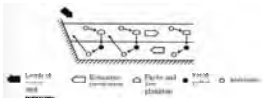
Sato-Umi
－A new concept for coastal sea management－
1.Introduction
2.Mankind and coastal sea
 2.1 Richness of the coastal sea
 2.2 Crisis of the coastal sea
3. Mankind and the forest
 3.1 Sato-Yama
4. Sato-Umi
 4.1 Concept of Sato-Umi
 4.2 Harvest of sea-glass bed
 4.3 New technology
 4.4 Stock enhancement 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.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.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

Anne MCDONALD
Director, United Nations Univ., Institute of Advanced Studies, Operating Unit Ishikawa/Kanazawa,
Hirosaka-chosha 2F 2-1-1, Hirosaka, Japan
annemcdonald65@gmail.com

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.

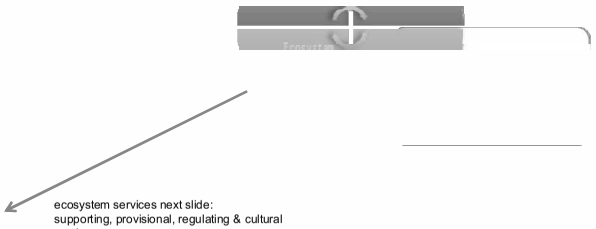
Concepts and practices of SATOYAMA SATO-UMI Sub-Global Assessment in Japan

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

MA Conceptual Framework

(modified from Millennium Ecosystem Assessment 2005)



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

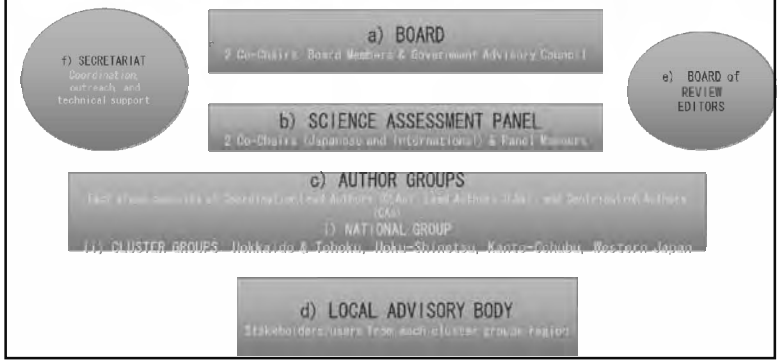
ECOSYSTEM SERVICES the benefits people obtain from ecosystems & constituents of wellbeing

(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)



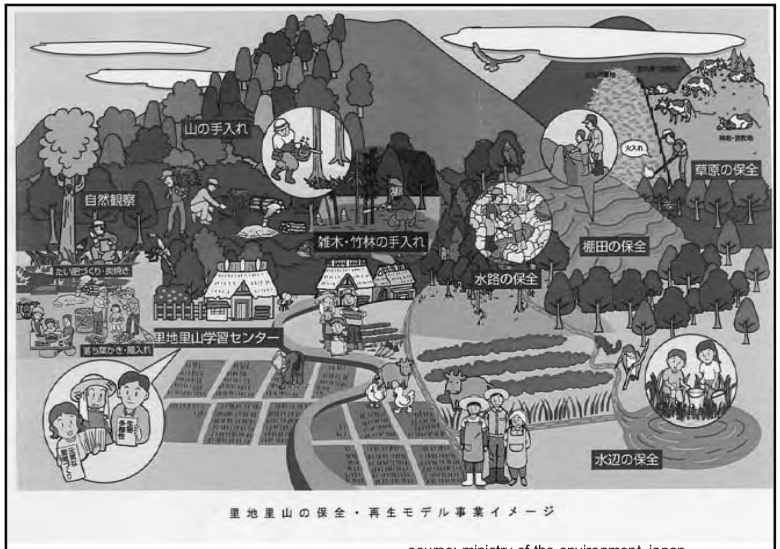
JSGA scoping process:

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 s*atoyama 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.



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 Tsunahide 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.

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

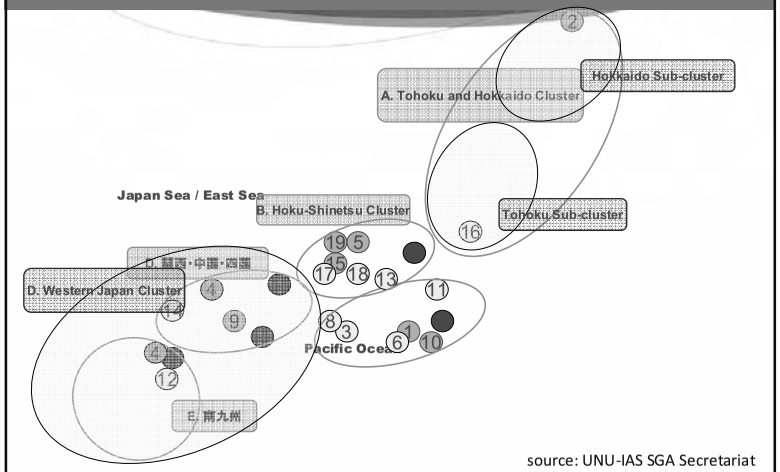
SOME QUESTIONS asked of JSGA contributors:
i) what is the historical context of *satoyama* & *satoumi*?

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?

UNU-IAS led *Satoyama Satoumi* Sub-global Ecosystem Assessment Clusters



source: UNU-IAS SGA Secretariat
CONTACT: Maiko NISHI at UNU-IAS

• integrative approach: involving stakeholders from the beginning: addressing strengths and weaknesses of MA; specifically end-user involvement

•policy maker involvement in data gathering: i) limitations = policy prescriptive dangers, raised 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

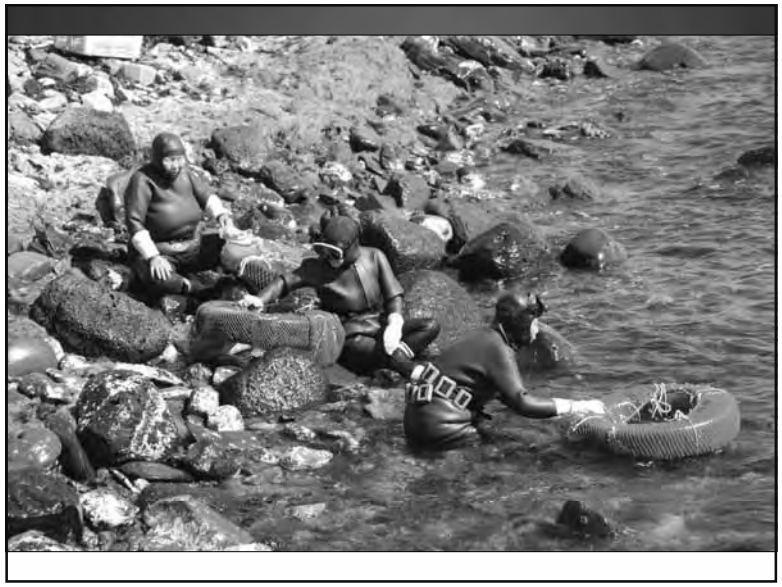
•limited human capacity leads to exploring partnerships with parallel initiatives: i) MOE Sato-umi Creation Project in Nanao Bay, Ishikawa Prefecture—establish steering committee with members from academia, local-based marine environment and fisheries research stations, prefectural and municipal government, 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 Operating Unit and Ishikawa Community Development Division 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 Edpalina Soc-Mon research project in Nanao Bay; environmentally-sound agriculture methods study agricultural impacts on marine ecosystems;

•outreach activities= working with media: i) video briefs production of satoyama and satoumi in 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 and Ethnological study of Ama-san of Hegura and Nanatsu Island

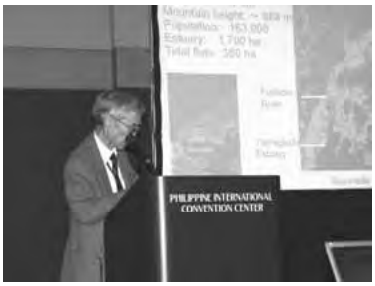

satoyama & *satoumi* interlinkages


sunrise august 2008


舳倉島
海女
ama-san: women free divers of hegura island, ishikawa
hereditary fishing rights & collective resource management



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 km^2, 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.

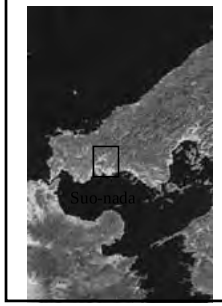
Case of Fushino River Estuary Initiatives in Japan

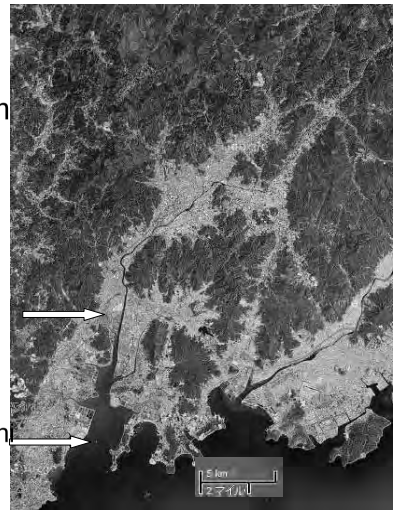
Masao Ukita*, Masahiko Sekine*,
and Hajime Yamano**

*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 km^2
Length : 30.3 km
Mountain height: ～ 688 m
Population: 163,000
Estuary: 1,700 ha
Tidal flats: 350 ha





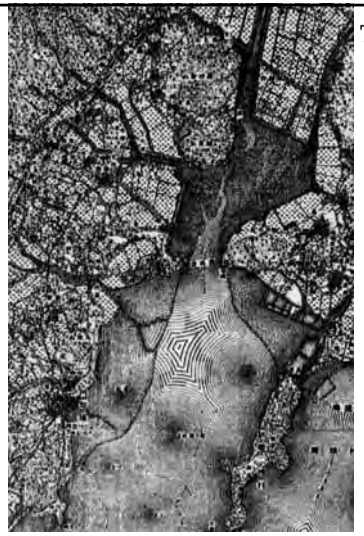
Suo-nada Google

Over view from Yamaguchi estuary to Fushino river basin

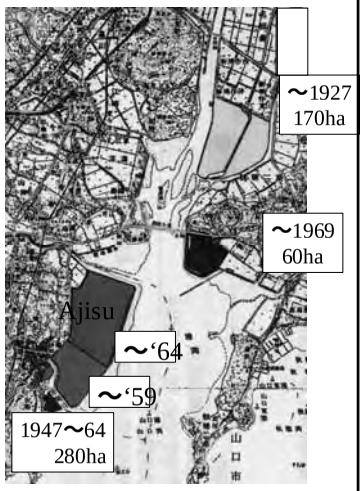
There are wide tidal flats Naka-gata, Shinchi-gata and Minami-gata etc, totally 350 ha. We can find many kinds of bird, and endangered species horseshoe crabs are still alive.

Changes of the river basin

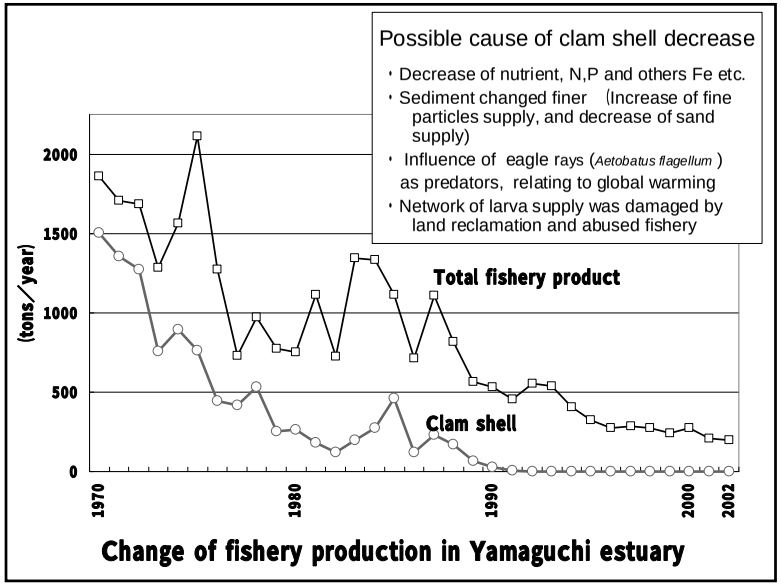
- Population increase 117,000(‘60) → 163,300(’00) ,mainly causing to the 3rd industries. While population working in the 1st industries decreased.
- Farmland decreased with urbanization.
  Paddy field 70 km^2 (1965) → 30 km^2 (2000)
- Agriculture: modernized (irrigation system, machinery use)
- Sewage 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.



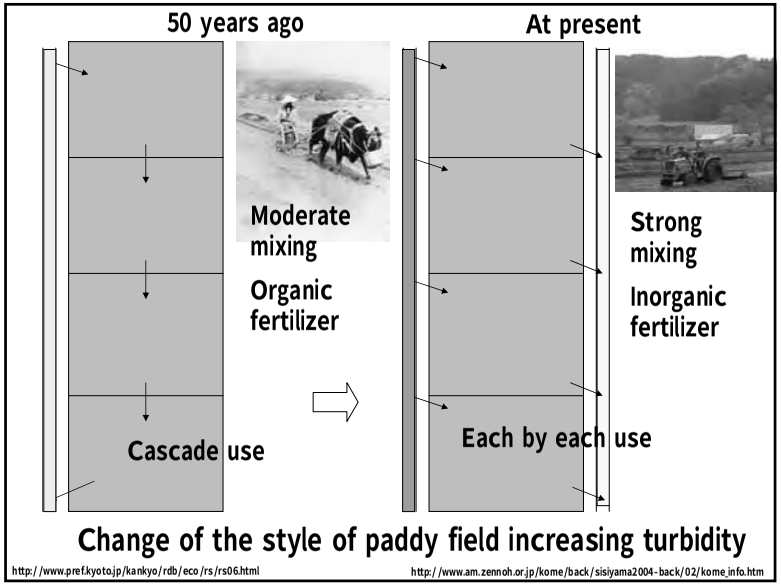
Topographic map in 1902



Land reclamation area and period



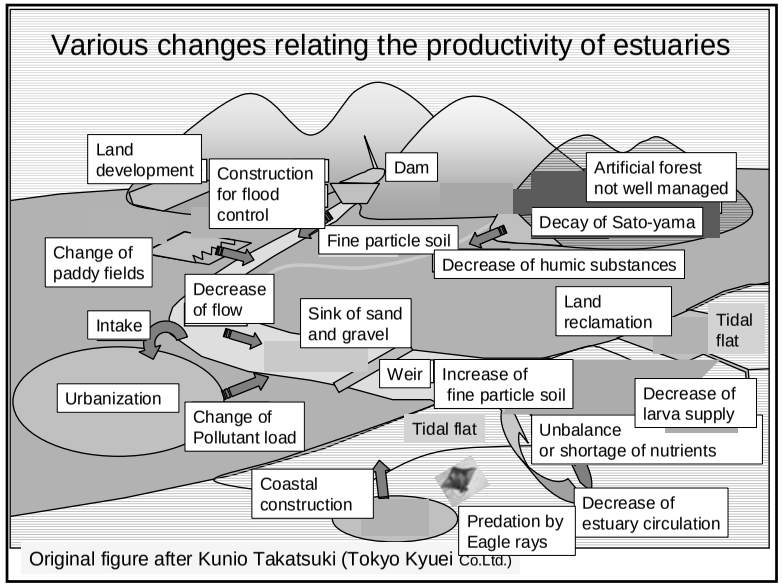
Change of fishery production in Yamaguchi estuary

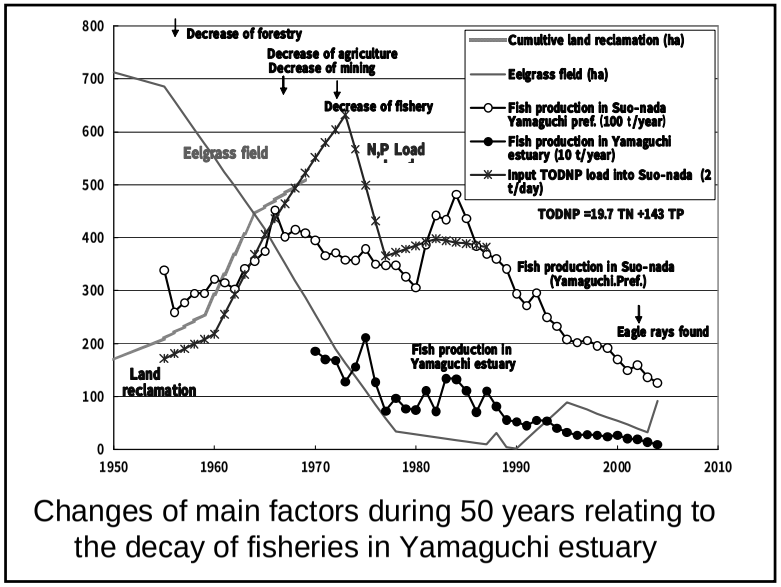


Change of the style of paddy field increasing turbidity

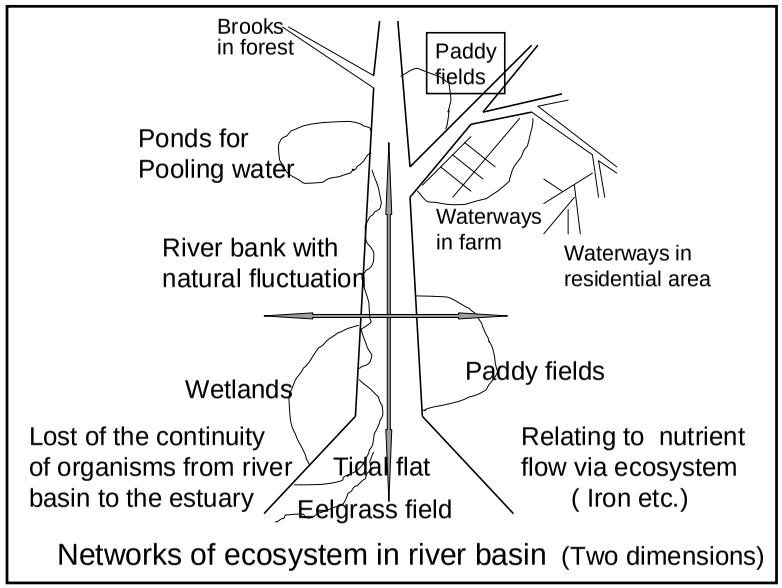
http://www.pref.kyoto.jp/kankyo/rdb/eco/rs/rs06.html

http://www.am.zennoh.or.jp/kome/back/sisiyama2004-back/02/kome_info.htm

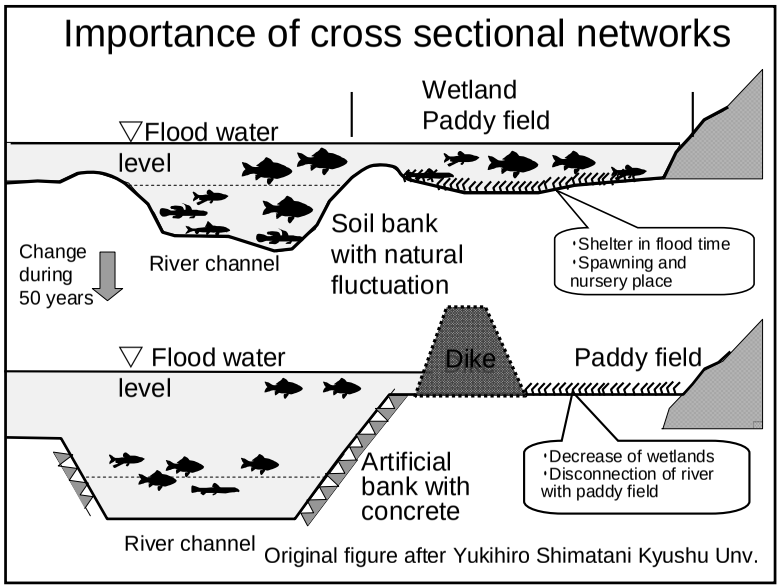




Changes of main factors during 50 years relating to the decay of fisheries in Yamaguchi estuary

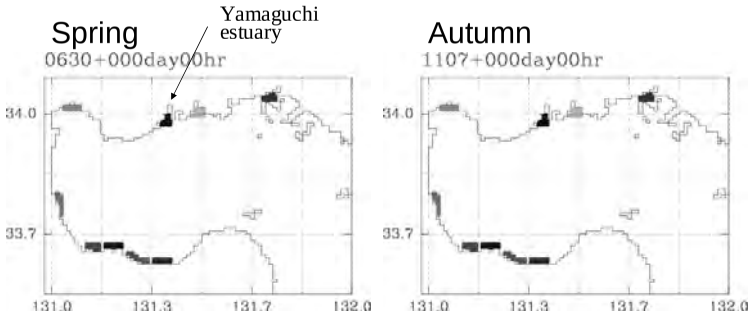


Networks of ecosystem in river basin (Two dimensions)



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

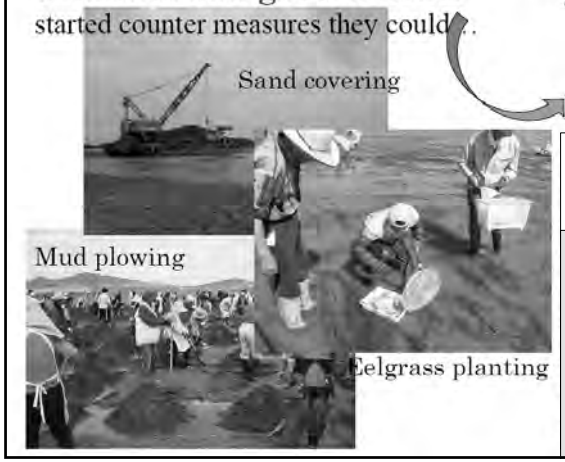
After N.Tezuka (National Research Institute of Fisheries and Environment of Inland Sea)

Similar situations were experienced in restoring eelgrass field though of smaller scale.

Adaptive cooperative management

Citizenes and governments

started counter measures they could.



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

Researchers

Study on the causes and the effectivenes 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

Miyuki MAEGAWA and Hideto URANAKA
514-8507, Mie University, 1577 Kurimamatiya, Tsu, Mie, Japan
maegawa@bio.mie-u.ac.jp

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 pear 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.

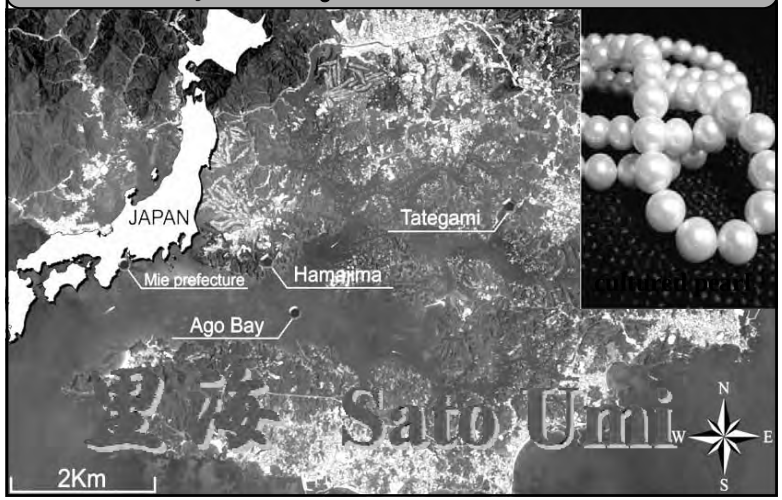
After the project, environmental research center for closed sea was opened in fisheries research station of Mie prefecture, and worked as total managements and developing of the results of this project as an aspect of the administrative measure of Mie prefectural office. In addition, committee for the 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.

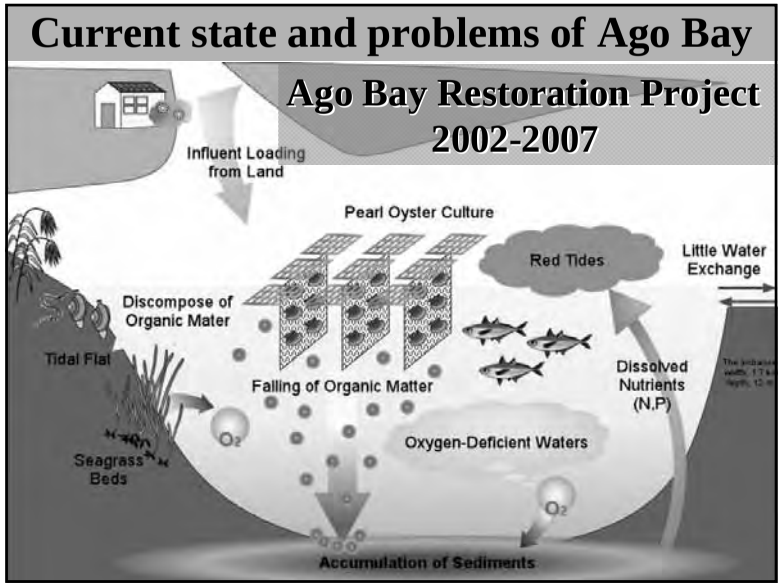
Around Ago bay area, social and economical circumstances changed drastically in recent years. Then, biological circulations and purification cycles were damaged by the excessive organic loads accumulating in the bay. Nowadays, we must have actions for symbiosis between natural environment and industry 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

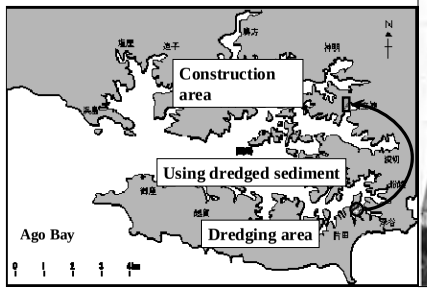


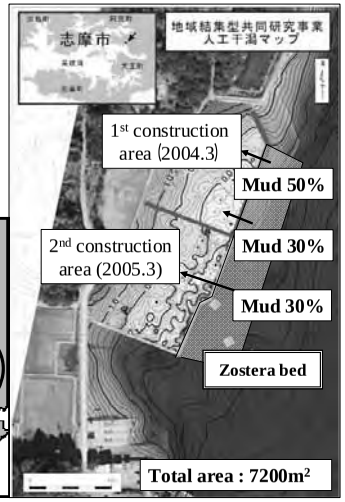
Current state and problems of Ago Bay



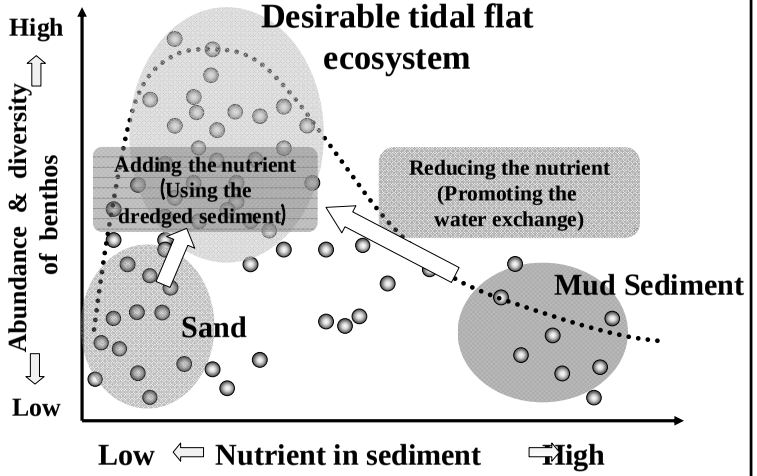
Construct Large Scale Artificial Tidal Flat

- Area : 7200 m²
- Ground level : DL+1.2～-0.8 m
- Slope : 2.5 m / 50 m
- Mixing ratio : 30%，50%





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

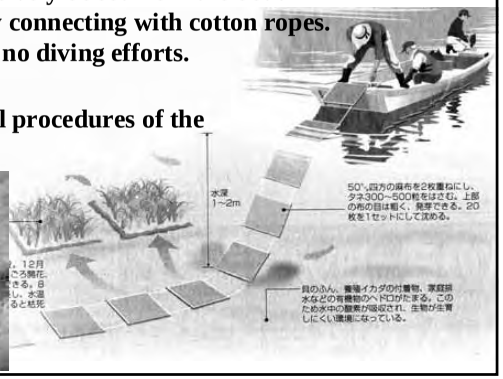
Advantages of *Zostera* mat

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.

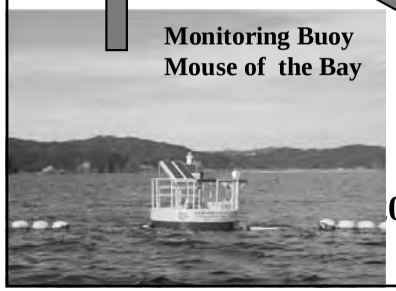
3. Fisherman can do all procedures of the routine works.

After 3 months



Ago Bay Environmental Monitoring System

Monitoring Buoy
Mouse of the Bay



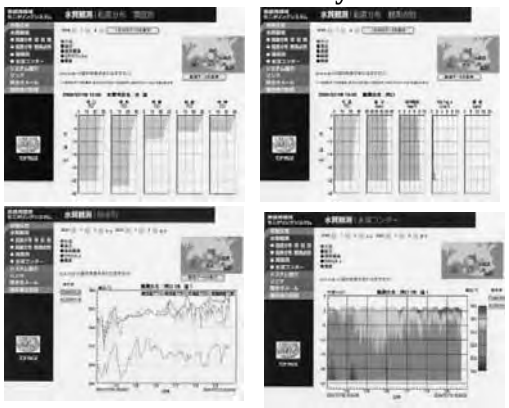
Raft system
Inner Bay

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

Real time service

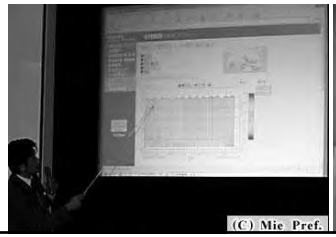
Internet System

Cellular Phone



Ago Bay Environmental Dynamic Model

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



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 citiz through a natural restoration of biologically abundant beautiful bay, which was famous for the cultured pe and was the center of Ise-Shima National Marine Park.

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

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

POTENTIAL OF URBAN WETLAND AS A TARGET OF HABITAT RESTORATION AND MANAGEMENT

Keita FURUKAWA
National Institute for Land and Infrastructure Management, 3-1-1, Nagase, Yokosuka, 239-0826, Japan
Furukawa-k92y2@ysk.nilim.go.jp

To restore the coastal habitat, surrounding dynamic coastal ecosystem (wetland system) also needs to be restored. Nevertheless, coastal wetlands are decreasing in alarming rate. It is unable to reverse the tendency unless changing fundamental causes such as uncontrolled economical development, excess use of resources, and lack of public interest. Nevertheless, it should not be a choice of "this or that". One way to implement breakthrough measures can be the restoration of wetlands in urban area using sound ecological engineering to incorporate the restoration and the development. Now Japan is trying to implement such an "urban wetland" solution by both top-down and bottom-up approach.

The top-down approach: The Tokyo bay renaissance promotion conference has enacted a mid-term action plan (ten years since 2003). The plan put a target as "restore the beautiful coastal environment for enabling pleasant use and sustaining biodiversity as a wealth of capital". The restoration of coastal wetland as a habitat is one of a prioritized action in the plan. The urban wetlands to be restored or managed have been listed up as "appeal points". The appeal point is monitoring point for assessing the achievement of the target. These structures of the target setting to assessing the plan enable to facilitate an adaptive management for the urban wetland implementation. These kinds of action plans have been set not only Tokyo Bay but also Osaka, Ise-mikawa, and Hiroshima Bays as a part of the national bay renaissance project.

For example, the "Shibaura-island's habitat creation project" has been implemented as a collaborative practice with local governments, researcher, and NPO to make an urban wetland for entertaining local residences in Tokyo Bay. The project has been supported by estuarine system research surrounding environment and structural consideration to sustain the suitable habitat quality. In Osaka Bay, the other practice has been ongoing. That is a collaborative research project at constructed wetland in the appeal point in Osaka Bay renaissance project. The targets of the research were habitat structural design in detail, and material selection for the rich biodiversity in the habitat.

Both urban wetlands have given good practice of adaptive management.

The bottom-up approach: Under these circumstances, situation understanding, target setting, research and development, and systemizing have been discussed and implemented for coastal habitat restoration by different sectors and organizations.

For example, a new terrace type wetland constructed by a governmental construction office in Yokohama. A public participate monitoring and maintenance practice is ongoing. An urban wetland park was planned by private development sector in Yokohama MM21. A NPO has designed management plan for the urban park with local residences, and organized a series of participatory classes. In Odaiba marine park in Tokyo, constructed by Tokyo metropolitan government, a primary school is operating environmental education program incorporate with a consortium of parents, NPO, government, and local fishermen. These wetland restorations have given chance to various sectors for participation.

POTENTIAL OF URBAN WETLNAD

AS A TARGET OF HABITAT RESTORATION AND MANAGEMENT

NILIM
National Institute for Land and Infrastructure Management

Keita Furukawa, NILIM, Japan

Bay Renaissance Project

東京湾環境情報センター Tokyo Bay Environmental Information Center

東亜建設工業 TOA CORPORATION

鹿島

PENTA-OCEAN CONSTRUCTION CO.,LTD

東洋建設

若築建設

鉄鋼スラグ協会 Nippon Slag Association

TAIHEIYO CEMENT

Tanaka

お台場環境教育推進協議会 umibay.cocolog-nifty.com

Odaiba Environmental Education Promotion Committee

UR都市機構

東京港埠頭株式会社

MLIT Ministry of Land, Infrastructure, Transport and Tourism

Tokyo Gyoren

Koyo Elementary School

東京都

港区 MINATO CITY

Association for Shore Environment Creation

Association of Banzu Satoumi

Urban Area: Mixture of Use

It should implement 'Wise use' concept in a balance of environmental conservation and development.

It can be an urban type "*Sato umi*"

Population:	26 million
Industries:	20-30% of Japan
Surface Area:	1,000km^2
Water Shed:	7,500km^2
Ave. Depth:	15m
River Discharge:	8-12x10^9 t/year
Load of N:	1.1x10^5 t/year

The top-down approach for Urban Wetland Restoration

Action Plans for Tokyo Bay Renaissance

Bay Renaissance Project

The Committee (Decision Maker)

Represented by Bureau Managers of Related Ministries and Local Governments (30)

Secretariat of the Committee (Decision Making Process)

Represented by Section Chief of Related Bureau (30)

Goal: Restore the beautiful coastal environment for enabling pleasant use and sustaining biodiversity as a wealth of capital.

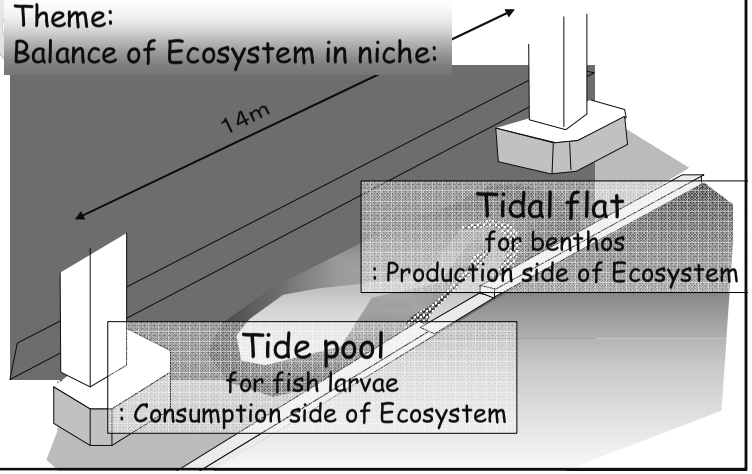
WG2: Sea

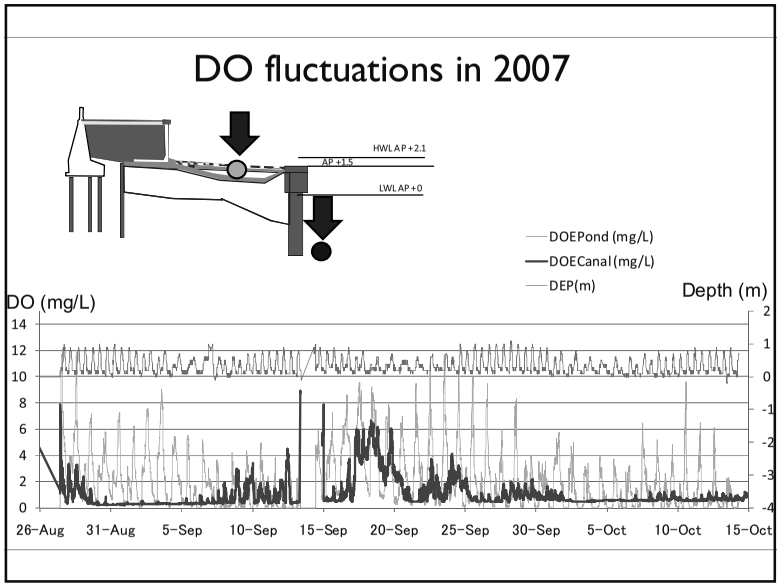
WG3: Monitoring

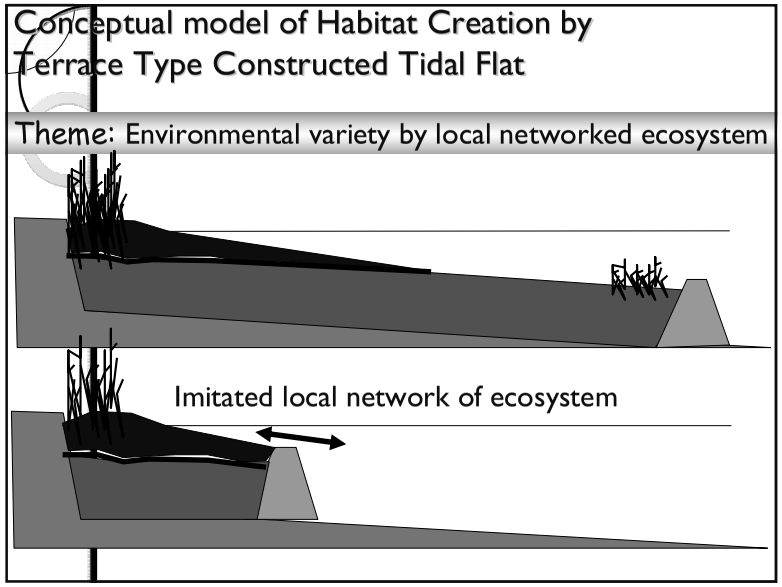
Tokyo Bay Renaissance Project, 28th March 2003 :10 years action plan

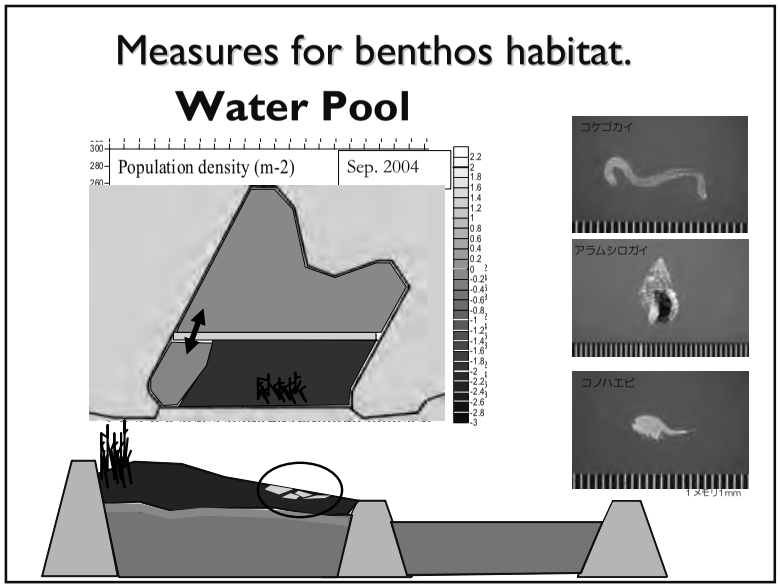
Conceptual model of Habitat Creation on Seawall

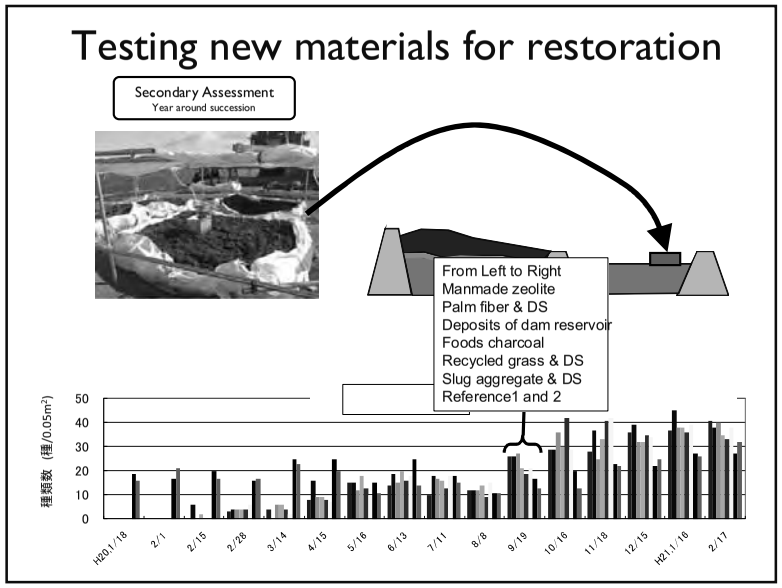
Theme:
Balance of Ecosystem in niche:




DO fluctuations in 2007
HWL AP +2.1
AP +1.5
LWL AP +0
DOEPond (mg/L)
DOECanal (mg/L)
DEP(m)
Depth (m)
DO (mg/L)
14
12
10
8
6
4
2
0
2
1
0
-1
-2
-3
-4
26-Aug
31-Aug
5-Sep
10-Sep
15-Sep
20-Sep
25-Sep
30-Sep
5-Oct
10-Oct
15-Oct


Conceptual model of Habitat Creation by
Terrace Type Constructed Tidal Flat
Theme: Environmental variety by local networked ecosystem
Imitated local network of ecosystem

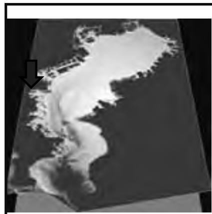

Measures for benthos habitat.
Water Pool
Population density (m-2)
Sep. 2004
コケゴカイ
アラムシロガイ
コノハエビ

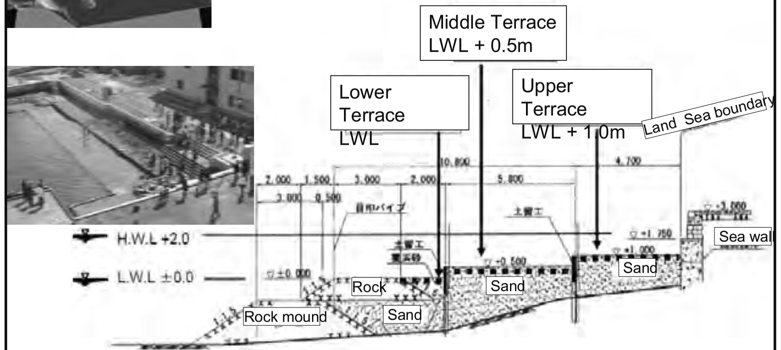

Testing new materials for restoration
Secondary Assessment
Year around succession
From Left to Right
Manmade zeolite
Palm fiber & DS
Deposits of dam reservoir
Foods charcoal
Recycled grass & DS
Slug aggregate & DS
Reference1 and 2
種類数（種/0.05m²）
50
40
30
20
10
0
H20.1/18
2/1
2/15
2/28
3/14
4/15
5/16
6/13
7/11
8/8
9/19
10/16
11/18
12/15
H21.1/16
2/17

The bottom-up approach for Urban Wetland Restoration

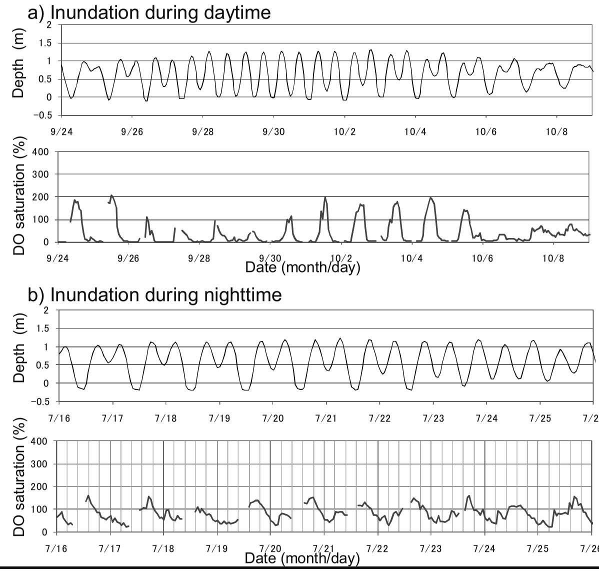
Terrace Type Tidal Flat

BENTHIC HABITAT RESTORATION ALONG SEAWALL

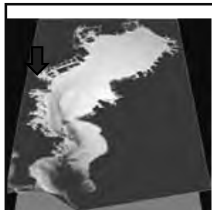




Yokohama Port and Airport Technology Investigation Office

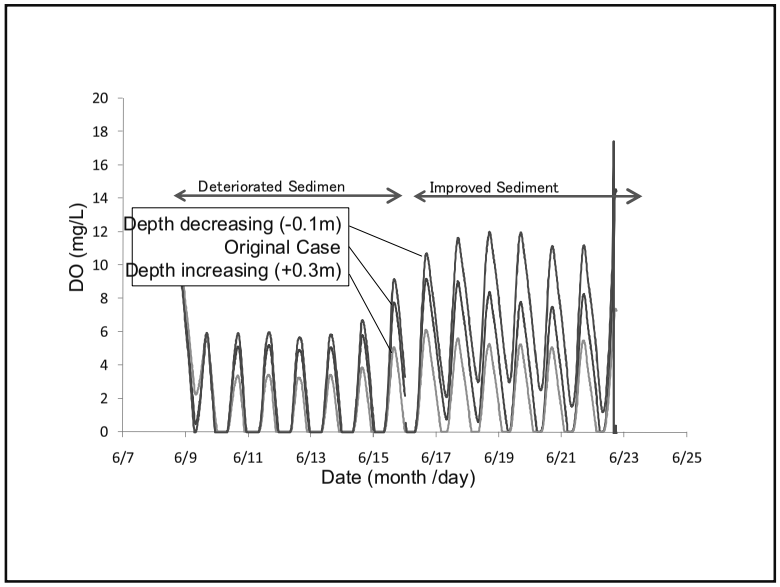


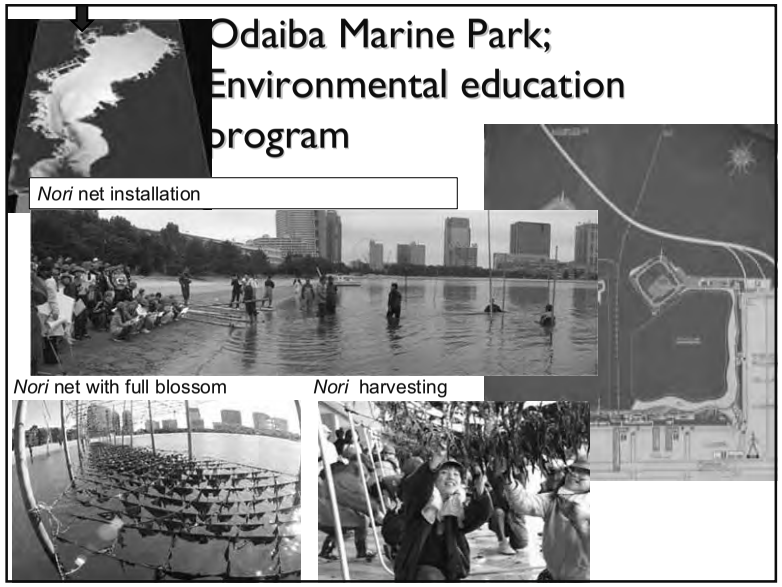
New Park Planning at Katabira River (帷子川) Mouth with Public Participation

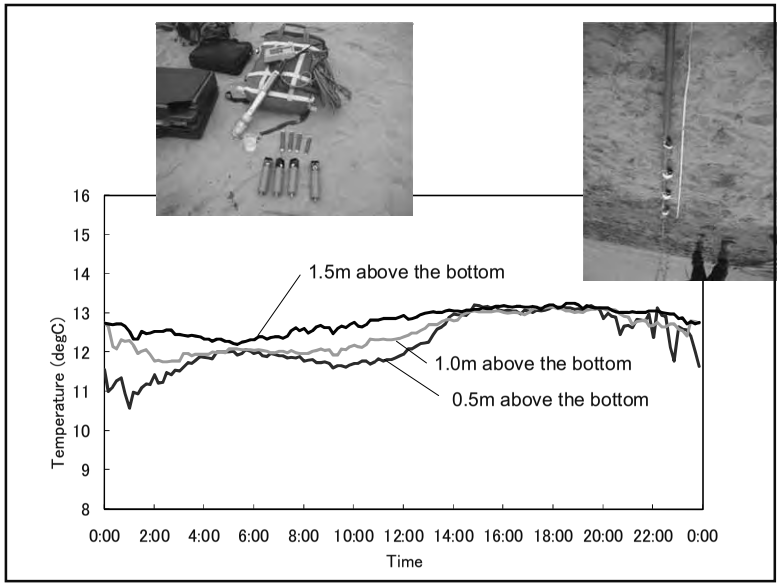


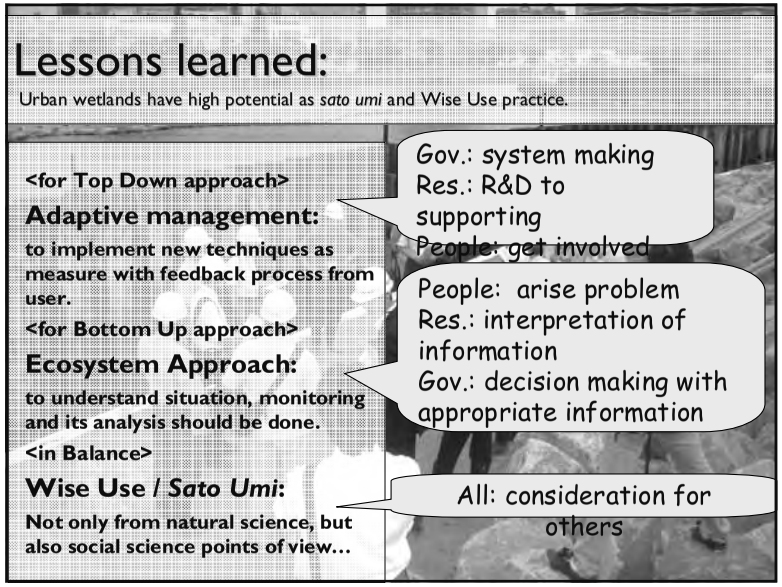
High Tide

Close up view of Terrace and Tide Pool


Deteriorated Sedimen
Improved Sediment
Depth decreasing (-0.1m)
Original Case
Depth increasing (+0.3m)
DO (mg/L)
Date (month /day)
6/7
6/9
6/11
6/13
6/15
6/17
6/19
6/21
6/23
6/25


Odaiba Marine Park;
Environmental education
program
Nori net installation
Nori net with full blossom
Nori harvesting


1.5m above the bottom
1.0m above the bottom
0.5m above the bottom
Temperature (degC)
Time
0:00
2:00
4:00
6:00
8:00
10:00
12:00
14:00
16:00
18:00
20:00
22:00
0:00


Lessons learned:
Urban wetlands have high potential as sato umi and Wise Use practice.
<for Top Down approach>
Adaptive management:
to implement new techniques as measure with feedback process from user.
<for Bottom Up approach>
Ecosystem Approach:
to understand situation, monitoring and its analysis should be done.
<in Balance>
Wise Use / Sato Umi:
Not only from natural science, but also social science points of view…
Gov.: system making
Res.: R&D to supporting
People: get involved
People: arise problem
Res.: interpretation of information
Gov.: decision making with appropriate information
All: consideration for others

COMMUNITY-BASED SEA GRASS BED RESTORATION AND MANAGEMENT IN SETO INLAND SEA: CASE OF AKOU COAST IN JAPAN

Osamu MATSUDA
Hiroshima University (Professor Emeritus),
Hachihonmatsu-Minami 6-8-13,
Higashi-Hiroshima 739-0144, Japan
matsuda036@go3.enjoy.ne.jp

Akou Coast located in the westernmost part of Hyogo Prefecture, Japan is one of representative sites for environmental restoration in Seto Inland Sea based on the concept of Sato-umi which is a currently topical term referring to coastal ecosystems with harmonized human interaction under community-based management. Since variety of activities on the environmental restoration and education has been developed in this area, local people and varieties of stakeholders joined the community-based or co-management activities. Among variety of activities, an activity on the conservation of Chikusa River watershed and an activity on sea grass bed restoration by marine divers are typical examples. Recently, these activities are integrated as a part of Sato-umi project in Akou Coast which Ministry of the Environment as central government, local government of Hyogo Prefecture as well as the municipality of Akou City supported.

Major targets of this Sato-umi project in Akou Coast are restoration of the deteriorated eel grass bed and unique shore vegetation along the coast. Restoration of decreased resource level of short-neck clam and promotion of environmental education are also important parts of the project. Among many related activities, achievement attained by Misaki elementary school is one of the highlights in which school children raised seedlings of eel grass and planted them in the targeted area after the frequent observation of the environment and ecosystem of Akou Coast.

During the progress of the Sato-umi project, many regional meetings were held in order to share the basic idea of the restoration based on the concept of Sato-umi. On the occasion of Sato-umi Symposium in Akou held in March, 2009, many people of community-based activity groups assembled at Akou City Hall, and discussed about future plan. This indicated the strong involvement of a variety of relevant persons, group and others in Sato-umi project. With a view to materializing future plans, the establishment of an Akou Coast Sato-umi Committee for co-management centered on Akou area is now within reach.

Historically, Akou Coast was well known for traditional salt making industry and local people had made a good use of shallow coastal area. A part of the old salt pan is converted to the public Seashore Park by the prefectural government, in which the Salt Industry Museum was founded. Since the Seashore Park is one of the activity center for the local people, combined activity of Sato-umi project with the Seashore Park is also expected.

The East Asian Seas Congress 2009

Partnerships at Work: Local Implementation and Good Practices

T3:2-Indigeneous Approaches to Habitat Protection and Restoration: Experiences in *Sato Umi* and Community Initiatives

Community-based sea grass bed restoration and management in Seto Inland Sea: Case of Akou coast in Japan

Osamu MATSUDA

Hiroshima University (Professor Emeritus)

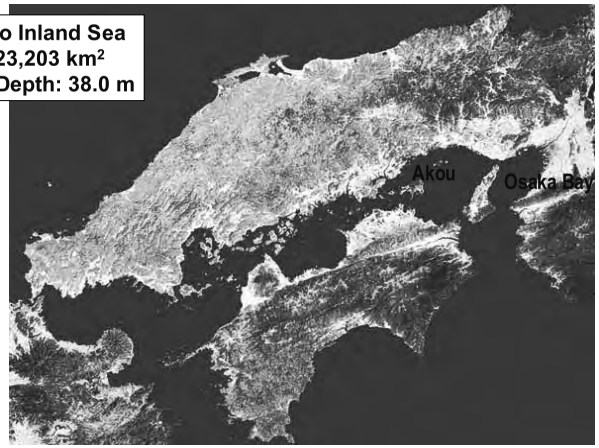
Nov. 24, 2009, Manila, Philippines

Outline

- The Seto Inland Sea: brief history
- Why *Sato-Umi* now?
- Legal frame of *Sato-Umi*
- *Sato-Umi* activity in Akou area
- Towards new type of ICM: possibility of combined management of *Sato-Yama* and *Sato-Umi*

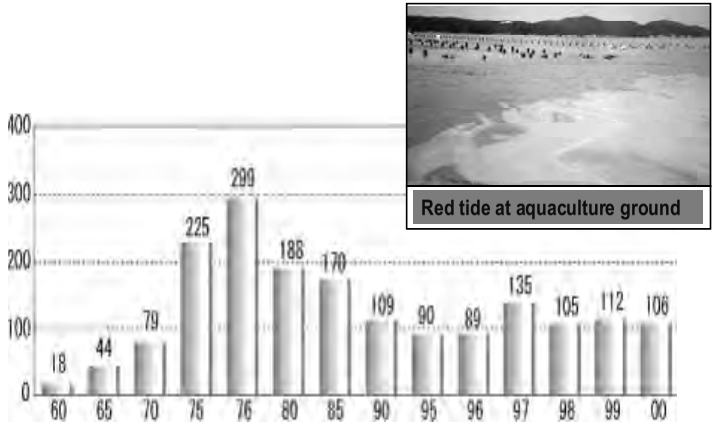
The Seto Inland Sea as the largest enclosed coastal sea in Japan

The Seto Inland Sea
Area: 23,203 km^2
Mean Depth: 38.0 m

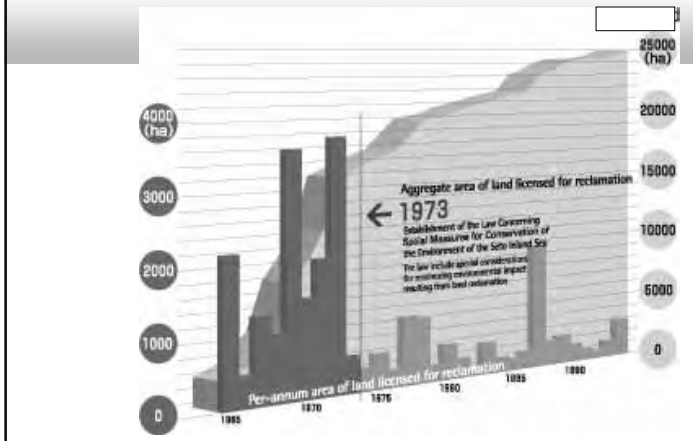


Seto Inland Sea suffered from serious water pollution since mid 1960s

Mass mortality of yellow tail by red tide in aquaculture ground

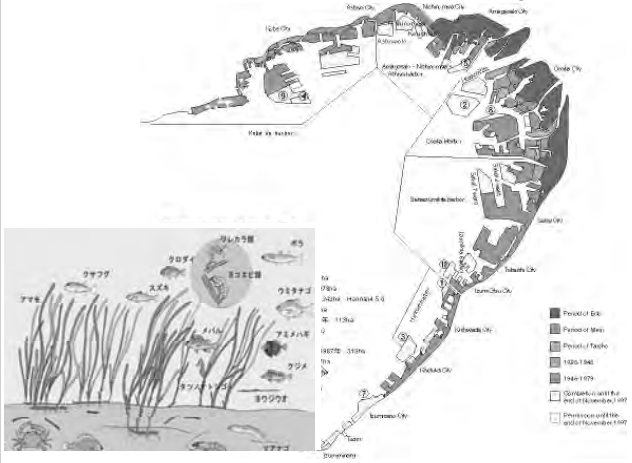


Number of occurrence of red tide observed in the Seto Inland Sea decreased after mid 70s mainly due to TPLC

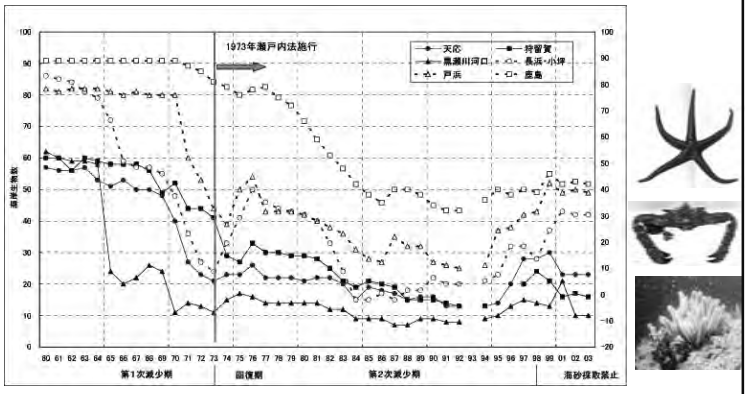


The areas for which land reclamation have been authorized in the Seto Inland Sea is still increasing

Result of land reclamation in Osaka Bay area



Actually, no natural coastline and shallow area at all !

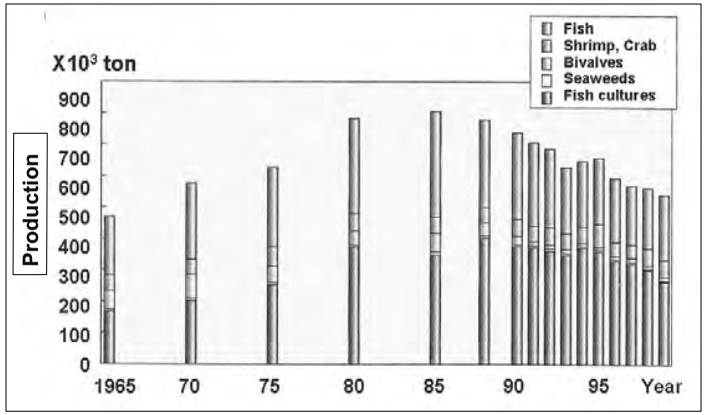


Changes in species number of seashore animals along the coast of Kure area in the Seto Inland Sea

(Yuasa)

Fishery production in the Seto Inland Sea

(SECA, 2001)



Brief History of the Seto Inland Sea

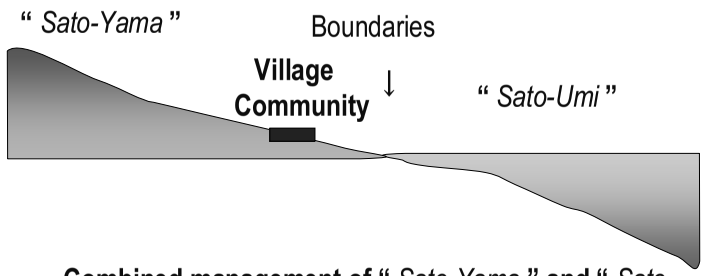
The Seto Inland Sea has long history in which many kinds of ecosystem services have been provided. However, serious water pollution and deterioration of ecosystem occurred during the rapid economic growth of mid-1960s to mid-70s.

Among many countermeasures, area wide total pollution load control (TPLC) system in terms of COD, TN and TP has played an important role on the improvement of water quality.

However, deterioration of habitat and living resources have not yet been recovered.

And therefore, environmental management of the Seto Inland Sea has gradually sifted recently from water pollution control to the wider goal such as creation of *Sato-Umi* which includes the restoration of habitat and well balanced nutrient cycle between land and sea, conservation of biodiversity and biological productivity.

Conceptual view of " *Sato-Yama* " and " *Sato-Umi* "



Combined management of " *Sato-Yama* " and " *Sato-Umi* " is more effective from the view point of material flow and integrated coastal management (ICM)

Historical evidence on the communication between *Sato-Yama* and *Sato-Umi* in Japan

Legend of *Umi-hiko* and *Yama-hiko*

- Communication between marine-people and mountain-
- people. They exchanged their products each other.

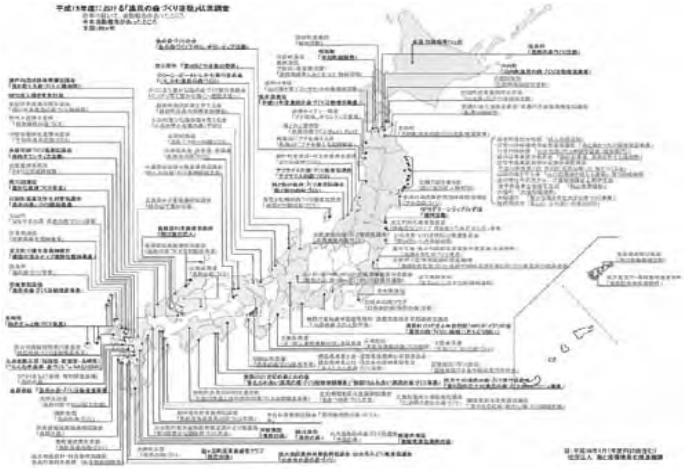
■*Uo-tsuki-rin* (Fish-Breeding Forest)

- Literal meaning: forest associated with fish, forest which
- attracts fish. Forest along the coast has been historically
- protected by the local people in order to conserve coastal
- marine environment and living resources. The law on the
- conservation of *Uo-tsuki-rin* was established more than
- 100 years ago (in 1897).

Signboard of *Uo-tsuki-rin* on the coast of near Akou

In this *Uo-tsuki-rin* (Fish-Breeding Forest), forest is highly protected

"Reforestation by fisherman" is very active in Japan



Existing boundaries between *Sato-Yama* and *Sato-Umi*

- ■Legal boundary
- ■Administrative boundary
- ■Geographical boundary
  - Community boundary
  - Historical boundary
  - Occupation boundary (ex. forestry vs fisheries)
  - Traditional boundary
  - Psychological boundary
  - Academic boundary

ICM has been proposed but little progress so far

Recent change in legal and institutional frame

- ICM has been officially introduced very recently:
  Basic Ocean Law in 2007
  Basic Ocean Plan in 2008 with includes the concept of *Sato-Umi*
  These include comprehensive management of watershed and coastal waters beyond the border of administrative sectors. Basic Ocean Plan is promoting the implementation of *Sato-Umi* .
- However, implementation of ICM is making little progress mainly due to strong bureaucratic sectionalism.
- *Sato-Umi* as a part of national strategy (2007)
  Ministry of the Environment is promoting creation of *Sato-Umi*
- There are some many local activities combining *Sato-Umi* and *Sato-Yama* beyond existing boundaries.

Activity on the Creation of *Sato-Umi* in Western Harima Area

Coordination by: Special Committee
Supported by: MOE, Hyogo prefecture, Akou & Aioi city
Site: Western coast of Harima-Nada area, Hyogo prefecture

Restoration of coastal area as *Sato-Umi*

Time table
Before FY2007: Variety of individual local activities
FY2007: Special Committee by specialists, field survey
FY2008: Local meeting, symposium
FY2009: Local organization by variety of stakeholders

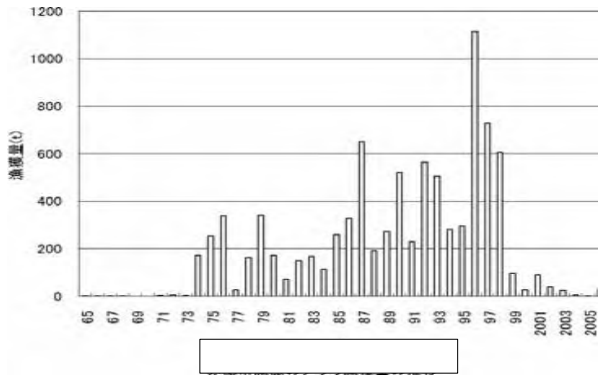
Restoration of artificial coastline (Sakoshi)

Recreation by local people

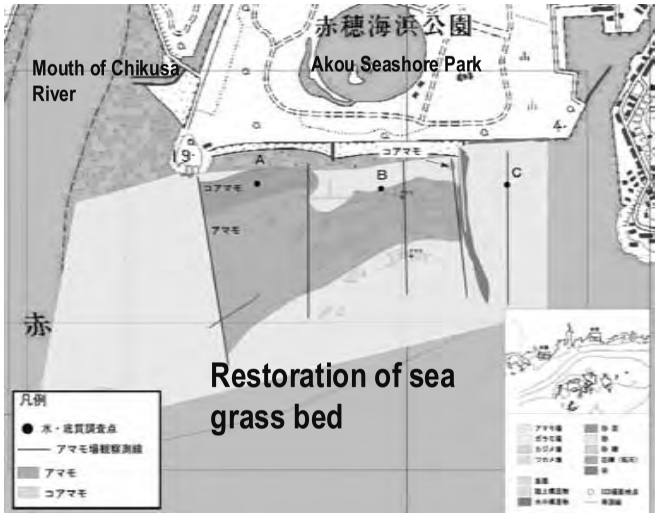
Combined activities of Akou coast and Chikusa River watershed restoration (collaboration among variety of stakeholders)

1. Restoration of sea grass bed:
   Umikko (Seaborn Child) Club, Misaki Elementary School, Ozaki Elementary School, Seed Bank of Eel Grass
2. Restoration of Chikusa River watershed:
   Committee on Clean Chikusa River Watershed
3. Supported by Ministry of the Environment, Hyogo prefecture, Akou City

Catch of Manila clam at Karasen tidal flat in Akou coast



(Hyogo prefecture)



Restoration of sea grass bed

図5. 6. 4　アマモ増殖活動

Participatory activities of school children to restore sea grass bed in *Sato-umi* project which is connected with conservation of Chikusa river watershed

図5.6.5千種川河口干潟

Community-based activities connecting rivers and coastal areas

図5. 6. 6千種川中流域

Performance by the school children of Misaki Elementary School on *Sato-Umi*

Field experiences in Chikusa River

Management of deteriorated forest is also included in this project

Conclusive Remarks

During the age of recent 40 years, shallow areas, in particular of tidal flat and sea grass bed have been drastically lost in the Seto Inland Sea mainly by land-based human impact. Therefore, combined restoration of watershed and coastal area is essential for coastal management. Community-based activities of *Sato-Umi* and *Sato-Yama* exemplified by Akou coast and Chikusa River watershed can play an important role on habitat protection, restoration and management in this area.

Thank you for your attention

SUPPORTING ACTIVITIES FOR THE CREATION OF SATO-UMI IN JAPAN

Yasuhiro MUROISHI, Takuya YAMADA and Naoto OGAWA
Office of Environmental Management of Enclosed Coastal Seas, Ministry of the Environment (MOE) Kasumigaseki 1-2-2, Chiyoda-ku, Tokyo, 100-8975 Japan
NAOTO_OGAWA@env.go.jp

In Japan, Total Pollutant Load Control System of COD_{Mn} has been implemented in enclosed coastal seas since 1978 and nitrogen and phosphorus have become controlled substances since 2000. Due to improved waste water equipment and control standards applied to factories, serious pollution has gradually been reduced. However, new environmental problems such as the deterioration of ecosystems, including marine resources, have occurred. Additionally, the public's unconcern, especially in urban areas, with its marine environment and impoverishment of fishing communities managing coastal sea areas also exists. Therefore, the creation of Sato-umi was designated in "Becoming a Leading National Environmental Strategy in the 21st Century (MOE, June 2007)" which should be started over the next one or two years, as a national policy.

Sato-umi has long been important in supporting fisheries, transport and culture, while helping to integrate management of land and coastal sea areas and preserve high productivity and biodiversity in the wake of the human interaction.

Sato-umi has become rooted in Japan since "Becoming a Leading National Environmental Strategy in the 21st Century" and "The National Biodiversity Strategy of Japan" made it national policy. "The Basic Plan on Ocean Policy (CO, March, 2008)" describes the embodiment of the concept of Sato-umi in the conservation and management of fishery resources. Therefore, the MOE began supporting Sato-umi activities in 2008.

The MOE promotes Sato-umi in order to achieve public consensus for marine environmental conservation and preserve high productivity and biodiversity in coastal sea areas. We conduct the following support projects with respect to Sato-umi:

1) We support model activities addressing environmental conservation and human coexistence within coastal sea areas in partnership with local governments. One such example is an Ishikawa Prefecture project in 2008, in which a steering committee with various members was established to promote the creation of

Sato-umi for Nanao Bay. Workshops and symposiums with diverse participants discussed water environment conditions, regional resources, environment education and a survey of Sato-umi, thus increasing awareness of Nanao Bay as Sato-umi. Four projects for 2008 and six for 2009 have been selected so far.

2) We classify Sato-umi activities into six types: Integrated River Basin Activities, Mitigation Activities, Urban Activities, and so on.（Fig.1）We also prescribe plans for Sato-umi creation for each type of activity.
3) We produce manuals for Sato-umi creation based on support activities, which describe the preliminary notes, essential activities and prospective achievements of Sato-umi.
4) We select advanced Sato-umi activities that are of help to others and we introduce them using the tools described in 5) and 6) below.
5) We collect information and data of domestic and overseas activities for preservation of coastal sea environments and have created a Sato-umi website.
6) We distribute pamphlets and leaflets on Sato-umi.

Consequently, The International Sato-umi Workshop in COP10 in November 2010 will take place in Nagoya, where we will explain Sato-umi further.

We aim to promote Sato-umi and preserve high productivity and biodiversity in coastal sea areas by gaining public consensus. We also aim to raise interest in environmental preservation of coastal areas in East Asia by spreading know-how related to Sato-umi.

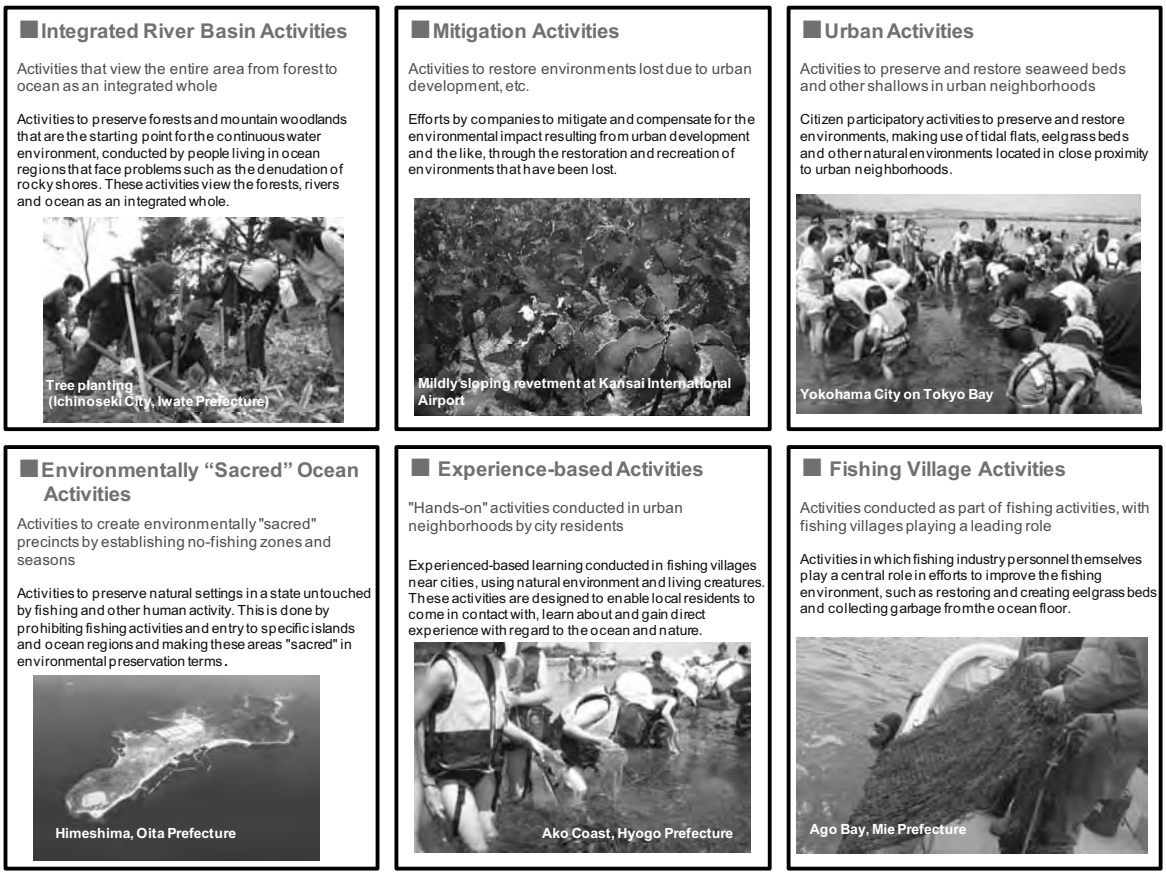


Fig 1. Classification of Sato-umi activities

Supporting Activities for the creation of Sato-umi in Japan

Office of Environmental Management of Enclosed Coastal Seas,
Water Environment Department, Environmental Management Bureau,
Ministry of the Environment, JAPAN

YASUHIRO Muroishi

1

Environmental Policies of Enclosed Coastal Seas in JAPAN

1950-70's

- Development by high economic growth and expansion of industrial activity
- Water pollution by plant effluent and living drainage
- Loss of Shallow zone by reclamation
- Frequent occurrence of large-scale red tide
- Frequent occurrence of oil spill

Response of environmental administration

- Restrict laws were enacted
- 1967 Basic Law for Environmental Pollution Control
- 1970 Water Pollution Control Law
- 1971 Environment Agency was established
- 1972 Nature Conservation Law
- 1973 Interim Law for Conservation of the Environment of the Seto Inland Sea
  → reduced by half COD from industrial drainage
- 1978 Total pollutant load control (TPLC) was adopted for COD

2

Environmental Policies of Enclosed Coastal Seas in JAPAN

1980-90's

- Continuous occurrence of red tide
- Generation of anoxic water
- Occurrence of large-scale oil spill
- Collection of sea gravel

1990's-

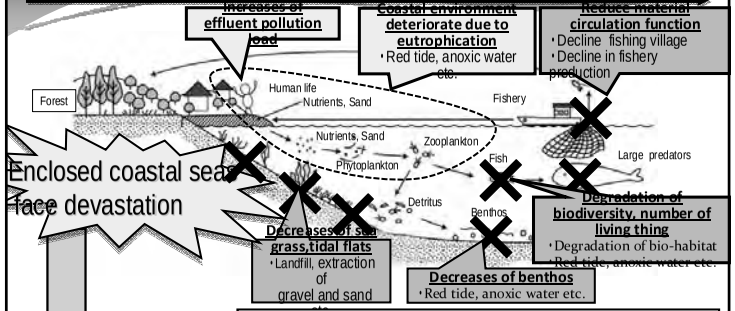
- Creation of environments to pass on to future
- International contributions

Response of environmental administration

- 1993 Basic Environmental Law
- 1993 Nitrogen and Phosphorus were added to the effluent standard
- 1994 NOWPAP was established
- 2000 EMECS was established
- 2000 Basic Plan for Conservation of the Environment of the Seto Inland Sea
  → prohibition of sea gravel collection
- 2001 Reorganized as Environment Ministry
- 2001 Nitrogen and Phosphorus were added to TPLC
- 2004 WEPA was established

3

Introduction of New Concept 'Creation of SATO-UMI'



Policy on New Concept

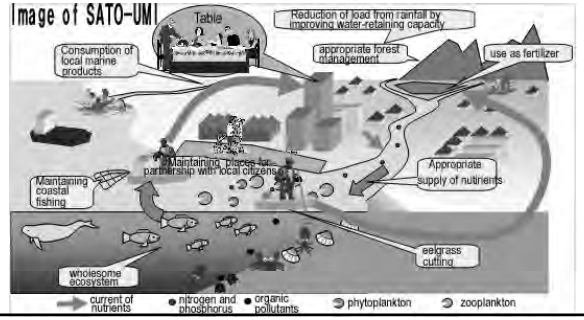
- Becoming a Leading Environmental Nation Strategy in the 21st Century (2007)
  Creation of Sato-umi rich in natural bounties listed
- Third National Strategy for Biodiversity (2007)
- Basic Act on Ocean Policy (2008)
  Materialized of Sato-umi concept and describing of importance

The activities begin under 'Creation of SATO-UMI'

4

Concept & Image of Sato-umi

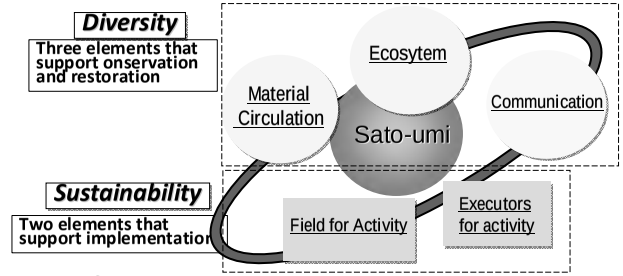
Coastal zone where land and coastal zone are managed in an integrated and comprehensive manner by human hands, with the result that material circulation functions are appropriately maintained and both high productivity and biodiversity are preserved.



5

Viewpoint of Sato-umi Creation

Viewpoint of Sato-umi Creation＝Component of Sato-umi Creation



Feature of Sato-umi Creation Activity

- Sato-umi is not only a spatial concept but also a concept generated among the human activities.
- Sato-umi is able to possess sustainability by being combined with lifestyle habits etc.
- Activity for creation of Sato-umi is a participation-and-cooperation type tool which is applicable to the comprehensive management of coastal area.

6

Projects to Support Sato-umi Creation by MOE

(2008-2010)

(1) Support for Sato-umi Creation Activities (Model Project)

(2) Preparation of Standard Sato-umi Creation Plans for Each Type of Activities

(3) Establishment of Sato-umi Creation Manual

(4) Selection of Examples of Advanced Sato-umi Creation Activities

(5) Construction of a Sato-umi Website & Datanetwork

(6) Publicity Activities (Pamphlet, Leaflet, Sympsium).

(7) Provision of Information Overseas

7

(1) Support for Sato-umi Creation Activities (Model Project)

MOE support model activities addressing environmental conservation and human coexistence within coastal sea areas in partnership with local governments.

8

Model Projects to Support Sato-umi Creation (FY 2008)

Omura Bay (Nagasaki Prefecture)

● **Activities**
- ➢Environmental education (Indian porpoise watching)
- ➢Holding of a seminar on the approach to local partnerships


[Indian porpoise watching]

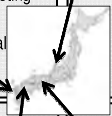
● **Results**
- ➢Determination of issues involved in promoting environmental education and obtaining necessary support
- ➢Enhanced cooperation on the part of local residents, environmental groups and the local government

Nanao Bay (Ishikawa Prefecture)

● **Activities**
- ➢Establishment of a steering committee
- ➢Survey of local resident opinion for Nanao bay
- ➢Listing, collection and organization of existing information on Nanao Bay
- ➢Start of Sato-umi monitoring
- ➢Holding of Hands-on activities, workshops and seminars


[Hands-on learning]

● **Results**
- ➢Preservation and restoration of water environments and ecosystems of Nanao.
- ➢Regional development and personnel training by local residents, etc.
- ➢Guidance in the creation of Sato-umi as a modern-day standard



Nakatsu Mudflat (Oita Prefecture)

● **Activities**
- ➢Survey of bottom sediment around *sasahibi.*
- ➢Holding of monitoring sessions to commune with the ocean.
- ➢Pamphlet prepared

● **Results**
- ➢water quality environmental standards for rivers. lakes and ocean regions based organisms beginning in FY 2009 .
(As the project increased interest in biodiversity.)


[Survey of "*sasahibi*"]

Ako Coast (Hyogo Prefecture)

● **Activities**
- ➢Establishment and operation of specialist committee
- ➢ Holding of discussions with relevant local entities
- ➢Study of water quality at the site and marine life habitation status

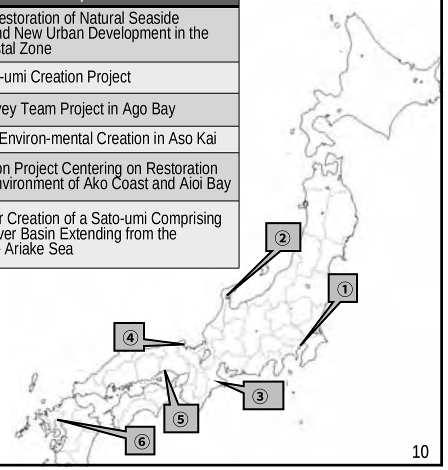
● **Results**
- ➢Determination of eelgrass habitation through an in-depth study
- ➢Formation of a central organization (council) to promote Sato-umi creation


[Local discussion meeting]

9

Model Projects to Support Sato-umi Creation (FY2009)

Implementing Entity	Model Project
Yokohama City (Kanagawa Pref.)	Project for the Restoration of Natural Seaside Environments and New Urban Development in the Yokohama Coastal Zone
Ishikawa Prefecture	Nanao Bay Sato-umi Creation Project
Shima City (Mie Pref.)	Natural Life Survey Team Project in Ago Bay
Kyoto Prefecture	Joint Project for Environ-mental Creation in Aso Kai
Hyogo Prefecture	Sato-umi Creation Project Centering on Restoration of the Natural Environment of Ako Coast and Aioi Bay
Saga Prefecture	Model Project for Creation of a Sato-umi Comprising an Integrated River Basin Extending from the Mountains to the Ariake Sea



10

(2) Preparation of Standard Sato-umi Creation Plans for Each Type of Activities

The purpose is to enable Sato-umi creation activities to be initiated easily by selecting the category to which the target activities belong.

11

Standard Sato-umi Creation Plan for Each Type of Activities

■Integrated River Basin Activities

Activities that view the entire area from forest to ocean as an integrated whole

Activities to preserve forests and mountain woodlands that are the starting point for the continuous water environment, conducted by people living in ocean regions that face problems such as the denudation of rocky shores. These activities view the forests, rivers and ocean as an integrated whole.


Tree planting (Ichinoseki City, Iwate Prefecture)

■Mitigation Activities

Activities to restore environments lost due to urban development, etc.

Efforts by companies to mitigate and compensate for the environmental impact resulting from urban development and the like, through the restoration and recreation of environments that have been lost.

■Urban Activities

Activities to preserve and restore seaweed beds and other shallows in urban neighborhoods

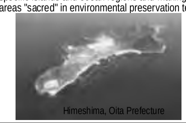
Citizen participatory activities to preserve and restore environments, making use of tidal flats, eelgrass beds and other natural environments located in close proximity to urban neighborhoods.


Yokohama City on Tokyo Bay

■Environmentally "Sacred" Ocean Activities

Activities to create environmentally "sacred" precincts by establishing no-fishing zones and seasons

Activities to preserve natural settings in a state untouched by fishing and other human activity. This is done by prohibiting fishing activities and entry to specific islands and ocean regions and making these areas "sacred" in environmental preservation terms.


Himeshima, Oita Prefecture

■ Experience-based Activities

"Hands-on" activities conducted in urban neighborhoods by city residents

Experienced-based learning conducted in fishing villages near cities, using natural environment and living creatures. These activities are designed to enable local residents to come in contact with, learn about and gain direct experience with regard to the ocean and nature.


Ako Coast, Hyogo Prefecture

■ Fishing Village Activities

Activities conducted as part of fishing activities, with fishing villages playing a leading role

Activities in which fishing industry personnel themselves play a central role in efforts to improve the fishing environment, such as restoring and creating eelgrass beds and collecting garbage from the ocean floor.


Ago Bay, Mie Prefecture

12

(3) Establishment of Sato-umi Creation Manual

The Manual will consist of

- matters that should be considered in advance,
- efforts that should be implemented,
- desirable results and other information that has been collected.

It will prove useful when new Sato-umi creation activities are conducted in the future by local governments, citizen's groups, etc.

13

Framework for Sato-umi Creation Manual

***Chapter 1* : Introduction**
Background to preparation of Sato-umi Creation Manual, role of manual, overview of content

***Chapter 2* : What is a Sato-umi?**
2.1 Connections between ocean, mountains and rivers and connections to people
2.2 How should we relate to the ocean?
2.3 What is a Sato-umi?
2.4 Protecting ocean environments and the need for restoration

***Chapter 3* : Sato-umi Creation Activities**
Describes the type of activities that constitute Sato-umi creation.

***Chapter 4* : Advance Preparations Before Initiating Sato-umi Creation**

- Study the range for Sato-umi creation activities
- Determine the relevant government agencies, organizations etc. for Sato-umi creation
- Participation of numerous entities
- Implementation of preliminary survey
- Organization of issues

***Chapter 5* : Approach to Sato-umi Creation: Establishment of Sato-umi Creation Plan**

- Establish objectives
- Select activities
- Study promotion organization
- Train groups and volunteers to be involved in activities

***Chapter 6* : Evaluation and Review of Sato-umi Creation Activities**

- Evaluation of nature (monitoring)
- Evaluation by society
- Review of activities

14

(4) Selection of Examples of Advanced Sato-umi Creation Activities

●MOE select advanced Sato-umi activities that are of help to others.

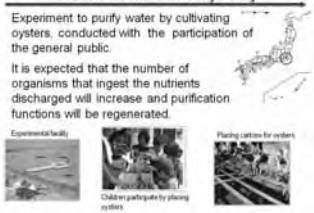
15

Selection of Advanced Examples of Sato-umi Creation Activities

Urban Activities in Tokyo Bay

Experiment to purify water by cultivating oysters, conducted with the participation of the general public.

It is expected that the number of organisms that ingest the nutrients discharged will increase and purification functions will be regenerated.



Activities at Fishing Village in Ise Bay

To achieve a balance between environmental preservation and pearl production by creating tidal flats and marine forests.

To improve natural purifying functions and establish a system of cultivation based on forecasts of water quality.

Effect of these activities
- Shima City plans to set up an 'Ago Bay Nature Restoration Council' to enable effective utilization of the achievements of this project.
- Based on the achievements of the project, Mie Prefecture initiated an Enclosed Coastal Sea restoration Program in 2007.

Integrated River Basin Activities in Suo-Nada

In the Fushino River, activities are being promoted in which, based on a plan, the whole river basin is to be integrated by various participants.

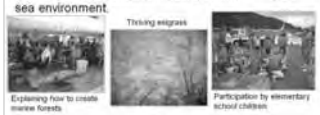
History of implementation
- 2003: Plan established.
- 2004: Nature Restoration Council established.
- 2005: Overall plan for the restoration of nature in the tidal flats of the Fushino River estuary established.

Effect of these activities
- Increased biodiversity and population of bivalves in the tidal flats etc. of the Fushino River
- Expanded Zosteraceae beds

Activity at a Fishing Village in Iyo-Nada

The creation of forests is being promoted, together with coastal clean-ups performed by local fishermen and NPOs with the participation of the general public.

It is expected to promote wide ranging awareness and education relating to the sea environment.



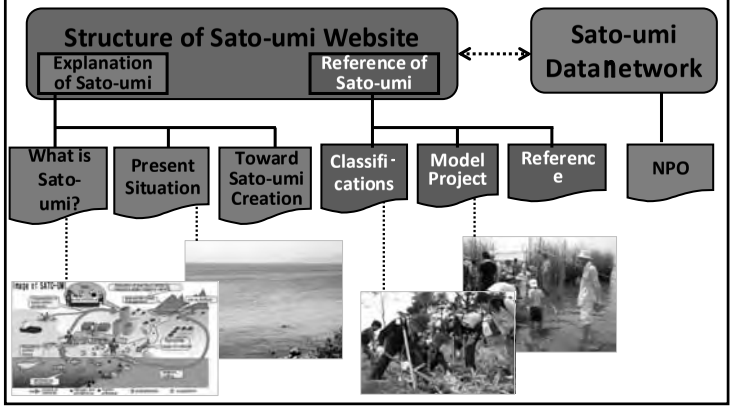
16

(5) Construction of a Sato-umi Website & Datanetwork

In order to make information on Sato-umi widely available to Internet users in Japan and other countries, Sato-umi website and datanetwork will be created.

17

Construction of a Sato-umi Website & Datanetwork



(6) Publicity Activities (Pamphlet, Leaflet, Symposium)

Pamphlets, leaflets and symposium relating to Sato-umi creation

Those efforts will be made

- to publicize the Sato-umi concept,
- to educate the general public regarding Sato-umi creation,
- to provide information both at home and abroad.

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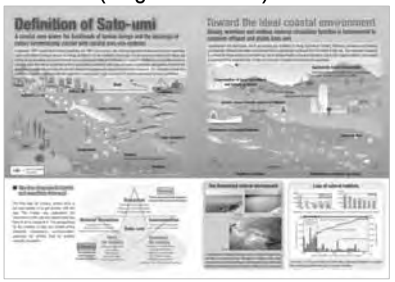
Sato-umi Pamphlet ,Symposium

Draft images of Sato-umi leaflet (English version)



Sato-umi Symposium in each area

(7) Provision of Information Overseas

An International Sato-umi Workshop are planned to be held at the 10th Conference of the Parties to the Convention on Biological Diversity (COP 10) at Nagoya, Japan in November 2010.

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Provision of Information Overseas

Arrangement for the 'International Sato-umi workshop' as a side-event on COP10, which will be held at Nagoya in 2010, is in progress.

The 10th Conference of the Parties to the Convention on Biological Diversity

- **Period: October 18- 29, 2010**
  (October 27-29, 2010: Ministerial-level meeting)
- **Place: Nagoya International Conference Arena**
  (Nagoya city in Aichi prefecture)
- **Participants: About 10,000 participants, including about 190 contracting countries, international organizations and observers, are expected.**
- **Host country and host: Japan(Minister of the Environment)**

22

Future Unfolding

JAPAN

Output of the Project to Support Sato-umi Creation

- Sato-umi Creation Manual
- Standard Sato-umi Creation Plan
- Example of advanced Sato-umi Creation
- Pamphlet & Leaflet
- Sato-umi Website & Sato-umi Data Network
- International Workshop

Countries in the World

Needs & Problems of Creation of SATO-UMI

Sato-umi Information Sharing

Preservation & restoration of environment of seas all over the world

23

Part 2: Indigenous knowledge and community based approaches in protecting, restoring and managing key habitats

6. Part 2 Summary

Integrated coastal management has often focused on the scientific. Referred to as a 'pioneering and daring' workshop, Sato-umi Workshop Part 2 took up where Part 1 left off with discussions challenging the often scientifically driven top-down status quo when designing and implementing integrated coastal management (ICM) initiatives. Chaired by A. McDonald and co-chaired by Dr. T. Yanagi, discussions explored how Asian communities can potentially work together to more effectively integrate science with local indigenous/traditional ecological knowledge as necessary elements of sustainable community based approaches in protecting, restoring and managing key habitats. Indigenous knowledge has often been absent in the scientifically driven ICM discourse. Science, many participants agreed, is but one key element. How to effectively integrate cultural elements with science in developing ICM initiatives throughout Asia, may in fact be the key to achieving sustainability.

Part 2 explored both the potentials and current limitations of community based approaches in Asia. Building on discussions initiated by the sato-umi concept and its application in Japan, Part 2 discussed the duality of diversity and universality of culture, history and nature views that influence, both directly and indirectly, resource use and management throughout Asian coastal communities. Discussions explored how shared experiences drawn from the wealth of diverse Asian cultures that have evolved over centuries of human interactions with nature, can further contribute to developing more holistic approaches in future Asian-led ICM initiatives. Part 2 also indirectly challenged participants to consider and discuss the role Asian community based approaches can potentially play in contributing to global discussions of culturally integrative science within the context of ICM discourse.

The following is an overview of Part 2 paper presentations. The papers reflect the diversity, width and depth of experiences from across Asia. Drawing on the successes and challenges of efforts in Thailand, Indonesia, Vietnam, Malaysia, Korea and the Philippines, the following nine papers were selected:

1. Implementing an ecosystems approach to coastal management through community-based organizations: An example from Andaman coast at Thailand
   This paper by J. Soonthornnawaphat and J. Silva, IUCN, Thailand Programme set the tone for Part 2 with the bottom-up community based organization's successes, highlighting their activities of marginalized community involvement. By involving

stateless indigenous coastal communities in a multi-stakeholder driven 'reef to ridge' ecosystem approach, indigenous knowledge was incorporated into watershed management. This has lead to empowerment among the communities, increasing their capacities to become sustainable managers of resources within the management framework.

2. Implementation of Tri Hita Karana, a local wisdom of Bali to maintain agricultural resources

   D. N. Suprapta, Director School of Postgraduate Udayana University drew on the cultural beliefs embodied in Tri Hita Karana practiced in Balinese Hindu communities as the foundation of resource conservation. Insight into how local wisdom such as Tri Hita Karana guides collective resource use and management and capacity building in communities were described. Tri Hita Karana, it was explained, emphasizes man and nature's harmonious relationship among the three elements of man, nature and God. Man's rules do not supersede those of nature in this relationship and morality and ethics as critical elements of resource use based on collectivism were also discussed.

3. Developing a mechanism of mobilization of various human and material resources in planting, taking care and protecting urban green trees in Danang City

   T. C. Hai, from the Danang Department of Natural Resource and Environment in Vietnam described the challenges of implementing government initiated community-based restoration projects in his talk about re-greening urban coastal communities where large-scale degradation such as Danang has occurred. Tree planting activities in coastal areas as capacity building for community based resource management drew parallels to uotsukirin practices among coastal communities in Japan.

4. Community Involvement in Coral Reef Restoration Projects in the Gulf of Thailand

   The Marine Biodiversity Research Group's paper from Ramkhamhaeng University introduced NGOs initiatives to involve local fishing communities and volunteer groups for low-cost coral reef restoration activities which have grown into multiple benefit community led ecotourism, environmental education and ecosystem research activities among all stakeholders. Short, mid and long-term planning mechanisms were also identified as key components in ensuring sustainable partnerships among the collective whole.

5. Evaluation of Artificial Reefs (ARs) in West Coast, Peninsular Malaysia

I. Ismail led the presentation by Institutional of Agricultural Food Policy Studies team at Universiti Putra Malaysia. Though results are yet conclusive, the team of researchers discussed their efforts to work with impoverished fishing communities facing depletion of fish stocks and marine resources. This project to build and monitor the effectiveness of artificial reefs (AR) has resulted in a moratorium on AR deployment in the area until AR guidelines are designed as potential long-term environmental concerns have been identified by the studies.

6. Community-based management approach at work in the Muan Wetland Protection Area: Changing perception, changing practice and changing policy

J.Y. Jang and Y.R. Choi of Eco-Horizon Institute discussed efforts in Korea to involve coastal communities as active players in marine protection areas (MPA) establishment and management. Project leaders noted that by involving communities from the beginning contributes to community empowerment and sense of ownership towards the project; thus increasing their commitment to the project and sense of responsibility as sustainable resource managers.

7. When the cradle falls: a case of management failure in community marine reserve in southern Philippines

A. B. Guzman from Mindanao State University of Naawan gave an insightful talk on lessons learnt from a community-based NGO-led initiative gone wrong when re-organization of administrative roles and responsibilities by central government lead to a sense of loss of ownership and involvement by the local communities who initiated the marine sanctuary project. Changes in administrative organization also led to a break down in marine resource management structures in the community and degradation of resources in the intended protection sanctuary have been observed. Re-involving the community as sanctuary guardians and re-assessment of the current management structure were recommended.

8. Conceptual framework of organizing communities for effective mangrove management

J.P. Savaris of the Zoological Society of London, Philippines spoke of her teams efforts to re-establish green belts in coastal communities. Their innovative approach involves integrating the scientific and indigenous knowledge. Though researchers admit that collecting oral histories from elders is a race against time, the knowledge about mangrove management practices among indigenous communities is noted as

critical knowledge in guiding scientists developing mangrove restoration projects based on community inputs and involvement.

9. Indigenous approaches to access, control and protection of coastal resources: a review of some Philippine experiences

E. Ferrer from the University of the Philippines closed Part 2 with a thoughtful discussion about how indigenous knowledge can be applied to resource management practices but also have the potential to be integrated into scientific approaches to community-based climate change adaptation strategies. Ferrer focused on the traditional fishing communities in Batang where ecological knowledge is rich. Harnessing the ecological knowledge of the fishing people and recording the observance of taboos and their performance rituals have added insight into indigenous approaches to resource management and use. Ferrer commented that traditional ritual as symbolic expression of the relationship between human beings and nature bring people and nature together, adding that this 'humanizing of nature, naturalizing of humans' learnt from indigenous knowledge, as proposed by Sato-umi, is critical to future community-based coastal management initiatives.

Chair of Part 2
Anne MCDONALD
Director, UNU-IAS Operating Unit Ishikawa/Kanazawa, Japan

7. Par 2 Oral Presentation

IMPLEMENTING AN ECOSYSTEM APPROACH TO COASTAL MANAGEMENT THROUGH COMMUNITY BASED ORGANIZATIONS: AN EXAMPLE FROM THE ANDAMAN COAST OF THAILAND

Somsak SOONTHORNNAWAPHAT and
Janaka de SILVA
IUCN, Thailand Programme. 63 Sukhumvit
Soi 39 Bangkok 10110, Thailand
Janaka@iucnt.org

Coastal ecosystems throughout the world are under significant pressure from a multitude of factors. Good coastal planning and management are an important element to maintaining and improving the health of coastal ecosystems. However, the effects poor planning and management are evident in many parts of the world and finding practical solutions that take into account the ground realties are needed.

This paper describes the learning from our work along a coastal stretch within Ranong and Phang Nga Provinces, Thailand. Assessments conducted identified human induced activities as one of the major drivers for change to the ecosystem. However, the legal mechanisms to implement an integrated approach are weak as the regulatory framework is complex and confusing, with overlapping jurisdictions.

To accommodate the situation, we have used an approach based upon a “reef to ridge” concept that encapsulates the ecosystem based approach which has been applied to coastal rehabilitation and management using a bottom up process that focused on local stakeholders with special emphasis on community based organizations.

By building upon the extensive base of community based organizations (CBO’s) within the area, who have already demonstrated a commitment to managing their environment we anticipate that the long term sustainability on the interventions are more likely to be achieved.

A framework for action was developed through an extensive participatory process that involved engaging with stakeholders at multiple levels ranging from the village to national levels who have been involved at the three stages of participatory assessment, planning and implementation using local stakeholders.

The approach also builds on the existing strengths of the institutions within the landscapes that are strongest to deliver the ecosystem approach and also focuses secondarily on institutions that show interest but may not have the full technical capacity to implement. We demonstrate how action can be taken within complex

systems where the ability to set up institutional mechanisms at a landscape level can be challenging and how a more decentralized approach can work to achieve similar results.

This approach has lead to the building of a network of stakeholders who work cooperatively in a manner that takes into consideration the needs and capacity of the individual stakeholders. The paper will present the case of two CBO's a forest and river conservation group on how communities are managing and taking action to protect important ecosystems within the watershed.

Implementing an Ecosystem Approach to Coastal Management with Community Based Organizations: An example from Thailand

Somsak Soonthornawaphat and Janaka de Silva

Demonstrating an integrated approach to managing ecosystems

Major Threats to Coastal & Marine Ecosystems direct drivers of change

Habitat loss & conversion

- coastal development
- conversion to aquaculture ponds
- coastal deforestation
- reclamation
- mining

Habitat Degradation

- eutrophication
- pollution
- alien species invasion
- erosion & siltation
- disease
- destructive fishing practices
- salinization (estuaries & lagoons)

Overexploitation

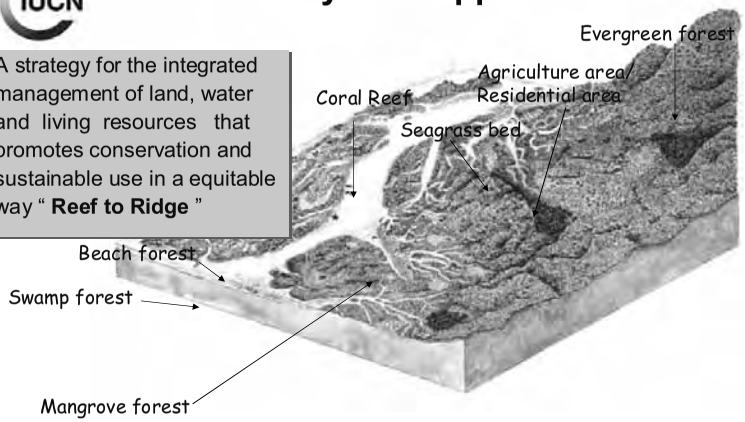
- unsustainable levels of fishing pressure
- incidental take or by-catch

'global warming', climatic changes & sea level rise

Demonstrating an integrated approach to managing ecosystems

The Ecosystem Approach

A strategy for the integrated management of land, water and living resources that promotes conservation and sustainable use in a equitable way " **Reef to Ridge** "



Demonstrating an integrated approach to managing ecosystems

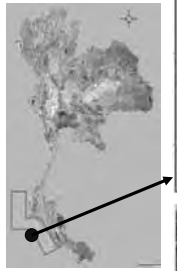
Goals

- To develop management framework incorporating current plans/ strategies, in which everyone has a role & responsibility
- Support establishment of sustainable management partnerships
- Deliver on the ground 'investments'/ interventions in line with priorities
- Further research, learning & knowledge exchange

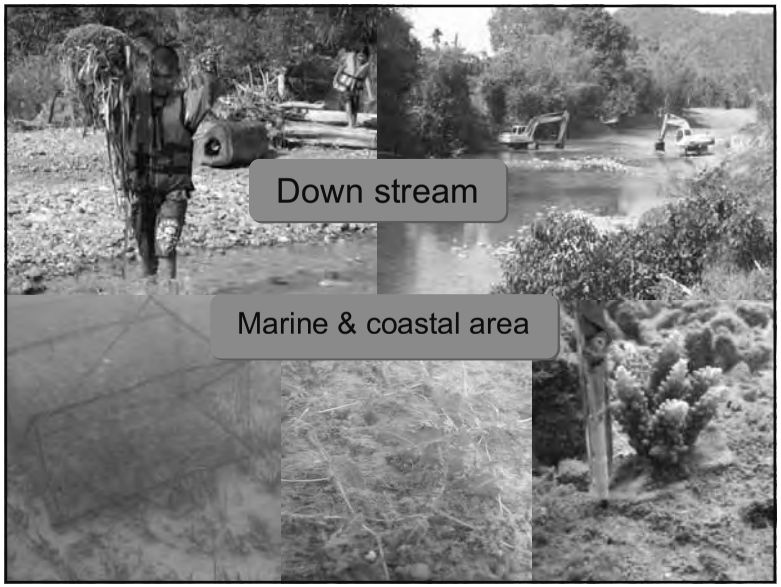
Demonstrating an integrated approach to managing ecosystems

Profile of project site

- 130 km. of coastal stretch
- 3 watershed areas
- focus on 1,800 households
- 6,500 population
- 300 stateless
- 3 National Park
- 1 Wild life Sanctuary
- 1 Ramsar site
- 1 No hunting area



Demonstrating an integrated approach to managing ecosystems

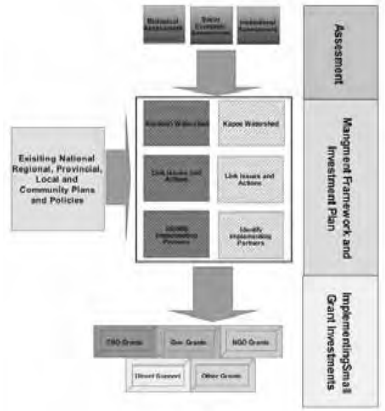


Rationale for Working With CBOs

- Ecosystems include People
- Rapid Changes to System
- Strong Network of Stakeholders
- Weak Law Enforcement
- Capacity of CBO Strengthened after Tsunami

Demonstrating an integrated approach to managing ecosystems

•20 Govt. Agencies and Experts
•9 Tambons in 4 Districts
•32 Villages
•170 community leaders
•240 School Kids

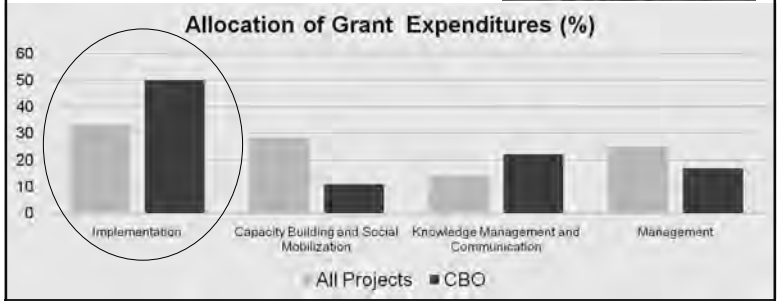


Demonstrating an integrated approach to managing ecosystems

Key Findings

- Have capacity for managing natural resources
- Actions need to fit capacity and needs
- Grantees need capacity building support

Demonstrating an integrated approach to managing ecosystems



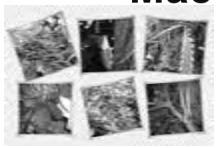
Demonstrating an integrated approach to managing ecosystems

Social Mobilization and Communication

- Promoting links between government and communities essential
- Network within area, in watershed and across the region.
- More Advocacy Support

Demonstrating an integrated approach to managing ecosystems

Mae Nam Khaew



Managing Forests outside Protected areas 35 Square Kilometers

- **Supported reduction of key threats; forest encroachment and hunting**
- **Documented Biodiversity Values**
- **Networking 7 villages to work together**
- **Set up rules and halted forest encroachment**
- **Less success on hunting**
- **Linked to Land Rights Network and sit on Provincial Committee**

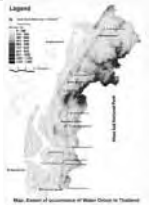
Demonstrating an integrated approach to managing ecosystems

Understanding Ecosystem Function

- Good understanding of ecosystem within their landscape
- Communities possess valuable ecological information and know how to document it

Demonstrating an integrated approach to managing ecosystems

Endemic Species and Local Knowledge



- Local communities helped assess status
- Exchanging Knowledge with other groups has enhanced monitoring skills across the landscape
- Advocacy skills need strengthening

Demonstrating an integrated approach to managing ecosystems

Thung Nam Dam

Monitoring Fauna and Promoting regulations

• Supporting community rules being incorporated into local regulations
•Monitoring and Assessing Orchid and *Melaluca* Forest diversity
•Developing seagrass monitoring protocols that capture local knowledge.

Demonstrating an integrated approach to managing ecosystems

The Conclusions

- CBOs are an effective mechanism to invest in coastal systems.
- Government engagement in participatory processes is good but varies
- Need to give support for advocacy development early
- Developing sustainable financing mechanism to support local conservation are needed

Demonstrating an integrated approach to managing ecosystems

Thank you

(In Thai : Kob-Khun-Khrap)

Demonstrating an integrated approach to managing ecosystems

IMPLEMENTATION OF *TRI HITA KARANA*, A LOCAL WISDOM OF BALI TO MAINTAIN AGRICULTURAL RESOURCES

Dewa Ngurah SUPRAPTA
Director School of Postgraduate Udayana University
Jl. PB. Sudirman Denpasar Bali Indonesia
biop@dps.centrin.net.id

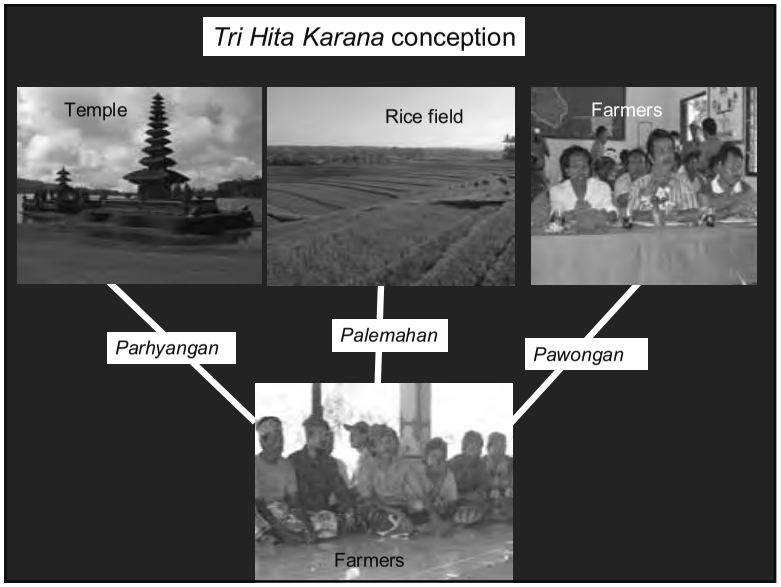
Balinese Hindu community considers that man is part of nature and is the creation of God. The existence and welfare of man are very much determined by his capability of keeping the harmonious relationship with God (**Parhyangan**), harmonious relationship with fellow human being (**Pawongan**), and harmonious relationship with the Nature (**Palemahan**). The key word of this conception is "**harmonious relationship**". Harmonious relationship is relationship developed based on values and rules of each element. The relationship with God is made based on values and rules of religion. Relationship with other human beings is also made based on values and rules of humanity, among others: the value of human right, democracy, equity, justice, and the like. The relationship with nature is also made based on the rules of the nature itself because man is alive and made alive by the surrounding environment. So, to sustain the life of man, nature must function continuously. Nature cannot be managed beyond the scope of its rules, so that nature can have its good cycle. Over-intervention to nature that causes damages or degradation in one or more of its components will be harmful. This coception is called ***Tri Hita Karana***, meaning three harmoniously relationship among related elements bringing welfare and happiness. The three elements are man, nature, and God. In Bali, there is organization which functions to maintain and generate various local wisdoms related to rice field called "**Subak**". Subak, whose members are farmers, has main activities to manage water and land resources for the interest of agriculture to develop it in a sustainable way. This paper describes briefly the implementation of ***Tri Hita Karana*** which constitutes one of the local wisdom in Bali in the field of agriculture to maintain agricultural resources.

Key Words: Local wisdom, Tri Hita Karana, agricultural resources

Implementation of *Tri Hita Karana*, a Local Wisdom of Bali to maintain agricultural Resources

Dewa Ngurah Suprapta

Udayana University, Bali



The key words for the conception :

Harmonious relationship : relationship developed based on values and rules of each element.

1. Relationship with God : based on values and rules of religion (*Parhyangan*)
2. Relationship with other human being is also based on values and rules of humanity, human right, democracy, equity, justice (*Pawongan*)
3. Relationship with nature is based on the rules of nature itself (*Palemahan*)

Implementation of *Parahyangan* in Agriculture :

1. Establishment of temples : place for worship of God
   - *Ulun Danu* temple : built near the lakes in Bali
   - *Ulun Suwi* temple : built at one region or several subaks.
   - *Bedugul* temple : built at dam or division of water
   - *Masceti* temple : built at each subak.
   - *Tugu* shrine : built at each farmer's rice field block.

Implementation of *Parhyangan* :

2. Ceremonies (rituals):

a. Collective/group ceremonies :

- *Magpag Toya*
- *Nyaeb*
- *Ngusaba*
- *Odalan*
- *Nangluk Merana*

b.Individual ceremonies by each farmer : from land preparation, harvest to postharvest , such as : *Ngendagin, Ngurit, Nandur, Biyukukung, Nguntap Sri, Mantenin*

Implementation of *Pawongan* :

Existence of Subak : organization developed by farmers to manage, maintain and preserve the water and land resources and social harmony.

-Subak management : by *Pekaseh* (head of *Subak*)

-Subak rules (*awig-awig*)

-Subak meeting

-Subak activities

Implementation of *Palemahan* :

Basic concept : Man is part of nature, his existence and welfare are very much dependent upon the surrounding environment.

-Appreciation to Plants : *Tumpek Uduh* ceremony dedicated to plant every 210 days.

-Appreciation to animal : *Tumpek kandang* ceremony dedicated to animal: every 210 days

-Regulating water resources

-Regulating planting pattern

-Etc.

Implementation of *Palemahan* :

There are six efforts which must be done to conserve the nature called *Sad Kertih* :

1.Atma Kertih : an effort to conserve and purify the *Atma* (human spirit and soul).

2. *Samudera Kertih* : an effort to conserve the ocean resources that having multifunction in human life.

3. *Wana Kertih* : an effort to conserve the forest along with its biodiversity

4. *Danu Kertih* : an effort to conserve fresh water resources such as spring, lake, river.

5. *Jagat Kertih* : an effort to conserve the harmony of truth-based dynamic and productive social relation.

6. *Jana Kertih* : an effort to develop human inner prosperity and human morality.

Concluding remarks :

- *Tri Hita Karana* : is one of Bali's local wisdom implemented in agriculture to maintain agricultural resources.
-This conception put human being as the part of the whole universe system, in which man should maintain harmonious relationship with God, nature and other people.
-*Subak* is established by farmers to maintain and implement *Tri Hita Karana* in agriculture.

Acknowledgement :

I would like to express my appreciation to the International EMECS Center , Kobe, Japan that kindly support the expences for my participation in this workshop.

DEVELOPING A MECHANISM OF MOBILIZATION OF VARIOUS HUMAN AND MATERIAL RESOUCES IN PLANTING, TAKING CARE AND PROTECTING URBAN GREEN TREES IN DANANG CITY

Truong Cong HAI
Danang Department of Natural Resource and Environment

Danang has been increasing planting urban green trees in recent years. However, its effectiveness is not high yet, the covering rate achieved $2m^2$/person. This reality was in consequence of various causes such as high rate of urbanization, natural disasters. And one of the important reasons is the management of urban green trees in Danang city contains many conflicts such as lacking of interagency coordination, overlaps in management mechanism between agencies, various financial resources are not mobilized while the city's budget is limited, lacking of mechanism for community participation.

According to the orientation of the City, the index for urban greening cover to the year 2015 will be $4m^2$/person, this will be difficult to attain unless there is a change in management mechanism, diversified financial support in urban greening.

Deriving from the reality, the Project of planting, taking care and protecting urban green trees in Danang city was implemented to increase the rate of urban greening, develop pilot models on mobilization of various human resources for urban greening to set background for changing management mechanism of urban greening.

Danang city assigned for Danang Association of Natural and Environment Protection to receive the project. The members of project executive board include the leaders of related departments, sectors, agencies to coordinate all activities of the project. With the above mechanism of project executive board and positive participation of social organizations, enterprises and communities, the project ensures the aim of mobilizing various human resources is to set background for intersectoral management mechanism of urban greening.

Total expenditure of the project is 1,780,150,000VND, in which GEF SGP sponsored 806,150,000VND, the city's budget is 974,000,000VND. Besides, during the implementation of the project, some enterprises, especially the polluters contributed expenditure for the project. This help to ensure sustainable financial resource for urban greening, this financial resource is one way to overcome pollution.

The implemented activities

1. Conduct survey to identify places for pilot models; Design planting models, including the selection of trees that suitable for each pilot places;
2. Conduct public awareness to enhance awareness on the role of urban green trees, regulations on management, the significance of the project, the role of community in green tree management and existing situation of green tree in the city; conduct trainings and guiding skills on planting, taking care and protecting urban green trees; propagandize on the project on mass media;
3. Conduct to plant trees. Forces participating in tree planting consists of pupils, social organizations, armed forces; After planting tree, stakeholders check sign the commitments to maintain taking care and protecting tree;
4. Check and assess the implementation of commitment of pilot places; Compile technical documents, lessons learned to scale up the project.

Actual accomplishments

The project planted more than 17,000 green trees of all kinds at 23 pilot places, remarkably the coastal pilot place of more than 2ha of 850 coconuts. Besides the selected pilot places, in the implementation of the project, Danang Association of Natural and Environment Protection received financial support from some enterprises in the city to plant more than 5,000 trees at 6 other places. This action can be seen as initial achievement of mobilization of various human and material resources.

The project conducted 17 training courses on the role of green trees, awareness on protecting urban green tree, the role of community in urban green tree management and regulations on urban green tree management for more than 3,000 people.

Through participating in the project, some officers mastered a mechanism of various human and material resources in planting and protecting urban green trees, understood the existing situation and expectation of community in planting, taking care and protecting urban green tree.

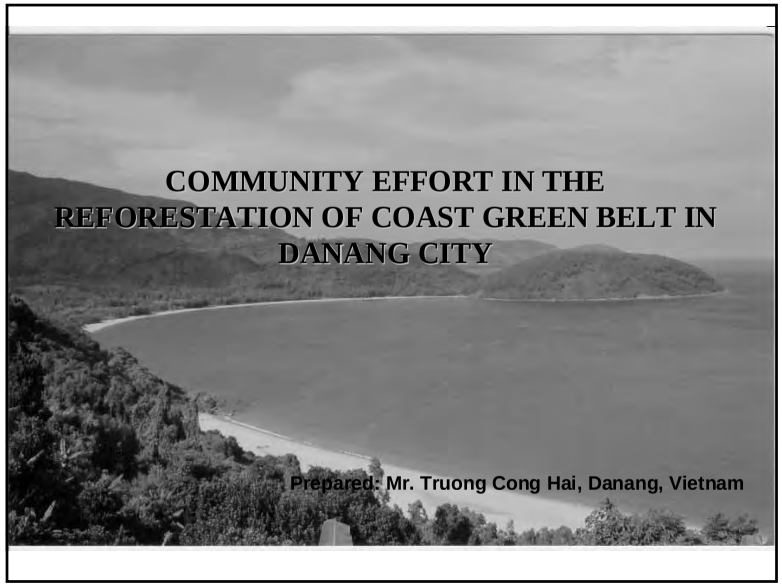
The project was successful in the mobilization of various human and material resources for planting, taking care and protecting urban green tree. Basing on the actual achievements of pilot models the project, Danang People's Committee directed related departments, sectors to develop a project of various human and material resources mobilization for planting, taking care and protecting urban green tree.

Lessons learned

- Consensus of stakeholders is decisive factor of the success of the project;
- Community and social organizations are the nucleus for mobilization of various

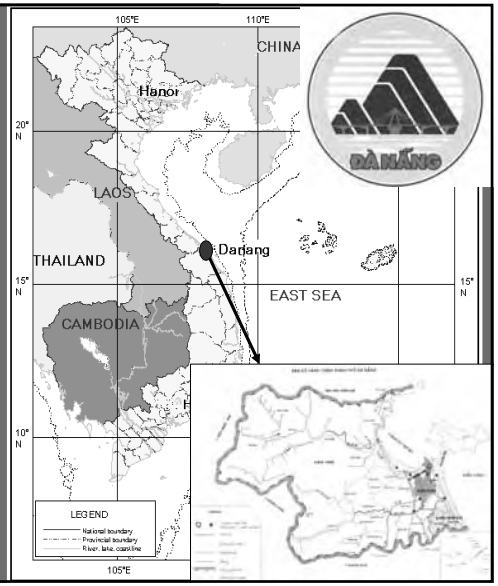
human and material resources;

- The head of the organization plays crucial role in the support and positive participation in the project;
- Propagandized activities need to be integrated with other action plans to be more effective;
- Need to cooperate with local government at all levels to put planting, taking care and protecting of urban green tree as emulated target.



DANANG CITY

- **Location:**
  Central Vietnam
- **Area**
  1,259 km²
- **Population**
  822,339 people
- **Coastline**:
  92 km
- **Watershed area:**
  954.38 km²
- **Administrative units**
  6 Districts
  2 Suburbs
- **Website:**
www.danang.egv.org.vn



EXISTING STATE OF GREEN AREA IN DANANG CITY

Danang city has low rate of green area:

- Aproximate 33,000 trees, if combine grass, flower and trees in offices and public centres, the covering rate is about 2m² per capita.
- Green trees along the coast was disappeared by urbanization.
- The Coastal Strategy for Danang City identified natural disasters as the factor that endanger the sustainable development of the coast. Increase the green rate and restore the coastal green belt are of the the solutions to cut down affects from typhoon and initiate the related ecosystems restoration.
- The City implemented many programs to increase the green rate but they were not effective. These problems were caused by the following reasons:

EXISTING STATE OF GREEN AREA IN DANANG CITY

The affect of natural disasters:

- Annually, the typhoons affected seriously to the green tree system.
- According to the statistics, on average, there were about 6,000 trees affected directly by typhoon per year. Meanwhile, the city only planted about 7,000 new trees of all kinds.
- Storm No.9 (Ketsana) destroyed 21,000 trees in which 6,000 trees could not be replanted

EXISTING STATE OF GREEN AREA IN DANANG CITY

The management capacity has not met the actual demand:

- There are many departments and authorities which manage green areas but there are lack of collaborating
- Residential roles are not concerned
- Awareness of residents are not good enough

The financial resources for green tree aspect was not mobilized:

- The whole budget invested for green tree aspect is from the city‘s budget in the context that the city‘s budget is still limitted
- Mechanism for mobilizing investment from private sectors and NGOs has not established

EXISTING STATE OF GREEN AREA IN DANANG CITY

Lack of space for restoration of green area along the coast:

- The coastal area has convenient condition for economic development
- In land use planning as well as integrated coastal use zoning, the space is reserved for green area is very limitted.

Techniques of planting and taking care trees are not appropriate

- Identify and arrange unsuitable kinds of trees for various sites;
- Trees are planted in a line along the roads, coast thus they are easily collapsed in windy and typhoon

ORIENTATION OF GREEN TREE DEVELOPMENT IN DANANG

- According to Vietnam‘s regulation for level 1 urban area, it must be ≥ 6 m^2 per capita.
- Increasing the green belt is one of the target to implement the project on environmental city
- In the green tree development plan, to the year 2015 the green cover must reach 4 m^2 per capita. However, it is difficult to reach this target .
- This circumstance requires us to change our management approach in green tree aspect.

DEVELOPED A PILOT MODEL OF MOBILIZATION OF PUPLIC AND PRIVATE PARTNERSHIP IN PLANTING, TAKING CARE AND PROTECTING URBAN GREEN TREES

PROJECT'S OBJECTIVE AND GOALS

Objective:

- Increase rate of green areas in Danang city; Develop a pilot model of public and private partnership for green areas which will be a concrete model for changing the current management structure.

Goals:

- Find the financial and human resources for developing urban green tree
- Create more spaces for tree arrangement
- Build teachniques of planting, taking care and protecting green trees for various sites

EXPENSE AND IMPLEMENTING DURATION

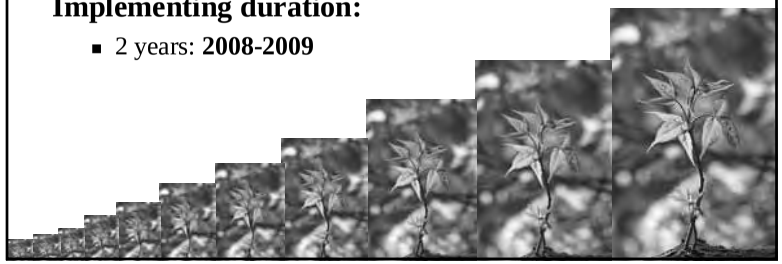
Expense:

Total budget of this project: **110,000** USD

- GEF SGP: **50,000**USD
- Local government: **60,000**USD.

Implementing duration:

- 2 years: **2008-2009**



CONTENTS

Choose the site for implementing pilot model:

- Sites chosen interested to this project and could adapt requirements of the project.
- Study the natural features such as soil, water resource, the capacity to be affected by typhoon… to select suitable tree for each site.
- The native knowledge are applied to select demonstration site
- 23 sites chosen: 7 roads, 7 schools, 6 quarters, 01 factory and 02 beaches.

CONTENTS

Design planting model:

- Selected suitable tree for each site. As for coastal area, we selected trees that are capable of confronting typhoons and salinity
- Due to narrow pavement, we cannot arrange trees in many lines. We encourage the residents and organizations to plant one more parallel line to increase confronting capacity
- We already create a green belt to protect the city

- Planters: students, unions' members, soldiers... With support from experts
- On each site, planters have to plant trees according to technique requirements.
- Stakeholders commit to take care and protect green areas as tecnique requirements.

CONTENTS

Enhance awareness:

- **Roles of green areas and relevant regulations,**
- **Objectives and Goals of this project,**
- **Roles of residents in managing green areas**
- **Technique of planting, taking care and protecting green areas;**

Monitoring and evaluation:

- **Implementation of sites to timely find out issues to overcome**
- **Measure technical parameters, such as diameter, growing ability to update on management software**

RESULTS

- This project planted **17,000** trees, some companies supported to planted more **5,000** trees for 6 different sites, it could be considered as the first step of socialization;
- The number of green tree were not affected seriously in the last typhoon.
- The city reserved 400ha of coastal land for planting green tree
- Identified types of tree and suitable plating techniques

RESULTS

- This project operate **17** training courses, enhance awareness for more **3,000** persons;
- Through project, managers understand the public and private partnership mechanism and protection of green areas
- This project successfully demonstrated pilot models on public and private partnership, Danang PC steered departments and related unions to develop a program of the public and private partnership of green areas.
- Confirmed the green tree development plan of the city can be implemented following public and private partnership the model.
- We are developing the plan to force the enterprises who polluted the environment to plant trees or contribute budget as surmounted budget.

EXPERIENCES

- This is a new management approach in greening. Despite the strong support from the PC, specialized organizations still do not have specific legal documents to implement. Agreement among stakeholders decides the success of project;
- Residents and unions are core for socialization; during the implementing process, we always attached special importance of the community and social organizations' involvement and their contributing ideas especially their native knowledge
- Roles of Leaders play very important for the support and participation of departments in this project.

- **haitruongcong@gmail.com**

COMMUNITY INVOLVEMENT IN CORAL REEF RESTORATION PROJECTS IN THE GULF OF THAILAND

Thamasak YEEMIN, Chaipichit SAENGHAISUK, Sitiporn PENGSAKUN and Makamas SUTTHACHEEP
Marine Biodiversity Research Group,
Department of Biology, Faculty of Science
Ramkhamhaeng University, Huamark,
Bangkok 10240, THAILAND
thamasakyeemin@yahoo.com

A lesson learned from Mu Koh Chang Coral Reef Demonstration Site, Trat Province, Thailand under UNEP/GEF Project on Reversing Environmental Degradation Trends in South China Sea and Gulf of Thailand during 2005 – 2008 was implementation of a demonstration site for coral reef restoration at Koh Mapling. The project worked in collaboration with local fishermen of Klong Son village, Association of Marine Biodiversity Conservation and Education (AMBCE), an NGO conservation group led by marine scientists, and certain volunteer groups in Trat Province. The demonstration site for coral reef restoration was carried out in a limited area where it can be easily controlled and managed for the benefits of ecotourism, education, raising public awareness, ecosystem restoration and research. It showed significant improvement of coordination among local communities, NGOs, private sector and government agencies to work actively in the planning and implementation processes. The AMBCE played a major role in providing scientific knowledge for coral reef restoration. A long-term cooperation mechanism between local communities and volunteer scientists was developed to ensure sustainable uses of coral reefs in the Gulf of Thailand. Several demonstration sites for coral reef restoration were established by local administrative offices, government agencies, NGOs, local communities and private sector. They participated actively in the planning, implementation processes and monitoring for their direct and indirect benefits from the demonstration sites. Coral fragments on coral reefs were used in order to increase the survival of natural coral fragments that might otherwise have had low survival because they were susceptible to being buried. A low cost coral reef restoration method, additional substrates for coral recruitment and attaching coral fragments by using clusters of designed cement blocks, was selected to show at the demonstration sites. The local administrative office was a key agency to encourage and strengthen collaborative management for long-term benefit at each

demonstration site. Good practices from demonstration sites for coral reef restoration were applied to establish several coral reef restoration sites in the Gulf of Thailand. A prominent case study was the modification techniques for coral reef restoration of Mu Koh Kood project which were transferred to Ao Mai Rood area to develop a demonstration site for coral reef restoration in coastal area of Trat Province. These activities better coordination among local communities, NGOs, private sector, government agencies and relevant organizations to work actively during the planning and implementation phases for coral reef conservation. A major concern for coral reef restoration projects is that techniques and methods used in the projects should be kept simple and use cheap materials available in local areas.

COMMUNITY INVOLVEMENT IN CORAL REEF RESTORATION PROJECTS IN THE GULF OF THAILAND

Thamasak Yeemin*, Chaipichit Saenghaisuk, Sittiporn Pengsakun and Makamas Sutthacheep

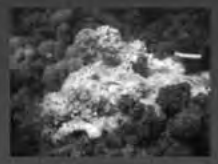
Marine Biodiversity Research Group, Department of Biology, Faculty of Science
Ramkhamhaeng University, Huamark, Bangkok 10240, THAILAND,
E-mail: thamasakyeemin@yahoo.com

Threats on Thai Coral Reefs

- sedimentation from infrastructure development
- impacts from expansion of tourism business
- unskilled divers
- illegal fishing

Threats on Thai Coral Reefs

- Storm
- Coral predators
- Coral diseases
- Coral bleaching



A Case Study

Demonstration Site for Coral Reef Restoration at Mu Koh Chang, Thailand

UNEP GEF SCS

Mu Koh Chang Coral Reef Demonstration Site

UNEP/GEF Project on Reversing Environmental Degradation Trends in the South China Sea and Gulf of Thailand

Demonstration project of coral reef restoration

- Benefit for ecotourism, education, raising public awareness, ecosystem restoration and research.
- Involvement of Local communities, government agencies, private sector and NGOs.
- Natural coral fragments were used in order to increase the survival of natural coral fragments.
- Providing artificial substrates for coral recruitment.



Demonstration Projects of Coral Reef Restoration

i) additional substrate for coral recruitment by using clusters of cylindrical concretes lay in triangle model;


ii) attaching branching *Acropora* spp. with screws to designed PVC pipe frames in the coral nursery area;


Demonstration Projects of Coral Reef Restoration

iii) additional substrate for coral recruitment and attaching coral fragments by using clusters of concrete blocks fused in horizontal and vertical directions;



iv) attaching branching fragments to dead branching corals by means of plastic straps.


Coordination among government and private agencies:-

Department of Marine and Coastal Resources
- Mu Koh Chang National Park
- Rambhai Barni Rajabhat University
- Ramkhamhaeng University
- Bangkok Technical Campus, Rajamankala Institute Technology
- Association of Marine Biodiversity Conservation and Education
- Kon Rak Bangbao Conservation Group
- Marine Science Activities and Conservation Foundation
- Koh Wai Pakarang Resort

Key ideas:

- Limited demonstration areas where they can be easily controlled and managed for the benefit of ecotourism, education, raising public awareness, ecosystem restoration and research.
- Natural coral fragments were used in order to increase the survival of natural coral fragments that might otherwise have had low survival because they were susceptible to being buried.
- Techniques and methods used in this project were kept simple, use cheap materials available in local areas and providing hard substrate for coral recruitment.

Demonstration Site for Coral Reef Restoration at Koh Mapling

Koh Mapling

Demonstration Site for Coral Reef Restoration at Koh Mapling

The project implementation in collaboration with

- Local fishermen of Klong Son village
- An NGO conservation group
- Marine scientists
- Volunteer groups
- Government agencies
- Association of Marine Biodiversity Conservation and Education (AMBCE)

Demonstration Site for Coral Reef Restoration at Koh Mapling

Association of Marine Biodiversity Conservation and Education (AMBCE), an NGO conservation group led by marine scientists, and certain volunteer groups in Trat Province, supported scientific knowledge to local communities.

Demonstration Site for Coral Reef Restoration at Koh Mapling

- The demonstration site for coral reef restoration was carried out in a limited area

- It can be easily controlled and managed for the benefits of ecotourism, education, raising public awareness, ecosystem restoration and research.

A Case Study at Koh Kood, Trat Province

Development of coral reef restoration project

- Koh Kood Local Administrative Office
- Koh Kood Local Communities
- Local Volunteer Groups for Coastal Resource Conservation
- Association of Marine Biodiversity Conservation and Education (AMBCE)

Supporting Agencies/Organizations

- Local Schools
- Tourism Business Companies
- Office of Natural Resources and Environment of Trat Province
- Department of Marine and Coastal Resources
- Universities
- Non-Government Organization for Coastal Conservation

AMBCE worked in collaboration with local communities, NGOs, private sector and government agencies

Local people learned coral restoration methods from the AMBCE

Lessons Learned

- The project showed significant improvement of coordination among local communities, NGOs, private sector and government agencies to work actively in the planning and implementation processes.

- The AMBCE played a major role in providing scientific knowledge for coral reef restoration.

- A long-term cooperation mechanism between local communities and volunteer scientists is needed to ensure sustainable uses of coral reefs in Thailand.

The modified techniques for coral reef restoration of Mu Koh Kood project was transferred to Ao Mai Rood area

Raising public awareness on coral reef conservation

Prevention and mitigation of coral reef degradation are more important than development of coral reef restoration projects.

Scientific Data for Planning of Coral Reef Restoration Projects

Basic data on coral biology are required for planning of coral reef restoration projects in order to select the best method for a local situation.



Local communities participated actively in the planning and implementation processes




Demonstration Site of Coral Reef Restoration for Local Schools and Tourists



Future Management Plans for Coral Reef Restoration in Thailand

- Develop a decision flow chart for coral reef restoration
- Determine priority sites for coral reef restoration
- Develop a management plan
  - Tourism management
  - Wastewater treatment
  - Reduction of sediment from coastal development
  - Management of reef based fisheries


Thank you for your attention
See You in Phuket !!!!
2nd Asia Pacific Coral Reef Symposium
June 20 - 24, 2010, Phuket, Thailand
http://www.thaicoralreef.in.th/2ndAPCRS
Marine Biodiversity Research Group
Department of Biology, Faculty of Science
Ramkhamhaeng University
Bangkok 10240, THAILAND
Tel/Fax: +66-2310-8415
E-mail: thamasakyeemin@yahoo.com

EVALUATION OF ARTIFICIAL REEFS IN WEST COAST, PENINSULAR MALAYSIA

Illisriyani ISMAIL, Kusairi Mohd NOR, Fatimah Mohamed ARSHAD and Aswani Farhana Mohd NOR
Institute of Agricultural and Food Policy Studies, Universiti Putra Malaysia, Putra Infoport-101 Resort, Jalan Kajang-Puchong, 43400 Serdang, Selangor, Malaysia
Tel: +603-8947 1074
illisriyani@gmail.com

The use of artificial reefs in Malaysia is relatively new and if properly constructed, artificial reefs (ARs) can enhance fish habitat and easier access to quality fishing grounds and improved quality of catch will benefit fishermen and coastal communities. The first ARs were built in year 1975 by Department of Fisheries Malaysia and now there are more than 250 ARs were built in Malaysia. This paper examines the economic return of artificial reefs on the fishermen and the industry in West Coast (states of Kedah, Perak and Melaka), Malaysia which are to asses the influence of these ARs on the fisheries and the impact of income changes on the socioeconomics conditions of fisher-folk fishing at ARs. In the middle of 2007 and early 2008, a survey has been carried out to evaluate artificial reefs in the states within a period of 10 months (from April 2007 until January 2008) and with a sample size of 7 boats in Kedah, 20 boats in Perak and 7 boats in Melaka. This survey involved two types of survey books which are the blue books and the red books. All the information regarding ARs and fishing operations were stated in the books by days and months. To analyze the collected data, the descriptive analyses which have been applied are monthly catch analysis, monthly operation cost, profitability operation analysis and cost-benefit analysis; to describe the information of the quantity of catch, value of catch, cost of catch, profitability and the income of the fishermen. From the results, Perak has the highest fish landing which is 30,819.35 kg, followed by Melaka (11,252.23 kg) and Kedah (11,190.50 kg). The income of the three states are between RM700-RM1,900 per month (increased by 20% to 700%) and the state that gained highest income is Perak. While the profitability percentage of the states are between 125.8% to 1400% which is lead by Melaka. The percentage of operation cost is referring to the difference between profitability and the income of the fishermen. The overall findings suggest that the deployment of ARs is

one of an effective way in helping the fishermen's income and their profitability.

Keywords: Artificial reefs (ARs), quantity of catch, value of catch, cost of catch, profitability, income of fishermen and fish landing

Evaluation of Artificial Reefs in West Coast, Peninsular Malaysia

ILLISRIYANI ISMAIL
KUSAIRI MOHD NOH (ASSOC. PROF)
FATIMAH MOHAMED ARSHAD (PROF., PHD)
ASWANI FARHANA MOHD. NOH
INSTITUTE OF AGRICULTURAL AND FOOD POLICY STUDIES
UNIVERSITI PUTRA MALAYSIA

EAS Congress, 22th – 27th November 2009, PICC, Manila, Philippines

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Introduction

- The deployment of ARs in Malaysia was started by small scale fishers in the East Coast, Peninsular Malaysia (Kelantan and Terengganu). Later in 1975, more advance ARs was undertaken by the Fisheries Research Institute, Penang. Since then, ARs was deployed all around Malaysia and these ARs had been placed in both non-protected and protected marine areas (Malaysian Nature Society, 2006).
- Now there are more than 250 ARs were built in Malaysia.
- By middle of 2007 and early 2008, the Fisheries Development Authority of Malaysia (LKIM) has carried out a survey to evaluate ARs in West Coast, Peninsular Malaysia.


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The objectives of this study are:

1) To assess the impact of such ARs on the livelihood of traditional fishers in West Coast, Peninsular Malaysia;
2) To evaluate the benefit cost of ARs


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Methodology

- This study involved two types of survey books which are the blue books and the red books.
- The red book contained weekdays data of total catch and the information about the operation cost while the blue book contained monthly data of total catch, monthly income and expenses and comparisons before and after application of ARs.
- Overall for each of the boats involved, will have 1 blue book and 10 red books for 10 months survey.


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Methodology

Based on all the data that contained in both books, below are the analyses which have been applied:

1) *Annual catch analysis* (quantity) by states;
2) *Annual operation cost*;
3) *Profitability operation analysis* which covers net return to operation, return on capital and return on labor;
4) *Cost-benefit analysis* (Net Present Value, Benefit Cost Ratio and Internal Rate of Return)

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Results

Table 1: Total average of catch, frequency catch and catch per trip by states (kg)

State	Catch	Frequency	Catch per Trip
Kedah	228.38	6	45.47
Perak	154.10	11	14.25
Melaka	167.99	8	26.42
West Coast	183.49	8	28.71

Table 2: Total average of catch, frequency catch and catch per trip by states (MYR)

State	Catch	Frequency	Catch per Trip
Kedah	2,984.06	6	607.79
Perak	1,887.30	11	179.75
Melaka	1,067.38	8	149.07
West Coast	1,979.58	8	312.21

MYR = Malaysia Ringgit

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Results

Table 3: Total average of cost, frequency cost and cost per trip by states (MYR)

State	Operation Cost	Frequency	Cost per Trip
Kedah	1,148.32	6	202.01
Perak	494.59	11	43.45
Melaka	229.56	6	37.26
West Coast	624.16	8	94.24

Table 4: Total average of catch per trip, operation cost per trip and revenue per trip by states (MYR)

State	Catch per Trip	Operation Cost per Trip	Revenue per Trip
Kedah	607.79	202.01	405.79
Perak	179.75	43.45	136.31
Melaka	149.07	37.26	111.81
West Coast	312.21	94.24	217.97

MYR = Malaysia Ringgit

Figure 1

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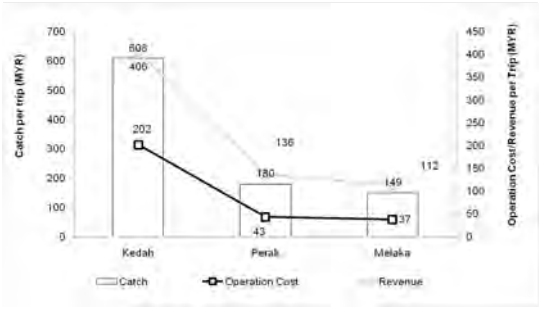
7

Results

Figure 1: Catch per trip, operation cost per trip and revenue per trip by states (MYR)



MYR = Malaysia Ringgit

next

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8

Results

Table 5: Cost Benefit Analyses; Evaluating the Net Economic Impact of Artificial Reefs in West Coast, Peninsular Malaysia

Details	Unit
Investment (MYR)	169,5000
Average of monthly revenue per boat (MYR)	1,244
Months of operation	10
Total of boats	34
Average of annually revenue (MYR)	423,023
Discount rate (%)	5
Benefit Cost Ratio (MYR)	30.62
Net Present Value (MYR)	13,150.6
Internal Rate of Return (%)	35.05

MYR = Malaysia Ringgit

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9

Conclusions

From this study, it is suggested that the ARs needs to be stringently managed and monitored to ensure sustainable harvests. Severely regulations and enforcement must be in position and be practical to avoid any destructive fishing practices that can harm the resource in the long run as this project do grant profitability to the fishers not only by income but also to an increase in catch volume which is to 'big believe' where it may swathe the demand of fish in Malaysia.

"SALAMAT / THANK YOU"

UNIVERSITI PUTRA MALAYSIA

COMMUNITY-BASED MANAGEMENT APPROACH AT WORK IN THE MUAN WETLAND PROTECTION AREA: CHANGING PERCEPTION, CHANGING PRACTICE AND CHANGING POLICY

Ji Young JANG and Young Rae CHOI
Eco-Horizon Institute, 426-13,
Hapjeong-dong, Mapo-gu, Seoul, Republic of Korea
ecojangjy@gmail.com

The Marine Protected Area (MPA) policy of the Republic of Korea has rapidly evolved since 1999, when was enacted the Wetland Protection Law, the first MPA supporting legal arrangement. The first coastal Wetland Protection Area (WPA) then was established in 2001 along the tidal-flat of Muan. Although the designation process was taken under the consent of local stakeholders, the management of the area has received little attention of local communities and governments until recently. Like all other later-designated MPAs, the area faced challenges such as a low policy priority by local government (thus, insufficient budget and political support), lack of stakeholders' understanding of MPA, and lack of managers which resulted in poor management status even after the designation as a protected area.

Amid the raising dissatisfaction of local communities against the government and their enervated expectations on having an MPA in their own villages, a community-based approach was introduced as a remediation. This approach aimed at two purposes: first, for empowering and benefiting local communities in the MPA management regime and second, for demonstrating the community-based management approach as an effective and successful way for managing protected areas in the national context.

The activities so far focused on changing local communities' attitudes towards nature and MPA policy. Instead of formal biodiversity education programs, a cultural approach that local people make their own lives at the tidal-flat as a folk play was adopted. Their work was presented at a number of art festivals, and eventually not only the site won a nation-wide recognition but also the local participants' pride and valuation of the nature and their living as fishermen were elevated. Successively, the foundation of a village cooperative enabled collective actions and active participation of local communities to various management issues. Other multiple activities such as meetings, seminars and surveys were carried simultaneously with local participation and contributed for

disabusing people of misunderstanding about conservation and MPA.

All these activities for three years made a prominent progress not only for changing people's conception, but are evaluated to affect their behaviors too, which could be seen from the emergence of local people's voluntary actions of patrolling, biodiversity status reporting, and suggestions of management ideas to governments. Meanwhile, these changes at a corner of the MPA affected the local governments' attitudes and behavior as well that the management of Muan tidal-flat has now higher policy priority and is given better institutional and political support.

In the Republic of Korea, where the community-based management approach has not been properly understood as a form of policy, the success case of Muan tidal-flat opens a new way for the improvement of MPA policy. It demonstrates that the local participation should be guaranteed for sustainable MPA management and that a targeted community-unit approach could be effective although those covering larger areas and larger number of people seem more relevant in general. Also the political willingness of local governments, who hold legal MPA management duties, could be gained from bottom, and eventually contribute to the better management of MPA.

Community-Based Management Approach at Work in the Muan Tidal Flat Wetland Protection Area

Changing Perception, Changing Practice and Changing Policy

Ji Young Jang(Eco-Horizon Institute) ecojangjy@gmail.com
Young Rae Choi(Korea Ocean Research & Development Institute) yrchoi@kordi.re.kr

24 Nov. 2009

Contents

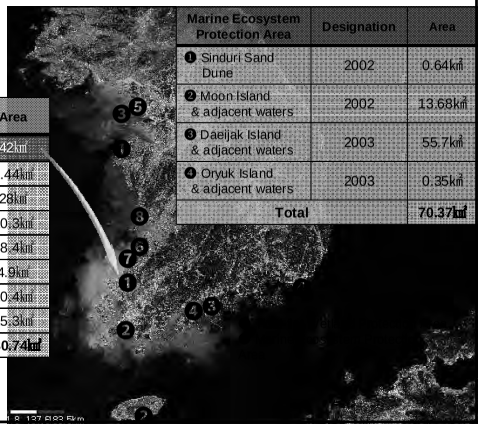
Current Status of Korean MPA Designation

Major Types of Marine Protection Area(MPA) in Korea

1)Tidal-flat Wetland Protection Area (WPA)
2)Marine Ecosystem Protection Area (MEPA)

Tidal-flat Wetland Protection Area	Designation	Area
❶ Muan	2001	42㎢
❷ Jindo	2002	1.44㎢
❸ Suncheon Bay	2003	28㎢
❹ Boseong-Beolgyo	2003	10.3㎢
❺ Ongjin-Jangbongdo	2003	68.4㎢
❻ Buan-Julpo Bay	2006	4.9㎢
❼ Gochang	2007	10.4㎢
❽ Seocheon	2008	15.3㎢
Total		180.74㎢

Marine Ecosystem Protection Area	Designation	Area
❶ Sinduri Sand Dune	2002	0.64㎢
❷ Moon Island & adjacent waters	2002	13.68㎢
❸ Daeijak Island & adjacent waters	2003	55.7㎢
❹ Oryuk Island & adjacent waters	2003	0.35㎢
Total		70.37㎢



Social Background of Muan WPA Designation

1997: Ramsar Membership of Korea & MPA Policy Initiative

- Importance of Korean tidal-flats, especially as waterbird habitat, was recognized
- ⇨ Raised awareness initiated tidal-flat conservation policy, incl. MPA policy

1998: 4th Stage Youngsan River Reclamation Project Cancelled

- Large-scale agriculture-purpose reclamation of 390 ㎢ was planned in 1979 Project was cancelled after strong opposition of local communities and NGOs

1999: Establishment of Wetland Conservation Act

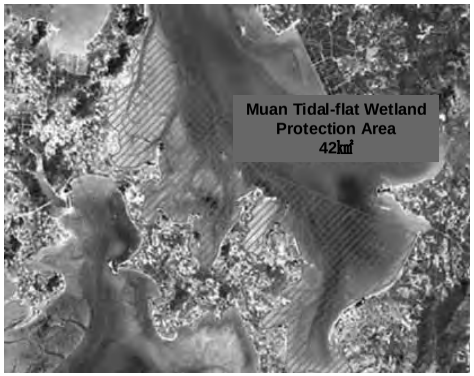
- Enactment of the Wetland Conservation Act provided legal foundation
- ⇨ Tidal-flat [illegible] support

2001: Muan Tidal-flat, Korea's First WPA Designation

- Value of the site was recognized both by the government and communities
- ⇨ Muan Tidal-flat was further designated as a Ramsar Site in 2008

Current Status of Ecosystem of Muan WPA

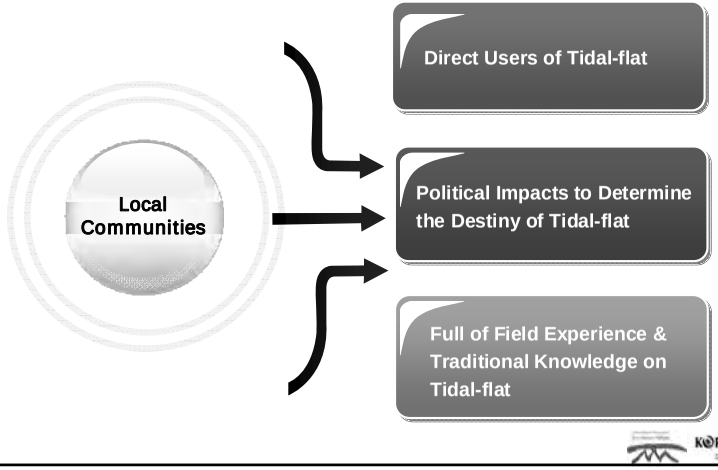
Macro Benthos 208 species, Birds 47 sp., Fish 22 sp.,
Halophyte 45sp. are found in Muan WPA



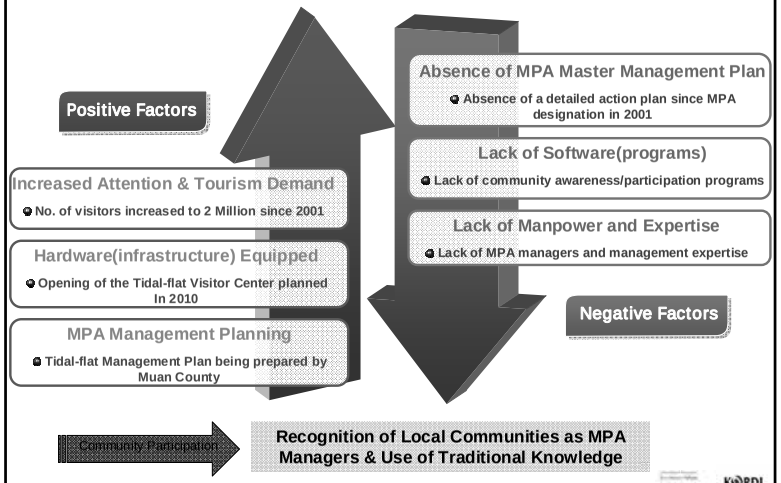
Current Status of Ecosystem of Muan WPA(2)

Macro Benthos 208 species, Birds 47 sp., Fish 22 sp.,
Halophyte 45sp. are found in Muan WPA

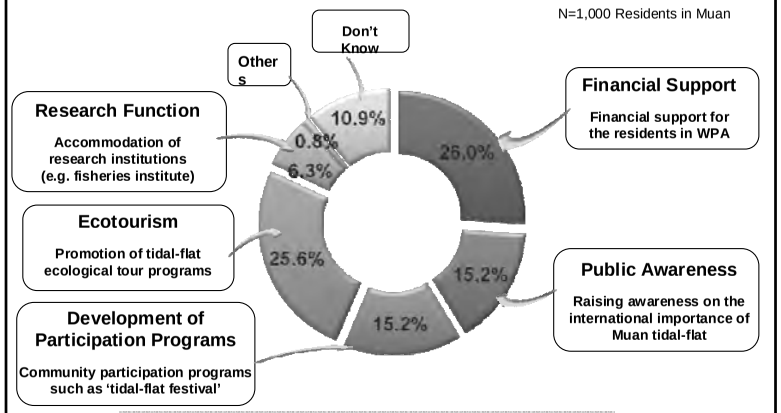
Why is the local community participation important?



Background of Community Participation Project

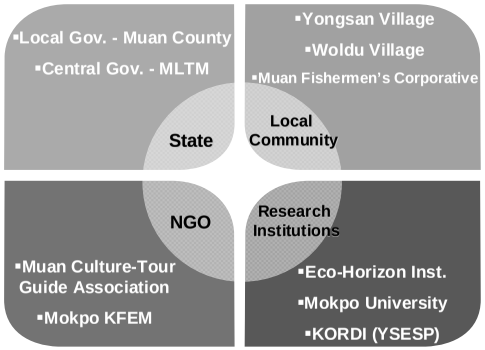


Local Communities Say 'The Most Necessary Support Is…'



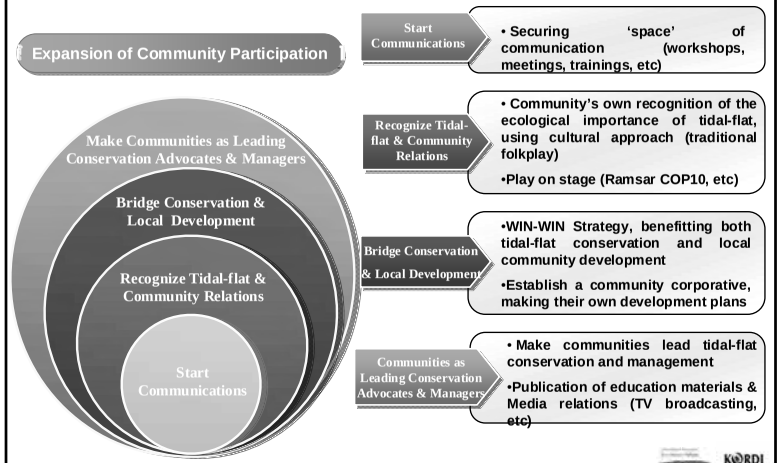
73.1% of The Respondents Requested Community Participation Activities

Muan Tidal-flat Stakeholder Networking



Networking of various stakeholders → **Identification of Potential Resources & Program Development •Implementation**

Muan WPA Community Participation Activities



Muan WPA Community Participation Activities(2)

Implications on MPA management & Future Challenges

Changing Perception → Changing Practice → Changing Policy

Present Outcome

- Past 3 years' activities contributed to the changes in perception of local communities and to the changes in their practices/behaviors
- Local/Central governments recognized the community participation approach in MPA policy
- Public awareness raised on the importance of community participation

Future Challenges

- Village-scale planning, regarding the Korean context of fishermen corporative management regimes
- National-scale tidal-flat ecotourism planning, benefitting both the ecosystem conservation and local economic & social development
- Effective MPA management, and the establishment of MPA center for supporting capacities of local government & people

KORDI

Thank You for Your Attention!

KORDI

WHEN THE CRADLE FALLS: A CASE OF MANAGEMENT FAILURE IN A COMMUNITY MARINE RESERVE IN SOUTHERN PHILIPPINES

Asuncion Biña-de GUZMAN
Mindanao State University at Naawan, 9023
Naawan, Misamis Oriental, Philippines
sony_deguzman@yahoo.com

The Baliangao Marine Sanctuary (BMS) in Danao Bay in Southern Philippines is an example of upscaling an NGO-driven, community-managed marine protected area (MPA) into a National Integrated Protected Areas System (NIPAS) site. The BMS is a 74-ha marine reserve complex composed of a shallow lagoon core area, extensive reef flats, and a narrow fore reef zone. The BMS was established in 1991 by the Pipuli Foundation which organized the Danao Bay Resource Management Organization (DB-REMO), a federation of people's organizations around the bay. In preparation for its exit the Pipuli Foundation empowered the DB-REMO to implement a community-based coastal resource management program around the MPA and the entire Danao Bay from 1998 to 2002 with only nominal support from the local government. The BMS was declared a NIPAS site in November 2000 and a Protected Area Management Board (PAMB) organized in 2002 took over its management. The abrupt change in institutional arrangements, perception of "losing ownership" of the project, and lack of representation to the PAMB had discouraged community stakeholders from active participation in the sanctuary management. Weakened law enforcement from lack of community participation gave way to massive fishing violations inside the MPA in early 2005.

Underwater assessment in August 2005 showed a reduction in hard coral cover, fish species diversity, and fish biomass from their 2001 levels. Average hard coral cover declined from 46.8% in 2001 to 31.2% in 2005. Fish diversity was reduced (by 30%) from 135 species to 94 species inside the sanctuary core area, while that in the reef slope had been reduced by as much as 70% from 93 to 23 species in 2005. Overall fish abundance inside the sanctuary core declined by 54% while the population of target food fish in the reef slopes of the MPA drastically declined by almost 80%. The most convincing proof of degradation in fish communities was the significant reduction in biomass of the target food fish from 35.86 kg $1000m^{-2}$ to 7.14 kg $1000m^{-2}$ inside the core area, and from 3.12 kg $1000m^{-2}$ to 0.06 kg $1000m^{-2}$.

The sad consequences of events leading to this management failure awakened the

PAMB and the municipal government of Baliangao to strengthen efforts on law enforcement around the MPA. The DB-REMO has become active again in guarding the sanctuary. Recent assessments in December 2006 and January 2008 showed that both hard coral cover and overall fish standing stock inside the MPA have improved since 2005, however, this development is still precarious and the MPA management has to remain militant in order to prevent future collapse in management.

These ecological impacts of management failure imply that upscaling a community-managed MPA to a NIPAS site does not always result in improved management and environmental governance. Many of the sites placed under NIPAS are small community reserves that are being effectively managed by people's organizations with support from NGOs and the local government. An evaluation of the NIPAS policy on MPAs in the Philippines is highly recommended.

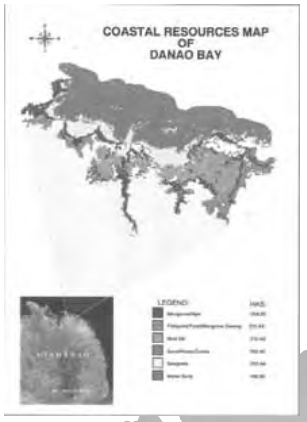
When The Cradle Falls:
A Case of Management Failure in a Community Marine Reserve In Southern Philippines

Asuncion Biña-de Guzman
Mindanao State University at Naawan

The East Asian Seas Congress 2009, 23-27 November 2009
Phil. International Convention Center, Manila, Philippines

Journey of the Baliangao Marine Sanctuary to NIPAS

- 74-hectare mangrove-seagrass-coral reef marine reserve complex
- Located in Danao Bay in the northern shore of Misamis Occidental



Source: NAMRIA Landsat map

- **Brief history & Timeline**
  - Established as a 74-ha Baliangao Marine Sanctuary in 1991 by the Pipuli Foundation
  - Renamed the Baliangao Wetland Park in 1994 with inclusion of 7-ha mangrove forest
  - Declaration as NIPAS site in December 22, 2000, renamed the Baliangao Protected Landscape and Seascape (BPLS)
  - Creation of a Protected Area Management Board (PAMB) on October

Changing Hands

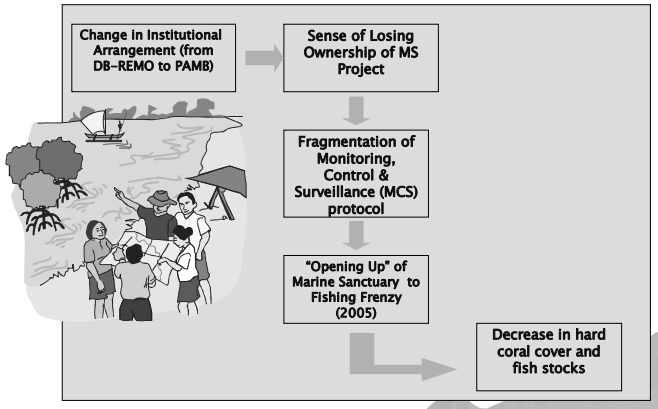
- Change in institutional arrangements
  - Began as NGO-initiated project with municipal support
  - NGO-driven Danao Bay CBCRM program with national/inter'l funding (FPE, SND, VSO, ICCO)
  - Empowerment of the Resource Mgmt Org. (DB-REMO) to undertake mgt after Pipuli exited in 2002

- Changing community perception
  - Sense of 'losing ownership' of the project ➔ growing disinterest ➔ decrease in enforcement
- Small Voice: lack of representation of the community to the PAMB
  - dominated by LGU officials
  - 7 PO's but only one representative to the PAMB

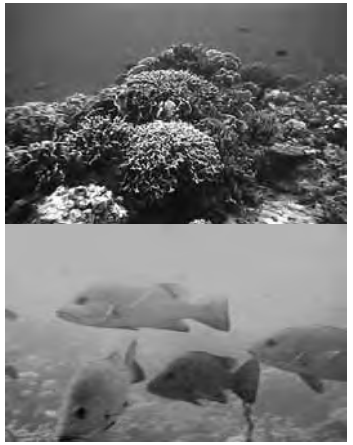
Management Failure

- By early 2005 law enforcement & guarding the sanctuary became fragmented
- Lack of LGU support & security of sanctuary guards
- In March 2005, a "fishing frenzy" by some 300 fishers and gleaners
- PAMB and DB-REMO unable to stop these violations

When the cradle falls…



Decline in habitat and resource quality

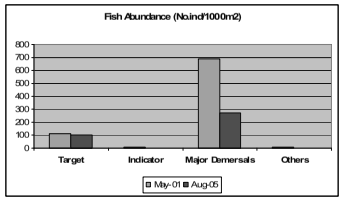


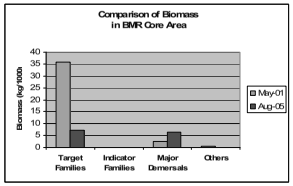
- Decrease in coral cover
- Decrease in fish diversity, abundance & biomass

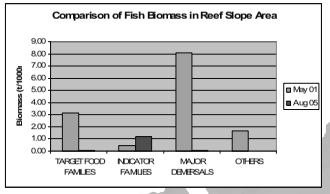
Disappearance of large predators (Lutjanus spp)

Decline in Bio-physical Quality

- decrease in Fish abundance by 80% (core) and
- decrease in Fish Biomass by - %





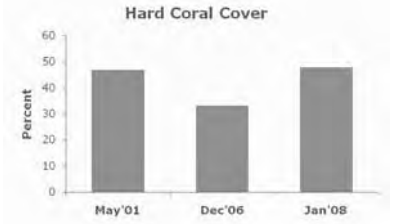


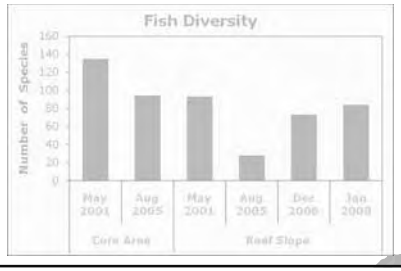
What this adds up to…

- Upscaling of community-managed MPA to a national (NIPAS) site has not been beneficial
  - Has not improved management & environmental governance
  - 'Partnership' between PAMB and community has not translated into co-management of project

- 'Top-bottom' approach "silenced" the community voice and extinguished their enthusiasm
- PAMB also lacks funds to pursue mgt rigorously - has placed enforcement of MPA regulations on the PO
- The PO, having no active support from the LGU, their security continually threatened by violators, became ineffectual in enforcement

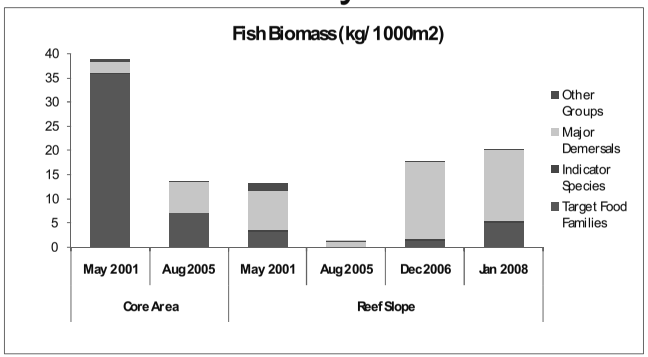
A recent attempt to bounce back





- Results of August 2005 assessment presented to PAMB in September meeting
- PAMB & DB-REMO agreed to measures to reverse the decline
- Improvement in hard coral cover during most recent assessment
- Recovery of fish diversity on reef slopes of MPA

Toward recovery?



- Fish biomass recovered after 2005, but dominated by small demersal fish (Pomacentridae, Labridae)
- Target food fish showed increase after 2006.

Still…the NIPAS Issues persist

- Integrated protected area fund (IPAF) remains 'inaccessible' by the local MPA management
  - Past revenues earned by the BMS part of IPAF; 75% for local MPA mgt but rarely accessed
  - Apo Island - generates millions of revenues each year but only a tiny fraction goes back to MPA mgt due to bureaucracy
- Many small, locally managed MPAs proclaimed as NIPAS sites wish to be

Hard-earned Lessons

- Communities or POs have demonstrated ability to effectively manage their MPAs
- What they need is support from LGU, NGAs, academe, NGOs, etc., capacity building and empowerment
- Upscaling well-managed LGU- or community MPAs to NIPAS level is not necessary in certain cases (e.g. Baliangao MS, Apo Is. MR)
- Moral of the story: "*Do not mend what is not torn, nor fix what is not damaged*"

CONCEPTUAL FRAMEWORK OF ORGANIZING COMMUNITIES FOR EFFECTIVE MANGROVE MANAGEMENT

Josephine P. SAVARIS, Rosalie JOVEN, Rodney GOLBEQUE and Edison ADVINCULA
Zoological Society of London Muzon San Luis Building, Quezon St., Iloilo City, Philippines

Our country today is facing the critical issue of sustainable fishery. Many factors have contributed to the grim situation. What makes the scenario worst is the destruction of the habitat, i.e., coral reefs, seagrass and mangroves.

The loss of mangrove forests to human development projects is a direct threat to fisheries-derived food resources and the health of the environment. Mangrove forests support natural fish production in near shore waters, provide an important nursery habitat for fish, prawns and crabs which are vital food and income sources for coastal communities, and trap sediment from the upland which would suffocate the coral reefs and seagrass beds. Loss of mangroves is a serious concern to people living along the coastline dependent on mangroves for food and economic livelihood. Coastal erosion has made coastal communities vulnerable to losing properties and lives.

The role of organized communities in mangrove management therefore cannot be discounted. Organized groups or People's Organization (POs) provide the formal structure within communities on which decisions and project implementation and sustainability depend upon.

An organizing framework which is being developed by the Zoological Society of London (ZSL) revolves around the Community-Based Forest Management Agreement (CBFMA) will be put to test for the duration of the Community-Based Mangrove Rehabilitation Project in the Philippines. The framework is expected to provide guidance to groups which would embark on similar projects. Likewise the framework is hoped to influence policy makers, NGOs and agencies of the government.

Supported by the ZSL, the 4-year project covers the 4 provinces in Western Visayas, i.e., Iloilo, Aklan, Capiz and Guimaras. ZSL will work closely with the DENR in securing CBFMA for the project sites. The CBFMA is a tenurial instrument which gives communities the right to manage a certain area of mangrove for a period of 25 years.

CONCEPTUAL FRAMEWORK IN ORGANIZING COMMUNITIES FOR EFFECTIVE MANGROVE MANAGEMENT

Josephine P. Savaris*, R. Joven, R. Golbeque, B. Bajoyo, J.Borci, J.H. Primavera

Zoological Society of London
MSL Building, Quezon St., Iloilo City

Background

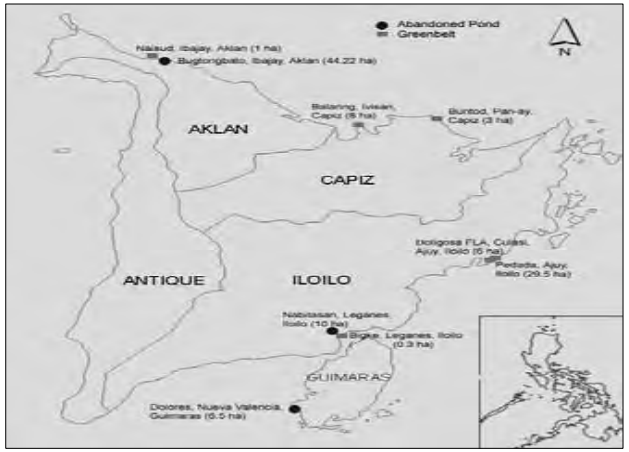
- Remaining mangroves being destroyed
- Disadvantaged coastal communities due to resource pressure resulting to food insecurity, loss of sustainable livelihoods, resource depletion and vulnerability to typhoons
- Loss of mangroves considered direct threat to fisheries resources
- Weak implementation of mangrove legislations
- **Community-based Mangrove Rehabilitation Project (CMRP)** – model to stimulate govt legislation, revert abandoned/ underutilized ponds to mangrove forest for sustainable livelihoods, poverty alleviation, decreased vulnerability to natural hazards

The CMRP project supported by ZSL

- 4-year project in 9 sites located in 6 municipalities in Panay and Guimaras
- Project objectives:
  - ✓secure CBFMA
  - ✓rehabilitation of **abandoned, underutilized and undeveloped fishponds**, and degraded nipa stands
  - ✓supplement community livelihoods
  - ✓re-establish legally mandated **greenbelt** along the coast
- Project goals: increased food resources and livelihood income, and coastal protection
- Key partners: DENR, BFAR, LGUs, Academe/schools, POs, Fishpond operators, civic groups

Sites of Community-Based Mangrove Rehabilitation Project

Panay and Guimaras Islands, Central Philippines



CO Framework for mangroves

Identifying mangrove issues and problems

Gathering for firewood

Weak law enforcement

~~CBFMA~~

No security of tenure

Conversion to fishponds

Identifying mangrove issues and problems

Mangroves destroyed for development projects (Iloilo Flood Control project)

Illegal settlers

Identifying mangrove issues and problems

Coastal erosion

- Identifying issues and problems
  - abandoned fishponds not reverted back to mangroves
  - families need cash for survival
  - poor appreciation for mangroves economic value
  - powerless communities

CO Framework for mangroves

- Defining strategic interventions

  - ❑Rehabilitation
  - ❑Community led
  - ❑Organization and strengthening of POs
  - ❑Livelihood supplementation
  - ❑ Partnership

CO process

- **Phase 1 – 8 to 12 months**

  Preliminary – team convergence and site selection

  Socio-eco

  – project orientation, MOA signing, Local Research Assistants PRA training/ data gathering, community socio-eco profile, PO formation and registration, organizational diagnosis, cross site visits, CBFMA orientation, clarifying FLA status, IEC

  Biophysical

  – Survey/ mapping of planting areas, water quality baseline data/ mangrove community structure, mangrove biology/ecology training, establishment of community nurseries, direct planting, rehabilitation planning

Mangrove ecology training

Delineating planting area

Cross site visit

MOA signing

CO process

- **Phase 2 – 10 to 24 months**

  Socio-eco

  – leadership training, PO systems & policies, CBFMA preparation and submission to DENR, survey of existing economic activities/ pilot testing for feasibility, project proposal development/ resource mobilization, orientation/training on gender and family planning, IEC, lobbying/passage of mangrove policies

  Biophysical

  – nursery maintenance, community planting, monitoring plant growth and survival, tagging, monitoring water and soil quality, rehabilitation plan review

Bagging

Planting with students

Nursery establishment

CO process

- **Phase 3 – 20 to 36 months**

Socio-eco

- PO meetings, lobby and advocacy, affiliation with other groups, mainstreaming PO agenda with LGU, DENR awarding of CBFMA, Community Resource Management Framework (CRMF) and Annual Work Plan development, livelihoods skills training/actual implementation, resource mobilization, benefit sharing scheme, Bantay Kalikasan training , IEC

Biophysical

- continue nursery, planting and monitoring with active community involvement, feed back water and soil quality data, rehabilitation plan review, community documentation of species/area planted, survival

CO process

- **Phase 4 – 30 months onward**

Socio-eco

- phase-out planning, PO projects evaluation/assessment, start yearly review of CRMF and AWP with DENR, PIME training, continue conduct of PO meetings, lobby and advocacy work , forum on PO best practices and learnings, IEC

Biophysical

- community review of rehabilitation plan, establishment of community system on monitoring and recording , continue community planting activities with various groups involvement

Challenges

- Need for community to sustain rehabilitation activities/ advocacy
- Abandoned pond- mangrove reversion process
- Securing tenurial instrument
- Sharing responsibility with LGU
- Improving socio-economic conditions
- Mitigating climate change

Thank you!

Century old mangroves in Ibajay

INDIGENOUS APPROACHES TO ACCESS, CONTROL AND PROTECTION OF COASTAL RESOURCES: A REVIEW OF SOME PHILIPPINE EXPERIENCES

Elmer FERRER
University of the Philippines, College of Social Work and Community Development (UP-CSWCD)

This paper will review several indigenous practices among traditional fishing communities in the Philippines in using, controlling and protecting the coastal resources.

The review will examine how traditional fishing communities in Batanes, northern Philippines and in Palawan, southern Philippines try to live in harmony with nature by a) harnessing the ecological knowledge of fishers, b) observance of taboos and the performance of rituals, c) observing economic arrangements to protect environment and the implementation of organizational rules formulated by the association of users.

The paper will also highlight the challenge faced by indigenous practices and institutions in a fast modernizing world.

Indigenous Approaches to Access, Control and Protect Coastal Resources: A Review of a Philippine Experience

Elmer Ferrer
Professor
University of the Philippines, College of Social Work and Community Development (UP-CSWCD)

Introduction

This paper will review indigenous practices in a traditional fishing community in northern Philippines in using, controlling and protecting its coastal resources – the "*vanua*" (Mangahas 1994).

The review will examine how a "*mataw*" fishing association in Batanes, northern Philippines try to live in harmony with nature by a) harnessing the ecological knowledge of fishers; b) observance of taboos and the performance of rituals; c) observing economic arrangements to protect environment and the implementation of organizational rules formulated by the association of users.

Project Site

- The site of this study is in the municipalities of Mahatao and Basco, Batan Island, Batanes. The Batanes Islands is composed of ten small islands found in the northernmost part of the Philippines.
- It is bounded by the South China Sea to the west and by the Philippine Sea and Pacific Ocean to the east.

- This brief review describes the beliefs and practices of fishermen in the Batanes Islands known as "*mataws*" who are engaged in the capture of seasonal flying fish.

- Mataw fishing is an indigenous fishing tradition - ”a particular way of deriving a living from the sea” that integrates i) harnessing the ecological knowledge of fishers; ii) observance of taboos and the performance of rituals; iii) observance of economic arrangements to protect environment and the iv) implementation of organizational rules formulated by the association.

Harnessing the ecological knowledge of fishers

- Local knowledge system of organizing perception of the nature of the relationship between humans and the environment and among members of the community;
  - High respect for the environment
  - Communal cooperation
  - Belief in the sacredness of relationships

Observance of taboos and the performance of rituals

- The rights to fish and use the “*vanua”* safely are gained by conducting an exchange through ritual sacrifices with the anitu or invisible spirit beings;
- The vanua becomes a sacred area for the duration of the fishing season and fishing success is explained within a framework of purity and pollution;

Rituals as tools for resource management

- While natural resources are God’s gift, the indigenous peoples consider deities as well as environmental and ancestral spirits as owners of the natural resources. Because of this, users need to consult them.
- Consultations take the form of rituals, which may include chanting, singing, dancing, praying, killing of animals e.g., chickens and pigs, wine drinking, and food sharing during communal meals.

- One result of rituals is the declaration of an area as a sacred site. As a result, sacred places become “de facto” protected areas.
- Rituals as symbolic expressions of the relationships between human beings and nature bring people and nature (land, water, wind, moon, stars, etc) into personalized relationships.

- Through this process, nature take on human characteristics which bring about a sense of familiarity and certainty over natural resources that otherwise would be nameless, unfamiliar, impersonal and difficult to work with.

Observing economic arrangements to protect environment

- Reciprocity and mutual help arrangements are the traditional base of Ivatan economy. This is partly because cash is scarce in Batanes.
- A person might give a mataw onions or a sack of rice at the onset of the fishing season which the mataw will try to reciprocate at the end of the season.

- The seasonal mataw fishing activity is closely integrated with farming which is a year round activity. Mataws, who are also farmers, contract with individuals to watch over their cattle or livestock and fields to enable them to concentrate on fishing during summer.

rules formulated by the association

- Mataw organizations regulate access and exploitation of resources within the vanua and traditional fishing grounds, under the leadership of the ideal fisherman who makes the first fishing trip for the season and who has the power to ritually set precedents for the season.

- The main objective of the vanua organization "is to protect the mataw fishing endeavor- to have a good season of fishing with as few accidents as possible.
- Mataws must organize to prepare the vanua for the fishing season, to perform communal rituals for the benefit of the entire group, to assist one another in case of emergency, and to resolve conflict among members.

- One important function of the vanua group is to formulate rules and regulations for fishing. The rules concern the behavior of the mataws, many spell out taboos and penalties for violations.
- The responsibilities of members of vanua associations include participation in meetings. If a mataw will be absent for urgent reasons he must send his wife or some other preson to proxy for him.
- Mataws are bound to help one another in case of accidents like capsizing, and in bringing their boats ashore.

- Mataws who break taboos has to provide the sacrificial animal to be used in "cleaning" the vanua.

Summary

- In summary, in order to access, control and protect its fishing ground, "*mataw*" fishing an indigenous fishing practice integrates 1) tapping/harnessing the ecological knowledge of fishers; 2) observance of taboos and the performance of rituals; 3) observance of economic arrangements to protect environment and the 4) implementation of organizational rules formulated by the association.

Part 3: Institutionalizing community-based efforts in habitat protection, restoration and management within an ICM framework

8. Panel Discussion Summary

Part 3, together with the Chair, Prof. Matsuda (Hiroshima University) and panelists, Prof. Yanagi (Kyushu University), Dir. Anne McDonald (UNU-IAS OUIK) and Prof. Elmer Ferrer (University of the Philippines) composed as the members of the interactive session wrap-up exploring institutionalizing community-based efforts within an ICM framework.

Before proceeding to the main topic of discussion, the Chair requested Prof. Yanagi, for comments and to the participants, for questions that they may have in the oral presentations during the morning and afternoon sessions.

Prof. Yanagi recalled that during his presentation, a question on any conclusive result of combining indigenous local wisdom in Japan was asked. Two examples were given based on Prof. Yanagi's experience working with the fishermen on clam culture and the seagrass rehabilitation. Examples wherein the cooperation of fishermen and scientists was very visible. Partnerships with fishermen, scientists and government for the success of the rehabilitation/restoration activities were highlighted

Specific example was given, in the central part of Japan. The local action of the fishermen union developing the clam culture system of juveniles with the technical assistance from the scientists was cited. Scientists provided technical knowledge on the procedures and proper way to do clam culture. As the fishermen and scientists worked together, clam culture system was established in the area. With the acquired knowledge, the fishermen union can do the culture by themselves. The fishermen union coordinated with Ministry of Transportation of Japan to provide them with dredged sand which they can use and spread in their tidal flats where they cultured clams. The success of the clam culture created jobs and increased of income of the fishermen. As a result, this gave inspiration to young generations of the fishing communities to return to their villages, hence, outmigration problem in the village was also addressed. The cooperation of fishermen and scientists in the area just show that both can work together to increase the clam harvest, increase income and get rid of outmigration of young generations in the village.

The restoration/rehabilitation of seagrass beds done by both the fishermen and scientists was the 2nd example. The Seto Inland Sea seagrass/eel grass beds declined drastically in the past years. With the decline of the seagrass beds, fishermen also observed decrease in fish catch. The above problem, made the fishermen union very eager to do the seagrass restoration and cooperate with the scientists who provided technical advice on the proper way on how to do it. After 10 years, fishermen noted the success of the restoration activities with the assistance from the scientists. There was

an increase in set net collected fish like red sea bream. Increased swimming crabs, and squids also were observed by the fishermen.

Dir. McDonald was given time to continue her presentation on the Sub Global Assessment (SGA) and Sato-umi initiative in Ishikawa. The presentation started with giving the visual words of Satoyama and Sato-umi. A photo showing the very traditional Satoyama in Noto Peninsula with all the landscapes and communities was presented. Below are some points discussed;

1. Three (3) possible ways in defining Satoyama based on Japan SGA, a.) to define Satoyama as traditional landscape which is understood mainly by Japanese; b) to modify the language or definition into a more global audience with emphasis on the socio-ecological production landscapes; or c) whether to expand the concept to include the areas beyond inland water bays.
2. SGA is not only the ecosystems' provisional/regulatory and supporting services, but also cultural services. Lessons from the past which reminds traditional rural societies knowledge, i.e. fishing, farming activities by the coastal communities up to the mountain communities is also an interesting aspect in this undertaking. The mosaic fusion between the traditional ways and approaches and modern science are valuable, while learning the kind of knowledge that was passed on from generation to generation is also important.
3. Satoyama initiative has to preserve old traditional landscapes in environmentally sound manner. The land-based activities and their impacts to the marine ecosystems has to be considered in looking into the interlinkages of Satoyama and Sato-umi. As an example, the Senmaida in Noto Peninsula which is a beautiful rice terraces paddy. Currently experiencing depopulation, abandonment and lack of human intervention. Heavy chemical, fertilizers and pesticides were used to maintain aesthetically the very beautiful terraces as a traditional landscape which is not environmentally sound.
4. Establishing the link between traditional knowledge of forest management and coastal communities. The Sato-umi assessment also looked into how the people in the communities along the Noto Peninsula utilize the marine resources and how they are connected to forest management, with small-scale saltmaking as an example. It currently links with the climate change, as well, considering that traditional knowledge might help develop adaptation policies and approaches to address the impacts of climate change. It was emphasized that integrating science and traditional knowledge from the local communities may provide solutions to that above problems.
5. The last discussion pointed to some initiatives in Hegura Island where the Amasan (women divers) community thrives. Researches on the natural vegetation,

archaeological, land and marine ecosystems was conducted some 50 years ago by Hokkoku Newspaper, a local newspaper in Japan in collaboration with Kanazawa University. A follow up research is currently conducted by Hokkoku Newspaper with the UNU-IAS OUIK, to determine the changes in the environment both the terrestrial and marine ecosystems, and the livelihood of Amasan. The study showed that lives of Amasan haven't change much, emphasizing that although this case is minor and not a mainstream example of fishing communities, this marginalized communities might hold some of the secrets how to combine traditional knowledge and approaches to coastal resources use and management, and modern science, as well.

Questions and comments/open forum from the previous sessions;

1. Seagrass transplantation using the algal mat presented by Prof. Maegawa was the interest of the participant from Philippines who has been doing seagrass transplantation. Prof. Maegawa (Japan) recommended seeding method is the better method to restore seagrass beds.
2. A question on the use of iron and Artificial Reefs (ARs) was asked citing that in the Philippines, the use of iron was discouraged because iron corrodes and the need for ARs to increase fish catch was stressed. Dr. de Guzman (Philippines) made comment that a moratorium was issued discouraging putting in ARs, unless those ARs that are already in place have been well studied. Researches to establish if the impacts on putting in ARs are really more on the positive than on the negative side was pushed by scientists. However, after the issuance of moratorium, there were still some efforts in putting in ARs. In the plenary talk of Dr. Gomez, he mentioned that there are already very established advanced methodologies on coral reef restoration. It was the opinion of Dr. de Guzman that if it comes to a choice between natural coral reef rehabilitation and ARs, she strongly recommended not subscribe to ARs, where it's possible to do coral reef management.
3. On the integration of Satoyama and Sato-umi was asked by Maida (Philippines), citing that in the Philippines, this concept is also known as “ridge to the reef”, “watershed management or catchment management”. Some projects have initiatives in both the Satoyama and Sato-umi but the question was, whether it is safe to say that there is already an “integration” or is there something more than just initiatives of upland and downstream.

   Dir. McDonald (Japan) responded to this question referring to the experiences of the Ishikawa Prefecture, who are trying to ensure the linkage and worked with river networks as well. The Satoyama Sato-umi project also worked with the communities and policy makers whose policies impact and/or affect the communities, and

empower stakeholders to be part of the initiative. This ensures integration on the ground while at the same time integrating the policy designing, as well. At present, at the Ishikawa Prefecture, meetings are going on to discuss and formulate Satoyama Sato-umi biodiversity strategy looking closely at ecosystem services fee system, similar to that forest environment tax of the Prefecture. Discussions are going on to explore the possibility of moving beyond not just forest tax by implementing Satoyama Sato-umi tax. This ensures that efforts are moving on that interlinkage and integration from the mountains to the oceans.

4. Reviewing the different ICM approaches in Asia or in the whole world, some principles and approaches in Sato-umi are very much similar to some approaches or traditional practices or community-based approaches in the Philippines. As a follow-up question posed by Maida (Philippines) was whether, the Philippines is already doing Sato-umi but it is just termed differently or whether Sato-umi has a special or unique element that Philippines doesn't have.

The Chair emphasized that the definition of Sato-umi is a big theme in this case, since official definition of Sato-umi is not yet in place. Prof. Yanagi, added that even in Japan, there is no standard definition of the Sato-umi concept citing the differences between Ishikawa and Seto Inland Sea. The situation in Philippines and Japan are also different. Prof. Yanagi further emphasized that the key terminology are twofold, i.e. “high biodiversity” and “high bioproduction”. These two phrases must be included when defining Sato-umi, but concrete definition maybe different from place to place.

Part 1 Session Summary (Prof. Yanagi)

1. That Sato-umi is defined as coastal sea with high biodiversity and high bioproductivity systems and adequate human interaction.
2. Emphasis on the role of fisherman's union as guardians of the seas and other stakeholders in habitat restoration of tidal flat and seagrass beds, coral reefs and mangrove ecosystems resulted to increased biodiversity, or bio-capacity.
3. Creation of new habitat or biotope or marine biota in the coastal ecosystem is essential to attain high biodiversity and high fish production, and implementation of adequate and indigenous fish resources management have been discussed.

The following were the recommendations of Dr. Yanagi;

1. ICM is the creation of new marine habitat. Successful ICM can only be possible in a coastal and marine area with good water quality which can only be attained with the implementation of an integrated management of the material flow from the mountain,

river to the coastal sea; and
2. Only environment-friendly activities should be developed and implemented to be able to realize a comprehensive management of the material flow.

Conclusion;

The “high biodiversity” and “high bio productivity” in Sato-umi result to improved quality of life of the local people. Effective implementation of Sato-umi in East Asia requires science, research and development, and culture. Specifically recognizing the relationship between human and nature, and traditional communities.

Part 2 Session Summary (Dir. McDonald)

1. There is no single answer or locally-based approach or community efforts to protect, restore and manage the key habitat. One important consideration is to look into cultural diversity of the different regions of Asia and determine how cultural foundations contribute to the management of the ecosystem
2. All the presentations brought in the different perspectives of the different approaches that the communities in Asia can share throughout the world. Successes, failures and challenges, balancing with science and technological innovations while maintaining traditional knowledge and local wisdom are some elements for a sustainable model of habitat protection.
3. It is extremely vital to take cultural and biological diversities, and the models and approaches of sustainable resource management and conservation, to the global stage. Sharing the Asian perspectives, approaches and methodologies, and beliefs to the global community was likewise recommended.

Comments from Prof. Ferrer

1. The presentations were pioneering and daring because they are challenging ICM. Pioneering because there is such thing as political economy of knowledge production. Prof. Ferrer stressed that knowing how ideas become dominant or are mainstreamed, therefore, it is important that dominant ideas are challenged and engaged with, so that an effective and more efficient practice is institutionalized.
2. In reference to Prof. Ferrer's comments creating Sato-umi within the discourse of ICM, he reiterated his point that approaches are frameworks. Approaches are paradigms, and not methods nor tools. ICM before was a planning tool to reconcile the conflict between the legal frameworks. In the Philippines for instance, the Bureau of Fisheries and Aquatic Resources (BFAR) wanted to establish more fishponds because of their mandate which is food production BUT, the Department

of Environment and Natural Resources (DENR) wanted to preserve the mangroves. So, because of the conflict of the policy, ICM was instituted to resolve the conflicts. However, in the course of time, ICM became an approach because, for one, it talks about empowerment and the appreciation of local knowledge.

3. To produce a homogenous ICM framework calls for, a.) biological and cultural diversities, b.) diverse frameworks to address diverse situations, and c.) rediscovery of knowledge by utilizing wisdom in the past to build on earlier activities.
4. Sato-umi can be describe as, “humanizing nature and naturalizing humans” based on the framework defined by Prof. Yanagi. This phrase captures what Sato-umi concept is trying to achieve. To protect and conserve our nature, one must fully understand and utilize the biological, natural and cultural/spiritual wisdom
5. Resources management is a healing process and nature heals itself naturally, if given the opportunity. The Sato-umi is a very important concept because it does not separate nature and human beings. Oftentimes, people are blamed as the causes of resources deterioration. In the Sato-umi concept, the process of healing can be addressed bringing in the nature and people, or reconcile the relationship between the people and the environment. So, the nature with human being can self heal or can attain the so-called “self organizing processes”. Sometimes, the healing processes can not be done biologically but can also be stimulated spiritually, therefore, religious wisdom has to be discovered.
6. Prof. Ferrer suggested to continuously discover new paradigms or rediscover some of the wisdom that have been or have declined. This suggestion was the offshoot of Dr. Ukita's talk about the network of ecosystems integration of Satoyama and Sato-umi. His findings show the declined industry in the upland resulted to declining fisheries in the coastal areas. The above basic processes can be called by any other names not just confining to ICM.

Open forum/discussions

1. According to Dr. Ukita, in the development of Satoyama Sato-umi it is very important to change the the lifestyle and philosophy as in the Bali experience on the Tri Hita Karana.
2. Prof. Ferrer agreed that change in lifestyle is critical element in resources management and the key in addressing issues. Oftentimes, it has been quoted as “be the change you want to be” therefore the real change should start from every one and all. Prof. Ferrer discussed the case of Mataw fishing in Batanes, Philippines which is an isolated place and perhaps protected because of isolation. However, being connected is also important. The idea of social energy was discussed.

3. Dir. McDonald stressed that standardized monoculture approaches sometimes the cause of the problems. A way forward achieving a sustainable societies is to explore for more diverse approaches and models, and referring to the diversity and framework and approaches from the past. This can be done by integrating the past and the present, and create a harmonized existence between nature and human, or as Prof. Ferrer referred to as “humanizing nature and naturalizing humans”. The Satoyama and Sato-umi concept is trying to bring to the global discourse Japan's local diversity of approaches. The combination of traditional knowledge and approaches that Japan might still have in Satoyama and Sato-umi communities, and modern science will be highlighted. She also mentioned the paper on “When the Cradle Falls” which presented and reflected on to some failures and weaknesses, and limitations in working towards sustainable models.
4. Dr. Dewa of Indonesia reiterated the Tri Hita Karana case to show paradigm change, the way of thinking and the way of life to be able to cope with the problems. Local wisdom or “Tri Hita Karana” is strongly kept and maintained by the local communities. He further explained that Tri Hita Karana is incorporated in the curriculum from elementary to the university levels and several activities related to this concept has been implemented. Dr. Dewa recommended that, to elaborate the scope of Satoyama Sato-umi, an instrument to support this concept should be in placed to make the concept easily understood by everybody. The Chair stressed that, with the environmental education presented, similar curriculum maybe an added point in implementing Satoyama and Sato-umi concept.
5. Prof. Ferrer suggested to use metaphors in defining concepts. For example, the essence of Sato-umi is “humanizing nature and naturalizing humans”. Metaphors may also be used to describe the phases of community organizing, as presented in one of the papers. It was emphasized that, although it's sometimes difficult to define, people have to create their own symbols to use. He recommended not to confine the understanding only to the words used but metaphors/symbols can also be utilized.
6. There was a concern on the possibility to use “maximized diversity and maximized productivity” in the Sato-umi definition, instead of “high biodiversity and high productivity”. The concern came out because there exist Sato-umi in urban areas. The Chair stressed that this concern is an important point to consider in defining Sato-umi.

Remarks from the Panelists

Prof. Yanagi;

The people who can protect the sea, are people who works in the sea. As a scientist,

helping the fishermen by sharing knowledge is a priority and considered an incentive to Sato-umi. The activities related to Sato-umi has to be continue, not only working on its definition but also identify the necessary activities and technologies to establish Sato-umi. Moreover, Sato-umi will be continuously studied based on the discussions and pointers generated in this Sato-umi session.

Dir. McDonald;

Dir McDonald stressed that the keys to the future are really in our past. The Sato-umi session not only looked into what can be learned from the past in order to build for futures, but also tolerance and diversity. She also mentioned CoP10 on the Convention on Biological Diversity will be held in Nagoya, Japan in October 2010. The meeting will address issues and concerns about cultural diversity and how to bring biological and cultural diversities together to build and achieve a sustainable society. In general, the Sato-umi session made some diverse paths that Asia may take to many different venues, discussions and dialogs both locally, regionally and globally.

Prof. Ferrer;

Prof. Ferrer emphasized that one important things for us in order learn, is "how we do things". He cited Dir. McDonald who mentioned that their efforts to do the SGA, things like, where and when you meet are very important details. While some people finds that learning actually takes place faster and more effective in small groups and informal settings. Dr. Ferrer hoped that in the next conference the above pointers to organize things could be taken into consideration. Appreciative inquiry is also important consideration in learning.

CONCLUSIONS

The key conclusions derived from the Sato-umi Session are as follows;

1. Part 3 recognizes that in order to attain the objectives of Sato-umi, it is important to understand the concept and process, the options for actions, and the institutional and organizational arrangements. Effective implementation of the Sato-umi concept can only be achieved through a combination of holistic measures including integrated management and planning, environmental education/awareness, training and research, among others. It is important that management should involve the local community, and that coordination among different sectors be given priority.
2. Noting on the discussion on Sato-umi definition, the following are some concerns raised:
   a. The use of metaphor to define Sato-umi would be an option if the concept can not

be easily describe in words.

b. The description Sato-umi in urban areas must also be taken into consideration.

c. Policy framework or other instrument to support Sato-umi concept must be in placed.

3. The fishermen's union efforts predominantly on rehabilitation and development efforts was noted, as well as the need to increased application of cross-sectoral approaches to coastal planning and management.
4. It also recognizes the contribution of traditional knowledge to ecosystem management and practices. The knowledge and wisdom have allowed people to live in their natural surroundings throughout the history.

Rapporteur of Part 3
Rosalejos-Edpalina RIZALITA, Ph. D
UNU-IAS Operating Unit Ishikawa/Kanazawa, Japan

Conclusions and Future Direction

9. Conclusions and Future Direction

Some conclusions of the workshop include the following.

It was recognized that long term cooperation mechanisms among local communities, scientists, private sectors, local and central government are necessary to ensure sustainable use of coastal and marine resources.

The “Sato-umi Workshop” stressed the need to explore diverse community-based approaches in protecting, restoring and managing key habitats which integrate traditional ecological knowledge, local wisdom and cultural beliefs. Combination of modern science and traditional ecological knowledge in coastal communities was identified as critical.

As coastal communities are faced with increasing habitat degradation and loss, “Sato-umi” concept and practices were recognized as providing an opportunity to restore the relationship between human and nature.

The workshop highlighted that participatory and community-based activities to restore and rehabilitate deteriorated ecosystem was an effective mechanism to encourage the community and other stakeholders to take part in the conservation and management to their own resources.

While, recommendations on “Sato-umi” concept, indigenous knowledge and community-based approaches might be as follows.

- Integrating science into management decisions and managing habitats through application of biological information from all available data sources
- Recognizing the importance of ecological networks from forest to sea including human dimension
- A comprehensive management of the material flow from mountain-farm-river to the coastal sea for successful ICM
- Managing coastal habitats by increasing public awareness, adopting appropriate legislation and enforcement,
- Coordinating across sectors to improve governance and efficiency, and addressing transboundary issue

In close relation to “Sato-umi”, ecosystem-based management (EBM) and community-based management (CBM) were also discussed in the EAS-Congress within the framework of ICM. Since “Sato” means community and “Sato-umi” focuses on human-nature relationship, “Sato-umi” can be a type of diversified CBM. “Sato-umi” is also focusing on biodiversity and biological productivity, and therefore, “Sato-umi” can be a part of EBM. Besides, combination of “Sato-yama” and “Sato-umi” can be a type of ICM including both land and sea. Similarities and differences among “Sato-umi”,

CBM, EBM and ICM should be made clear with easy-to-understand manner in near future. Result of Satoyama-Satoumi SGA may support these understandings from the internationally accepted viewpoint of Millennium Ecosystem Assessment (MA) frame.

As a result of “Sato-umi Workshop” of EAS-Congress 2009, understanding of “Sato-umi” deepened in relation to indigenous knowledge and community-based management in Asian countries. Next possible step of “Sato-umi” in the international context might be as follows.

As you know, the year of 2010 is the UN year of biodiversity. In addition, COP10 of the convention of biodiversity (CBD) will be held in Nagoya, Japan in October 2010. Since “Sato-umi” is a concept including conservation and restoration of biodiversity, CBD-COP10 will be a good opportunity to introduce “Sato-umi” and related activities to broader part of society in the world in particular to policy maker and planner of environmental conservation. In order to connect the result of “Sato-umi Workshop” of EAS-Congress 2009 to CBD-COP10, International EMECS Forum will be held on February 10, 2010 in Kobe, Japan with the theme of “Sato-umi and Biodiversity Activities in Asia and Activities in Japan”.

In CBD-COP10, Satoyama-Satoumi SGA report focusing on ecosystem services of “Sato-yama” and “Sato-umi” will be presented in which role of “Sato-yama” and “Sato-umi” on the conservation of biodiversity will be made clear. “Sato-umi” related symposium organized by Ministry of the Environment focusing on conservation and restoration of marine biodiversity is also expected to be held in CBD-COP10.

As perspective after CBD-COP10, in the 9th International EMECS conference which will be held in Baltimore of USA in 2011, it is expected that international status of “Sato-umi” from the viewpoint of natural and social science will be established. In the 4th EAS-Congress which will be held in Yosu, Korea in 2012, results of “Sato-umi” and related activities will be presented in more complete manner from theory, framework to achievement and how effective is “Sato-umi” as an unique management tool in relation to ICM frame. For future perspective of longer time range, expansion of “Sato-umi” concept and its implementation all over the world will be expected.

Chair of the Workshop
Osamu MATSDSA, Ph. D
Professor Emeritus, Hiroshima University, Japan

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SATO-UMI WORKSHOP

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